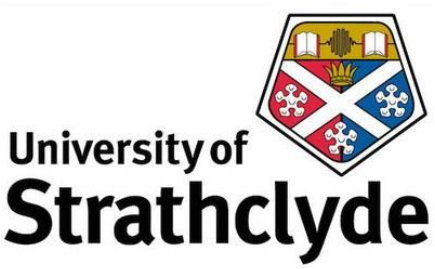

A Spoonful of Sugar: Dietary Advice and Diabetes in Britain and the United States, 1945-2015

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This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

Signed: Rachel Meach

Date: 7 February 2022

Abstract

In 1924, Haven Emerson, professor of preventative medicine and former health commissioner for the city of New York, along with his colleague Louise Larrimore, published the results of the first major epidemiological study of diabetes. The study found a wide range of factors associated with diabetes, including; race, affluence, lack of physical activity and changes in dietary habits, in particular a growing abundance of all foods. Overall, the findings suggested that diabetes was influenced considerably by social, economic and environmental factors. Despite these findings, governments, the medical profession and academics have predominantly focused on drug development and have tended to favour pharmaceutical responses to the disease, despite the fact that only 10% of diabetes (Type 1) is treatable with insulin. In contrast to this medical focus, this thesis adopts a social and cultural analysis of chronic disease in the twentieth century which considers the idea of Type 2 diabetes as a 'disease of civilisation', linked to societal changes, such as: the development of agriculture, industrialisation, dietary changes linked to advances in the food industry and the growth of the pharmaceutical industry and its consequent power to determine how disease is defined and treated. Using oral history testimonies this thesis outlines the changes in dietary recommendations received by diabetic patients against the backdrop of these changes occurring throughout the course of the twentieth century. Through this lens, this thesis places the current epidemic of Type 2 diabetes in historical perspective, illuminating the ways in which medical advice and treatments are shaped by social, cultural and political contexts.

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Acknowledgments

Completing this thesis while raising two wild girls has without a doubt been the most challenging and rewarding six years of my life. Reaching the finish line of the PhD while juggling life's demands, motherhood and the obstacles life throws at you, a global pandemic and a house fire to name a few, would simply not have been possible without a solid support network and everyone who has encouraged me along the way.

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Thank you to the archivists at the Wellcome Library, University of Leicester Special Collections, Lothian Health Archive, Joslin Diabetes Centre and Rockefeller Archive Centre. A special thank you here to the late Tom Rosenbaum who sadly passed away in 2020. An archivist at the Rockefeller Archive from the 1970s, Tom worked with and inspired generations of researchers and I am grateful to be one of them. Our conversation about the importance of this research has always stayed with me and served as a reminder to never give up.

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This is for my daughters, Alex and Mila, who inspire me to be a good role model, to speak up in rooms where I would want them to be heard and who remind me to stay curious.

List of Figures

Abbreviations

ADA	American Diabetic Association
AHA	American Hospital Association
AMA	American Medical Association
APWA	American Public Welfare Association
BMJ	*British Medical Journal*
BDA	British Diabetes Association
CCI	Commission on Chronic Illness
CRUK	Cancer Research UK
DPP	Diabetes Prevention Programme
FDA	Food and Drug Administration (United States)
FSA	Food Standards Agency (United Kingdom)
JAMA	*Journal of the American Medical Association*
NACNE	National Advisory Committee on Nutrition Education
NIH	National Institutes of Health
NHS	National Health Service
NIH	National Institutes of Health
PWD	People/Person with Diabetes
SOHC	Scottish Oral History Centre
T1D	Type 1 Diabetes
T2D	Type 2 Diabetes
UGDP	University Group Diabetes Programme
UKPDS	United Kingdom Prospective Diabetes Study
USDA	United States Department of Agriculture

Chapter 1:

Introduction

> In these days when newspapers and magazines are continually pouring forth a flood of popular advice about properties of diet to a hungry audience that eagerly devours anything pertaining to health, the layman finds it difficult to steer a safe course amid the innumerable do's and don'ts of nutrition…Amid the traditions of the past, the dogma and propaganda of the present, the enthusiasm of the food faddist and the indifference of a healthy majority, one scarcely knows where to turn for sane and dependable advice.[1]

Written anonymously in the *Journal of the American Medical Association* in 1913, the above extract unveils the all too familiar dilemma of what to eat, what not to eat, and the fallibility of nutritional advice. While the author's concern lay primarily with the health implications of consuming refined sugar, the quotation highlights important questions regarding the origins and reliability of nutritional advice, revealing a tension that still lingers today between the traditions of the past and 'novel' ideas of the present. While the author here describes an indifference towards such advice by the 'healthy majority', for individuals with a diet-related disease, good health has often hinged upon the ebb and flow of nutritional advice and emergent understandings of the relationship between diet and disease. This is particularly true for people diagnosed with Type 2 diabetes, for whom the principle of maintaining a 'good' or 'balanced' diet has been the mainstay of treatment for over a hundred years.

[1] Anonymous, 'Sugar as Food', *JAMA*, 61:7 (1913), p. 492.

Historically, diet has been implicated in both the aetiology of diabetes and, in the absence of a cure, has been the key to controlling symptoms and long-term management. The findings of the first major epidemiology study of diabetes carried out in New York, published in 1924 by health commissioners Haven Emerson (1906-1997) and Louise Larimore, found a range of factors influential to aetiology.[2] Among these were; race, affluence, lack of physical activity, changes in dietary habits, but above all, the growing abundance of all foods. Principally, Emerson and Larrimore identified a significant correlation between the reported rise in diabetes incidence and mortality and the consumption of sugar, which seemed endemic across every level of society.[3] Twenty years later, English physician Percy Stocks, having studied diabetic mortality in England and Wales from 1861 to 1942, began to observe a similar correlation. Stocks drew attention to the marked decline in diabetic incidence and mortality during the two World Wars, leading him to conclude that the rationing of all foods, particularly sugar, provided the most palpable explanation.[4] This data was reassessed in 1966 by English surgeons Cleave and Campbell who found a similar link between a decline in sugar consumption during both world wars and a corresponding decline in diabetes mortality.[5] Unnatural, refined carbohydrates in the form of white flour and sugar, they argued, could be linked to a host of conditions from varicose veins and peptic ulcers to coronary artery disease, obesity and diabetes.[6] Echoing these concerns amidst rising deaths from coronary heart disease in the post-war decades was British nutrition scientist John Yudkin. While

[2] H. Emerson and L. D. Larrimore, 'Diabetes Mellitus: A contribution to its epidemiology based chiefly on mortality statistics', *Archives of Internal Medicine*, 34:5 (1924), pp. 585-630.
[3] Ibid.
[4] P. Stocks, 'Diabetes mortality in 1861-1942 and some of the factors affecting it', *Journal of Hygiene*, 43:4 (1944), pp. 242-247.
[5] D. P. Burkitt, *Refined Carbohydrate Foods and Disease*, (London: Academic Press, 1975), p. 35.
[6] T. L. Cleave and G. D. Campbell, 'Diabetes, Coronary Thrombosis and the Saccharine Disease', *Journal of the Royal College of General Practitioners*, 18:85 (1969), p. 122.

Yudkin's North American adversary, Ancel Keys, was mounting an international campaign targeting dietary fat as the culprit of diet-related disease, Yudkin maintained that the nutritional component responsible was not fat, but refined carbohydrates, in particular sugar.[7] Yudkin solidified his indictment of the role of sugar in diabetes and many other chronic conditions in his seminal *Pure, White and Deadly*, in which he concluded 'if only a small fraction of what we already know about the effects of sugar were to be revealed in relation to any other material used as a food additive, that material would promptly be banned.'[8]

As a result of decades of historical research connecting diabetes to nutrition and lifestyle, diet is now considered one of the key aetiological factors involved in adult-onset diabetes among a host of additional risk factors including age, race, body weight and heredity.[9] Yet, while diet remains a central feature among discussions on prevention, aetiology, self-management, and, more recently, the idea of 'remission', there remains a lack of consensus on what constitutes the ideal diabetic diet.[10] Contemporary medical discussions regarding the relationship between diet and Type 2 diabetes (T2D), prompted by its unrelenting rise since the Second World War, have highlighted a history of 'futile cycles' in which medical professionals, patient organisations and nutritionists have failed to reach a consensus on the ideal diet for the prevention and management of T2D.[11] Consequently, over the course of the last century, the dietary regimens endorsed for managing diabetes have been subject to

[7] J. Yudkin, 'Dietary fat and dietary sugar in relation to ischaemic heart disease and diabetes', *Lancet*, 2 (1964), pp. 4-5; A. Keys, 'Coronary heart disease in seven countries', *Circulation*, 41:1 (1970), pp. 186-195.
[8] J. Yudkin, *Pure, White and Deadly*, (London: Penguin Books, 1972), p. 162.
[9] 'Diabetes Risk Factors', *Diabetes UK*, https://www.diabetes.org.uk/preventing-type-2-diabetes/diabetes-risk-factors
[10] G. Taubes, 'What if it's all been a big fat lie?', *New York Times*, 7 July 2002; R. Taylor et al, 'Nutritional basis of type 2 diabetes remission', *BMJ*, 374 (2021), p. 1449.
[11] L. Sawyer and E. A. M. Gale, 'Diet, Delusion and Diabetes', *Diabetologia*, 52 (2009), pp. 1-7.

periodic overhauls, ranging from the 'starvation diets' of the pre-insulin era, to the 'free diets' of the 1930s, towards a gradual liberalisation of carbohydrates with the increasing availability of insulin. With the emergence of the diet-heart debate in the post-war era, and the subsequent ushering in of the low-fat era, diets considerably higher in carbohydrate began to be recommended to diabetics for the first time, a move which has since been contested in light of more transparent knowledge regarding the volume of 'hidden sugars' found in low-fat foods. As a result of this reversal, today dietary recommendations for T2D are beginning to turn away from decades of low-fat advice in favour of a 'balanced diet', one which encourages the consumption of 'healthy fats' and wholegrain foods, rather than low-fat substitutes and refined carbohydrates.[12] It is the purpose of this thesis to comprehend these cycles, to better understand how dietary advice has been forged, as well as the historical forces which have prompted change and such sweeping reversals of diabetic guidelines. As this thesis demonstrates, such overhauls have been shaped not only by developments in medicine and the science of nutrition, but have been driven by the ideas, experiences and agendas of key individuals, both patients and professionals, as well as by wider developments and events occurring within the very culture and society in which debates about diet and diabetes have taken place.

While diet has been an important part of diabetes management, and remains a crucial component in controlling symptoms, the rise of biomedical explanations from the 1970s onwards began to consider dietary prescriptions redundant and concentrated attention instead on finding pharmaceutical solutions to managing the disease.[13]

[12] '10 tips for healthy eating if you are at risk of type 2 diabetes', *Diabetes UK* , 9 September 2021.
[13] K. M. West, 'Diet Therapy of Diabetes: An Analysis of Failure', *Annals of Internal Medicine*, 79:3 (1973), pp. 425-434; F. Q. Nuttall, 'Diet and the Diabetic Patient', *Diabetes Care*, 6 (1983), pp. 197-

Within this context, as the oral testimonies carried out for this research attest, diet therapy, once the principal form of treatment, has been consigned to the realms of alternative medicine and as a result is often lacking in consultations with newly diagnosed patients.[14] An indication of diet therapy's obscured status in the management of diabetes can be found in recent research that describes diet as the 'novel' solution that might just hold the key to reversing the milder form of the disease.[15] This comes only sixteen years after the results of the Diabetes Prevention Program (DPP) study, a randomised clinical trial that found that diet and exercise were more effective than drugs such as metformin at controlling and preventing the onset of T2D.[16]

As medical historian Roberta Bivins identifies, from a western, twenty-first-century perspective, 'biomedicine' may appear both powerful and long-established, yet the sweeping cultural authority granted to modern science is relatively new.[17] While diabetes has all the hallmarks of a disease subjected to medicalisation, the aim of this thesis is to demonstrate the complex history of contemporary diabetes management, presenting both the over-medicalisation of diabetes and its consequences while also shedding light on the developments beyond medicine which have shaped how diabetes is treated. Moving away from the tendency to present the history of diabetes

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207; F. C. Wood and E. L. Bierman, 'Is Diet the Cornerstone of Diabetes Management?' Massachusetts Medical Society, (1986), pp. 1224-1227.

[14] In the interviews carried out for this research, only two participants could recall receiving dietary advice upon diagnosis which in both instances was in the form of diet sheets produced by the pharmaceutical industry. The GPs interviewed for this research explained this in terms of a combination of factors; reliance on practice dietician or referral to diabetic clinics, the ease and effectiveness of new medications, and a lack of instruction on nutrition and dietary prescriptions during medical school training.

[15] S. Boseley, 'Radical diet can reverse type 2 diabetes, even six years into the disease, a new study has found', *Guardian*, 5 December 2017; R. Taylor et al, 'Nutritional basis of type 2 diabetes remission', *BMJ*, 374 (2021), p. 1449.

[16] Diabetes Prevention Program Research Group, 'Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin', *New England Journal of Medicine*, 346:6 (2002), pp. 393-403.

[17] R. Bivins, *Alternative Medicine? A History*, (Oxford: Oxford University Press, 2007), p. 4.

as ‘the history of insulin’, this thesis situates the history of diabetes within a wider social framework which views the history of diabetes in the twentieth century as a disease of civilisation, shaped not only by the rise of agriculture, industrialisation, the food and pharmaceutical industries, but by the pursuits and agendas of individual clinicians, integrating women into the history of diabetes for the first time, as well as incorporating the lived experience of patients themselves. It is a history which considers the interplay between individuals, ideas and industry and how their interactions on both a local and global level have shaped how diabetes is treated and understood. Ultimately, it is the aim of this thesis to ascertain how the fate of the dietary prescription in diabetes could become so obscured as to seem an unfathomable notion in a disease primarily understood to be caused by diet and lifestyle.

In order to answer this question, this thesis investigates the history of the diabetic diet and dietary recommendations for diabetes, including its origins and place within the contemporary management of diabetes, its evolution alongside the development of novel medicines, and how the effectiveness of diet in diabetes has been perceived by both patients and clinicians throughout the twentieth century. The thesis provides a contextual account of the history of diabetes, which not only contributes to the histories of food, nutrition and science, and specifically to the history of diabetes, but also engages with challenging and sometimes contentious issues in the history of medicine. Such issues include medicalisation, the development of the idea of food as medicine, the role of drugs in treating dietary related illness, and the geneticisation of disease. Finally, the thesis considers how patients themselves have interpreted and engaged with medical advice and contemporary disease models, in particular how

diabetic patients have interpreted and negotiated the notion of individual responsibility inherent in contemporary self-management models, and the interplay between the self, society and the management of diabetes.

The argument set out in this thesis, in short, is that diet was not disregarded after discovery of insulin, as often appears in traditional narratives. It remained crucial to managing diabetic symptoms and the prevention of later complications until the development of the first oral hypoglycaemic drugs in the 1950s, when the importance of diet, and discussions of primary prevention, began to wane. Yet, as laid out in the following chapters, it would be simplistic to suggest this constitutes a straightforward tale of medicalisation. Rather, a complex interplay of socioeconomic, political and ideological factors ranging from global wars to international debates on nutrition, as well as the influence and ideas of individual historical actors, all contributed to how diet has been perceived. Given these arguments, and the importance of context, the thesis is organised in chronological order with chapters which each reflect key stages and developments in diabetes and within the field of medical history that have shaped understandings of aetiology and the course of diabetes management. In order to provide a historical context for the place of diet in diabetes, Chapter 2 considers the origins of diet therapy in the treatment of diabetes both before and after the mass availability of insulin. This chapter challenges the notion inherent in diabetes histories that insulin neatly supplanted the use of diets in the treatment of diabetes, demonstrating instead the sustained importance of diet in controlling symptoms and the faith physicians placed in nutrition to increase longevity. As diabetes transformed from an acute to chronic disease, physicians continued to uphold the importance of diet. Moreover, as experience with dietary regimens expanded, the

rationales for controlling dietary intake expanded beyond their basic physiological benefits towards a greater acknowledgement of the social and psychological needs of the patient. Chapter 2 thus illustrates how the discovery of insulin, far from replacing diet, enabled physicians to examine and utilise diet as a tool for emotional wellbeing and later in the context of war, effective citizenship as well.

Chapter 3 analyses where advice for diabetics originated in the years following the availability of insulin, examining the influence of new authorities which emerged in the 1930s and 1940s and the subsequent shift in responsibility to inform patients about their condition from family physicians to patient organisations and the state. Within this period, the establishment of the first patient organisation for diabetes, the Diabetic Association, followed by the outbreak of the Second World War and rationing, spurred revisions to the diabetic diet and altered the rationales provided for its use. Chapter 3 situates dietary recommendations of the 1930s and 1940s within this historical context in order to illustrate how the move towards a more liberal diet for diabetics was shaped not only by the availability of insulin, but complex, synchronous events such as the formation of the Diabetic Association, and later, concerns surrounding national efficiency produced by war. The second strand of the thesis considers diet therapy and diabetes within the context of the expansion of both the pharmaceutical and food industries; exploring the ways in which these industries and their products transformed how diabetes was managed and how the relationship between diet and disease was understood. The impact of war on the incidence of diabetes and mortality prompted greater consideration of the primary prevention of diabetes. Accordingly, a number of key figures drew attention to the role of diet, in particular the benefits of a restricted carbohydrate diet, in preventing adult-onset

diabetes. While genetic discourses and the idea of hereditary predisposition had convinced early twentieth-century specialists that the development of diabetes in family members was somewhat inevitable, the wartime decline in diabetes and its complications during a period of food restrictions had suggested that much could be done to postpone or prevent diabetes altogether. By the 1950s, diabetes specialists upheld the role of diet in both treating and preventing disease, with some individuals such as the British scientist Harold Himsworth declaring that if only the nation's diet could be regulated, then there would be no need for medical intervention at all. However, while these discussions around prevention were taking place, so too was the development of the first oral anti-diabetic drugs. Towards the end of the 1950s, individuals diagnosed with diabetes, in addition to diet and insulin, were now confronted with an extensive array of new 'wonder drugs', oral hypoglycaemic agents such as Orinase and Phenformin. Chapter 4 examines the development of the first oral hypoglycaemic drugs for diabetes and considers the fate of diet therapy within a context which was becoming increasingly preoccupied with the pharmaceutical management of disease. Analysing the contentions which arose within the medical profession over the use of the new drugs, Chapter 4 explores their development from the initial discovery and marketing stages through to the National Institutes of Health (NIH) funded U.S study, the University Group Diabetes Programme (1961-1978), the first largescale trial designed to test their effectiveness which, controversially, provided considerable evidence of harm. Utilising archival evidence from the Rockefeller Archive, such as the medical profession's principal publication on the evaluation of new drugs, *The Medical Letter*, Chapter 4 challenges the notion that the development and mass use of oral anti-diabetic agents represents a

neat tale of medicalisation. Instead, it outlines new evidence of the division, suspicion and uncertainty which arose over the use of the new drugs and their use in managing milder cases of diabetes. Despite such hesitancy among certain sections of the profession, oral hypoglycaemic agents quickly became the principal form of treatment from the 1960s onwards, shifting medical attention away from dietary interventions and social and environmental discussions of aetiology, towards a focus on 'prevention through early detection' and early treatment with anti-diabetic drugs. Building upon the previous chapters, Chapter 5 sheds further light on the historical developments which altered the fate of diet therapy and the post-war interest which had gathered in support of primary prevention through an evaluation of attempts to uncover 'hidden' cases of diabetes among asymptomatic populations. Chapter 5 examines how the roll-out of mass screening campaigns, and the focus they placed upon familial risk and genetics, aided support for the pharmaceutical management of diabetes, relegating diet to a minor key in the post-war decades. With a key focus on aetiology, Chapter 5 considers the role of diabetes detection campaigns in shifting understandings of diabetes from the psychosocial explanations present around mid-century toward a firmly biomedical view in which heredity resurfaced as the most viable explanation behind the ever-increasing number of new cases. While Chapters 4 and 5 explore the influence of pharmaceutical expansion and the geneticisation of diabetes, Chapter 6 explores the concurrent debates which played out alongside the development of oral drugs and the detection campaigns which further impacted diabetic management in the post-war decades. Coinciding with the development of the first anti-diabetic drugs and the expansion of their use in the treatment of milder patients, was the post-war 'diet-heart' debate, a fierce consideration of the role of

diet in disease and the individual nutrients responsible for conditions such as coronary heart disease, stroke and diabetes. Chapter 6 re-examines the diet-heart debate and its significance for diabetes, exploring the introduction of 'low-fat' diets and debates surrounding the use of artificial sweeteners and their impact on the post-war management of diabetes. Bringing all of these developments to the fore, Chapter 7 examines the lived experience of diabetes. Utilising patient testimonies carried out with people with diabetes (PWD), this concluding chapter considers how patients themselves have negotiated the advice given to them about diet and the legacy of the themes explored throughout the thesis including; responsibility, individual versus social explanations for disease, the medicalisation of diabetes, and the moral implications of contemporary self-management models.

Sources

In order to answer the research questions of this project, a wide range of primary sources have been consulted which reflect the involvement of patients, the medical profession, the pharmaceutical and food industries, and the media in shaping diabetes management in the twentieth century. The first set of primary sources, utilised throughout the thesis, is published medical literature written by diabetes specialists, nutrition scientists and physicians which span the twentieth century to the present day. Some of the medical journals consulted include: the *British Medical Journal*, the *Lancet*, the *Journal of the American Medical Association*, *Diabetes*, the *Canadian Medical Association Journal*, *Annals of Internal Medicine, Metabolism* and the *International Journal of Epidemiology*. In addition to published medical

literature, the thesis draws upon archival material including: physician manuals, speeches and correspondence, public health reports, patient handbooks and self-help literature, medical textbooks, dietary guidelines and nutritional recommendations, public health campaign material, pharmaceutical advertisements and a number of academic and popular publications by leading twentieth-century nutritionists. A number of key archive collections were consulted, including: the Joan Walker Collection at the University of Leicester Special Collections, the Wellcome Library for the History of Medicine, the Lothian Health Archive, the Joslin Diabetes Center and the Rockefeller Archive Center. Accessing the latter, located in Boston and New York, allowed for a comparative analysis of diabetes management in Britain and the United States, revealing both tensions and collaboration between diabetes clinics particularly in the post-war period surrounding the use of the new oral hypoglycaemic drugs. Included in these archives are collections of unpublished archival evidence, such as correspondence between diabetes specialists, patients and pharmaceutical manufacturers, industry advertisements, medical records relating to patient experiences of the new drugs, as well as industry and physician responses to the medical trials, such as the UGDP (1961-1978). This evidence not only reveals patient and professional responses to the trial and the use of oral medications in treating milder diabetes, but also the involvement of third parties, such as the pharmaceutical industry, in shaping how mild diabetes was managed and understood. Moreover, these collections reveal the diverse responses among the medical profession towards contentious topics such as the results of the UGDP and the continued use of anti-diabetic drugs despite negative reports from clinical trials. Complementing the published primary source material, this evidence contributes to a

more complete picture of diabetes management in Britain and the United States in the twentieth century. Another key source utilised throughout the thesis are media reports relating to the latest developments in diabetes such as the discovery of insulin and oral hypoglycaemic drugs. Analysing media reports reveals that the media played a key role in shaping ideas about aetiology, in particular the notion of diabetes as a typically genetic disease. These reports provide a key source of evidence on how the media reinforced aetiological theories which promoted individual responsibility and treatment solutions which focused on pharmaceutical management. As well as reporting on specific developments in diabetes, media reports provide a useful source of evidence for understanding the post-war debate on diet and disease, and the foods which were labelled responsible for the rising rates of diabetes and coronary heart disease. A number of American and British media sources were consulted including; *Time*, the *New York Times*, the *Washington Post*, the *Boston Herald*, the *Boston Daily Advertiser*, the *Guardian*, the *Times* and the British Broadcasting Corporation (BBC).

Crucial to understanding the changes in dietary recommendations and treatments for diabetes throughout the twentieth century are the stories of PWD themselves. Accordingly, oral history testimonies constitute the final category of primary source material utilised. One of the principal aims of the thesis was to uncover patient understandings and lived experiences of Type 2 diabetes, in particular to investigate how PWD have understood their condition and how they have negotiated the advice given to them about how to improve their health through diet. The decision to incorporate life history interviews into this project stemmed from the desire to include a sense of what E.P. Thompson described as 'history from below' – to

include the voices of real people in order to create a fuller, more democratic historical process.[18] Oral history allows us to collect information and evidence from people and communities who lack a voice or access to appropriate spaces to express their experiences; hence it was the aim of this project to resolve this issue by using personal narratives of diabetes as a key source of evidence. The history of diabetes accounts for a surprisingly small body of literature within the history of medicine. Within these existing histories is an overwhelming tendency to focus on the history of insulin and the individuals involved in its discovery and development. Like many early histories of medicine these accounts often represent a neat tale of science's mastery of disease, in which patients, or women in medicine, rarely appear. With the exception of Chris Feudtner's *Bittersweet: Diabetes, Insulin and the Transformation of Illness*, historians have overlooked the lived experience of diabetes. While Feudtner utilises patient testimonies in *Bittersweet*, these are principally concerned with North American patients with Type 1 diabetes (T1D), meaning to date, the voices of people with T2D are entirely absent in the history of diabetes. In order to fill this gap in the literature, this thesis relies heavily upon the testimonies of people living with T2D, thus providing the first history of its kind. The thesis analyses these narratives within the social, cultural and political context in which individuals experiences of diagnosis and treatment of diabetes have occurred. In agreement with the merits of oral history made by E. P. Thompson and Alessandro Portelli, oral history methods were incorporated into this research in order to elicit more personal and detailed interpretations of experiences of health, but, also, to find

[18] E. P. Thompson, 'History from Below', *Times Literary Supplement*, 7 April 1966, pp. 279-80.

the deeper meaning behind these experiences; what do we consider 'healthy'?[19] Who is responsible for our health? How do we interpret the aetiology of disease and what forces have helped to shape the advice we receive about them? How do these same forces then influence how we negotiate them?

Nineteen participants were interviewed, comprising thirteen people diagnosed with T2D in the last fifty years, five health care professionals and one health policy maker. Interviewees with diabetes were recruited by attending diabetes support groups in Glasgow and Edinburgh and, to ensure geographical representation, support groups in the Scottish Highlands were also contacted which allowed participants from rural areas to contribute as well. In addition to new interviews carried out by the researcher, existing oral history collections were also utilised, including the Wellcome Trust-funded Oxford University oral history project 'Diabetes Stories'.[20] These interviews, which were primarily carried out with English and Welsh participants, provided a valuable addition to the Scottish interviews conducted for this research and enriched the overall representation of 'British' experiences. Regrettably, Northern Irish perspectives were not available, however, ongoing research by Northern Irish historian Lauren Young will incidentally fill this gap in representation.[21] The oral testimonies were analysed in accordance with two of the key theoretical perspectives used in oral history; the 'reminiscence model' which is primarily undertaken for the sole purpose of recovering voices and placing them on record while it is still possible, and the

[19] E. P. Thompson, 'History from Below', *Times Literary Supplement*, 7 April 1966, pp. 279-80; A. Portelli, 'Living Voices: The Oral History Interview as Dialogue and Experience', *Oral History Review*, 45:2 (2018), pp. 239-248.
[20] www.diabetes-stories.com
[21] L. Young, 'A Curse of a Disease: Exploring the History and Lived Experience of Diabetes through Patient Memory', PhD thesis, (Queens University, PhD thesis, 2022).

'community model' which involves the critical analysis of groups of interviews in terms of cultural context and theories of narrative and language. Narrative analysis techniques such as those developed by Mike Bury and Catherine Riessman were used which allowed the research to uncover crucial elements of the diabetic experience that are fundamentally absent in traditional sources.[22] Using these techniques to analyse elements of the narratives such as; language, tone, volume range and rhythm of speech revealed unspoken meanings within the narratives, both individual and collective, which ultimately have enriched this research and raise a number of points worthy of future research. Graham Dawson's theory of 'composure' was also utilised for the narrative analysis of the oral testimonies carried out for this research. According to Dawson, in life-story telling composure has a double meaning; it refers to both the active cultural construction of the narrative and its psychosomatic effect, in other words the sense of self within our social world the interviewee chooses to depict throughout the course of the interview.[23] For many life-story theorists, composure is an ongoing process whereby interpretation and reinterpretation never ends. For Penny Summerfield, 'it cannot stop, because the social world is always in flux and we are constantly seeking ways of understanding both it and ourselves within it'.[24] Using the theory of composure in interpreting patient-centred narratives offers insight into how the person being interviewed views themselves in relation to their condition, as well as how they perceive the condition to be viewed by wider society. This form of analysis proved

[22] C. K. Riessman, 'Strategic uses of narrative in the presentation of self and illness: A research note', *Social Science and Medicine*, 30:11 (1990), pp. 1195-1120; M. Bury, 'Illness Narratives: Fact or Fiction?', *Sociology of Health and Illness*, 23:3 (2001), pp. 263-85.
[23] G. Dawson, *Soldier Heroes: British Adventure, Empire, and the Imagining of Masculinities*, (Oxford: Routledge, 1994).
[24] Ibid.

particularly useful for interpreting the interviews conducted for this thesis, allowing for a number of key themes such as stigma and responsibility to be discerned when the interviews were analysed both individually and as a whole.

The interviews conducted were semi-structured in that they followed two of the main interview formats used in oral history. The first stage of the interview involved using the life history interview format, during which interviewee's were encouraged to speak freely with no time limit, providing the opportunity to disclose background information and gauge a sense of the interviewee's character and circumstance. This method typically involves a great deal of listening and little questioning and thus naturally varies between participants; where some interviewees felt comfortable to talk at length about their past others struggled to recall this information or simply did not include it because they felt it was irrelevant. Towards the end of the interview the interviews took a thematic approach in which participants were asked a set of specific questions related to the research interests, for example: how did they feel about the care they had received and what did they believe were the main contributory causes of diabetes and the most effective forms of treatment. A choice of interview locations were provided in order to allow participants to be interviewed in a location they felt most comfortable. Most of the interviews were conducted in person either in an interview room within the Scottish Oral History Centre, at the participant's own home or in a local community centre or cafe. Occasionally when a participant felt uncomfortable meeting in person or their health prevented them from doing so the interviews were conducted via email or telephone. Once completed and transcribed, interviewees received full transcripts of their interviews and were given the opportunity to make amendments or omit answers. In the event participants were

happy with their transcripts, no editing was required. The interviews were then analysed and in some instances interviewees were sent follow-up questions to encourage them to expand on some of their answers. All of the interviewees responded and often provided more information than originally disclosed in the interview. As historians Juliette Pattinson, Corina Peniston-Bird and Penny Summerfield have shown, the oral history interview is an intersubjective process, throughout which gender, social status and generation can either subtly or overtly shape the narrative which is told.[25] In the context of the interviews carried out for this research, interpersonal dynamics such as social status, gender and generation, to varying degrees and at different moments, served to influence the interview process and how the narratives were told. For example, in the interviews conducted with participants with a university education I encountered lengthy, descriptive explanations of rudimentary concepts on a number of occasions. While my age and gender may have influenced the narrator feeling compelled to provide these accounts, social class and education appeared to be more influential in determining who narrated them. Similar to Pattinson's experience of interviewing British war veterans, my experience of gendered subjectivities were not clear cut. While at times it felt as though my position as a young, female researcher, particularly in interviews with educated, retired, male interviewees shaped the tone and content of the interview, at other times interpersonal dynamics such as social class and relatability appeared to override gender in how interviewees composed their narratives. For

[25] P. Summerfield, 'Culture and Composure: Creating Narratives of the Gendered Self in Oral History Interviews', *Journal of the Social History Society*, 1 (2004), 65-93; C. Peniston-Bird, 'Oral History: The Sound of Memory' in S. Barber and C. Peniston-Bird (eds.) *History Beyond the Text: A Student's Guide to Approaching Alternative Sources*, (London: Routledge, 2009), p.111; J. Pattinson, 'The thing that made me hesitate…': Re-examining gendered intersubjectivities in interviews with British secret war veterans', *Women's History Review*, 20:2 (2011), pp. 246-263.

example, interviewees to whom I had revealed my family history of diabetes were more likely to provide a personal, emotive account which came from a place of mutual understanding of the psychological components of the condition and its effects on their lives. On the whole, rapport was easy to build with both male and female interviewees and, contrary to gender assumptions, several male interviewees were as open as female respondents, and both genders showed the ability to be open and conversational about their lives.

In the instance of interviewees wishing to retain anonymity they were asked to provide their preferred pseudonym and any information which may have revealed their identity was omitted from both the transcript and audio recording. This methodology provided a rich and unique understanding of what it means to live with a chronic disease and a better knowledge of the symptoms, causes and treatments available for T2D. Ultimately however, it allowed the voices of ordinary people to be heard and work towards creating a 'shared authority' in their own history, something that until now has been wholly lacking in histories of diabetes.[26] While in recent years scholars have questioned the viability of achieving true shared authority, this thesis approaches the concept as a collaborative process which does not end with the interview, but continues well after the completion of the research.[27] For this research specifically, this will entail ongoing work between the researcher, the

[26] M. Frisch, *A Shared Authority: Essays on the Craft and Meaning of Oral and Public History*, (Albany: State University of New York Press, 1990).
[27] L. Sitzia, 'A Shared Authority: An Impossible Goal?', *Oral History Review*, 30:1 (2003), pp. 87-101.

Scottish Government and diabetes support groups to ensure these narratives are used to shape health policy.[28]

Finally, in addition to the interviews carried out with PWD, a number of interviews were conducted with health care professionals and policy makers. The former include interviews with general practitioners working in Glasgow as well an interview with Joan McDowell, the first specialist diabetes nurse in Scotland. These interviews served to expand knowledge of how diabetes has been treated both past and present, as well as offer new insight into the development of the first diabetic clinics in Britain. Additionally, the interviews with GPs provided a nuanced understanding of medical education in Britain during the time period covered in the second half of the thesis. This offered a clearer understanding of how medical students and health care professionals were educated on oral hypoglycaemic agents and in turn how this transformed the treatment solutions offered to patients in general practice. One final interview was carried out on an archival visit to the United States with Karen Collins, former Deputy Chief Medical Officer of New York City Health and Hospitals Department. Before running the office of Healthcare Quality Clinical Services in New York, Dr Collins began her career by completing a bachelor's degree in history and science at Harvard before moving on to study medicine and move into health policy. Dr Collins has worked in health policy for many years, in particular working on improving access and quality of care for underprivileged populations living with a chronic disease in the United States. This interview drew attention to the importance of the connection between the way health care is funded and the insurance system in America and the significant disparities in outcomes in

[28] At the time of writing, all interviews are in the process of being archived at the Scottish Oral History Centre, https://atom.lib.strath.ac.uk/sohc-archive

patients with diabetes from poor populations and ethnic minorities. Additionally, it covered a range of recent diabetes self-management and prevention programmes currently being undertaken in various states that are looking to be rolled out over the coming years and offered an interesting comparison to the views of the British medical profession regarding the potential to reverse or push diabetes into remission. Together, the oral history interviews carried out for this research provide a range of perspectives, knowledge and insight which were not available in traditional archival records, which ultimately contributes a richer, more reflective history of diabetes built upon the experiences of those who have lived it.

Literature

Diabetes Histories

Today, increasing rates of T2D and its associated costs account for 9 percent of the annual National Health Service (NHS) budget (approximately £8.8 billion per year), positioning diabetes prevention and management as a national public health concern demanding dynamic policy responses.[29] In 2019, diabetes was ranked ninth in the top ten leading causes of death worldwide by the World Health Organisation (WHO).[30] Yet despite such a position within contemporary public health problems, T2D remains a small and under-researched field within the history of medicine. Typically, both academic histories and clinical texts trace the history of diabetes to ancient Greece where diabetes was first described by Greek physician Arataeus as a

[29] J. Smith, 'Health Matters: Preventing Type 2 Diabetes', *Public Health England*, 24 May 2018.
[30] 'The Top 10 Causes of Death', http://www.who.int/mediacentre/factsheets/fs310/en/, accessed 18 February 2021.

'mysterious illness [where] the flesh and limbs melt into the urine'.[31] Like many diseases, the very first histories of diabetes to appear were those written by medical professionals themselves, rather than historians. Included among these early histories are the texts of prominent diabetologists such as Elliot P. Joslin and Frank N. Allan. These early histories, written exclusively by male members of the medical establishment, largely offer superficial, descriptive accounts of developments in diabetic treatment. Typical of these accounts, *The History of the Treatment of Diabetes by Diet* by Canadian physician Frank N. Allan chronicles the evolution of diabetic diets as prescribed by leading physicians up until the discovery of insulin. Characteristic of early histories written by medical professionals is a tendency to recount a descriptive chronology of the latest advances and often the reality, which was that those with severe diabetes were only living a few a years longer than a century prior, was often misconstrued in favour of a narrative of progress.[32] Moreover, early histories of diabetes such as Allan's make no attempt to connect developments in diabetes management to the wider social, economic and political context in which they occurred. Without such analysis, these histories often conclude around the discovery of insulin and assume that this was the end of diet therapy in diabetes, as Allan remarks 'when treatment by diet had reached its most successful point, insulin was discovered'.[33]

[31] Feudtner, *Bittersweet*, p. 4.
[32] F. N. Allan, 'The History of the Treatment of Diabetes by Diet', *Journal of the American Dietetic Association*, 6:1 (1930), p. 235.
[33] Ibid, p. 237.

The next contribution to the literature on diabetes to appear during the late 1940s were histories commissioned by national diabetic organisations. Again, these histories provide straightforward accounts which approach diabetes in rather clinical terms neglecting an analysis of diabetes within its socio-cultural structures. Lee Sanders' *The Philatelic History of Diabetes: In Search of a Cure* produced and published by the American Diabetes Association (ADA) in 1947 attempts to categorise the history of diabetes into four developmental and chronological periods: the *descriptive* period, which covers the age of antiquity and early attempts to try and understand and label diabetes, the *diagnostic* period which transpired throughout the Renaissance, the *experimental* period in which the discovery of insulin occurred, and the present *therapeutic* era which is broadly defined in terms of the need to make insulin more widely available.[34] The Australian Diabetes Society's *A History of Diabetes in Australia* commissioned by the medical and scientific branch of Diabetes Australia in the 1990s, provided a similar account of diabetes, placing its organisation at the centre of 'Ten Years of Progress'.[35] Contributing a similar history to that of the ADA, Diabetes Australia's history of diabetes largely directs attention towards T1D and the role of insulin. By contrast, T2D features little throughout the text and appears only within a framework of drug development, thus contributing to the notion that T2D is most amenable to pharmaceutical, rather than dietary, solutions. Notably absent in institutional histories is a discussion of the use of diet in managing diabetes and its role in the condition's onset, preferring instead to focus scientific accomplishments rather the social and environmental factors implicated in the disease.

[34] L. J. Sanders, *The Philatelic History of Diabetes: In Search of a Cure*, (Virginia: American Diabetes Association, 1947).
[35] F. Martin, *A History of Diabetes in Australia*, (Melbourne: Miranova Publishers, 1998).

From the 1960s to 1980s, interest in the aetiology of diabetes gathered as mass population screening campaigns to uncover 'hidden diabetes' generated a new wave of literature on its features and the history of its treatment. Resembling the first histories of diabetes, many of these were written by physicians-turned historians and focused primarily on the clinical progress made by male physicians such as the discovery of insulin. Poulsen's *Features in the History of Diabetology* for example, mirroring the biomedical milieu of the early 1980s concentrated on the disease's biological pathogenesis, primarily its potential genetic basis, dedicating little consideration to the sociocultural elements influential to its onset or the lived experience of the condition.[36] Similarly, *The Discovery of Insulin* by Canadian historian Michael Bliss, concentrates more or less on the 1920s and the events surrounding the discovery and isolation of insulin in Toronto. Using Banting's personal papers, Bliss retells the narrative, or myth, that insulin was discovered solely by Banting and Best, elucidating their role as only part of the discovery of insulin, Bliss reveals the taught process of scientific discovery and the multiple individuals, and their contributions, that are often omitted.[37] By narrowing his focus to the conflict involved in the discovery of insulin, Bliss's account, like previous narratives, limits its scope to the history of T1D and lingers on advances in treatment, chiefly the discovery of insulin in 1922.[38] Such broad-stroke accounts as those outlined here, have distracted from the lived experience of diabetes and have often downplayed the role of patients in constructing their own means of self-management.

[36] J. E. Poulsen, *Features in the History of Diabetology*, (Copenhagen: Munksgaard, 1982), p. 86. For other works of this kind, see N. S. Papaspyros, *The History of Diabetes Mellitus*, (Stuttgart: Georg Thieme, 1964).
[37] Ibid, p. 209.
[38] M. Bliss, *The Discovery of Insulin*, (Chicago: The University of Chicago Press, 2007).

The turn of the new millennium and the unabating rise of diabetes, particularly in its milder form, stimulated a renewed interest in diabetes, as reflected in a number of new histories which attempted to document and piece together the theoretical and scientific developments which have led to contemporary treatment models. Among this new collection of texts to consider diabetes in historical perspective; Chris Feudtner's *Bittersweet: Diabetes, Insulin and the Transformation of Illness* (2003), Elizabeth Furdell's *Fatal Thirst: Diabetes in Britain until Insulin* (2009), and Robert Tattersalls' *Diabetes: The Biography* (2009) have, until now, constituted the primary body of literature on diabetes. The first of these, *Bittersweet: Diabetes, Insulin and the Transformation of Illness* by practicing paediatrician Chris Feudtner, explores the social and cultural history of diabetes in the pre- and post-insulin era. Drawing on medical archives and letters exchanged between patients, their family members and staff at the Joslin Diabetes Centre in Boston, Feudtner recounts the history of T1D in children in the United States throughout the twentieth century. In turning away from the tendency to neglect the lived realities of diabetes, Feudtner's text was the first history of diabetes to offer the patient's perspective. By his own admission however, Feudtner's testimonies are limited to a group of young white patients with T1D living in the Boston area and thus the diversity of perspectives are limited. As the title suggests, Feudtner's central focus are the ironies of medical progress, viewing insulin as emblematic of both the triumphs and disappointments of twentieth century medicine. In the days before insulin when diabetes was fatal, starvation diets could delay death in adults and the elderly, but for children the disease progressed rapidly, leading to rapid weight loss, ketoacidosis, and death. With the discovery of insulin, as Feudtner elucidates, diabetes transformed from an acute to chronic disease as

insulin offered a novel means to control the disease, extending the lives of PWD significantly. Yet, as Feudtner points out, it was not a cure for the disease. Insulin served to further clarify the distinction between the two apparent forms of diabetes, demonstrating the difference between those whose bodies did not produce any insulin but could now inject the hormone and ward off the severest of symptoms, and those who appeared to suffer only mild symptoms and could manage these by altering their diet. Feudtner's main contribution is the presentation of diabetes as a model condition through which to view this 'paradigm of disease transmutation'. Through the lens of insulin and those with lived experience of T1D, Feudtner demonstrates how the discovery of insulin transformed diabetes from an acute to chronic disease, altering the illness experience of diabetes into one that, although easier to manage, came wrought with new complications and new forms. Through an examination of archival sources, mainly letters between Joslin, his patients and their family members, Feudtner weaves together the history of diabetic care, primarily around the Boston area in the twentieth century, exploring narratives of T1D and insulin use from some of the first patients to be treated with it. Additionally, Feudtner raises questions around some of the key themes in the history of medicine, such as responsibility, encouraging the reader to consider who is responsible for health, the state or the individual? *Bittersweet's* strengths lie in Feudtner's careful uncovering of the origins of diabetes, and the role of individuals such as Joslin in facilitating and nurturing ideas of personal responsibility for disease and the notion that successful management hinged as much upon moralistic ideas of 'good' patient behaviour as it did upon science. The book's main limitation is Feudtner's reliance on a very narrow patient population, a small group of

predominantly white T1D juvenile patients from the Boston area. However, he is careful to note that these individuals do not represent all diabetics, nor do they furnish archetypal diabetic experiences.[39] Moreover, while Feudtner openly criticises the dominant biomedical model inherent in modern understanding of diabetes, arguing that 'focusing on physiology and technology, narrows our perspective of health', Feudtner, too, contributes to the existing narrative that centres attention on medical interventions and suggests that insulin and drug therapies neatly supplanted the use of diet in managing diabetes.[40] In a table outlining 'Cyclic Periods of Diabetes Transmutation' Feudtner suggests that diets, along with opium, were the main forms of treatment available in the pre-1912 era, followed by low-calorie diets from 1913-22. Feudtner then lists a series of medical innovations such as insulin, antimicrobials, anti-hypertensives, transplants, pancreatic surgery and dialysis, thus suggesting that diets have only been used in the pre-insulin area and were disregarded thereafter with the discovery of new technologies. Though Feudtner includes a small section on 'the rigorous cycles of diet' the focus here is primarily in relation to insulin and these cycles are not examined in any great detail. Feudtner explains how 'diabetic lives were affected not only by changes in the medical world but also by broader social changes', fleetingly referencing the Depression and the Second World War, but ultimately withholds historical analysis here. This thesis, by contrast, completes this gap in the literature by historically analysing the broader social changes which have affected PWD and the care and treatment options they have been afforded.

[39] Feudtner, *Bittersweet*, p. 16.
[40] Ibid, p. 41.

Elizabeth Furdell's *Fatal Thirst: Diabetes in Britain until Insulin*, is guilty of similar limitations, centring its focus around the discovery of insulin and the changes to diabetic care in the immediate post-insulin era. However, unlike previous histories Furdell dedicates greater attention to the ideas which helped forge modern understandings of diabetes, for example by delving into the competing theories of diabetes which circulated in the pre-insulin era, from Galen's emphasis on balance and diet to medical astrology and herbal medicine.[41] The book's central focus however is one which rests on the discovery of insulin and the subsequent changes wrought to diabetes management. In a brief consideration of T2D, Furdell acknowledges the role of diet and lifestyle factors implicated in the onset of diabetes, yet her overall argument is one that points to pharmaceutical solutions and medical technologies for successful management. Where Type 2 is discussed in the book, Furdell's main agenda is to reinforce hereditary ideas, largely framing T2D as a genetic disease, pointing to human genome research as the solution to understanding diabetes and referring to those offering alternatives as 'quacks and charlatans' out to attack 'modern medicine and big drug companies'.[42] Moreover, while Furdell claims in the book's preface to offer 'a biography of diabetes from the dual perspective of doctors and patients', patient voices feature very little if at all throughout the book and are often overshadowed by those of the medical profession.

Covering much of the same ground, *Diabetes: The Biography* and *The Pissing Evil: A Comprehensive History of Diabetes Mellitus* by retired diabetologist turned historian Robert Tattersall provide the first general outline of diabetes history, tracing the history of medical and popular ideas about diabetes, from the earliest

[41] E. L. Furdell, *Fatal Thirst: Diabetes in Britain until Insulin*, (Leiden: Boston, 2009).
[42] Ibid, p. 160.

description found on Egyptian papyrus to contemporary responses to the current epidemic.[43] Concentrating primarily on technological developments as Tattersall himself admits, *Diabetes: The Biography* chronicles twentieth century scientific innovations in diabetic care from the chemical analysis of sugar in the urine to the discovery of the importance of the pancreas, the manipulation of diets and the extraction of hormones which allowed for the discovery of insulin in the 1920s. Where Tattersall grapples with the mid to late twentieth century, with which this thesis contends, his scope, perhaps reflecting his clinical background, is largely scientific, focusing on the outcomes of recent clinical trials and the ability of the pharmaceutical industry to respond to the present epidemic of diabetes. However, like Feudtner, Tattersall refrains from painting insulin as a wonder drug, defining the post-insulin era as 'the dark ages' he offers instead a balanced appraisal of the impact of insulin, noting the way in which it transformed diabetes into a chronic disease, leading to an 'epidemic of complications'.[44]

Where Tattersall provides an overview of the scientific developments which have altered diabetic management in the twentieth century, in more recent years historians have turned their attention to more specific features of diabetes history. In *Managing Diabetes, Managing Medicine: Chronic Disease and Clinical Bureaucracy in Post-War Britain*, historian Martin Moore presents a well-researched and engaging social and political history of diabetes management in Britain in the post-war era.[45] Moore carefully traces the political attention granted to chronic disease management in

[43] R. Tattersall, *Diabetes: The Biography*, (Oxford: Oxford University Press, 2009); R. Tattersall, *The Pissing Evil: A Comprehensive History of Diabetes Mellitus*, (Fife: Swan & Horn, 2017).
[44] R. Tattersall, *Diabetes*, p. 82.
[45] M. D. Moore, *Managing Diabetes, Managing Medicine: Chronic Disease and Clinical Bureaucracy in Post-War Britain*, (Manchester: Manchester University Press, 2019).

Britain, examining the wider social and political context of attempts to bureaucratise disease management, and the key actors involved in shaping management and forging the current structures and systems in place. In moving away from the archetypal 'history of diabetes as the history of insulin', Moore provides an engaging analysis of how the management of such a demanding disease has been shaped in the twentieth century by considering the influence of national politics, neoliberal ideology, and policy agendas upon the *sites* of management in diabetes care and treatment. Moore's main contributions lie in the book's revelation of key actors, such as health visitors and patient organisations, and the hidden connections instrumental in the creation of bureaucratic observation systems and in the tireless promotion of diabetes as a political concern. These areas in particular, provide significant contributions to the literature and Moore's social and political analysis of this era offered a new perspective which was wholly lacking in previous histories. In the earlier chapters, Moore examines changes to diabetic care that occurred as a result of the creation of the NHS, exploring the acceleration of hospital-based care and the development of bureaucratic tools for managing diabetes by a small group of clinicians. Charting the planning process and key actors involved in the creation of regional diabetes services, as well as discussions about chronic disease management in the 1950s, Moore demonstrates how diabetes became entwined in the medical and political interests of the time and was central among discussions regarding how chronic disease could be cared for in the community. In this context, new guidance – shaped by both GPs and other community care actors – emerged in an attempt to expand diabetes care beyond the walls of the hospital. In subsequent chapters, Moore details the convergence of both novel innovations and professional and

political interactions involved in the remaking of diabetes management, exploring the development and expansion of mini-clinics throughout the 1970s, the rise of surveillance medicine, the shifts in discussions around preventative medicine which led diabetes to re-emerge as a political concern during the 1970s, and the involvement of patient organisations in the development of standard and guidelines in British diabetes care over the last quarter of the twentieth century. Like Feudtner, Moore uses patient testimonies as a means to complement traditional sources, rather than to form the core narrative. Nevertheless, he uses oral testimonies to good effect, effectively illustrating the book's claims regarding the connection between medicine and politics and the lived realties of diabetes which resulted. While Moore briefly touches upon aetiology in the introduction, he chooses not to contend with how these changes in management shaped wider debates surrounding aetiology. Nor does Moore delve too deeply into the development of specific treatments such as oral hypoglycaemic drugs or the international debates surrounding their use, despite focusing on the same time period. Nevertheless, *Managing Diabetes, Managing Medicine* contributed a much-needed new perspective of diabetes history which replaced an excessive focus on insulin with an insight into the rise of surveillance medicine, and the resulting responsibility and expectations placed on PWD and their practitioners that is evident today.

Historians have also begun to assess the history of diabetes in relation to race and the ethnography of disease.[46] Laying the foundations for a greater social and cultural focus, historian Arlene Tuchman's *Diabetes: A History of Race and Disease*

[46] For a historical perspective see A. M. Tuchman, *Diabetes: A History of Race and Disease*, (New Haven: Yale University Press, 2020). For a sociological perspective of diabetes and race in the U.S see also J. Doucet-Battle, *Sweetness in the Blood: Race, Risk and Type 2 Diabetes*, (Minneapolis: University of Minnesota Press, 2021).

provides the first history of diabetes of its kind, exploring the changing demographic of diabetes and the stories that accompany why particular populations are at greater risk of developing the disease. Of particular relevance to this thesis is Tuchman's historical analysis of diabetes detection campaigns in the post-war era. Screening programmes in the United States revealed diabetes to be a disease of minority groups exposing the extent of racial and ethnic incidence and the vast inequality of care present compared to the white diabetic population. According to Tuchman, the revelation of the true incidence of diabetes among black and Mexican American communities, led to greater knowledge about diabetes, and the potential consequences and complications without treatment within these communities. In contrast to Jeremy Greene, who depicts the development of oral hypoglycaemic drugs and population screening as a tool to medicate largely healthy populations, Tuchman demonstrates how population screening to find 'the hidden million' was taken up by black communities and civil rights leaders in a bid to achieve equal health care and eradicate racial health injustices.[47] Incorporating the agency of black leaders into histories of screening, Tuchman explains:

> That so many of those million were found among populations that were neither white nor middle class can best be explained by the civil rights movements battle to get the nation to recognise - and then to eradicate - racial and economic injustices.[48]

In identifying a range of actors involved in the history of screening in the U.S, Tuchman demonstrates the central role of black leaders and physicians in establishing diabetes as a civil rights issue. In doing so she illustrates the

[47] J. A. Greene, *Prescribing by Numbers: Drugs and the Definition of Disease*, (Baltimore: John Hopkins University Press, 2007).
[48] Tuchman, *Diabetes: A History of Race and Disease*, p. 147.

complexities of this period in the history of diabetes which have hitherto been overlooked, revealing a history of diabetes which transcends the development of insulin to reveal, instead, a history intimately linked to poverty, race and health disparities.

This thesis contributes to the existing literature outlined above, providing a historical analysis of further aspects within the history of diabetes which have yet to be examined, such as the role of female physicians in the history of diabetes, the development of the first oral drugs for diabetes and their influence upon aetiology and treatment, the role of patients, their practitioners and patient organisations in shaping how diabetes has been managed, and the influence of wider events, ranging from war to international debates on diet and disease, in shaping how diabetes has been treated and understood. Moreover, as much of the existing literature has concentrated on the United States or T1D, this chapter fills a significant gap in the literature by accounting for the development of diabetes management in Britain and the perspectives of people with T2D as well.

One of the main disputes amongst historians of diabetes is whether we can broadly define 'diabetic symptoms' when dealing with sources prior to the formal distinction of T1D and T2D. Louise Curth warns of the danger of attempting to apply modern biomedical standards, disease labels and ideas to retro-diagnose or reconstruct conditions described in historical texts, noting how definitions of health and illness are firmly linked to the time, culture and society of the place in which they are situated.[49] This means that historians must be careful when approaching diseases

[49] L. H. Curth, 'Fatal Thirst: Diabetes in Britain until Insulin', *Social History of Medicine*, 10:1093 (2009), p. 637.

like diabetes which were not always diagnosed and labelled as distinct groups as they are today. The division of T1D and T2D is still a fairly recent categorisation, therefore earlier, broader definitions found for example in physician handbooks of the late nineteenth and early twentieth centuries which refer to 'acute' or 'chronic' forms of the disease may not simply transfer to modern categories used to understand and define diabetes today. This thesis aligns with the points outlined here by Curth, and put forth elsewhere such as Feudtner's *Bittersweet*, that as diseases can mutate and change biologically over time historians must be cautious when applying modern understandings to historical accounts. As far as possible, this thesis will refer to Type 2 diabetes as 'T2D' or simply 'diabetes' or 'mild diabetes' when dealing with earlier time periods when the classification T1D and T2D were not yet available. It will avoid the use of treatment-specific categories such as non-insulin dependent diabetes mellitus (NIDDM) as this has become somewhat outdated in recent years as many patients traditionally considered 'mild' or to have T2D have increasingly been prescribed insulin to manage their symptoms. With respect for those living with diabetes, and to avoid labelling people by their condition, this thesis will refer to 'people with diabetes' (PWD) rather than 'diabetics' as is often used in traditional histories of diabetes and older medical literature.

Patient-Centred Histories

According to the Oral History Association, oral history is a field of study and a method of gathering, preserving and interpreting the voices and memories of people, communities, and participants in past events. It is both the oldest type of historical inquiry, predating the written word, and one of the most modern, initiated with tape

recorders in the 1940s and now using twenty first-century digital technologies.[50] According to the late Roy Porter, patient narratives are vital sources of primary evidence of social and cultural discourses which allow the historian to better understand how sickness has been labelled, as well as the individual's beliefs and assumptions about the conditions cause, type, prognosis, and remedy'.[51] However, as historian Erin Jessee has identified, while oral history expands our gaze to consider intimate accounts of the human experience, like all primary sources, it has its limits and issues which make it controversial.[52] Yet, as long as these ethical considerations are understood and adhered to by the researcher, the inclusion of individual and community responses to health, sickness and medical treatment can contribute innovative perspectives of health and disease both past and present.

Despite a broad consensus on the merits of oral history methods in the history of medicine, historians of diabetes have tended to eschew the use of lived experience, incorporating the patient's perspective into histories of diabetes only in recent years. Paul Thompson's *The Voice of the Past*, which provides an extensive historiographical review of oral history research, reveals the conspicuous absence of oral history projects which engage with PWD, and patient narratives generally.[53] With the exception of Feudtner and Moore, the histories of diabetes cited in the above literature review have relied primarily upon traditional archival sources rather than the use of patient testimonies taken from PWD themselves. Where patient testimonies have appeared in the history of diabetes they have been utilised in

[50] Oral History: Defined, Oral History Association, https://www.oralhistory.org/about/do-oral-history/, accessed 6 October 2021.
[51] R. Porter, 'The Patient's View: Doing Medical History from Below', *Theory and Society*, 14:2 (1985), p. 193.
[52] E. Jessee, 'The Limits of Oral History: Ethics and Methodology Amid Highly Politicised Research Settings', *Oral History Review*, 38:2 (2011), pp. 287-307.
[53] P. Thompson, *The Voice of the Past: Oral History*, (Oxford: Oxford University Press, 2000).

multifarious ways; Moore, for example, utilises existing oral histories to complement traditional sources, whereas Feudtner's use of patient testimonies appear in the form of patient letters from a small patient population of people with T1D held in the archive of the Joslin Diabetes Centre. More recently, doctoral researchers Stuart Bradwel and Lauren Young have conducted oral histories in Scotland and Northern Ireland, making use of oral history to place lived experiences of T1D at the centre of historical research.[54] Their use of oral history methodology aids a deeper and more meaningful understanding of patient experiences of T1D, shedding new light on patient expertise, changing patient expectations and the reorganisation of the consultative relationship, as well as patient experiences of novel medical devices such as insulin pens, insulin pumps and glucose monitors.[55]

Due to the prevailing focus on T1D in the histories outlined above, this thesis directs its attention toward those who remain absent in the existing literature. To incorporate the views of people living with T2D, the thesis exploits both existing oral history collections, as well as interviews conducted by the researcher to analyse the lived experience and perspectives of an illness which has grown significantly in recent times. By including oral history as a principal methodology, this thesis contributes to the existing literature by providing the first patient-centred view of the history of diet and diabetes, a fundamental perspective which has yet to be tackled by historians. As the interviews carried out for *Diabetes Stories*, the existing collection used in this thesis, offered only those perspectives of English PWD, the interviews

[54] S. Bradwel, 'Doctor's Orders: Type 1 Diabetes and the Consultative Relationship, 1948-1922', (University of Strathclyde, PhD thesis, 2020); L. Young, 'A Curse of a Disease': Exploring the History and Lived Experience of Diabetes through Patient Memory', (Queens University, PhD thesis, 2022).
[55] Ibid.

conducted for this research sought to include the perspectives of Scottish people living with T2D and their practitioners.[56] The following provides a brief overview of the development and merits of oral history and a review of some of key patient-centred histories undertaken in recent years which encompass theoretical perspectives and methodologies which complement this thesis.

In his seminal article published in 1985, Roy Porter proposed an alternative history of medicine, one which placed patient experience at the heart of accounts of health and illness. Until now, he argued, the history of healing had been the history of doctors and thus he challenged historians to move away from physician-centred accounts which prevailed among histories of Western medicine. According to Porter, it takes two to make a medical encounter, the sick person as well as the doctor, yet 'the sufferers' role in the history of healing, in both its social and cognitive dimensions, was routinely ignored by scholars'.[57] Porter's article encouraged a profound historiographical shift, prompting historians to create an alternative history of medicine, one which became known as 'medical history from below'. In 1991, in a review for the *Social History of Medicine*, Paul Thompson, commented further on the limited use of evidence from oral history or life story

[56] In recent years, encouraged by the debate over Scottish Independence, numerous commentators have drawn attention to the lack of Scottish perspectives not only in history, but on television, in literature and in the media as well. This thesis strives to overcome this by striving for greater inclusion of Scottish voices. For some examples of this sentiment see S. Jeffries, 'Dear Scotland: Here are 76 things we'd like to apologise for, love England', *Guardian*, 19 February 2014, https://www.theguardian.com/politics/2014/feb/19/scottish-independence-76-things-apologise, accessed 12 January 2022; Holly. M, 'Forgotten Scottish Authors', *Glasgow Women's Library*, 13 May 2021, https://womenslibrary.org.uk/2021/05/13/forgotten-scottish-authors/, accessed 12 January 2022; K. Guru-Murthy, 'Is British TV Failing Scotland?', *Channel 4 News*, 8 May 2011, https://www.channel4.com/news/is-british-tv-failing-scotland, accessed 12 January 2022

[57] R. Porter, 'The Patient's View: Doing Medical History from Below', *Theory and Society*, 14:2 (1985), p.176.

interviews by British medical historians.[58] By the mid-1990s however, historians of medicine gradually began to engage with oral sources, particularly with patient testimonies, both archived and those which they recorded themselves. In early attempts to produce patient-centred research historians mainly utilised patient records, memoirs and diaries simply as untapped primary evidence to either support or contest traditional documentary sources.[59] These histories mirrored a wider trend in oral history throughout the 1970s and 1980s of discovering 'hidden histories' or 'recovery history' which had sought to find evidence absent in conventional historical sources.[60]

Among these early patient-centred histories, Sanjiv Kakar's research involved the use of oral testimonies conducted with leprosy patients in India to trace the history of the disease and its treatment in the twentieth century.[61] The use of oral testimonies in Kakar's work revealed the influence of wider events, such as the introduction of Western medical systems and practices, on the patient's experience of the disease. Kakar's use of pre-existing archived testimonies provided valuable insights into patient perceptions of contagion, transmission and curability, experiences of discrimination and patient involvement in the detection of new cases.[62] Additionally, the oral testimonies revealed wider issues relating to perceptions of health and disease in colonial India, the tension between traditional and modern forms of

[58] P. Thompson, 'Oral History and the History of Medicine: A Review', *Social History of Medicine*, 4:2 (1991), p. 372.
[59] J. Cornwell, *Hard-Earned Lives: Accounts of Health and Illness from East London*, (London: Routledge, 1984); R. Adam and R. Van Riel, *In Sickness and in Health*, (Age Exchange, 1985), Reviewed in P. Thomson, 'Oral History and the History of Medicine', 4:2 (1991), pp. 371-383.
[60] L. Abrams, *Oral History Theory*, (London: Routledge, 2010), p. 7.
[61] S. Kakar, 'Leprosy in India: The Intervention of Oral History', *The Oral History Reader*, 23:1 (1995), pp. 37-45.
[62] Ibid.

treatment and when cross-referenced with colonial sources, uncovered greater patient agency than conventional histories had assumed.

Historians with an interest in health among communities have conducted research using oral testimonies to trace the diffusion of, and resistance, to medical advances and lay understandings of disease. Elizabeth Peretz followed this method in her study of the development of community health care in interwar Britain in order to ascertain lay attitudes towards health care provision.[63] Similarly, historian Virginia Berridge employed oral history in her study of opium to challenge official sources, as well as to question the stereotypes of opium use and reconsider the medical and pharmaceutical professions as agents of progress.[64] In *Health Culture in the Heartland, 1880-1980* historian Lucinda Beier recounts more than a century of health care through the perspectives local residents, nurses, doctors and public health professionals. Providing an important counterweight to physician-centred studies, Beier's study of McLean County in North Illinois provides insight into topics such as the home management of ill-health, birth, and death, nurses' training and practices, the experiences of African American healers and patients, and public health provision.[65] Fusing together personal responses to national developments, Beier uses oral testimonies to demonstrate how wider changes, including; urbanisation, as well as scientific and technological advances have altered the sites of medical treatment, medical practices and public health initiatives. By applying a critical historical perspective, Beier refutes the assumption of progress within the history of medicine,

[63] E. Peretz, 'The Professionalization of Childcare', *Oral History*, 17:1 (1989); E. Peretz, 'A Maternity Service for England and Wales: Local Authority Maternity Care in the Interwar Period in Oxfordshire and Tottenham', in J. Garcia, R. Kilpatrick and M. Richards (eds.) *The Politics of Maternity Care*, (Oxford: Clarendon Press, 1990).
[64] V. Berridge, 'Opium and Oral History', *Oral History*, 7:2 (1979), pp. 48-58.
[65] L. Beier, *Health Culture in the Heartland, 1880-1980: An Oral History*, (Chicago: University of Illinois Press, 2009).

ending the book with a contemporary health study of the same region which highlights important issues around class, health insurance and access to health care, particularly among residents living with a chronic disease.[66]

Historian Mary Jo Festle's oral history of recipients of lung transplants provides an effective case study of patient-centred research which utilises oral testimonies to observe attitudes towards a particular treatment. Festle uses oral testimonies to contrast the views of patients with the health care professionals delivering their treatment. Patients, she argues 'provide their own definitions of quality of life, determine for themselves in what areas they are doing well or need help, and assign their own values to the aspects of life they consider most important'.[67] Similarly, Glenn Smith, Annie Bartlett, and Michael King place patient narratives at the centre of their research into the 'treatment' of homosexuality in the 1950s to reveal powerful accounts of the medicalisation of sexuality from both patients and their therapists.[68] Likewise, Ali Haggett's history of anxiety, stress and depression among women in the 1950s and 1960s uses oral testimonies to reveal women's perceptions of the cause of their neuroses and their feelings towards treatment. While the focus here is mental health, Haggett's book covers a similar timespan, location and many of the themes covered in this thesis which offers a useful framework for interpreting oral testimonies of health care and treatment during this time period. Haggett situates patient and physician testimonies within the historical context of the post-war debate surrounding the diagnosis of symptoms and the categorization of

[66] Ibid.
[67] M. J. Festle, 'Qualifying the Quantifying: Assessing the Quality of Life of Lung Transplant Recipients', *Oral History Review*, 29:1 (2002), pp. 59-86.
[68] K. Fisher, 'Oral Testimony and the History of Medicine', in M. Jackson (ed.) *The Oxford Handbook of the History of Medicine*, (Oxford: Oxford University Press, 2011), p. 603.

disorders, illuminating the wide range of explanations for mental disorder during this period.[69] Providing the central narrative of the book are the oral testimonies of a group of women who were wives and mothers during the post-war period, respondents who were drawn from the formerly known National Housewives Register. Haggett uses oral history here to challenge prevailing assumptions that depression, anxiety and dissatisfaction stemmed from housework or mothering, but rather from troubled relationships or the uprooting to the suburbs where women felt isolated. Additionally, the use of oral testimonies here challenge the view that women were purposefully targeted by drug companies, showing instead that women took medication in higher numbers simply because they were more likely to see a doctor than men. Haggett observes how interviewees, when making sense of their lives, will naturally draw upon a range of cultural discourses that are available to them while respectively maintaining the capacity to 'engage critically and constructively with inherited ideas and beliefs'.[70] In other words, when analysing oral testimonies it is important to understand the ways in which cultural discourses shape our narratives, while being careful not to let the focus on cultural discourses minimise or discard the value of individual memory or the interviewee's agency.[71]

Reflecting the development of oral history from a method of simply recording the stories absent in conventional histories, towards an analytical practice used to reveal meanings beneath patient narratives, historians of health and medicine have begun to use testimonies as a means to understanding the impact of cultural circuits. An

[69] A. Haggett, *Desperate Housewives, Neuroses, and the Domestic Environment, 1945-70*, (London: Pickering and Chatto, 2012), p. 7.
[70] Ibid, p. 5.
[71] A. Green, 'Individual Remembering and 'Collective Memory': Theoretical presumptions and contemporary debates', *Oral History Review*, 32:2, (2004), pp. 35.

effective example of this type of research is Angela Davis' work on the history of maternity services in Oxfordshire between 1948 and 1974. Davis uses oral history to uncover women's experiences of health care following the establishment of the National Health Service (NHS), refuting the prevailing assumption that women and children had been its greatest beneficiaries. In Davis's analysis of the testimonies she examines the way the women articulated their stories and the influence of class, locality and family circumstances in their understandings of motherhood.[72] The use of oral history to understand social and cultural discourses has become a popular methodology among historians of health and medicine in recent years as historians have sought to understand the cultural factors which shape our experiences, as well as the narrative being told. In Arthur McIvor and Ronald Johnston's work on the occupational health of workers in Glasgow, oral history interviews exposed the physical effects of harmful work environments, but also revealed the stigma associated with occupational health hazards and the self-identities, in this case 'macho cultures', which framed interviewees responses to ill-health.[73] In both McIvor and Johnston's research on asbestosis and Davis' work on women's experience of maternity services, the use of oral history transcends elementary experiences of health, to reveal underlying ways in which health and illness are related to the construction of the individual's identity.[74] Wendy Rickard's history of HIV and AIDS provides yet another valuable example of this approach. Rickard explores the composition of individual personal identities following diagnosis, using

[72] A. Davis, 'A Revolution in Maternity Care? Women and the Maternity Services, Oxfordshire, 1948-1974', *Social History of Medicine*, 24: 2 (2011), p. 402.
[73] A. McIvor, *Lethal Work: A History of the Asbestos Tragedy in Scotland*, (East Linton: Tuckwell, 2000), p. 220.
[74] K. Fisher, 'Oral Testimony and the History of Medicine', in M. Jackson, (ed.) *The Oxford Handbook of the History of Medicine*, (Oxford: Oxford University Press, 2011), p. 603.

oral history interviews to discern individual's reactions to their diagnosis and treatment. Resembling the history of diabetes, early histories of HIV were often dominated by the history of drug development and ignored the complex relationship between medical theories of disease, diagnosis and the individual's self-perception. This thesis adopts a similar method to that used by Rickard and the oral historians cited above to create a patient-centred history of diabetes which takes into consideration both the patients' perception of disease, as well as the cultural circuits which influence the construction of self-identities in relation to it.

Finally, while not histories of medicine, two further studies conducted by medical anthropologists contribute important theoretical perspectives relevant to this research. *Cancer in the Community: Class and Medical Authority* by anthropologist Martha Balshem provides a case history of a neighbourhood in Philadelphia notorious for high cancer rates. In the study, Balshem uses extensive interviews with patients and physicians to examine the contrasting attitudes within the community regarding the causes of cancer, illuminating underlying struggles concerning class, power inequalities and the control of knowledge.[75] For community residents, cancer rates were caused by an unhealthy environment which many of the residents attributed to contaminated waste from local industrial facilities, while professionals credited the resident's lifestyles for the high incidence of cancer, suggesting that personal behaviours such as cigarette smoking, alcohol consumption and diets consisting of high-fat foods were to blame.[76] Whilst Balshem's study provides an ethnographic rather than historical perspective, her method of contrasting the views

[75] M. Balshem, *Cancer in the Community: Class and Medical Authority,* (Washington: Smithsonian Institution Press, 1993).
[76] Ibid.

of patients with those of the medical profession, in particular to reveal notions of blame and responsibility for disease, offers a valuable perspective which has helped inform the analysis of narratives within this thesis. One of the few studies conducted with PWD to uncover lived experience of diabetes, *Diabetes among the Pima* by Carolyn Smith-Morris provides a patient-centred account of gestational diabetes among Pima women of the Gila River community in Southern Arizona.[77] Of this community fifty percent of all adults are diabetic, yet despite this statistic researchers have limited their scope to biomedical causes and to date the epidemic among Pima women remains unchecked. Living among the Pima women for ten years, Smith-Morris' research provides an in-depth account of the women's experiences of diabetes and their attitudes towards aetiology and treatment. The study adopts a cultural explanatory model for understanding the causes of disease by focusing on Pima women's 'cultural obstacles' such as gender identities, traditions and values which were found to act as barriers to successful prevention, screening and intervention. While this study draws on a number of cultural obstacles to successful management, the lack of historical perspective avoids delving into important factors such as nutritional changes or socioeconomic factors which may explain or aid a better understanding of rising rates among particular communities. Nevertheless, *Diabetes among the Pima* raises important questions surrounding the social and cultural issues at the heart of the diabetes epidemic and highlights gender and health care disparities among native populations such as the Pima Indians.

[77] C. Smith-Morris, *Diabetes among the Pima: Stories of Survival*, (Tucson: University of Arizona Press, 2006).

According to Penny Summerfield 'oral historians enter the world of the life-story in search of personal accounts of historical processes'.[78] However, as Roy Porter anticipated, telling history from the point of view of the sick would be 'fraught with its own pitfalls too'.[79] One of the main critiques of oral history concerns the idea of empowerment and the challenge of ensuring 'shared authority' when interviewing patients or vulnerable groups. For oral historian Luisa Passerini, the concept of 'democratising' history was problematic in that oral history may provide groups absent in traditional histories with a voice, but the interview situation itself is inherently unequal.[80] Yet, skilled historians have found ways of diminishing power gaps in order to critically engage with oral testimonies and use oral history as a power base for change. Jan Walmsley, one of the leading historians in the field of oral history and disability, pioneered collaboration with her research subjects in order to uncover the obstacles which prevent people with disabilities from being heard and how their perspectives could be used to shape policy. Walmsley's use of life maps and illustrated accounts allowed interviewees to create their own life-stories in a format that was both clear and familiar, yet despite her efforts, Walmsley concluded that due to the comprehension gap between herself and her interviewees, true 'shared authority' and the eradication of power imbalances remained a challenge.[81] Walmsley's research thus highlights some of the potential pitfalls of using oral history. Whilst historians best efforts to create a 'medical history from below' in which patients or those who have experienced illness or disability can become part of

[78] P. Summerfield, 'Dis/composing the subject: intersubjectivities in oral history' in T. Coslett, C. Lucy and P. Summerfield (eds.), *Feminism and Autobiography: Texts, Theories and Methods*, (London: Routledge, 2000), p. 92.
[79] R. Porter, 'The Patient's View: Doing Medical History from Below', *Theory and Society*, 14:2 (1985), p. 182.
[80] L. Abrams, *Oral History Theory*, (London: Routledge, 2010), p. 161.
[81] J. Walmsley, 'Life History Interviews with People with Learning Disabilities', *Oral History*, 23:1 (1995), p. 186.

the process of creating their own history, inevitably the problem of who sets the agenda and how to truly produce shared authority of the research can often remain.

To sum up, the many histories reviewed here serve to incorporate individual experience into the historical frame and humanize the history of medicine. Yet, if oral history is to be utilised successfully it must go beyond simply documenting these experiences and use them instead to understand and even challenge existing medical structures. It is within the growing body of literature of patient-centred histories, seeking to create what Porter described as an 'alternative history of medicine', which this thesis contributes to. One which is fluid, fully allows the voice of the people themselves to be heard in their own history, carefully analyses lived experiences of diabetes within their social and cultural context, yet does not underestimate or devalue the power of the individual in understanding and contesting the wider forces which shape our understandings of health and disease.

Chapter Two:

'Eat, Drink and Be Merry, For Tomorrow You Die': Diabetes and the Origins of the Diabetic Diet

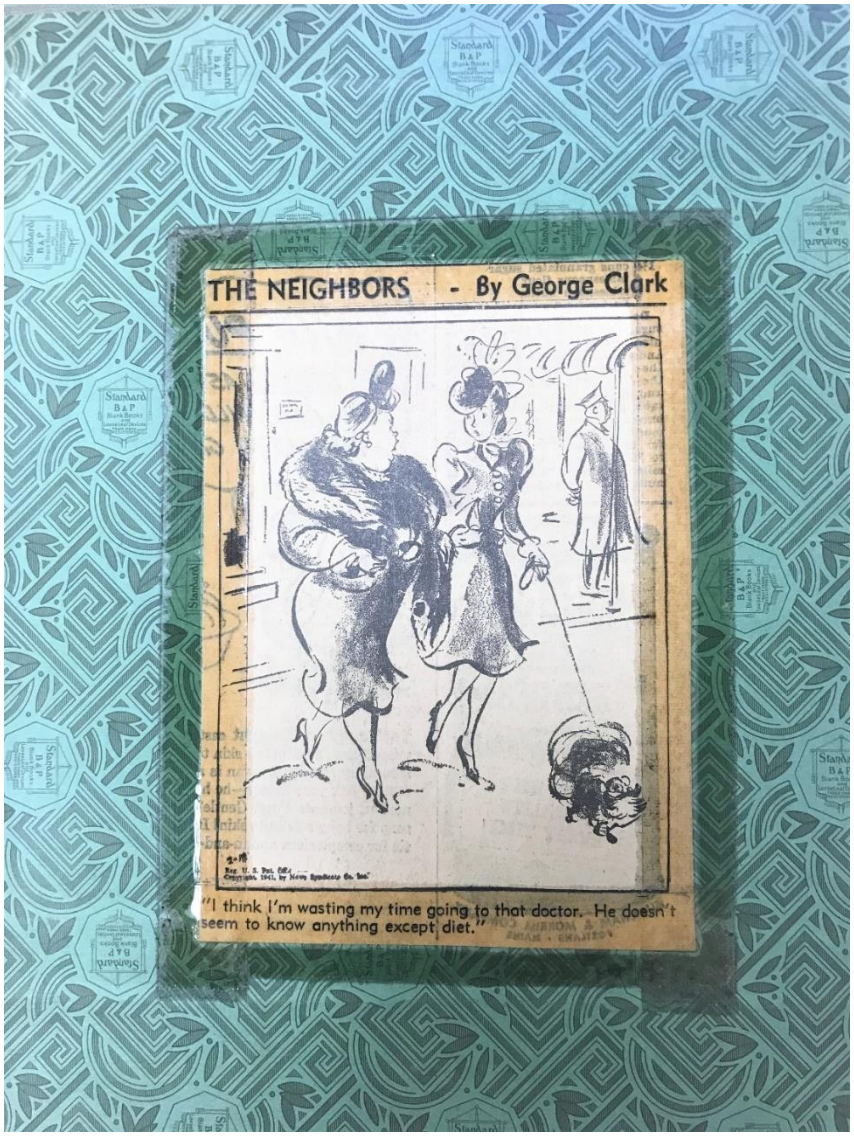


Figure 2.1: Diet and Diabetes Scrapbook, [Courtesy of the Joslin Diabetes Centre].

Introduction

Long before the rise of biomedicine, diet was considered a key component of orthodox medicine across the globe, and for centuries a holistic understanding of mind and body held cultural authority over understandings of sickness, health and the treatment of disease.[82] In the earliest written record of diabetes, from the second century AD, Greek physician Arataeus of Cappadocia described diabetes as 'a mysterious illness where the flesh and limbs melt into the urine', for which he prescribed a dietary regimen of milk and cereals and the complete avoidance of alcohol.[83] Areataeus' medical practice was based upon the principals of the Pneumatic school which highlighted the vital role of pneuma (air) and the importance of the four humours (blood, black bile, yellow bile and phlegm), evident in his description of the thirst of a diabetic 'as if scorched up with fire'. Influenced by Hippocratic medicine with its focus on lifestyle, diet, exercise and calm and moderate living, classical philosophers lay the origins for our modern ideas about food, health and disease. The Greek philosopher Plato, for example, held that eating in excess would inevitably lead to ill-health and that the best remedy for disease was not medication, but the regulation of diet: 'Wherefore one ought to control all such diseases, so far as one has the time to spare, by means of dieting rather than irritate a fractious evil by drugging' ('Timaeus' 89C-D).[84] Greek historian Plutarch, likewise upheld the importance of diet, describing the body as 'a ship not to be overloaded', and described a good doctor as one willing to use to diet rather than resort to 'drugs

[82] R. Bivins, *Alternative Medicine: A History* (Oxford: Oxford University Press, 2007), p. 4.
[83] M. Karamanou et al, 'Milestones in the history of diabetes mellitus: The main contributors', *World Journal of Diabetes*, 7:1 (2016), pp. 1-7.
[84] P. K. Skiadas and J. G. Lascaratos, 'Dietetics in Ancient Greek Philosophy', *European Journal of Clinical* Nutrition, 55 (2001), p. 536.

or the knife'.[85] In the stages of medical care performed in the ancient world, the prescription of medical preparations or surgery were deemed unnecessary unless diet had been attempted and proved ineffective. Diabetes, like many diseases, was traditionally managed following this same rationale, yet, within the historiography there is a tendency to suggest that following the discovery of insulin, diet became redundant in the management of diabetes and was abandoned in favour of new, medical means, of management.[86] Many existing accounts assume that once insulin became available, Western physicians began hastily releasing their patients from the meticulous weighing of foods and careful calculation of carbohydrates, thereby 'throwing off the shackles' of the diabetic diet.[87] By contrast, this chapter, examining the use of diet to manage diabetes both before and after the availability of insulin, explores the complex ways in which insulin therapy altered the practice of management. By re-assessing the place of diet within the context of insulin and the new medical gaze in diabetes management, the following chapter demonstrates that, rather than replace traditional means of management, insulin reinforced the importance of diet in managing what remained a complex and poorly understood disease. Additionally, the rationales provided for upholding a strict adherence to diet are discussed, exploring how these evolved within the context of the transformation of diabetes from an acute to chronic disease. Utilising physician handbooks, published medical literature and dietary guidelines from the late nineteenth and early twentieth century, this chapter examines the origins of diet therapy in diabetes and

[85] L. Foxcroft, *Calories and Corsets: A History of Dieting over 2000 Years,* (London: Profile Books, 2013), p. 19.
[85] Ibid.
[86] C. Feudtner, *Bittersweet*, p. 412.
[87] M. Bliss, *The Discovery of Insulin* (London: Faber and Faber Ltd, 1988); M. Moore, 'World Diabetes Day – Diets', *The Exeter Blog*, 14th November 2014.

the theoretical understandings underpinning its use. The first section of the chapter examines some of the early means of managing diabetes, examining the dietary principles which governed how diabetes was treated and understood. The second strand of the chapter explores the history of diabetes after insulin, drawing attention to the role of key physicians such as Elliot Joslin and R. D. Lawrence in shaping diabetic management in the early twentieth century. It also examines how insulin, as it transformed diabetes from an acute to chronic disease, provoked a renewed debate on aetiology, accentuating tensions around the culpability of disease.

Diet and Diabetes before Insulin

The historical connection between diet and diabetes is often traced to ancient India, where the classical medical writer Susruta described diabetes as the result of a gluttonous overindulgence in rice, flour and sugar.[88] From the ancient world, the next juncture in modern understandings of diet and diabetes, most commonly cited by historians, came in 1674 with the publication of *The Diabetes or Pissing Evil* by English physician Thomas Willis. Willis' observation of the sweetness of diabetic urine 'as if it were imbued with Honey or Sugar', contributed greatly to diagnosis by allowing physicians to identify diabetes on the odour of the patients urine.[89] One hundred years later, as physicians continued to ruminate over the sweetness of their patients' urine, physician Matthew Dobson discovered that the sweetness was formed not in the kidneys, as previously held, but in the serum of the blood (glycosuria).[90]

[88] N. S. Papaspyros, *The History of Diabetes Mellitus* (Stuttgart: G. Thieme, 1964) cited in S. Gilman, *Diets and Dieting: A Cultural Encyclopaedia* (New York: Routledge, 2008), p. 177.
[89] M. Karamanou et al, 'Milestones in the history of diabetes mellitus: The main contributors', *World Journal of Diabetes*, 7:1 (2016), pp. 1-7.
[90] M. Dobson, *Experiments and Observations on the Urine of a Diabetic*, (London: W. Johnston, 1776); R. B. Bush, 'Urine is an Harlot, or a Lier', *JAMA*, 208:1 (1969), pp. 131-134.

Following Dobson's account, a succession of nutritional therapies were devised in an attempt to control diabetic symptoms by feeding patients with food their bodies could assimilate.[91] Included among these was the protein-packed red meat diet devised by Scottish military surgeon John Rollo in 1797, a diet wholly meat-based featuring items such as 'plain-blood pudding' and 'fat and rancid old meats'.[92] Void of sweet or vegetable foods, Rollo's diet was one of the first low-carbohydrate diets used to treat diabetes and was widely held to be considered more of a penance than a pleasurable meal.[93] Throughout the nineteenth century, in addition to Rollo's meat-based diets, physicians experimented with a wide range of diets underpinned by diverse nutritional understandings. In the late 1850s, French physician Priorry advised his patients to consume large quantities of sugar to treat their diabetes while French pharmacist Apollinaire Bouchardat placed his patients on a low-carbohydrate diet, advocating the use of fasting as a means to relieve the work of the pancreas.[94] According to medical journals and physician handbooks, diabetic management in the pre-insulin era involved both the calculation of diets that patients' bodies could metabolise, as well ensuring that patients followed and continued with their prescribed diets. The unwillingness of many patients to adhere to their dietary regimens led a number of physicians to extreme measures, such as the Italian doctor Cantoni and German physician Bernard Naunyn who detained their patients under lock and key for up to five months at a time until they were free of sugar.[95] Amidst such therapeutic uncertainty, nineteenth-century physicians experimented with a

[91] Feudtner, *Bittersweet*, p.6.
[92] J. Rollo, *Cases of the Diabetes Mellitus: With the Results of the Trials of Certain Acids, and Other Substances* (London: J. Callow, 1806), p. 1-69.
[93] Ibid.
[94] S. Gilman, *Diets and Dieting: A Cultural Encyclopaedia* (New York: Routledge, 2008), p. 177.
[95] M. Bliss, *The Discovery of Insulin*, p. 20.

range of dietary remedies in hope of controlling their patient's symptoms ranging from the oatmeal cure, milk diet and the rice cure to 'potato therapy'.[96] In an article published in the *Journal of the American Medical Association* in 1884, Dr Austin Flint, Professor of Physiology at the Bellevue Medical Hospital recommended a range of alternative measures, from opium, bromides and sulphide of calcium to those aimed at stimulating 'the proper action of the skin' such as massage and bathing in Turkish and Russian baths.[97] Yet, according to Flint, all such methods were unsatisfactory compared to a rigid diet:

> Of course it is difficult to estimate the value of drugs in this as in many other diseases, particularly as the physician is not justified, in my opinion, in neglecting to enforce a rigid diet…There is no remedy that exerts a curative influence over diabetes in the absence of proper dietetic measures.[98]

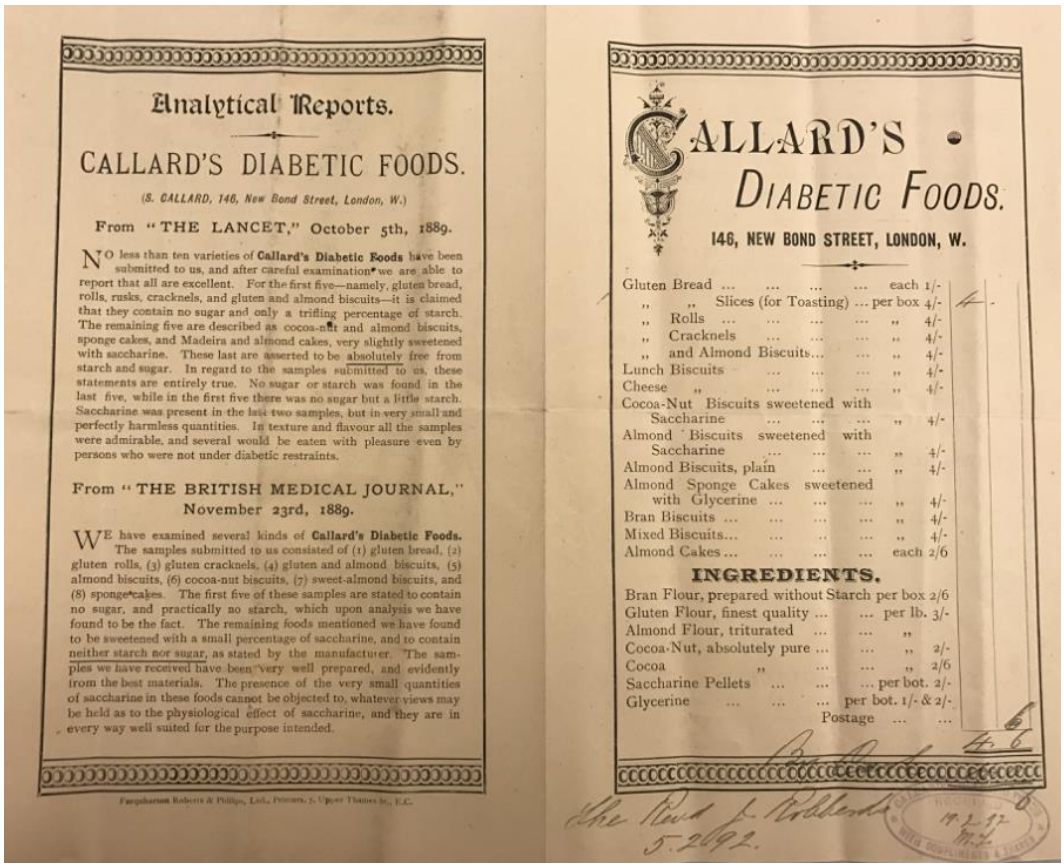
In the decades preceding the discovery of insulin, diet was thus the principal, and most effective form, of managing diabetes. In addition to the diets devised by physicians, the food industry began to tap into the market for diabetic diets by developing alternative foods and diet plans which were promoted as less monotonous and easier to follow. In keeping with the nutritional consensus, alternatives were sought and produced particularly for foods deemed problematic such as those high in carbohydrate and sugar. However, an examination of the advertisements for some of the first diabetic foods illustrates that, rather than being promoted as alternatives to the dietary regimens devised by the physicians, the medical profession often promoted the use of such substitutions and encouraged patients to incorporate them into their diabetic diet. In an advertisement featuring endorsement from both the

[96] Gilman, *Diets and* Dieting, p. 177.
[97] A. Flint, 'The Treatment of Diabetes Mellitus', *JAMA*, 3:2 (1884), p. 33.
[98] Ibid.

Lancet and the *BMJ* (Figure 1.1), manufacturers such as Callard's Diabetic Foods promoted the use of a wide range of sugar and starch-free alternatives to regular foods.[99] Further food industry sources such as advertisements from the early twentieth century demonstrate the role of food manufacturers in shaping dietary advice and what constituted the ideal diabetic diet. For example, between 1910 to 1919, the Battle Creek Food Company, headed by nutrition pioneer John Harvey Kellogg at the Battle Creek Sanatorium, published a series of pamphlets as part of the 'Battle Creek Diet System' titled *What to Eat in Diabetes.* Reflecting Kellogg's view that meat encouraged 'the constipation and putrefaction of the colon', the Battle Creek diet for diabetes recommended a nutritional regimen free of meat, low in carbohydrate and sugar and high in 'Lime and iron'.[100] The Battle Creek diet system was informed by the view that diabetes was caused by constipation due to overeating, particularly of cane sugar, thus alongside diet tables and food guides, the Battle Creek Food Company produced an array of bran-based and starch-free products marketed to both PWD and their physicians. In line with Kellogg's Adventist values which preached temperance and the importance of scientific eating, PWD who followed the Battle Creek Diet System were expected to follow a number of rules, such as cultivating self-control, and in eating scientifically, were to regard the pleasure of eating an 'altogether secondary consideration'.[101] These sources demonstrate that as early as the 1890s, dietary advice for diabetes could be influenced by commercial interests and the personal ideologies of nutritionists, such as can be seen with Kellogg's Battle Creek Diet System which advocated the

[99] S. Callards Diabetic Foods, (1892), Wellcome Library, Ephemera Box 545.
[100] 'What to Eat in Diabetes: Recipes, Menus, Tables, Rules', *Battle Creek Food Company*, Michigan (1910), Wellcome Library, WK800 191.
[101] Ibid.

principles of vegetarianism and temperance in order to shape the population's eating habits.



Analytical Reports.

CALLARD'S DIABETIC FOODS.

(S. CALLARD, 146, New Bond Street, London, W.)

From "THE LANCET," October 5th, 1889.

NO less than ten varieties of **Callard's Diabetic Foods** have been submitted to us, and after careful examination we are able to report that all are excellent. For the first five—namely, gluten bread, rolls, rusks, cracknels, and gluten and almond biscuits—it is claimed that they contain no sugar and only a trifling percentage of starch. The remaining five are described as cocoa-nut and almond biscuits, sponge cakes, and Madeira and almond cakes, very slightly sweetened with saccharine. These last are asserted to be absolutely free from starch and sugar. In regard to the samples submitted to us, these statements are entirely true. No sugar or starch was found in the last five, while in the first five there was no sugar but a little starch. Saccharine was present in the last two samples, but in very small and perfectly harmless quantities. In texture and flavour all the samples were admirable, and several would be eaten with pleasure even by persons who were not under diabetic restraints.

From "THE BRITISH MEDICAL JOURNAL," November 23rd, 1889.

WE have examined several kinds of **Callard's Diabetic Foods.** The samples submitted to us consisted of (1) gluten bread, (2) gluten rolls, (3) gluten cracknels, (4) gluten and almond biscuits, (5) almond biscuits, (6) cocoa-nut biscuits, (7) sweet-almond biscuits, and (8) sponge-cakes. The first five of these samples are stated to contain no sugar, and practically no starch, which upon analysis we have found to be the fact. The remaining foods mentioned we have found to be sweetened with a small percentage of saccharine, and to contain neither starch nor sugar, as stated by the manufacturer. The samples we have received have been very well prepared, and evidently from the best materials. The presence of the very small quantities of saccharine in these foods cannot be objected to, whatever views may be held as to the physiological effect of saccharine, and they are in every way well suited for the purpose intended.

Farquharson Roberts & Phillips, Ltd., Printers, 7, Upper Thames St., E.C.

CALLARD'S
DIABETIC FOODS.
146, NEW BOND STREET, LONDON, W.

Gluten Bread	each	1/-
,, ,, Slices (for Toasting) ...	per box	4/-
,, Rolls	,,	4/-
,, Cracknels	,,	4/-
,, and Almond Biscuits... ...	,,	4/-
Lunch Biscuits	,,	4/-
Cheese ,, ...	,,	4/-
Cocoa-Nut Biscuits sweetened with Saccharine	,,	4/-
Almond Biscuits sweetened with Saccharine	,,	4/-
Almond Biscuits, plain	,,	4/-
Almond Sponge Cakes sweetened with Glycerine	,,	4/-
Bran Biscuits	,,	4/-
Mixed Biscuits...	,,	4/-
Almond Cakes	each	2/6

INGREDIENTS.

Bran Flour, prepared without Starch	per box	2/6
Gluten Flour, finest quality	per lb.	3/-
Almond Flour, triturated	,,	
Cocoa-Nut, absolutely pure	,,	2/-
Cocoa ,, ...	,,	2/6
Saccharine Pellets	... per bot.	2/-
Glycerine	per bot.	1/- & 2/-
Postage		

The Revd J. Robberds
5.2.92.

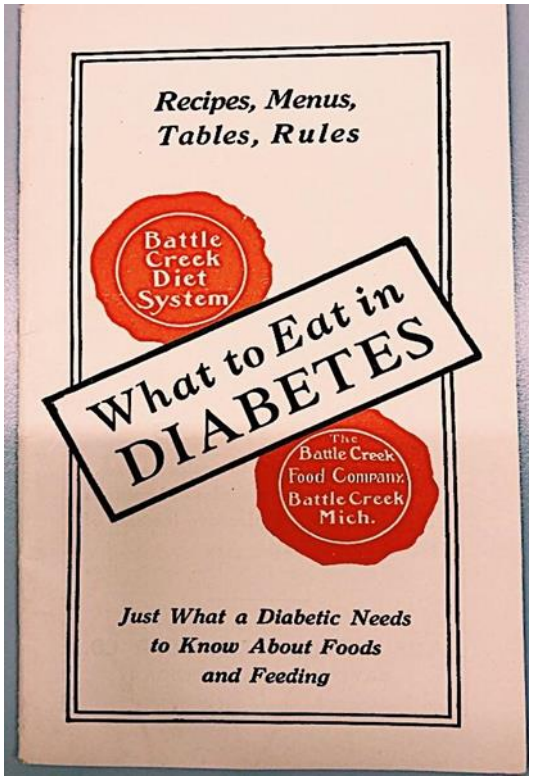
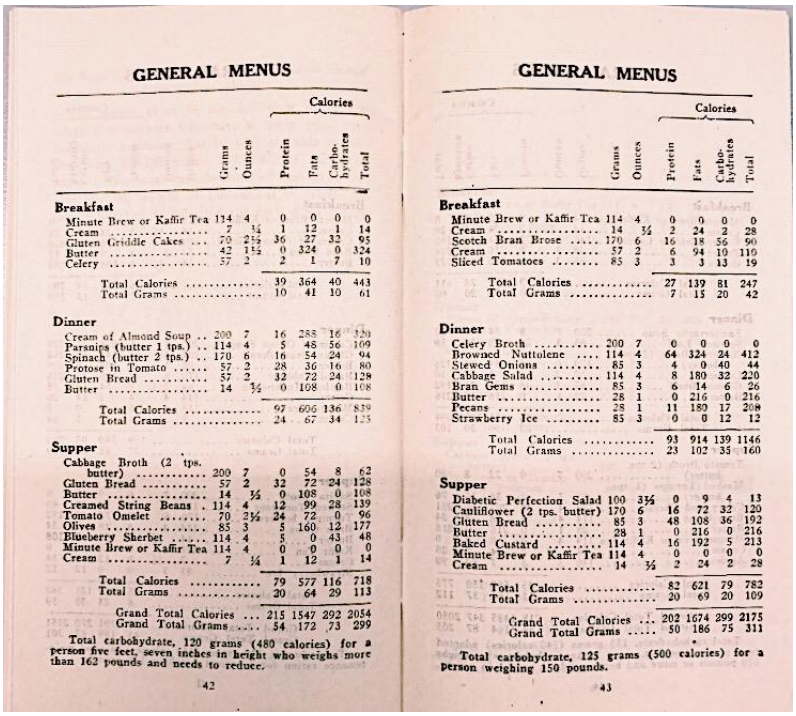


Figure 2.3: 'What to Eat in Diabetes' by The Battle Creek Food Company (c. 1910-1919), [Courtesy of the Wellcome Library WK800 191].



GENERAL MENUS

	Grams	Ounces	Calories: Protein	Fats	Carbo-hydrates	Total
Breakfast						
Minute Brew or Kaffir Tea	114	4	0	0	0	0
Cream	7	¼	1	12	1	14
Gluten Griddle Cakes	70	2½	36	27	32	95
Butter	42	1½	0	324	0	324
Celery	57	2	2	1	7	10
Total Calories			39	364	40	443
Total Grams			10	41	10	61
Dinner						
Cream of Almond Soup	200	7	16	288	16	320
Parsnips (butter 1 tps.)	114	4	5	48	56	109
Spinach (butter 2 tps.)	170	6	16	54	24	94
Protose in Tomato	57	2	28	36	16	80
Gluten Bread	57	2	32	72	24	128
Butter	14	½	0	108	0	108
Total Calories			97	606	136	839
Total Grams			24	67	34	125
Supper						
Cabbage Broth (2 tps. butter)	200	7	0	54	8	62
Gluten Bread	57	2	32	72	24	128
Butter	14	½	0	108	0	108
Creamed String Beans	114	4	12	99	28	139
Tomato Omelet	70	2½	24	72	0	96
Olives	85	3	5	160	12	177
Blueberry Sherbet	114	4	5	0	43	48
Minute Brew or Kaffir Tea	114	4	0	0	0	0
Cream	7	¼	1	12	1	14
Total Calories			79	577	116	718
Total Grams			20	64	29	113
Grand Total Calories			215	1547	292	2054
Grand Total Grams			54	172	73	299

Total carbohydrate, 120 grams (480 calories) for a person five feet, seven inches in height who weighs more than 162 pounds and needs to reduce.

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GENERAL MENUS

	Grams	Ounces	Calories: Protein	Fats	Carbo-hydrates	Total
Breakfast						
Minute Brew or Kaffir Tea	114	4	0	0	0	0
Cream	14	½	2	24	2	28
Scotch Bran Brose	170	6	16	18	56	90
Cream	57	2	6	94	10	110
Sliced Tomatoes	85	3	3	3	13	19
Total Calories			27	139	81	247
Total Grams			7	15	20	42
Dinner						
Celery Broth	200	7	0	0	0	0
Browned Nuttolene	114	4	64	324	24	412
Stewed Onions	85	3	4	0	40	44
Cabbage Salad	114	4	8	180	32	220
Bran Gems	85	3	6	14	6	26
Butter	28	1	0	216	0	216
Pecans	28	1	11	180	17	208
Strawberry Ice	85	3	0	0	12	12
Total Calories			93	914	139	1146
Total Grams			23	102	35	160
Supper						
Diabetic Perfection Salad	100	3½	0	9	4	13
Cauliflower (2 tps. butter)	170	6	16	72	32	120
Gluten Bread	85	3	48	108	36	192
Butter	28	1	0	216	0	216
Baked Custard	114	4	16	192	5	213
Minute Brew or Kaffir Tea	114	4	0	0	0	0
Cream	14	½	2	24	2	28
Total Calories			82	621	79	782
Total Grams			20	69	20	109
Grand Total Calories			202	1674	299	2175
Grand Total Grams			50	186	75	311

Total carbohydrate, 125 grams (500 calories) for a person weighing 150 pounds.

43

Figure 2.4: 'What to Eat in Diabetes' by The Battle Creek Food Company (c. 1910-1919), [Courtesy of the Wellcome Library WK800 191].

While methods of dietary restriction may have 'worked marvels' for those with mild diabetes, allowing patients to control and therefore ease their symptoms, for those with severe diabetes, diet could merely delay death, which for most patients inevitably came after three to six years.[102] As Feudtner describes, even patients who could afford the best medical care spent these fatal years living in a semi-starved state that typically ended in coma, infection or starvation.[103] Reflecting on the management of diabetes prior to the discovery of insulin, Boston diabetologist and 'founding father of diabetes' Elliot Joslin, recalled:

> …this was a dismal epoch, because fear ruled, yet it served a purpose, because all learned that the average diabetic, conservatively treated, could live 4.8 years and that someone had blundered if he lived less.[104]

For overweight patients with mild diabetes, diets such as those above were sufficient to manage symptoms, but for those with severe diabetes, whose bodies could not produce any insulin, the diets which provided the greatest results were those grounded in metabolic theories of 'undernutrition', a theory derived from the work of American diabetes specialist Frederik Madison Allen. While working as a fellow in the Preventative Medicine and Hygiene Laboratory at Harvard Medical School from 1909 to 1912, Allen had discovered that when diabetic animals were fed a restricted amount of calories their bodies eventually reverted to a normal state of metabolism.[105] Later, when working at the Hospital of the Rockefeller Institute for Medical Research, Allen decided to apply the same 'starvation' diet to his patients and discovered the same results:

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[102] E. P. Joslin, 'The Treatment of Diabetes Mellitus', *Canadian Medical Association Journal*, 14:9 (1924), p. 808; Feudtner, *Bittersweet*, p. 6.
[103] Feudtner, Bittersweet, p. 6.
[104] E. P. Joslin, 'The Treatment of Diabetes Mellitus', p. 808.
[105] C. Feudtner, *Bittersweet*, p. 54.

> For forty-eight hours after treatment is begun the patient is kept on his ordinary diet, to determine the severity of his diabetes. Then he is starved, and no food allowed save clear soup or black coffee. The immediate fasting applies to ordinary cases of diabetes of mild or moderate degree. In dealing with cases of long standing, as well as in obese cases, and all cases of acidosis, it is best, as Dr Joslin has pointed out, not to start the fast abruptly but to prepare for it more slowly by omitting certain articles of food from the diet. He first omits the fat, after two days the protein, and then halves the carbohydrate intake daily until the patient is only taking 10 grams. After this fasting may be started. Starvation is continued until the urine shows no sugar.[106]

Impressed by Allen's findings and principles of undernutrition, Boston diabetologist Elliot Joslin began to revise the diets offered to his patients in line with Allen's theories of undernutrition. Born in Oxford, Massachusetts in 1869, Joslin hailed from a wealthy yet ailing family, plagued with four generations of diabetes. Backed by a Harvard professorship in medicine, in 1898 Dr Joslin entered into private practice and joined the New England Deaconess Hospital in Boston.[107] Motivated by the prevalence of diabetes in his family Joslin chose to specialise in diabetes and quickly became sought out by patients and their families at his brownstone home and offices at 81 Bay Street in Boston.[108] Aided by a team of dedicated physicians, Joslin's clinical and research endeavours flourished, leading to the publication of his landmark textbook *The Treatment of Diabetes Mellitus* in 1916.[109] Joslin's approach to diabetes management was grounded in theories of metabolism and heavily influenced by Allen's starvation diet and method of undernutrition. Writing in 1924 Joslin explained how:

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[106] L. W. Hill and R. S. Eckman, *The Allen (starvation) Treatment of Diabetes: With a series of graduated diets* (Boston: The Colonial Press, 1921), p. 10.
[107] 'Selected Milestones in the History of Joslin Diabetes Centre' Joslin Diabetes Center Archive, Boston, Box 14, Folder 1.
[108] Ibid.
[109] E. P. Joslin, *The Treatment of Diabetes Mellitus* (Boston: Lea & Febiger, 1916).

> Undernutrition simplified our understanding of diabetes. It tempted and allowed a study of the elementary principles of diet, an analysis of the excretions of the fasting diabetic for comparison with those of the fasting normal, promoted accurate and tentative methods of dietary control of the patient, stimulated in all the laboratories the scientific investigation of clinical cases and thus brought nearer together the laboratory and the clinic and made evident their interdependence.[110]

Informed by Allen's starvation diet, Joslin revised his high fat, low carbohydrate diet previously prescribed to his patients to a low fat, moderate carbohydrate and reduced calorie regimen.[111] The total dietary restriction and fast days introduced by both Allen and Joslin prolonged the lives of many severe diabetics by allowing the pancreas enough rest so that it could improve the body's tolerance for glucose. Inevitably, however, such dietary regimens could not stave off death, with those patients with severe diabetes living on average a further three to six years.[112]

The principal contribution of undernutrition, according to Joslin, was the realisation that most cases of diabetes were preventable if excess weight gain could be prevented. Writing in 1924 Joslin explained how the majority of cases of diabetes were due to obesity and prevention was possible if only the nation would cease increasing in weight:

> Diabetes is common in the fat, but rare in the thin. If the people in the United States would only accept as their standard of form and figure the slender ladies and agile gentlemen which serve as fashion's models in our newspapers the Diabetic Club of America would have but a hundred thousand instead of a million members…Who wants to be fat after reading the newspapers? The good which newspapers and designers of styles of men's and women's clothes accomplish by their portrayal of slim models of grace and beauty in their columns may not be entirely altruistic, but it is nonetheless philanthropic. Yet how few of the public realise

[110] E. P. Joslin, 'The Treatment of Diabetes Mellitus', p. 808.
[111] C. Feudtner, *Bittersweet,* p. 54.
[112] Ibid, p. 6.

> that all these lithe creatures are examples of how to prevent the development of the disease, obesity and its offspring, diabetes. Let us hope the time is not far distant when the Jordans and the Jays[113] and all the rest will print above their latest importations the caption 'Follow the Fashions and Be Thin' and beneath the same words, 'Immune to Diabetes'.[114]

With a 'showman's knack and a preacher's zeal', Joslin, more than any other diabetes specialist in the twentieth century, can be credited with spreading his message of diabetic care in such a way as to entwine both a medical a moral message.[115] As seen here, Joslin's language used to describe the overweight and PWD often carried moral overtones which implied individual responsibility. For Joslin, the virtue of control was paramount to successful management of diabetes and those who lacked control were considered lacking in willpower and self-discipline. As a consequence of this conviction, Joslin's approach to managing diabetes, reflecting his pious character, was wrought with moral overtones which reinforced the notion of individual responsibility for disease and espoused inward solutions to management. Yet, viewed in historical context in which they were written, Joslin's ideas of individual responsibility and use of both moral and medical language were not uncommon for the early twentieth century. As historian Sander Gilman notes in his history of diets and dieting, 'dieting was the tool of the physician, but it was also the means by which lay practitioners of the modern health culture were able to claim

[113] By the 'Jordans and the Jays' Joslin is presumably referring here to the characters Jordan Baker and Jay Gatsby from F. Scott. Fitzgerald's *The Great Gatsby* (1925). Baker in particular was seen to represent one of the 'new women' of the 1920s, beautiful, slim and competitive, while Gatsby represented the extremes and exuberance of the roaring twenties, Joslin refers to them here as the celebrities of the 1920s, hoping this class of people will use the promotion of the twenties ideal of a slim figure to promote the prevention of diabetes.

[114] E. P. Joslin, *Diabetes: Its Prevention and Treatment*, (Boston, 1924) printed in *Women's World* July 1924 and reprinted as a pamphlet by the AMA and Eli Lily thereafter. Joslin Archive , Box 1, Folder 8.

[115] Feudtner, *Bittersweet*, p. 35

the too fat and the very thin as their clients'.[116] Levenstein also describes the early twentieth century as a time in which much of the 'bloated well-to-do Western world were accustomed to tales of how illnesses had been cured by restricting diets'.[117] Early twentieth century dietary advice, whether for the general public or people with chronic conditions, was often packed full of moral overtones. For example the American food faddist Horace Fletcher, or 'the Great Masticator', in advocating his intense chewing diet to achieve 'proper nutrition', described the mouth as a person's 'three inches of personal responsibility'.[118]

The late nineteenth and early twentieth century had thus seen an increase in interest and research into the physiological mechanisms of diabetes and dietary treatments. Informed by a metabolic understanding of disease and an assumption that foods high in carbohydrates and sugar could not be tolerated by those with diabetes, physicians, diabetic specialists and indeed the food industry, worked to formulate diets which they hoped their patients could metabolise, in order to ease their symptoms and prevent acidosis, coma and death. Whether mild or severe in its presentation, the aim of diabetic treatment prior to insulin then was the same; to free the body of excess sugar. This reframing of diabetes at the turn of the century in terms of metabolism was largely influenced by developments in nutrition science which had begun to view the body as a machine and food as the 'fuel for the engine'.[119] Thus the basic science of food and metabolism was the first and most common rationale provided

[116] Gilman, *Diets and Dieting*, p.x.
[117] H. Levenstein, *Revolution at the Table: The Transformation of the American Diet*, (New York: Oxford University Press, 1988), p. 87.
[118] Foxcroft, *Calories and Corsets*, p. 20.
[119] B. Turner, 'The Government of the Body: Medical Regimens and the Rationalisation of the Diet', *British Journal of Sociology*, 33:2 (1982), pp. 254-69 cited in G. Scrinis, *Nutritionism: The Science and Politics of Dietary Advice*, (New York: Columbia University Press, 2013), p. 58.

by specialists when advocating particular dietary regimens to their patients.[120] Informed by this metabolic framework, physicians developed complex methods of undernutrition in order to stave off death in their patients, yet, results were often mixed. While their efforts were effective in some cases, many patients also perished or became undernourished. In light of this, a wide range of diets were tried by practitioners in the early twentieth century in an attempt to avoid the extremes of those such as Cantoni and Nauyn and furnish the diabetic with a diet sufficient enough to satisfy their caloric requirements.[121] Contrary to Joslin, Allen and others who promoted protein-rich, restricted carbohydrate regimens, Indian physician Basu, while working at Guys Hospital in London, observed that the diabetic diets being prescribed to patients that were considerably high in meat did very little to aid health. Hypothesising that meat was the problem, Basu was the first physician to advocate a vegetarian diet in the treatment of diabetes. Unlike his peers at the time, Basu held that a rigid diet, especially for the treatment of mild diabetes, was unnecessary. Referring to rigid diets as a 'craze' he believed the complete removal of carbohydrate was responsible for great harm and deterioration of the disease, such as diabetic coma.[122] Ruminating upon the multifactorial aetiology of glycosuria and the conditions leading up to its production, Basu produced a list of suspected causes, among which he included the overconsumption of saccharine and carbohydrate, a metabolic fault of the organs (Basu wrongly posited the stomach as the organ at fault instead of the pancreas as was soon discovered), a toxaemic reaction from poisons such as chloroform, tumours, afflictions of the nervous system, as well as causes

[120] M. Moore, 'Food as Medicine: Diet, Diabetes Management and the Patient in Twentieth Century Britain', *Journal of the History of Medicine and Allied Sciences*, 73:2 (2018), p. 152.
[121] W. R. Campbell, 'Dietetic Treatment in Diabetes Mellitus', *Canadian Medical Association Journal*, 13:4 (1923), p. 488.
[122] B. D. Basu, *The Dietetic Treatment of Diabetes* (Ashram: The Panini Office, 1916), p. 29.

such as emotional strain, problems with the thyroid or ovaries, age and sex.[123] Additionally, Basu pointed to recent changes in food production and manufacture as potential causes of increasing diabetes, highlighting changes such as the roller process of milling wheat and bleaching of flour (and their resulting extraction of nutrients), the polishing of rice and resulting removal of vitamins, the adulteration of milk and the use of preservatives in foods, all of which he strongly condemned.[124] A follower of Horace Fletcher, Basu urged the public to 'properly masticate and insalivate the food', reflecting his beliefs that the pace of modern life prevalent among western civilisations had disrupted the digestive system.[125] Moreover, in addition to his avocation of vegetarianism, Basu also appears to have been the first physician to identify and coin the term 'pre-diabetes':

> By studying the history of diabetic patients in India, we are enabled to know that they show certain symptoms before the discovery of sugar in the urine. I call this stage the PRE-GLYCOSURIC or PRE-DIABETIC.[126]

Basu's novel discovery of the pre-diabetic state was ground-breaking for its time, yet it would not be until in the 1960s that the importance of prediabetes and its connection with later compilations would be fully understood.[127] Nevertheless, this was a fundamental moment in the development of modern understandings of diabetes. As Basu discovered the existence of the pre-diabetic state and advanced ideas of a multifactorial basis for diabetes aetiology, Joslin and others were tirelessly calculating various forms of dietary regimens which could extend the lives of their

[123] Ibid, p. 10.
[124] Ibid.
[125] C. E. Rosenberg, 'Pathologies of Progress: The Idea of Civilisation as Risk', *Bulletin of the History of Medicine*, 72:4 (1998), pp. 714-730; D. G. Schuster, *Neurasthenic Nation: America's Search for Health, Happiness and Comfort, 1869-1920* (New Jersey: Rutgers University Press, 2011).
[126] Emphasis here is the authors own, Ibid, p.12.
[127] See chapter six.

patients, all the while the discovery of insulin would soon occur in a laboratory in Toronto, transforming the management of diabetes profoundly.

Diet after Insulin: Carbohydrates and Complications

By all accounts diabetes was a deadly disease and prior to the development of insulin the prognosis for people with severe diabetes was bleak. In the summer of 1921, Frederik G. Banting, Charles H. Best, James B. Collip and John J. R. MacLeod and other researchers in Toronto changed the outlook for those patients dramatically with the discovery and isolation of insulin.[128] In 1922, Dr Howard Root, a colleague of Joslin's in New England, administered insulin for the first time to thirty-seven-year-old nurse Elizabeth Mudge. Having shrunk from 157 to 72 pounds in the five years since her diabetes was diagnosed; Elizabeth improved dramatically with the help of several injections a day. Elizabeth's story made international news and by the summer of 1922 insulin was being made commercially and the drugs miraculous effects publicised in medical journals and newspapers across the globe. Included within these reports were contrasting images which portrayed some of the first children treated with insulin by Banting and Best (Figure 2.1). The images, which provided visual evidence of insulin's success, pictured an emaciated child, who had followed a starvation diet for two years, alongside a picture of a healthy child of normal weight after just two months of treatment with insulin.[129]

[128] The controversial debate surrounding insulin and credit for its discovery has been covered extensively in M. Bliss, *The Discovery of Insulin* (London: Faber and Faber Ltd, 1988). See also K. Hall, 'The Discovery of Insulin: A story of monstrous egos and toxic rivalries', *The Conversation*, 11 January 2022.

[129] 'Two views of a child suffering from diabetes; the before and after views reflect the change after treatment with insulin', United States National Library of Medicine Digital Collections, Verso: WHO/18198. EURO. Diabetes. SM 5-1979.

Figure 2.5: Before and after photograph of child treated with insulin in 1922 by Charles Best and Frederick Banting [Courtesy of the WHO and U.S National Library of Medicine Digital Collections].

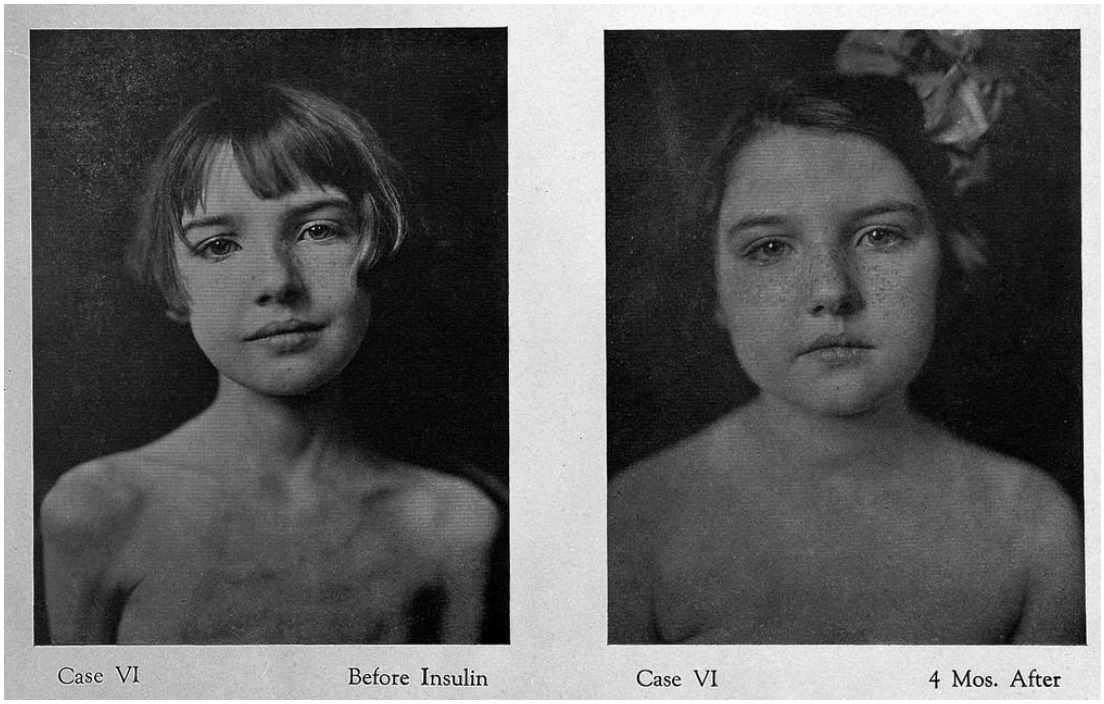


Figure 2.6: Young girl before and after insulin treatment [Courtesy of the Wellcome Collection].

The enthusiasm for insulin was exhibited not only in medical literature but also publicised widely in national and local newspapers. Together these reports and the images they presented played a significant role in communicating the efficacy of insulin to the public. In 1923, on the front cover of a special issue of the *New York Times*, Secretary of State Robert Lansing and Elizabeth Hughes, daughter of the former Secretary of State, both of whom had been diagnosed with diabetes, were pictured celebrating their recoveries following treatment with insulin.[130] The article described how Lansing had 'gained greatly in flesh and strength' owing to the freedom the new treatment wrought in terms of diet.[131] With his previous dietary restrictions now having been completely removed, the article described how Lansing was now permitted to eat as much as he desired of 'all varieties of food'.[132] Examining the language used to communicate insulin's discovery to the public from around this time demonstrates how insulin was not only heralded as a cure for insulin, but also scientific medicine's conquest of disease. As a *New York Times* article in 1923 reported:

> One by one, the implacable enemies of man, the diseases which seek his destruction, are overcome by Science. Diabetes, one of the most dreaded, is the latest to succumb.[133]

Writing in the *New England Journal of Medicine* in 1930, Frederick Allen echoed a similar sentiment, asserting confidently to his peers how diabetes had been

[130] Feudtner, *Bittersweet*, p. 8.
[131] 'Ex-Secretary Lansing; Ill from Diabetes, Improves Under Treatment with Insulin', *New York Times*, 28 June 1923, p. 1.
[132] Ibid.
[133] J. Collins, 'Diabetes, Dreaded Disease, Yields to New Gland Cure', *New York Times*, 6 May 1923, p. 12.

'scientifically mastered' and that, theoretically, every patient should expect to live out 'his full natural lifetime'.[134]

Insulin, initially held by many to be a cure for diabetes, bolstered the medical profession's enthusiasm for science and faith in the power of science to overcome disease. Among the first to administer insulin to their patients were Joslin and his colleagues in Boston. Writing in 1924, Joslin announced the transformations he witnessed in his patients, stating triumphantly how:

> The weak ones have become strong, the men initially inactive have become alert and wan bodies through added nutrition have assumed the appearance of health.[135]

While insulin had transformed the outlook of diabetes for many, these accounts of insulin contribute to what Feudtner describes as 'a modern yet mythic account of diabetes history' which form part of a larger American tendency to embrace science and technology as the best solutions to society's problems.[136] Similar to the promotion of antidepressants and antipsychotics as 'magic bullets' for psychological problems in the second half of the twentieth century, embedded within the history of diabetes is a heroic narrative of insulin which uncritically promotes the medical treatment of disease and embellishes the tale of scientific progress. In *Bittersweet* Feudtner warns how:

> …the tale of scientific progress has legitimised the prestige and power that Americans have invested in scientific medicine and its technical wizardry. The mythically framed accounts of diabetes history, however, conceal more than they reveal. Focusing on a

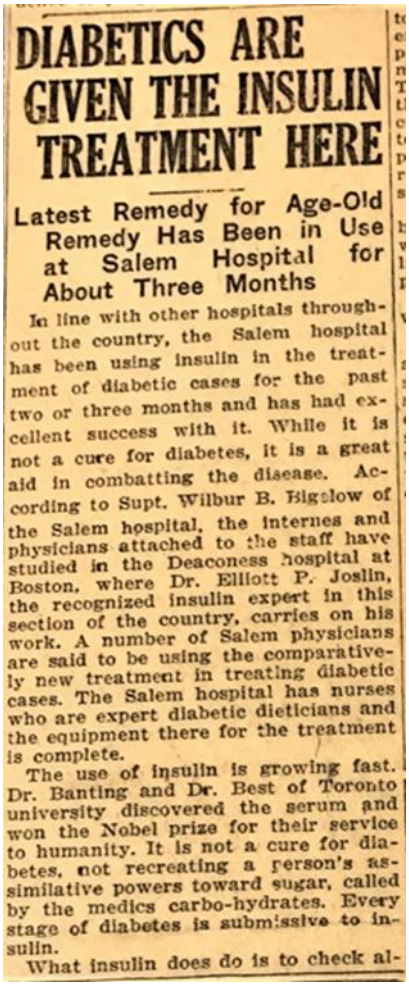
[134] F. M. Allen, 'Methods and Results of Diabetic Treatment', *New England Journal of Medicine,* 203:22 (1930), pp. 1133.
[135] E. P. Joslin, 'The Treatment of Diabetes Mellitus', *Canadian Medical Association Journal,* 14:9 (1924), p. 809.
[136] Feudtner, *Bittersweet*, p. 9.

> wonder drug, they distract from the human realities of living with diabetes.[137]

Despite this assertion, Feudtner himself contributes to this narrative. In a table of the 'Cyclic Periods of Diabetes Transmutation' which features in *Bittersweet* Feudtner charts the history of diabetic treatments, in which he suggests insulin and subsequent modified insulins and anti-hypertensives neatly supplanted the use of diet therapy.[138] In doing so, Feudtner too, contributes to 'the history of diabetes as the history of insulin' that he himself critiques. An examination of archival material and published medical literature from this period, however, indicates that despite the initial enthusiasm for insulin, many within the medical profession were hesitant to consider insulin a cure for diabetes, viewing it instead as an aid to established dietary measures. As a report which appeared in *The Boston Transcript* in 1923 clarified:

> In line with other hospitals throughout the country, the Salem hospital has been using insulin in the treatment of diabetic cases for the past two or three months and has had excellent success with it. While it is not a cure for diabetes, it is a great aid in combatting the disease.[139]

[137] Feudtner, *Bittersweet*, p. 9.
[138] Ibid, p. 41.
[139] 'Diabetics Are Given the Insulin Treatment Here', *The Boston Transcript*, 19 September 1923, Joslin Diabetes Center, Box 5, Folder 1.



DIABETICS ARE GIVEN THE INSULIN TREATMENT HERE

Latest Remedy for Age-Old Remedy Has Been in Use at Salem Hospital for About Three Months

In line with other hospitals throughout the country, the Salem hospital has been using insulin in the treatment of diabetic cases for the past two or three months and has had excellent success with it. While it is not a cure for diabetes, it is a great aid in combatting the disease. According to Supt. Wilbur B. Bigelow of the Salem hospital, the internes and physicians attached to the staff have studied in the Deaconess hospital at Boston, where Dr. Elliott P. Joslin, the recognized insulin expert in this section of the country, carries on his work. A number of Salem physicians are said to be using the comparatively new treatment in treating diabetic cases. The Salem hospital has nurses who are expert diabetic dieticians and the equipment there for the treatment is complete.

The use of insulin is growing fast. Dr. Banting and Dr. Best of Toronto university discovered the serum and won the Nobel prize for their service to humanity. It is not a cure for diabetes, not recreating a person's assimilative powers toward sugar, called by the medics carbo-hydrates. Every stage of diabetes is submissive to insulin.

What insulin does do is to check al-

Figure 2.7: 'Diabetics are given the insulin treatment here', *The Boston Transcript*, 19 September 1923, [Courtesy of the Joslin Diabetes Center, Box 5, Folder 1].

In outlining the latest regimen for patients following the addition of insulin, the article emphasised the continued importance of diet throughout the patient's course of therapy:

> The patient, on arriving at the hospital for insulin treatment, is stripped and weighed, the weight figuring largely in the regulation of diet, large persons requiring more calories than small ones. In every case, the doctors insist upon a few days confinement to the hospital, as the treatment is as much an education as a medical prescription. Blood and urine tests are made to determine the concentration of the sugar, indicative of the extent of the disease. Upon the knowledge gained are built the individual person's diet and the amount of insulin to be injected per dose…All persons who leave the hospital are given a small hypodermic needle with which to take insulin injections according to prescription, and with an education in the

> management of diet obtained at the hospital, are able to keep themselves fit so that they will live their full, normal lifetime. The greatest difficulty is found in teaching patients while at the hospital the unfailing persistency with which they must obey their 'Diabetic Arithmetic' in arranging their meals. They are provided with tabulated lists of foods and their respective ingredients of carbohydrates, fat and protein. Many patients will cheat themselves on their diet. Those who do are destroying the benefits of insulin, which alone is useless. Insulin is the first step. Diet is the second, but the most important consideration. The two are inseparable if a 'cure' is to be obtained.[140]

Thus in contrast to the prevailing narrative within early histories of diabetes, that suggests diet therapy was abandoned with the advent of insulin, evidence suggests that physicians continued to uphold the importance of dietary measures irrespective of new, pharmaceutical, means of management. Physician handbooks from the mid-1920s onwards demonstrates the enthusiasm for insulin and changes it allowed in diabetes care, such as a careful increase in carbohydrate, yet the importance of diet in controlling diabetes remained paramount. Writing in 1924, describing the means and objectives of treatment since the arrival of insulin, American physician G. A. Harrop explained:

> A great advantage which the introduction of insulin has afforded is that extreme grades of undernutrition are now no longer necessary or desirable, and that sufficient carbohydrate can now be added to the diet to make it palatable. The aim of the present treatment in diabetes is the relief of symptoms and the restoration of normal bodily weight, vigour and activity. This can be accomplished only if a diet adequate for the individuals needs is properly utilised. If this occurs without insulin then there is no need for insulin.[141]

According to these sources, diet remained the mainstay of diabetic treatment, and insulin, rather than supplant the use of nutritional management, served to reinforce

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[140] 'Diabetics are given the insulin treatment here', *The Boston Transcript*, 19 September 1923, Joslin Diabetes Center, Box 5, Folder 1.

[141] G. A. Harrop, *Management of Diabetes: Treatment by Dietary Regulation and the Use of Insulin* (New York: Paul B. Hoeber Inc, 1924), p. 23.

the importance of diet in managing diabetes. As Canadian physician W. R. Campbell encapsulated in 1923:

> If one surveys the history of the treatment of diabetes mellitus it becomes apparent that successful treatment, of certain patients at least, has been accomplished in seemingly diverse ways. It is now universally admitted that diet, not drugs, is the mainstay of any successful treatment of this disease. For the less severe cases of diabetes mellitus dietetic control alone will effect considerable improvement in their condition. For a certain proportion of cases no type of dietetic treatment is adequate in controlling the disease. For such patients, 'insulin', has been recently introduced into clinical use in conjunction with dietetic treatment. It may be said however, that there is no case, whatever its severity may be, in which it will ever be advisable to use insulin without due attention to dietetic principles...At the present time there is a tendency even under insulin treatment to neglect this important factor in the belief that increased insulin will take care of any further loss of tolerance which may develop. Nothing could be more fallacious.[142]

As insulin transitioned diabetes from an acute to chronic disease it removed the bleak prognosis of an uncertain few years of starvation towards the possibility of a normal life and, by 1930, the belief that the extreme restriction of carbohydrate was necessary gradually began to give way.[143] While not all agreed on increasing the patient's carbohydrate intake, a special issue of the *Lancet* published in 1932 reported that while this change of opinion had been slow at first, 'it had since become rapid'.[144] This transition can be seen by examining diet tables from the 1920s and 1930s, which indicate how a carbohydrate allowance of only 50 grams in 1928 had increased to 200g by 1932.[145] According to historian Martin Moore, the rationale for these increases went beyond questions of metabolism. Clinical observation and the exposure of medical teams to patients' experiences with the

[142] W. R. Campbell, 'Dietetic Treatment in Diabetes Mellitus', *Canadian Medical Association Journal*, 13:4 (1923), p. 490.
[143] Anonymous, 'Special Issue - Diet and Diabetes', *The Lancet*, 223 (1932), p. 1116.
[144] Ibid.
[145] Ibid.

establishment of specialist clinics in the 1920s played a significant role in the rationales provided for altering the diabetic diet. Greater contact with patients in diabetic clinics allowed clinicians to observe and develop a greater understanding not only of the physiological but the social and psychological challenges of diabetes. Accordingly, doctors began to favour a high-carbohydrate diet in part because it facilitated 'patient productivity and social reintegration in line with concerns over national efficiency'.[146] While many began to acknowledge the benefits of increasing the carbohydrate component of the diabetic diet, illustrated in the many published clinical experiences of diet and diabetes throughout the 1920s and 1930s, others warned of the potential consequences of relaxing diet too far:

> The use of such higher carbohydrate diets with insulin is a material gain from the patient's point of view because he is able to take a simpler and more physiological diet. Many clinical reports show he also feels better. As regards the effect of the disease itself it is perhaps too early to judge, but a good deal of evidence points to some improvement under the new regime...it is a notable gain that a greater freedom in food is now known to be possible in diabetes, and if there is any danger in change of opinion it is only that this freedom may perhaps be taken too far.[147]

While some feared that dietary amendments would be taken advantage of, a consensus was forming among physicians on the merits of increasing carbohydrate, not only for its metabolic effects, but to meet the social, psychological and economic needs of the patient as well. As Moore has discussed, the liberalisation of carbohydrate was further driven by economic concerns regarding the cost of the

[146] M. Moore, 'Food as Medicine: Diet, Diabetes Management and the Patient in 20th Century Britain', *Journal of the History of Medicine and Allied Sciences*, 73:2 (2019), p. 156. See also I. Zweiniger-Bargielowska., 'Raising a Nation of Good Animal: The New Health Society and Health Education Campaigns in Interwar Britain', *Social History of Medicine*, 20:1 (2007), pp. 73-89.
[147] Anonymous, 'Special Issue - Diet and Diabetes', *The Lancet*, 223 (1932), p. 1116.

diabetic diet.[148] With the expense of insulin and carbohydrate alternatives, and low cost of carbohydrates, widely acknowledged to be the cheapest food source in the early twentieth century, physicians stressed the value of increasing carbohydrate not only to simplify treatment, but to meet the economic needs of the patient as well.[149] Evidently then, rather than replace diet as the principle means of managing diabetes, insulin allowed a new, and more liberal, system of control which balanced the control of metabolic effects with the social, psychological and economic needs of the patient, not only extending the duration of the patients life but also drastically improving their overall wellbeing and quality of life as well.

Among those who championed the importance of diet in managing diabetes in the period following the discovery of insulin was Scottish physician R. D. Lawrence. Both a pioneer of the diabetic diet and a diabetic himself, Lawrence had developed diabetes in 1921 during his surgical training at Kings College Hospital. Upon receiving the news he had little time to live, he chose to end his days quietly in the city of Florence. In 1923, his health deteriorating and nearing death, Lawrence received a telegram summoning him back to London with the news that insulin had become available, and that it appeared to work. Lawrence's health quickly improved with insulin treatment and he was soon well enough to be appointed biochemist at Kings, running the hospital's diabetic department until he retired in 1957. In the only recorded speech given by Lawrence, on Australian Radio in 1953, he recalled of this time:

[148] M. Moore, 'Food as Medicine: Diet, Diabetes Management and the Patient in 20th Century Britain', *Journal of the History of Medicine and Allied Sciences*, 73:2 (2019), p. 156.
[149] Ibid, p. 157.

> I just want to mention one or two things. Before insulin, diabetics died. Their life was not worth much. It was thought that the diabetic was a useless person - and that prejudice still remains.[150]

Despite his unwavering recognition of the value of insulin in drastically improving the outlook in diabetes, Lawrence was one of many diabetic specialists who continued to promote the importance of diet for the control of symptoms and overall successful management of the diabetes. Writing in 1927, Lawrence explained:

> We can commence treatment with a diet sufficient for the real needs of the patient in the knowledge that we can, if necessary, supplement with insulin. But the principles which Allen established, namely that of restricted diets, of normal blood sugars where possible, and of pancreatic rest, are still the basis of our treatment, although starvation has happily been eliminated.[151]

Lawrence spent his time at King's performing experiments on himself and 'never failed to explore any avenue which might offer hope to diabetic patients'.[152] In the context of overcrowded hospitals and a severely underfunded specialism, Lawrence saw the greatest need as being out-patient teaching. Accordingly, he persuaded the hospital authorities to provide a room to be used as a diet kitchen and appointed a full-time nurse in charge who 'fed the patients and taught them diets and injections and all sorts of things'.[153] Ann from London, interviewed as part of the *Diabetes Stories* oral history project, recalls Lawrence's diabetic clinic clearly:

> I felt miserable, and I got thinner and thinner and thinner and I felt extremely ill. And one day I was having a bath and the matron walked in and she said 'Ann Walton, what are you doing drinking the bath water?!' I was lying in my bath just drinking the water. I said 'well I can't stop being thirsty, I'm thirsty the whole time', and she said 'right, you must see the doctor tomorrow'. She was

[150] R. D. Lawrence (1953), *Diabetes Stories*, Interview 102.
[151] R. D. Lawrence, *The Diabetic Life: Its Control by Diet and Insulin* (London: J & A Churchill, 1927), p. 3.
[152] J. G. L. Jackson, 'R. D. Lawrence and the Formation of the Diabetic Association', *Diabetic Medicine*, 13 (1996), p. 9.
[153] Ibid, p. 17.

> marvellous, she was as quick as that. Well, I saw the doctor and two days later my mother turned up and said 'I've got to take you to London'. She took me back to her old hospital, King's College Hospital, which was extremely lucky for me because in those days it was the leading hospital on diabetic control. The man who really got this going was a Dr Lawrence and he had started a diabetic clinic there, and not only that, a diabetic wing, which wasn't just one ward, it was several wards, and the whole thing was beautifully, beautifully set up.[154]

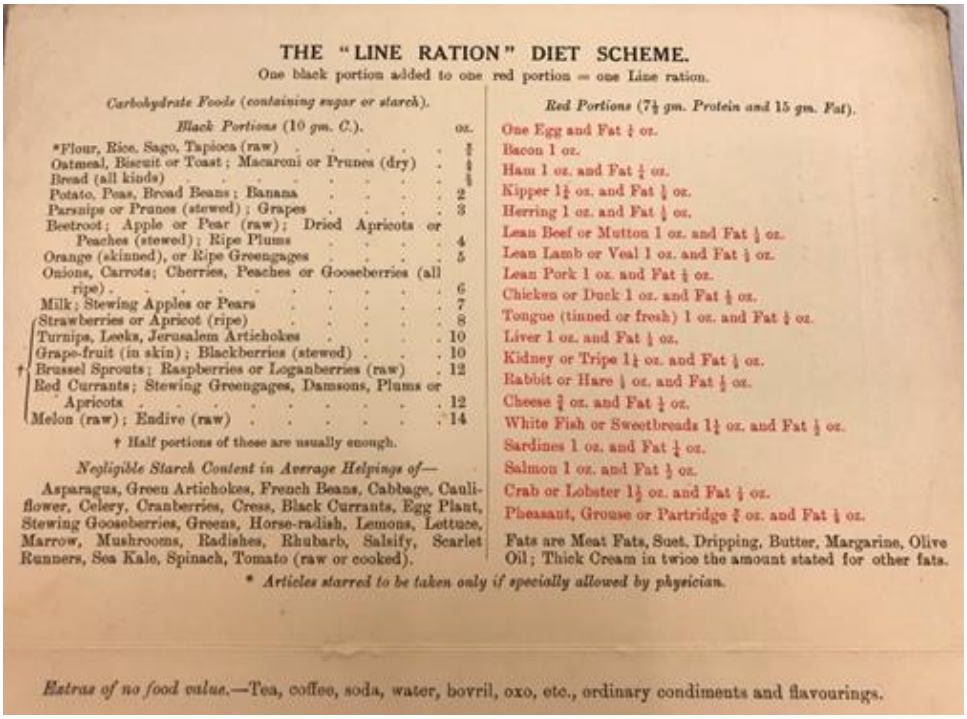
From personal experience, as well as insights drawn from lecturing to the local doctor's society, Lawrence understood that most doctors lacked both the time and knowledge to educate their patient about diet. Accordingly, Lawrence decided to simplify the diabetic diet for both the patient and the physician by devising his own diet method: the 'Line-Ration Diet'.[155] Lawrence laid out the scheme in his handbook for patients and practitioners *The Diabetic Life* (1925) and *The Diabetic ABC* (1929), used by physicians around the world and reprinted well into the 1960s. In *The Diabetic Life* Lawrence explained the scheme, which aimed to phase out complicated diets, allowing the patient greater freedom and control while saving both doctors and patients valuable time:

> By means of a simple yet varied and accurate diet scheme - the Line Ration Diet - the busiest doctor is enabled to start accurate treatment without any elaborate calculation of diets and food values. At the same time, the patient is at once able to follow and apply the scheme, to vary his food widely to suit his own tastes, and he seldom requires to enter a hospital even at the commencement of treatment.[156]

Lawrence's system sought to help patients live a normal life by accepting and mastering their own condition. Like Joslin, Lawrence made clear the need for self-

[154] Ann Walton, Interview, 8 August 2002, British Library C1239/01.
[155] J. G. L. Jackson, 'R. D. Lawrence and the Formation of the Diabetic Association', *Diabetic Medicine*, 13 (1996), p. 9.
[156] R. D. Lawrence, *The Diabetic Life: Its Control by Diet and Insulin*, (London: J & A Churchill, 1927), p. 10.

discipline and rational decision making, which if followed alongside weighing foods, promised to offer patients a more normal life, free of complex or restrictive diets. Lawrence's diet simplified the diabetic diet, alleviating the need to weigh proteins and fats and eased restrictions on carbohydrates, though they were still listed as 'dangerous foods'. Moreover, it allowed patients to 'self-manage' their condition at home rather than stay in hospital, a significant benefit given funding issues and overcrowding of hospitals in the interwar years. Thus, in addition to the factors outlined so far, the reorganisation of health care and overcrowding in hospitals in Britain provided further impetus for the development of dietary means of managing diabetes, freeing up space in hospitals and allowing PWD to manage their condition independently. Lawrence's Line Ration Diet, provided a solution to these challenges, removing the need for constant observation of the patient by physicians, and granting PWD greater control over their condition. Ultimately however, Lawrence's diet reinforced the importance of the dietary management of diabetes in the post-insulin era, providing physicians with a lack of knowledge of diabetes dietetic principles with a simple of means of educating their patients regarding the value of nutrition which was both comprehensible and effective.



THE "LINE RATION" DIET SCHEME.

One black portion added to one red portion = one Line ration.

Carbohydrate Foods (containing sugar or starch).

Black Portions (10 gm. C.).

	oz.
*Flour, Rice, Sago, Tapioca (raw)	½
Oatmeal, Biscuit or Toast; Macaroni or Prunes (dry)	¾
Bread (all kinds)	1
Potato, Peas, Broad Beans; Banana	2
Parsnips or Prunes (stewed); Grapes	3
Beetroot; Apple or Pear (raw); Dried Apricots or Peaches (stewed); Ripe Plums	4
Orange (skinned), or Ripe Greengages	5
Onions, Carrots; Cherries, Peaches or Gooseberries (all ripe)	6
Milk; Stewing Apples or Pears	7
Strawberries or Apricot (ripe)	8
Turnips, Leeks, Jerusalem Artichokes	10
Grape-fruit (in skin); Blackberries (stewed)	10
†Brussel Sprouts; Raspberries or Loganberries (raw)	12
Red Currants; Stewing Greengages, Damsons, Plums or Apricots	12
Melon (raw); Endive (raw)	14

† Half portions of these are usually enough.

Negligible Starch Content in Average Helpings of—

Asparagus, Green Artichokes, French Beans, Cabbage, Cauliflower, Celery, Cranberries, Cress, Black Currants, Egg Plant, Stewing Gooseberries, Greens, Horse-radish, Lemons, Lettuce, Marrow, Mushrooms, Radishes, Rhubarb, Salsify, Scarlet Runners, Sea Kale, Spinach, Tomato (raw or cooked).

Red Portions (7½ gm. Protein and 15 gm. Fat).

One Egg and Fat ½ oz.
Bacon 1 oz.
Ham 1 oz. and Fat ½ oz.
Kipper 1½ oz. and Fat ½ oz.
Herring 1 oz. and Fat ½ oz.
Lean Beef or Mutton 1 oz. and Fat ½ oz.
Lean Lamb or Veal 1 oz. and Fat ½ oz.
Lean Pork 1 oz. and Fat ½ oz.
Chicken or Duck 1 oz. and Fat ½ oz.
Tongue (tinned or fresh) 1 oz. and Fat ½ oz.
Liver 1 oz. and Fat ½ oz.
Kidney or Tripe 1½ oz. and Fat ½ oz.
Rabbit or Hare ½ oz. and Fat ½ oz.
Cheese ¾ oz. and Fat ½ oz.
White Fish or Sweetbreads 1½ oz. and Fat ½ oz.
Sardines 1 oz. and Fat ½ oz.
Salmon 1 oz. and Fat ½ oz.
Crab or Lobster 1½ oz. and Fat ½ oz.
Pheasant, Grouse or Partridge ¾ oz. and Fat ½ oz.

Fats are Meat Fats, Suet, Dripping, Butter, Margarine, Olive Oil; Thick Cream in twice the amount stated for other fats.

* *Articles starred to be taken only if specially allowed by physician.*

Extras of no food value.—Tea, coffee, soda, water, bovril, oxo, etc., ordinary condiments and flavourings.

Figure 2.8: Lawrence's Line Ration Scheme (1932) [Courtesy of the Wellcome Library].

From an Acute to Chronic Disease

By the mid-1920s it had become clear that the discovery of insulin markedly increased the life span of those living with severe diabetes, while revisions to the diabetic diet enabled the control of symptoms and enabled a more normal life for most patients. Concerns began to arise, however, that while treatments had become more effective in keeping patients alive, they were, ironically, transforming the disease from an acute to chronic one. Additionally, incidence of the milder form of diabetes that was not dependent upon insulin appeared to be rising sharply. In 1924, having noted these changes, epidemiologists Haven Emerson and Louise Larrimore conducted the first epidemiological study of diabetes in New York that sought to understand changes to the city's leading causes of death. The researchers reported

that while the causes of death from infectious diseases such as tuberculosis had dropped from first to fourth place, such a shift had brought diabetes to tenth place, reaching one in every fifty-one recorded deaths by 1923.[157] Moreover they found that in the U.S overall diabetes mortality had increased from 2.8 to 16.1 per 100,000 of the population, while the death rate from all causes had fallen steadily during this period.[158] In New York alone, figures recorded by the registrar's office of the Department of Health of the City of New York reported 23,254 deaths which could be attributed to diabetes between 1866 and 1923. The only break in this trend was found during two distinct periods: the influenza pandemic of 1898 to 1901 and 1916 to 1917 when wartime food restrictions were temporarily enforced.[159] Their aim then was not to simply trace the life history of the disease, but rather to explore what epidemiology could tell them about the causes and distribution of disease and if any common factors could be found, such as: age, sex, race, occupation, geographical distribution, heredity and environment. While physicians had ruminated on the causes of diabetes prior to the discovery of insulin, their attention had been consumed by the principal task of keeping patients alive. Diabetes was considered primarily as a disease of metabolism, and while some, such as the Indian physician Basu, ruminated on the multifactorial causes of diabetes, no large scale study of aetiology had ever been conducted. Emerson and Larrimore's study was thus the first of its kind and identified a key number of variables influential to both cause and distribution of the disease. The study revealed, among several findings, that Jewish people and whites in particular were more likely to suffer diabetes, so much so that

[157] H. Emerson and L. Larrimore, 'Diabetes Mellitus: A Contribution to its Epidemiology Based Chiefly on Morality Statistics', *Archives of Internal Medicine*, 34:5 (1924), p. 589.
[158] Ibid, p. 590.
[159] Ibid, p. 594.

diabetes was sometimes referred to as 'Judenkrankheit' - the Jewish sickness.[160] It is important to note here that Emerson and Larrimore were not implying these racial differences were biological, but rather associated with variables among races such as occupation, economic status and dietary habits. These explanations were almost radical for their time, challenging the prevailing tendency which implied moral weakness, 'lack of will', or the hereditary explanations emphasised by leading diabetes specialists such as Joslin.[161] Additionally, the study found diabetes to be significantly more prevalent among the sedentary and higher paid occupations such as merchants and clerical workers. However, the most influential finding in their research was that which examined death rates from diabetes in relation to variation in per capita consumption of food, most notably sugar:

> It is reported by the Bureau of Animal Industry of the U.S Department of Agriculture that the annual per capita consumption of meat has fallen in the last fifteen years from 179 to 155 pounds, this reduction having been replaced by the use of cereals, sugar, milk and fruits. With our present food habits we provide 500 calories a day in our average ration of 3600 calories for all ages from sugar which we not only like but find a cheap food and most effective for workers.[162]

As diabetes and other chronic diseases such as cancer began to compete with infectious disease as the leading causes of death, Emerson and Larrimore's research drew urgent attention to aetiology. While they did not disregard the role of heredity entirely, their findings suggested that social and environmental factors, such as diet, the increasing tendency towards a sedentary lifestyle due to changing work patterns, and psychosocial stress, were much greater considerations, particularly in the milder

[160] Ibid, p.603.
[161] A. M. Tuchman, 'Diabetes and 'Defective' Genes in the Twentieth Century United States', *Journal of the History of Medicine and Allied Sciences*, 70:1 (2015), pp. 1-33.
[162] H. Emerson and L. Larrimore, 'Diabetes Mellitus', p. 623.

form of the disease. As Emerson later explained during his position as President of the American Public Health Association (APHA):

> The small fraction of cases of diabetes which can reasonably be attributed to hereditary defect is probably on the increase, owing to the skill of physicians and the discoveries of laboratory workers who save the child diabetic to survive into parenthood, and carry an adult diabetic through the years of procreation, and yet we have no sufficient justification for interfering by law or persuasion with the marriage and child-bearing of those with this inherent defect. There remains the vast majority of adult diabetics whose manner of life is the major if not the only factor in the development of the disease. The obese, the sedentary persons of the later decades of life who by occupation and inclination avoid so far as possible, even in their amusement, and games, such exercise of the great mass of body muscles as in the past was necessary for almost everyone, these are the victims of a way of life in which appetite and easy access to abundance in variety and amount of food, and slight necessity for bodily exertion, are the rule.[163]

Emerson and Larrimore's findings, particularly those pertaining to changes in lifestyle and eating habits, reinvigorated a discussion about aetiology in a time where eugenics and Social Darwinism dominated.[164] Being the first epidemiological study of diabetes of its kind, the study drew a direct correlation drawn between increased consumption of foods containing refined sugar, and the documented rise in the incidence of the milder form of diabetes:

> It is apparent that rises and falls in the sugar consumption are followed with fair regularity within a few months by similar rises and falls in the death rates from diabetes, the changes during the period of the World War being particularly striking…The changes in food habits in the United States have probably contributed to the increase of diabetes, the higher carbohydrate element and greater abundance or superalimination being believed to be a cause of over fatiguing the function of sugar tolerance.[165]

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[163] H. Emerson, 'Public Health Awaits Social Courage', *American Journal of Public Health and the Nation's Health*, 24:10 (1934), p. 1018.
[164] E. Dyck, *Facing Eugenics: Reproduction, Sterilisation and the Politics of Choice*, (Toronto: University of Toronto Press, 2013).
[165] H. Emerson and L. Larrimore, 'Diabetes Mellitus', p. 627.

Emerson and Larrimore's correlation between diet, increased sugar consumption, and diabetes death rates was a controversial one. Joslin in particular disagreed with their hypothesis and argued that the increased *quantity* rather than *type* of food was a more convincing explanation for the rise in diabetes.[166] In a discussion on diabetes which featured in *JAMA* in 1924 between Joslin, Dr Searle Harris and Dr Russell Wilder, Joslin commented:

> I believe that the reason for the diabetic tendency of the Jews, is that they take too much food and too little exercise. I do not think that it is a question of the kind of food. In China, diabetes is not common, and these people use a preponderance of starchy diet. In Japan, more sugar is eaten and diabetes is more common. However, I do not think that it is so much the kind of food as it is the amount of food. If we prevent a gain in weight, we shall accomplish more.[167]

Moreover, in a subsequent discussion of their article, a number of medical professionals, including Dr Louis I. Dublin, while praising the research for being the first of its kind in its methodological approach, were keen to use Emerson and Larrimore's findings to support their own agenda in promoting racial theories of diabetes. Dublin in particular used the study's findings to emphasise racial incidence and biological factors and downplay the disease's social dimension. In particular, Dublin was keen to point out the number of Jewish and Irish diabetics, claiming;

> The enormous increase in the city of New York is obviously due to the large increase in the number of Jews in that community, also the number of Irish…While it is true that very generally the coloured race has a low incidence compared to the white race, there are states in the South in which the condition is reversed, especially true of the urban populations.[168]

[166] Ibid, p.626.
[167] E. P. Joslin, 'Discussion on Diabetes', *JAMA*, 83:10 (1924), p. 737.
[168] Emerson and Larrimore, 'Diabetes Mellitus', p. 628.

While historians have tended to focus on the role of insulin in transforming diabetes from an acute to chronic disease, what these accounts have overlooked are the ways in which this transition, prompted by rising rates of diabetes, also generated new ideas regarding aetiology. Emerson and Larrimore's findings from their epidemiological study of diabetes in New York, drawing due attention to social and environmental, as well as biological factors, forced a greater consideration of the complex aetiology of diabetes which challenged prevailing assumptions regarding race and heredity, which as seen in the quotes above were not wholly accepted by the medical establishment. An examination of how this debate played out in leading medical journals indicates that by 1930 a dialogue between those who recognised diabetes could be attributed to faulty diets, and those who favoured biomedical explanations for the disease, featured within the majority of research papers published on diabetes from around this time:

> It has generally been believed by the laity that successful treatment of many diseases depended on diet. Many physicians, while aware of the possible dietary deficiencies, do not believe that the causes, except indirect ones, of many diseases are to be found in faulty diets. They believe that other factors are also of great importance, such as hereditary predisposition to disease, infections and their sequelae, and tissue changes that inevitably result from wear and tear and lapse of time.[169]

Due to the findings of Emerson and Larrimore's research, a greater consideration of the aetiology of diabetes had taken place, and by 1930 hospital records began to note diabetes vast and complex range of causes, such as the Victoria Infirmary in Glasgow, which in 1930 noted up to twelve different causes of diabetes, including;

[169] W. J. Stone, 'Dietary Facts, Fads and Fancies', *JAMA*, 95:10 (1930), p. 709.

hereditary, obesity, nervousness, infection, arteriosclerosis, syphilis, trauma, pancreas, thyroid, hypothesis, hepatic and problems associated with the kidney.[170]

Despite the introduction of insulin and the ongoing use of diet, uncertainty regarding aetiology remained, especially concerning the role of biology and environment, and the specific nutritional factors at stake. Emerson and Larimore's research raised questions about sugar's role in disease during a time when sugar was actively promoted as a useful and nutritious source of energy, particularly in the diets of children and the working class.[171] Among sugar's key proponents in the U.S was teacher and 'mother of home economics' Mary Hinman Abel. In 1906, on behalf of the USDA, Abel published Farmers Bulletin no. 93 *Sugar as Food*, a pamphlet aimed at the American general public dedicated to the promotion of sugar's nutritional value.[172] Abel promoted the consumption of sugar as 'a useful and valuable food' and advocated its use in improving the nutrition of the underfed, as an energy source in the diet of children and as a useful food source for those conducting 'muscular work'.[173] In support of Abel, an anonymous article which appeared in *JAMA* claimed:

> One must go far to find a more comprehensive, unbiased and intelligently compiled account of sugar and its value as food than is presented in the latest Bulletin by Mrs. Mary Hinman Abel of Baltimore.[174]

[170] Victoria Infirmary Diabetic Clinic Patient Records (1930), Glasgow University Archives 095/1/2/3/13.
[171] S. W. Mintz, *Sweetness and Power: The Place of Sugar in Modern History*, (New York: Penguin Books, 1985), p. 143; E. Abbott, *Sugar: A Bittersweet History*, (London: Duckworth Publishers, 2009), pp. 53-54.
[172] M. H. Abel, *Sugar as Food*, p. 7.
[173] Ibid.
[174] Anonymous, 'Sugar as Food', *JAMA*, 61:7 (1913), pp. 492-3.

While promoting the consumption of sugar as 'both wholesome and nutritious', the article also shed light on the wider nutritional discourse relating to sugar in the early twentieth century, acknowledging how sugar had received its 'fair share of criticism' and had been charged with 'its quota of participation in the genesis of human ills'.[175]

In 1924, the same year as Emerson and Larrimore's study, American physician Seale Harris noted symptoms similar to diabetes in his non-diabetic patients, including hunger, weakness and anxiety neuroses. Describing the condition as 'hyperinsulinism', in *JAMA,* Harris explained how these symptoms could appear in anyone as the result of consuming refined sugar and flour, and thus he warned they should be avoided.[176] In the same period, the incidence of cancer was also rising sharply, with mortality in Britain increasing sevenfold from 1838 to the 1930s.[177] Similar to diabetes, many denounced processed foods and pointed to diet as an important means of both prevention and treatment of cancer. However unlike diabetes, which retained a strong connection with diet, those who suggested a similar connection between diet and cancer were either denounced by medical journals as 'ill-informed' or branded a heretic.[178] Falling victim to the latter was German physician Max Gerson. Gerson held that most diseases could be explained in terms of a 'disturbance of unbalancing of the entire metabolism' caused by artificial fertilisers which he argued disturbed the body's biological balance, contributing to; nutritional disorders, cancer, asthma and a host of other conditions.[179] Gerson argued

[175] Ibid.
[176] S. Harris, 'Hyperinsulinism and Dyinsulinism', *JAMA*, 83:10 (1924), p. 729.
[177] B. Griggs, *The Food Factor: Why We Are What We Eat* (London: Viking Books, 1987), p. 214.
[178] H. Halliday, 'Cancer: How it is caused, how it can be prevented', *The Lancet*, 204:5264 (1924), pp. 140-141.
[179] M. Gerson, *A Cancer Therapy* (New York: Dura Books, 1958).

that cancer along with other degenerative diseases like diabetes would cease to plague the West until agriculture had returned to organic farming. The medical profession, in particular lupus specialists, branded Gerson a heretic, refusing to believe cancer could be treated, and indeed prevented, with such a simple method like diet.[180]

In the field of diabetes, however, diet remained a fundamental part of treatment and sat alongside multiple explanations of aetiology during the 1920s and 1930s. Haven and Emerson's study strengthened the importance of diet in diabetes by highlighting the connection between changes to the nation's diet and the rise in milder cases, but also drew attention to the fact that insulin had not reduced, but postponed mortality in patients:

> While the use of insulin may be postponing markedly the deaths of diabetic patients, it has not yet been shown that any permanent improvement in the death rate from this disease can be attributed solely to its use.[181]

By the 1930s, then, while insulin was heralded a miracle drug in the management of diabetes it was also clear that diet could not be disregarded. The importance of diet in understanding and managing diabetes was reinforced further with British scientist Harold Himsworth's distinction between the two types of diabetes made in 1939. In a paper presented for the Goulstonian Lecture to the Royal College of Physicians in London, Himsworth questioned the broadly held belief that all cases of diabetes could be explained by a deficiency of insulin, proposing instead that a 'state of diabetes might result from inefficient action of insulin as well as from a lack of

[180] Griggs, *The Food Factor*, p. 217.
[181] H. Emerson and L. Larrimore, 'Diabetes Mellitus', p. 587.

insulin'.[182] While Himsworth acknowledged that it remained possible for both factors to operate simultaneously, what he was suggesting was the idea of diabetes as consisting of two distinct forms or *types* with wholly different pathogenesis: those whose bodies could not produce insulin, and those who were merely sensitive to it. Himsworth's distinction allowed physicians to progress beyond the prevailing view of diabetes as a general disorder of the metabolism and begin to identify divergent therapeutic strategies, particularly dietary interventions, for both severe and milder patients, examined further in the following chapters.

Conclusion

Historically, the regulation of diet was held as key to good health and the prevention of disease across competing medical systems. The management of diabetes, like many diseases, traditionally followed this model. Accordingly, prior to the development of medical means of management such as insulin and oral hypoglycaemic agents, diabetes was managed with a range of dietary prescriptions informed by wide-ranging nutritional principles. Yet within histories of diabetes is a tendency to suggest that with the discovery of insulin in 1921, diet became redundant and was abandoned in favour of new medical 'cures'. In contrast to this existing literature, this chapter, having examined the relationship between diet and diabetes both before and after insulin, suggests that rather than replace traditional approaches to management, insulin served to reinforce the importance of diet in what remained a complex disease.

[182] H. Himsworth, 'The Mechanisms of Diabetes Mellitus', *Lancet*, 234:6044 (1939), pp. 1-6.

Prior to the discovery of insulin in 1921, Allen's undernutrition or 'starvation diet' was the principal method of treatment chosen by practitioners for their patients. Developed in line with metabolic theories of disease, a range of diets were tried and tested in this era in order to simply prolong the lives of patients and avoid the devastating occurrence of coma, acidosis and death. While the introduction of insulin as a method of control in 1921 brought relief for many diabetics and prolonged life, it concurrently brought with it new and unpredictable problems. As PWD began to live longer, a pattern of complications including retinopathy and cardiovascular disease appeared and, while many patients and their doctors hoped that diets could be relaxed, it became ever more apparent that insulin was not a replacement for dietetic measures.[183] With the availability of insulin, however, undernutrition was no longer necessary; with careful consideration, carbohydrate could be increased for the first time, allowing the patient to follow a more satisfying diet while relieving them of their symptoms and restoring normal bodily weight. What insulin offered then was a new system of management that balanced the metabolic effects of diet with the social, psychological and economic needs of the patient. Additionally, this chapter has drawn attention to the role of previously overlooked figures, such as R. D. Lawrence, in reinforcing the value of diet in the post-insulin era. Lawrence's Line Ration Diet provided a simplified method of the diabetic diet which served to simplify treatment for patients and physicians while providing much relief to overcrowded hospitals. In contrast to existing histories which have limited their scope to the discovery of insulin, and narrowly interpret its discovery to have meant the end of diet therapy, this chapter has thus demonstrated

instead how insulin reinforced, rather than diminished the role of diet in the management of diabetes. Thus in contrast to the prevailing narrative which suggests PWD were freed from stringent dietary prescriptions with the availability of insulin, the evidence presented here suggests that physicians and diabetes specialists upheld the importance of a controlled, low-carbohydrate diet as the most effective means of managing diabetic symptoms and avoiding future complications.

Additionally, this chapter has explored the transition of diabetes from an acute to chronic disease and insulin's role in stimulating a new debate regarding aetiology. The publication of the first epidemiological research on diabetes, which drew a clear correlation between diabetes and changes to diet and lifestyle, highlighted divisions over the consumption of sugar and its relationship to disease, and provoked existing tensions surrounding race and responsibility for disease. With the further realisation that insulin had failed to reduce diabetic death rates, it became ever more apparent that the role of diet in diabetes could not be disregarded. Thus unlike other conditions such as cancer, where the link between diet, aetiology and prevention was treated as heresy, diabetes retained a strong connection with diet which spanned centuries. Bolstered by figures such as Lawrence, who reformed the diabetic diet into a simple system of management, in addition to new epidemiological evidence which drew a direct correlation between diabetes incidence, diet and lifestyle, diet was not abandoned, but remained a viable form of treatment in this period.

In the coming decades, the relationship between diet and diabetes, and the rationales provided for its use, would continuously be altered by changes wrought by science,

politics and the reorganization of health care. It is to these developments, and their implications for the dietary management of diabetes, that this thesis now turns.

Chapter Three

War, Nutrition and the Establishment of the British Diabetic Association

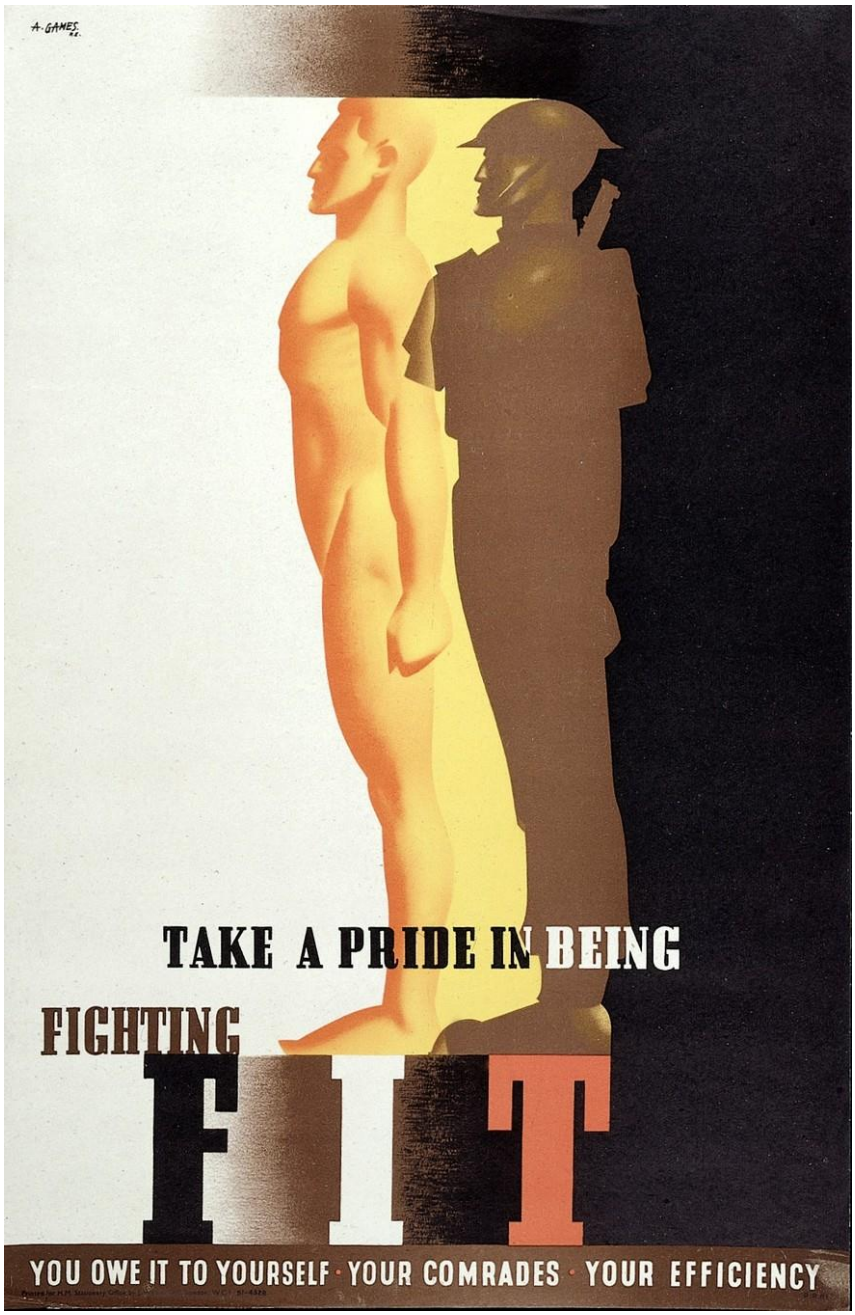


Figure 3.1: A healthy solider in profile, naked and in uniform equating fitness with efficiency (1942). [Courtesy of the Wellcome Library].

> The diabetic patient today is incomparably more fortunate than he was twenty-five years ago, and should have no complaints about the relatively easy routine to which he is subjected. Before the insulin era, the diabetic was pitifully restricted and starved in an effort to postpone the ever-menacing death from the disease. Now, as time has proved, a diabetic can do everything that a non-diabetic can do…We have had insulin now for twenty-five years and clearly great progress has been made during this time. Hence the diabetic has much to be thankful for, and he should be made to realise it.[184]

By 1933, the discovery of insulin was seen as having enhanced, not diminished, the role of diet in treating diabetes. Research throughout the 1920s and 1930s had demonstrated the importance of adhering to a diabetic diet to manage the disease and prevent later complications.[185] Despite debate over the inevitability of complications among physicians, two principles in nutrition remained the same: undernutrition - that is maintaining a body weight slightly below average - was preferable to the practice of starvation characteristic of pre-insulin regimens, and the consumption of sugars should continue to be avoided.[186] Historians agree that while insulin may have made an adequate diet possible, it not did necessarily simplify the task of the physician, nor cure the disease. Ultimately, the new choices in treatment necessitated new decisions on the best methods of attaining the goals of good nutrition and, consequently, control of the disease. As the Mayo Clinic's Frank Allan explained: 'The discovery of insulin had changed the problems of diet in diabetes…The liberty which insulin gives in dieting has led to further diversity of treatment', which he added had further led to 'totally different plans…by different authorities'.[187] While Allan did not explain what these plans entailed or whom he

[184] H. John, 'The Diabetic Patient', 1939. (Joan Walker Collection, University of Leicester).
[185] See chapter two.
[186] J. W. Presley, *A History of Diabetes in the United States, 1880-1990*, PhD Thesis (Austin: University of Texas, 1991), p. 475.
[187] F. N. Allan, 'Diabetes before and after insulin', *Medical History*, 16:3 (1972), pp. 266-273.

regarded as the 'new authorities', this excerpt draws attention to the fact that in the years following the discovery of insulin, not only did the content of the diets provided to patients begin to change, but so too did the authorities responsible for their production and dissemination. In the existing literature, the period spanning the arrival of insulin in 1921 to the end of the Second World War has often been overlooked, with a tendency to document the history of insulin followed by the post-war pharmaceutical era and the subsequent explosion of diabetes as an epidemic.[188] However, within this period two considerable developments involving what Allan refers to here as 'new authorities' emerged which are fundamental for understanding the transformation of diabetes into its own specialism, as well as the sites of diabetes management and changes to the diabetic diet. This chapter demonstrates the importance of this period and its significance for understanding where dietary advice comes from and the individuals or groups who have shaped the content of diabetic guidelines in the twentieth century. The first of these developments examined here considers the interwar years and the origins of diabetes as its own medical specialism, examining the establishment of the first patient association for diabetes in Britain, the formerly named Diabetic Association (later the British Diabetic Association and known today as Diabetes UK and Diabetes Scotland). Historians, notably Moore and Jackson, have touched on the formation of the Diabetic Association in their research, accounting for its establishment as a response to the challenges of diabetes as it transformed from an acute to chronic disease.[189] While this was certainly the case, to date there has been no analysis of the establishment of

[188] R. Tattersall, *Diabetes: The Biography*, (Oxford: Oxford University Press, 2009).
[189] M. Moore, *Managing Diabetes, Managing Medicine: Chronic Disease and Clinical Bureaucracy in Post-war Britain*, (Manchester: Manchester University Press, 2019); J. G. Jackson, 'R.D. Lawrence and the Formation of the Diabetic Association', *Diabetic Medicine*, 13:1 (1996), pp. 9-22.

the Diabetic Association in relation to the wider context in which it emerged, nor the ideas and influences of its founding members, both of which aid a better understanding of how diabetic guidelines were shaped in this period. As I argue here, the personal experiences and private ambitions of those who founded the Association elucidates the function the organisation later came to play, in particular its role in informing health policy in wartime and subsequently throughout the period of post-war reconstruction.

A greater consideration of the role played by patient associations, the wider context in which they were established and the ideas and values of those who founded them, helps to elucidate the meanings attached to dietary advice, exposing a lesser considered explanation as to why nutritional guidelines became more liberal in this period. As explored in Chapter Two, the relationship between food and medicine in the early twentieth century was complex and approaches to the treatment of diet-related diseases evolved rapidly in line with the latest ideas and developments in the science of nutrition.[190] The origins and development of diet therapy evolved within this complexity and was shaped not only by the discovery of insulin, but by a multitude of developments that to date remain largely unexplored.[191] Throughout the history of diets and dieting, various groups and individuals have been responsible for devising and distributing dietary advice, from the Church and religious groups, to physicians, celebrities and public figures. However, within the history of diabetes there has been no thorough analysis of dietary management in twentieth century

[190] D. Gentilcore and M. Smith (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2018).
[191] Apart from Moore's assessment of the 1930s and alterations to the diabetic diet in line with research which drew a correlation between diet and later complications, wider factors which have shaped the content of diets for diabetes has been overlooked.

British diabetes care, nor the historical events and individuals which have shaped the advice provided.[192] The following chapter thus fills this gap in the existing literature by documenting and analysing two important developments which shifted the responsibility to inform people with diabetes about how to manage their condition from individual physicians and diabetes specialists, to disease-specific organisations and the state. The aim of this chapter then is to draw attention to the wider, historical events and figures which shaped diabetes in this period, demonstrating that as much as the diabetic diet was shaped by evolving nutritional theories and medical innovations such as insulin, the re-structuring of health care and the outbreak of war as well as the formation of the first patient association for diabetes further shaped ideas about diabetes and its management. In order to examine the role played by the Diabetic Association, the following chapter is divided into two sections. Section one explores the early role of the Association, examining to what extent the new authority contributed to revisions in the diabetic diet and altered the rationales provided for its use. Within the period examined here, the Diabetic Association, headed by leading figures in diabetes research such as R. D. Lawrence, became new authorities in diabetes management, providing guidelines on all aspects of diabetes care followed by patients, physicians and from the outbreak of war, the state. The early life and experiences of figures such as Lawrence and his colleague and friend, author H.G. Wells, both of whom had diabetes, are examined in order to ascertain the ways in which their own experience of diabetes shaped their attitudes about health and illness, thereby aligning with concerns over national efficiency. The early lives and experiences of the Association's founding members provides both a fascinating

[192] S. Gilman, *Diets and Dieting: A Cultural History*, (New York: Routledge, 2007), p. 223.

and crucial part of the story of why the Association was established, and the role it would later come to play in the context of war and post-war reconstruction. The second section of this chapter explores the next major development which impacted upon diabetes in this period: the outbreak of the Second World War and the impact of national food policies such as rationing. Section two examines the increase in state intervention as a result of war, particularly into the nation's health and nutrition and what this meant for people living with diabetes. Contributing to a wide body of literature which connects developments in the history of medicine to ideas about national efficiency and citizenship in the early twentieth century, this chapter situates the establishment of the Diabetic Association within its historical context, illustrating the connection between diabetic guidelines and the social and political environment in which they are created. Ultimately, examining this period illuminates the meanings attached to dietary advice, providing a new perspective on why nutritional guidelines began to move towards a more liberal diabetic diet.

R. D. Lawrence and the Establishment of the Diabetic Association

In the years following the discovery of insulin in 1921 the problems facing patients with diabetes, and parents of children with diabetes, were considerable. Insulin had certainly prolonged life, but as Feudtner describes, the transmutation of diabetes from an acute to chronic disease, came at a sizeable cost both emotionally and physically to patients. Insulin was keeping patients alive but had created major strains regarding the need for constant supervision, not only in terms of injections, but also of diets, variable urine tests, and in the case of child and adolescent

diabetics, additional supervision and monitoring of behaviour in relation to injections.[193] As Jackson identifies, these problems were twofold for the very poor, since the cost of the diabetic diet was formidable, and crowded and unsanitary homes could provide further complications, for example the systematic sterilisation of insulin syringes.[194] Additionally, as the number of living patients increased and the diabetic regimen, with the incorporation of insulin, became more complex and required greater instruction and supervision, the need for improved patient education and improved standards and organisation of care warranted urgent attention. Evidence from oral testimonies indicates that, until this time, patient education had varied considerably by practitioner and place. By the 1920s and early 1930s, patients living away from urban centres such as London and who had managed the condition for many years alone often knew more about the condition than their physician.[195] The rapid increase of both new diagnoses and patients living longer with diabetes due to insulin placed an enormous pressure on already overstretched hospitals and their staff during the interwar period. Despite physicians' attempts to move away from hospital-based care, experimentation with insulin and dietary instruction could inevitably lead to a prolonged in-patient stay due to the length of time required for thorough, methodical instruction and patient observation.[196] Consequently, an urgent response from within the profession was needed in order to address *where* patients

[193] J. G. Jackson, 'R.D. Lawrence and the Formation of the Diabetic Association', *Diabetic Medicine*, 13:1 (1996), p. 19.
[194] Ibid.
[195] M. Elliot, Interview,12 July 2004, British Library C1239/33.
[196] This was subject to affordability, for example those who could afford private care, had received a charitable donation or where eligible for National Insurance through their employer. Prior to the establishment of the NHS, diabetic care was only free for those who paid into a thrift club or were eligible for National Insurance through their employer, otherwise patients were required to pay for private care or rely on a charitable donation. See M. D. Moore (eds.) *Balancing the Self: Medicine, Politics and the Regulation of Health in the Twentieth Century*, (Manchester, Manchester University Press, 2020), p. 39. See also interview with M. Elliot.

were to be treated and to coordinate the available expertise in order to produce uniform guidelines that could easily be followed by both physicians and their patients. Consequently, by the 1930s it was becoming increasingly apparent that what was required in order to manage the new demands in diabetes was greater specialism and an organisation which would promote both the needs of the profession and take on the role of creating and delivering patient education and advice.

Beginning in the 1920s, specialist clinics similar to those already well-established by Joslin and his colleagues in Boston were created in Britain. From the 1920s onwards, the leading figures in diabetes research and care were all situated in these clinics which allowed for greater observation of patients and in turn greater specialist knowledge of the disease.[197] Following this relocation discussions of treatment began to alter based on new and increased observation of patients and a collaboration of expertise. As Moore describes:

> …now that clinicians were following patients over a long period, these doctors became exposed to the complaints and problems faced by their patients on a quotidian level. Whereas clinicians and research scientists removed in-patients from their social context…they now saw some out-patients for months and years.[198]

The move towards greater specialism and the establishment of disease-specific organisations was not unique to diabetes but reflects the wider cultural milieu of the early twentieth century which saw medical knowledge increasingly look towards science and expertise in order to find its legitimation.[199] In this 'era of the expert' according to Barona, the pressure of war and economic crisis saw governments

[197] M. Moore, *Food as Medicine*, p. 155.
[198] Ibid, p. 156.
[199] J. L. Barona, 'Nutrition and Health: The International Context during the Inter-War Crisis', *Social History of Medicine*, 21:1 (2008), p. 95.

assume greater responsibility for food and health. Accordingly, the role of expert scientists extended beyond influencing knowledge to inspiring health policies, education and propaganda programmes aimed at civilising and correcting popular habits.[200] Moreover, changes in health concerns in the early twentieth century, namely the control of infectious disease in the wake of the Spanish flu and sequential rise in chronic disease, had shifted the focus of the medical profession, encouraging the rise of new specialisms and their associated societies and journals. Throughout the 1920s, specialists in cancer, diabetes, heart disease and rheumatism established societies and associations dedicated to publicising the threat posed by chronic disease in order to both increase awareness of the toll of these diseases and to attract funds for research and innovation.[201] Within this context a number of disease-specific organisations made up of specialists and other individuals from their field were established in both Britain and the United States, including; the American Cancer Society (1913), the American Heart Association (1915), the British Empire Cancer Campaign (1923) and the American Rheumatism Association (1934).[202] The convening of two Conferences of Experts in 1932 at the height of this 'era of the expert' embodied much of the scientific milieu of the 1930s. Held in Rome and Berlin, the conferences were intended to discuss dietary standards and physiological methods to detect nutrition.[203] In 1923, as discussions got underway regarding the establishment of a diabetic association, the British Empire Cancer Campaign was

[200] Ibid.
[201] G. Weisz, *Chronic Disease in the Twentieth Century*, (Baltimore: John Hopkins University Press, 2014), p. 17.
[202] A number of other disease-specific organisations were established in the early post-war period including the Multiple Sclerosis Society. See M. Nicolson and G. W. Lowis, 'The Early History of the Multiple Sclerosis Society of Great Britain and Northern Ireland: A Socio-Historical Study of Lay/Practitioner Interaction in the Context of a Medical Charity', *Medical History*, 46:2 (2002), pp. 141-174.
[203] J. L. Barona, 'Nutrition and Health: The International Context During the Inter-War Crisis', *Social History of Medicine*, 21:1 (2008), p. 95.

founded to 'attack and defeat the disease of cancer in all its forms, investigate its causes, distribution, symptoms, pathology and treatment, and to promote its cure'.[204] Thus, not only were the new demands that accompanied insulin driving the need for greater specialism and re-organisation of diabetes and its sites of management, these changes were also occurring within a culture of legitimating medicine through scientific expertise and the rapid formation of disease-specific organisations. It was within this context then, that the first organisation for diabetes in Britain, the Diabetic Association, was founded.

The story of Britain's first patient association for diabetes begins with R. D. Lawrence, the Scottish physician born in Aberdeen in 1892, who along with friend and author H.G. Wells formed the Diabetic Association (later the British Diabetic Association and subsequently Diabetes UK) in 1934.[205] It is not the purpose of the chapter to duplicate the biographical material which has already been documented on the founders' lives, but rather to assess to what extent their experience of illness inspired the Diabetic Associations early objectives, in particular the aim of removing the stigma associated with diabetes and improving the social position of those afflicted.

Lawrence, born in Aberdeen in 1892, graduated from medicine in 1916 and joined the Royal Army Medical Corps where he was posted to join the Mesopotamia Expeditionary Force as a senior Medical Officer. Lawrence spent most of his time stationed in the North West of India where he withstood both the First World War

[204] W. L. Harnett, *British Empire Cancer Campaign: A Survey of Cancer in London* (London: British Empire Cancer Campaign, 1952).
[205] Second in the world after APDP Diabetes Portugal founded in 1926. https://ncdalliance.org/apdp-diabetes-portugal

and the Spanish Flu. By October the same year the Spanish flu had reached India, Lawrence's experience of which can be found in the many letters written to his mother. In a letter from 20 October 1918 Lawrence writes:

> The great influenza world epidemic has broken upon us and is pretty bad here. We have about 30% of the British troops in hospital and as they are coming in and being sent out as soon as possible, it must represent a very large proportion of the station sick. Two of the MO's are sick which means still more work for the three of us who have not succumbed. I am almost proud to be one of those, as it seems to argue some strong inherent qualities in one's tissues which defies the disease – for which of course I have my heredity and early environment to thank.[206]

As this letter confirms, Lawrence fortunately did not succumb to the flu, but according to him the reasons for this lay not in good fortune or sanitation, but rather some 'strong inherent qualities' passed on through heredity. Lawrence only remained in India until 1919, when he was discharged with dysentery and sent back to London.[207] After being declared unfit to continue in military service by a Military Board, Lawrence returned to Aberdeen to recover. After a few weeks at home with his family, Lawrence travelled back to London to return to his career in medicine, where he took up the post of House Surgeon in the Casualty Department of King's College Hospital.[208] Six months later, in the summer of 1920, Lawrence was appointed Assistant Surgeon in the Ear, Nose and Throat Department and it was during this position that Lawrence's own diagnosis with diabetes transpired. Recalling the event Lawrence described how:

> It was usual where I was warded for the Night Nurse to teach the probationers how to test urine; and one night they happened to test mine and found it was loaded with sugar. Next day, the biochemist,

[206] J. G. L. Jackson, 'R. D. Lawrence: A Father of International Diabetes', *Diabetes Metabolism Research and Reviews*, 18 (2002), p. 407.
[207] Ibid.
[208] Ibid.

> Dr. G. A. Harrison, did a blood sugar test and found it was three times the normal, so there was no doubt that I had diabetes.[209]

Having shown none of the classic symptoms for diabetes (thirst, weight loss or polyuria) Lawrence was confounded and began to research all he could on the condition in pursuit of a more promising prognosis. As was still typical at the time, Lawrence was put on Allen's starvation diet until his urine was completely free of sugar and his carbohydrate tolerance slowly increased until he could manage 150 grams a day, at which point he could return to work. Yet, despite strict dietary adherence, Lawrence's glycosuria persisted. Upon reading Joslin's prediction that patient's following the Allen treatment could expect to live only three or four years, Lawrence packed up and chose to end his days living a quiet life in the Italian city of Florence. Once settled in Florence, Lawrence set up a small practice and managed a good quality of life until the winter of 1922-3 when he developed bronchitis followed some months later by severe peripheral neuritis, contributing to the rapid deterioration of both his diabetes and mental outlook.[210] Believing himself days away from death, Lawrence received a letter from diabetes specialist Dr Harrison in London telling him that insulin had been discovered, and that it appeared to work.[211] Harrison urged Lawrence to return and try the new treatment, and after much deliberation and scepticism, Lawrence made his way back to London, arriving on the 28th May 1923, in his own words, 'more dead than alive'.[212]

Upon arrival back at King's Lawrence started insulin treatment immediately and spent the first three weeks of insulin therapy experimenting with his diet in a

[209] R. D. Lawrence quoted in J. G. L. Jackson, 'R. D. Lawrence and the Formation of the Diabetic Association' in *Diabetic Medicine*, 13:1 (1996), p. 11.
[210] Ibid.
[211] C. Parkinson, 'H. G. Wells: The first celebrity charity campaigner?' *BBC News*, 15 February 2014.
[212] Ibid.

desperate attempt to balance his blood sugar levels against the new treatment. After three weeks of treatment with insulin, Lawrence found himself experimenting with a range of regimens and ideas still in circulation at the time which varied from the Graham Diet, a restricted carbohydrate diet, to the consumption of raw pancreas, none of which seemed to allow for a reduction of insulin injections. Frustrated at the lack of coherent advice for both patients and their physicians Lawrence decided to devise his own, simple diabetic diet scheme, The Line Ration Diet, produced in a pamphlet for patients and their physicians and re-produced in his later publications *The Diabetic Life* and *The Diabetic ABC*.[213] Armed with these texts, patients now had a manual with which they could teach themselves how to self-manage their diet, injections and in later editions, how to prevent complications and manage their condition during unexpected circumstances such as wartime.[214]

Lawrence's experiences of diabetes, both in private practice and his personal experience of the disease, had allowed him to think broadly about the challenges faced by patients and their practitioners. By the 1930s, the Line Ration scheme was used and adapted widely, both in Britain and the U.S, but Lawrence remained troubled by the lack of authority, interest and funding for diabetes as its own specialism.[215] Together with a rise in prevalence of the disease, Lawrence believed the state of diabetes as it were warranted the creation of an organisation that would safeguard the needs of patients and promote these interests throughout Britain, and, eventually, connect with similar organisations abroad. Among Lawrence's patients in London was the author and scientist H. G. Wells who had been referred to him in

[213] See chapter two.
[214] R. D. Lawrence, *The Diabetic Life*, (London: J & A Churchill, 1939).
[215] Despite the availability of insulin, 'quack' remedies such as opiate tinctures were still being touted for the treatment of diabetes.

1931. Wells shared much of Lawrence's views and volunteered to write a letter appealing to the nation for greater attention and support in matters relating to diabetes. The letter, titled 'The Select Company of Diabetics – for the Benefit of their Cult', was published in *The Times* in April 1933 and asked readers for donations towards the renewal of 'ageing equipment and abysmally crowded conditions'.[216] In the letter Wells added: 'I am a little surprised we have not already formed a Diabetic Association to watch over and extend this most benign branch of medicine to which we owe our lives'.[217]

The public's response was overwhelming and Wells received the money within a matter of weeks along with letters of support for an Association. A few months later on 3 November 1933 twelve people gathered at the home of H. G. Wells where it was unanimously decided that an association would be formed.[218] In March the following year a second meeting was held, this time with the presence of doctors, nurses, dieticians, insulin manufacturer representatives and laymen. With Wells as Chair the first draft articles of the Diabetic Association were created, the first of which outlined:

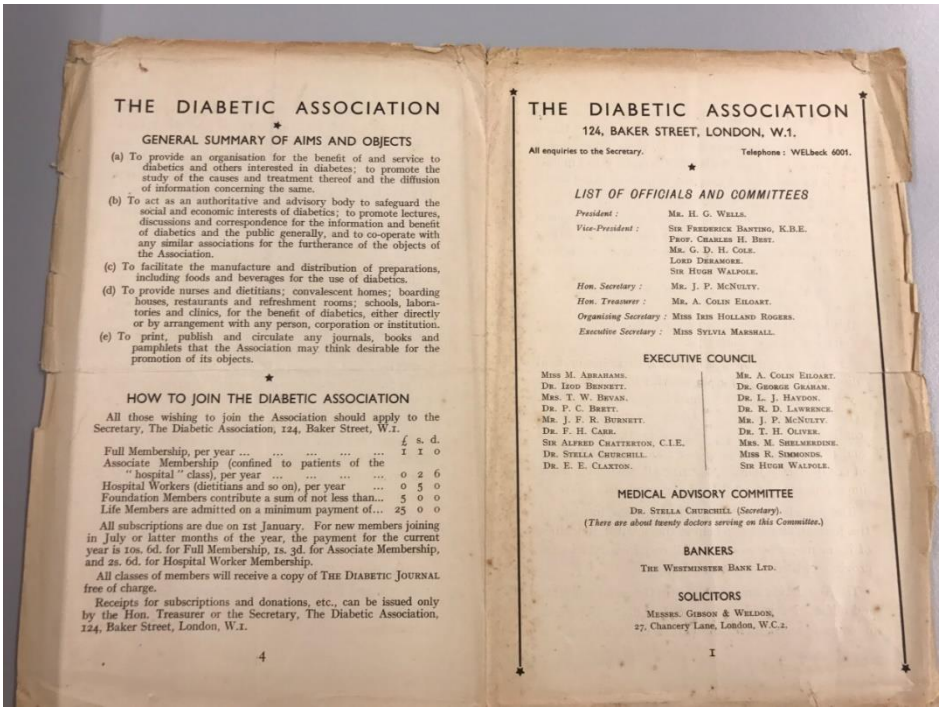
> That a Diabetic Association organised for service and not for profit be established for diabetics and those interested in diabetes for mutual aid and benefit and to promote the study, the diffusion of precise knowledge and the better treatment of diabetes in this country.[219]

[216] J. G. L. Jackson, 'R. D. Lawrence and the Formation of the Diabetic Association' in *Diabetic Medicine*, 13:1 (1996), p. 17.
[217] Ibid.
[218] C. Parkinson, 'H. G. Wells: The first celebrity charity campaigner?' *BBC News*, 15 February 2014.
[219] Ibid.

Article two outlined the Association's second aim which would see the organisation: 'act as an authoritative body to safeguard the social and economic interests of diabetics and to co-operate with similar Associations abroad'.[220] The Association set to work quickly and within months had established plans for a periodical, *The Diabetic Journal*, which would cover various aspects of living with diabetes, from the cost of the diabetic diet, meal plans and diabetic kitchens to unemployment, education and diabetes in children. The full list of aims of the Association were laid out by its founding members as follows: to be of service to diabetics and others interested in diabetes; to study the causes and treatment of diabetes; to safeguard the social and economic interests of diabetics; to promote lectures, discussions and correspondence for their information and benefit and for the enlightenment of the general public; to co-operate with similar associations; to facilitate the manufacture and distribution of preparations, including food and drink, for the use of diabetics; to provide nurses, dieticians, convalescent homes, boarding houses, schools, laboratories and clinics, for the benefit of diabetics and, lastly, to print, publish and circulate books, journals and pamphlets to further the Association's aims.[221]

[220] The British Diabetic Association was second only to the Diabetes Portugal, the Portuguese patient association founded in 1926 to supply insulin to disadvantaged diabetics across Portugal. The establishment of the British Diabetic Association in 1934 was quickly followed by the French Association (1936), the American Diabetic Association (1940) and the Belgian Association (1942). Sweden followed in 1943 and Holland in 1945, eventually promoting a meeting in 1950 to form the International Diabetes Federation (IDF).

[221] Leicester Branch of the British Diabetic Association notice of meeting held by R. D. Lawrence on 8th October 1954. Joan Walker Collection, University of Leicester.



THE DIABETIC ASSOCIATION

GENERAL SUMMARY OF AIMS AND OBJECTS

(a) To provide an organisation for the benefit of and service to diabetics and others interested in diabetes; to promote the study of the causes and treatment thereof and the diffusion of information concerning the same.

(b) To act as an authoritative and advisory body to safeguard the social and economic interests of diabetics; to promote lectures, discussions and correspondence for the information and benefit of diabetics and the public generally, and to co-operate with any similar associations for the furtherance of the objects of the Association.

(c) To facilitate the manufacture and distribution of preparations, including foods and beverages for the use of diabetics.

(d) To provide nurses and dietitians; convalescent homes; boarding houses, restaurants and refreshment rooms; schools, laboratories and clinics, for the benefit of diabetics, either directly or by arrangement with any person, corporation or institution.

(e) To print, publish and circulate any journals, books and pamphlets that the Association may think desirable for the promotion of its objects.

HOW TO JOIN THE DIABETIC ASSOCIATION

All those wishing to join the Association should apply to the Secretary, The Diabetic Association, 124, Baker Street, W.1.

	£	s.	d.
Full Membership, per year	1	1	0
Associate Membership (confined to patients of the "hospital" class), per year	0	2	6
Hospital Workers (dietitians and so on), per year ...	0	5	0
Foundation Members contribute a sum of not less than...	5	0	0
Life Members are admitted on a minimum payment of...	25	0	0

All subscriptions are due on 1st January. For new members joining in July or latter months of the year, the payment for the current year is 10s. 6d. for Full Membership, 1s. 3d. for Associate Membership, and 2s. 6d. for Hospital Worker Membership.

All classes of members will receive a copy of THE DIABETIC JOURNAL free of charge.

Receipts for subscriptions and donations, etc., can be issued only by the Hon. Treasurer or the Secretary, The Diabetic Association, 124, Baker Street, London, W.1.

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THE DIABETIC ASSOCIATION

124, BAKER STREET, LONDON, W.1.

All enquiries to the Secretary. Telephone: WELbeck 6001.

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Figure 3.2: Early pamphlet of the Diabetic Association (1937) [Courtesy of the Wellcome Library].

Throughout the 1930s the Association transformed the modern outlook towards treatment in diabetes by prompting a more holistic understanding of the condition and those who lived with it. In a leaflet published in 1937, the Association described how in addition to the dissemination of knowledge regarding insulin treatment the Association also aimed:

> …at helping in the social problems and difficulties which arise for the diabetic patient in several ways. The individual diabetic is often seriously handicapped in employment by the ignorance and prejudice of his employer and the widespread belief that being a diabetic is necessarily an *inefficient invalid*. He is barred from many suitable services and most pensionable jobs, and it is our aim to prove that this attitude is wrong and to rectify it.[222]

[222] Diabetic Association Pamphlet (1937), Wellcome Library EPH546.

This social, more holistic view towards diabetes and its management was fundamentally different from any approach to treatment that had come before and was markedly progressive for its time. As O'Donnell notes; in the early twentieth century physicians demanded no less than full mastery over diabetes and 'few appeared to consider, even in the passing, the social and material living conditions of patients'.[223] For historian Martin Moore, it was the development of specialist clinics - and greater observation of patients which followed - that prompted discussions of patient's social and psychological wellbeing.[224] Alongside discussions of the financial challenges posed by the diabetic diet, a greater awareness of the lived experience of diabetes promoted discussions of liberalising the diabetic diet, in particular increasing the patient's allowance of carbohydrate, not only to improve the palatability of the patient's diet, but to improve overall mental wellbeing as well.[225] As an editorial in the *Lancet* suggested, a key advantage of high carbohydrate diets was that 'the patient with diabetes need no longer make himself conspicuous by avoiding food which contain carbohydrate'.[226]

However, while the role of specialist clinics and improved observation of patients throughout the 1920s and 1930s certainly allowed for these social and psychological observations to be made, and undoubtedly contributed to a relaxing of previous dietary ideals, the establishment of the Diabetic Association and the principles of some its key founders provide further examples of developments which shaped diabetic management in this period. An analysis of the cultural context in which

[223] S. O'Donnell, 'Changing Social and Scientific Discourses on Type 2 Diabetes between 1800 and 1950', *Sociology of Health and Illness*, 37:7 (2015), p. 1113.
[224] Moore, *Food as Medicine*, p. 142.
[225] D. M. Dunlop, 'Are diabetic complications preventable?', *BMJ*, 2: 4884 (1954), p. 383.
[226] 'Diet in Diabetes', *Lancet*, p.142 quoted in Moore, *Food as Medicine*, p. 156.

Lawrence and Wells' own experiences of diabetes transpired explains their concerns with how diabetes was perceived, and the use of dietary revisions to portray PWD as able to live a more normal, productive life.

One of the Association's original objectives was to improve the 'social problems and difficulties which arise for the diabetic patient' which contribute towards a view of the diabetic as an 'inefficient invalid'.[227] This objective highlighted the Association's commitment to tackling the stigma associated with diabetes, the roots of which, as I argue here, can be traced to the personal experiences of its founding members and a cultural context which equated health with ideas of 'good citizenship'. Worthy of attention here is the Association's aim to overturn the widespread belief of the diabetic as 'inefficient invalid' amidst wider concerns about national efficiency and patient productivity. As stated previously, Lawrence had been rejected from military service by a medical board in London in 1919. While Lawrence was unaware of his diabetes at this time, and it is likely his dismissal was due to having dysentery, this experience itself was stigmatising, particularly for someone with a medical background and occurring at a time when health was intertwined with productivity and efficient citizenship.[228] Lawrence was discharged as an Officer in the RAMC Reserve and remained in England where he returned almost immediately to his studies and career in medicine. It is plausible that this early experience, which occurred alongside a national debate regarding rejection rates and national efficiency, shaped Lawrence's attitudes towards diabetes and the stigma attached to it, thus encouraging the Diabetic Association to strive to improve

[227] Diabetic Association Pamphlet (1937), Wellcome Library EPH546.
[228] I. Zweiniger-Bargielowska, 'Building a British Superman: Physical Culture in Interwar Britain', *Journal of Contemporary History*, 41:4 (2006), pp. 595-610.

the social challenges experienced by PWD very early on. Lawrence, though often described as stern by his colleagues, was also known for his empathy towards certain patients, namely the disabled and mentally handicapped, where other physicians around this time would have considered this use of treatment and resources 'wasted and displaced'.[229] Similarly, the health principles of co-founder H.G. Wells undoubtedly shaped the outlook and activities of the Association and its objective of removing the stigma attached to diabetes. Wells, diagnosed with diabetes in his late 60s, became one of a handful of Lawrence's private patients and shared his ideas of the problems in medicine, particularly the lack of interest and funding available for what he saw as such a worthy specialism as diabetes. According to Wells' biographer Rosslyn Haynes, Wells was one of the first professional writers of fiction to have had a formal scientific education and 'the first for whom the role of science in society was a primary question'.[230] His futuristic, almost prophetic visions grappled with the profound choices made by mankind in respect to science, technology, war and social order on a global scale.[231] Moreover, as a follower of the New Health Society, Wells aligned himself with the ideas associated with the physical culture movement, popularised by physical culture instructor Frederick Arthur Hornibrook.[232] Branded 'the father of Britain's physical culture movement', Hornibrook lived in London where he worked as a massage therapist for clients such as Wells and other middle-class followers of his 1929 slimming and fitness

[229] R. D. Lawrence, 'Three Diabetic Mongol Idiots', *BMJ,* 1:4248 (1942), p. 695.
[230] R. D. Haynes, *H. G. Wells: Discoverer of the Future*, (London: MacMillan Press, 1980), p. 1
[231] Diabetes UK 'Our History', www.diabetes.org.uk, accessed 20 February 2018.
[232] The New Health Society was Britain's first organised body of social medicine, founded in 1925 by surgeon Sir Arbuthnot Lane, it combined eugenicist rhetoric with utopian health ideals, emphasising the individual's personal responsibility to good health as a 'duty of citizenship', See I. Zweiniger-Bargielowska, 'Raising a Nation of Good Animals: The New Health Society and Health Education Campaigns in Interwar Britain', *Social History of Medicine* 20:1 (2007), pp. 73-89

handbook *The Culture of the Abdomen*.[233] Hornibook had been encouraged to publish his ideas by President of the New Health Society Sir Arbuthnot Lane in order to 'convert what is a rapidly degenerating community…a C3 nation, into an A1 nation composed of healthy, vigorous members whose bodies will be able to avoid and combat disease'.[234] Yet diagnosed with a chronic disease in later life, Wells' was now among those portrayed as not fitting the 'A1 nation' ideal, enabling him to sympathise with those deemed disabled or inefficient due to disease. In his announcement of the Diabetic Association in *The Times* in 1934, Wells described diabetes as:

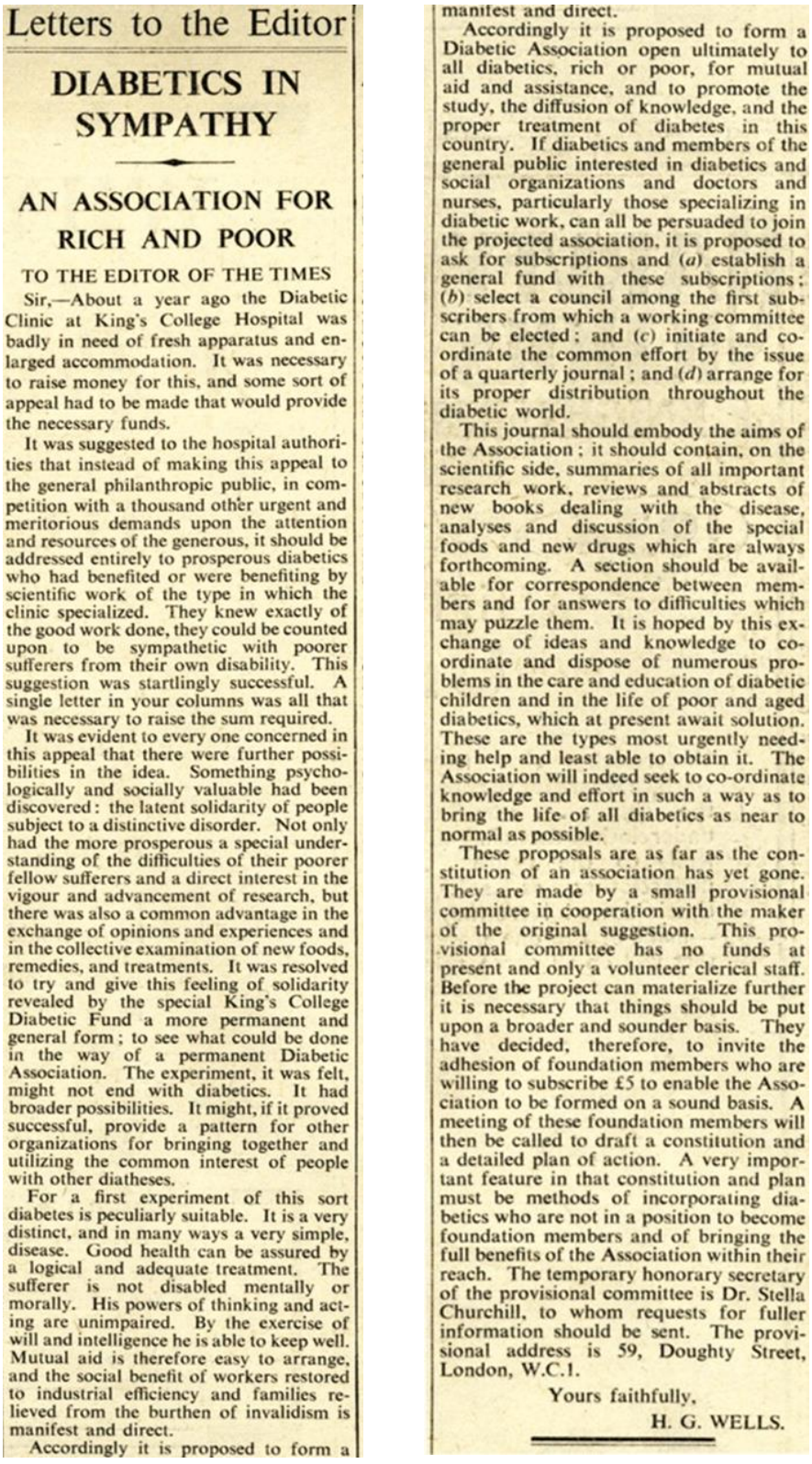
> …a very distinct, and in many ways simple, disease. Good health can be assured by a logical and adequate treatment. The sufferer is not disabled mentally or morally. His powers of thinking and acting are unimpaired. By the exercise of will and intelligence he is able to keep well. Mutual aid is therefore easy to arrange, and the social benefit of workers restored to industrial efficiency and families relieved from the burthen of invalidism is manifest and direct. Accordingly, it is proposed to form a Diabetic Association open ultimately to all diabetics, rich or poor, for mutual aid and assistance, and to promote the study, the diffusion of knowledge, and the proper treatment of diabetes in this country.[235]

An examination of the background of the founders of the Association, in addition to the cultural context in which it was established, provides an enriched understanding of the meanings attached to health in this period, helping to explain the principles of the Diabetic Association and the core aims laid out with its formation. As Wells noted in *The Times*, national concerns of 'industrial efficiency' were contributing towards a stigma and prejudice against those diagnosed with diabetes. In response to anxieties of perceived physical deterioration in the interwar period, the physical

[233] F. A. Hornibrook, *The Culture of the Abdomen: The Cure of Obesity and Constipation*, (London: W. Heinemann, 1927).
[234] I. Zweiniger-Bargielowska, 'The Culture of the Abdomen: Obesity and Reducing in Britain, circa 1900-1939', *Journal of British Studies*, 44:2 (2005), p. 261.
[235] H. G. Wells, 'Diabetics in Sympathy', *The Times*, 15 February 1934.

culture movement, to which Wells himself aligned, was promoted in order to attest to the nation's strength and quell concerns about national fitness and efficiency.[236] Physical culturalists, according to historian Zweiniger-Bargielowska, represented 'the cultivation of a fit male body as an obligation of citizenship and a patriotic response to the needs of the British Empire'.[237] At the height of this movement, The National Fitness Campaign aimed to harness the pursuit of individual fitness in order to promote 'national vigour and imperial power…cementing the link between manliness, physical culture and patriotism in interwar Britain'.[238] The Diabetic Association was thus established within a cultural context in which health was equated with patriotism and national efficiency. The Association's founders had experienced the stigma of diabetes first hand, with Lawrence having been rejected from military service and Wells in being forced out of his career in teaching. It is plausible that these ideas then found their way into the inauguration of the Diabetic Association, thus explaining why challenging the social position and productive capability of PWD became one of the Associations first objectives.

[236] Military rejection rates during the Boer War likewise contributed to these anxieties. See J. M. Winter, 'Military Fitness and Civilian Health in Britain during the First World War', *Journal of Contemporary History*, 15:2 (1980), pp. 211-244.
[237] I. Zweiniger-Bargielowska, 'Building a British Superman: Physical Culture in Interwar Britain', *Journal of Contemporary History*, 41:4 (2006), p. 596.
[238] Ibid, p.609. See also E. Newlands, *Civilians into Soldiers: War, the Body and British Army Recruits, 1939-45*, (Manchester: Manchester University Press, 2014).



Letters to the Editor

DIABETICS IN SYMPATHY

AN ASSOCIATION FOR RICH AND POOR

TO THE EDITOR OF THE TIMES

Sir,—About a year ago the Diabetic Clinic at King's College Hospital was badly in need of fresh apparatus and enlarged accommodation. It was necessary to raise money for this, and some sort of appeal had to be made that would provide the necessary funds.

It was suggested to the hospital authorities that instead of making this appeal to the general philanthropic public, in competition with a thousand other urgent and meritorious demands upon the attention and resources of the generous, it should be addressed entirely to prosperous diabetics who had benefited or were benefiting by scientific work of the type in which the clinic specialized. They knew exactly of the good work done, they could be counted upon to be sympathetic with poorer sufferers from their own disability. This suggestion was startlingly successful. A single letter in your columns was all that was necessary to raise the sum required.

It was evident to every one concerned in this appeal that there were further possibilities in the idea. Something psychologically and socially valuable had been discovered: the latent solidarity of people subject to a distinctive disorder. Not only had the more prosperous a special understanding of the difficulties of their poorer fellow sufferers and a direct interest in the vigour and advancement of research, but there was also a common advantage in the exchange of opinions and experiences and in the collective examination of new foods, remedies, and treatments. It was resolved to try and give this feeling of solidarity revealed by the special King's College Diabetic Fund a more permanent and general form; to see what could be done in the way of a permanent Diabetic Association. The experiment, it was felt, might not end with diabetics. It had broader possibilities. It might, if it proved successful, provide a pattern for other organizations for bringing together and utilizing the common interest of people with other diatheses.

For a first experiment of this sort diabetes is peculiarly suitable. It is a very distinct, and in many ways a very simple, disease. Good health can be assured by a logical and adequate treatment. The sufferer is not disabled mentally or morally. His powers of thinking and acting are unimpaired. By the exercise of will and intelligence he is able to keep well. Mutual aid is therefore easy to arrange, and the social benefit of workers restored to industrial efficiency and families relieved from the burthen of invalidism is manifest and direct.

Accordingly it is proposed to form a Diabetic Association open ultimately to all diabetics, rich or poor, for mutual aid and assistance, and to promote the study, the diffusion of knowledge, and the proper treatment of diabetes in this country. If diabetics and members of the general public interested in diabetics and social organizations and doctors and nurses, particularly those specializing in diabetic work, can all be persuaded to join the projected association, it is proposed to ask for subscriptions and (*a*) establish a general fund with these subscriptions; (*b*) select a council among the first subscribers from which a working committee can be elected; and (*c*) initiate and co-ordinate the common effort by the issue of a quarterly journal; and (*d*) arrange for its proper distribution throughout the diabetic world.

This journal should embody the aims of the Association; it should contain, on the scientific side, summaries of all important research work, reviews and abstracts of new books dealing with the disease, analyses and discussion of the special foods and new drugs which are always forthcoming. A section should be available for correspondence between members and for answers to difficulties which may puzzle them. It is hoped by this exchange of ideas and knowledge to co-ordinate and dispose of numerous problems in the care and education of diabetic children and in the life of poor and aged diabetics, which at present await solution. These are the types most urgently needing help and least able to obtain it. The Association will indeed seek to co-ordinate knowledge and effort in such a way as to bring the life of all diabetics as near to normal as possible.

These proposals are as far as the constitution of an association has yet gone. They are made by a small provisional committee in cooperation with the maker of the original suggestion. This provisional committee has no funds at present and only a volunteer clerical staff. Before the project can materialize further it is necessary that things should be put upon a broader and sounder basis. They have decided, therefore, to invite the adhesion of foundation members who are willing to subscribe £5 to enable the Association to be formed on a sound basis. A meeting of these foundation members will then be called to draft a constitution and a detailed plan of action. A very important feature in that constitution and plan must be methods of incorporating diabetics who are not in a position to become foundation members and of bringing the full benefits of the Association within their reach. The temporary honorary secretary of the provisional committee is Dr. Stella Churchill, to whom requests for fuller information should be sent. The provisional address is 59, Doughty Street, London, W.C.1.

Yours faithfully,

H. G. WELLS.

Figure 3.3: Letter announcing the establishment of the Diabetic Association by H.G. Wells published in *The Times* on 15 February 1934 [Courtesy of Diabetes UK].

Having explored the establishment of the Diabetic Association and a number of factors which shaped its outlook of both patients and treatment, the following section examines the ways in which these values impacted upon the dietary management of diabetes, exploring how the Association's social and political objectives shaped responses to diabetes in the context of war.

Diabetes, Nutrition and War

Throughout the 1930s and 1940s, the social and psychological implications of diabetes began to feature prominently in the writings of physicians, not only among members of the British Diabetic Association, but through increased consultation with international societies, among physicians overseas as well. Writing in 1939, American physician and later member of the ADA, Dr Henry John, reflected on the changes to management since the discovery of insulin and the current position of the diabetic patient:

> No diabetic patient should be allowed to feel sorry for himself and lead a miserable life. The physician should remind him of the difference between the pre-insulin era and now, and should instil in his mind the idea that the simple routine he has to follow is little more onerous than having to shave, to wash one's face, or to take a bath each day. This proper psychologic emphasis often spells the difference between successful and unsuccessful handling of a diabetic. It is always a mistake to treat the diabetes, and to forget the individual.[239]

This holistic sentiment which characterised the 1930s was echoed by leading diabetes specialists. Both Joslin in Boston and Lawrence at Kings College in

[239] H. J. John, 'The Diabetic Patient', *The Ohio State Medical Journal*, 35:4 (1939), p. 33.

London frequently acknowledged the importance of the balance between dietary regulation and the patient's mental outlook. As discussed in the previous chapter, both insulin and a greater focus on the patient's overall wellbeing had encouraged diabetes specialists and medical professionals to slowly increase the carbohydrate component of their patient's diets. Moreover, the establishment of a patient organisation headed by figures such as Lawrence had highlighted how greater flexibility with the diabetic diet could reduce stigma as well. This was reinforced further with the outbreak of war in 1939, which as I argue here, provided yet another impetus to simplify treatment, and an opportunity to achieve the Diabetic Association's objective of improving the social position of diabetes. As this section demonstrates, alterations made to the diabetic diet in this context of the 1930s and 1940s reflected wider concerns about the health and productivity of a nation at war as much as they did patient wellbeing and the social life of the diabetic.

With the outbreak of war, eating right became a patriotic duty for civilians and soldiers alike in both Britain and the U.S., consequently expanding the level of state interest and intervention into the population's health and nutrition. Within this context, the government and state-appointed nutritionists tasked with encouraging better eating habits tapped into national concerns regarding the war effort in order to encourage the population to become fitter and healthier. Having learned from the repercussions of minimal state intervention during the First World War, verified by high rejection rates of soldiers on the grounds of malnutrition and poor health, it was in the government's interests in the 1930s and 1940s to position public health and nutrition as a leading policy priority. Accordingly, governments on both sides of the Atlantic launched a series of national and international vitamin fortification

programmes to eradicate deficiency diseases within certain populations.[240] Nutritional shortcomings were so alarming during the war that in 1940, the U.S National Academy of Sciences established a committee to advise the government on nutritional problems that had the potential to threaten defence. A year later this committee became the Food and Nutrition Board and was tasked with creating the first Recommended Daily Allowances (RDAs) for both the armed forces and civilians. The result was a standardised food guide, the Basic 7, which would instruct the population on how to eat, fuelling both themselves and the war effort.[241] The aim of wartime national nutrition programmes was to boost the nutritional quality of food in order to eradicate deficiency diseases and thus create a healthier, more productive population. The key message of wartime food reformers echoed the earlier ideas of the 'New Nutritionists' which encouraged citizens to *eat more* health-promoting foods such as the vitamin rich 'protective foods', advice that would later be reversed entirely in the post-war years as nutritional messages switched to advising the population to *eat less*.[242] Throughout the 1940s then there was a very palpable connection between good nutrition and the war effort. In American food pamphlets this rhetoric was explicit. *Food for Strong Bodies*, a pamphlet distributed in 1942, told the public 'America needs us strong now as ever before. It is the duty of everyone to know what foods we should eat everyday' while another pamphlet titled *Feeding Four on a Dollar a Day* described nutritional knowledge as a 'patriotic duty for everyone' which would pay dividends in family, health and life, and national

[240] H. Levenstein, *Revolution at the Table: The Transformation of the American Diet*, (Oxford: Oxford University Press, 1988), p. 64.
[241] M. Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health*, (Berkeley: University of California Press, 2002), p. 35.
[242] H. Levenstein, The Politics of Nutrition in North America', *Neuroscience and Biobehavioural Reviews*, 20:1 (1996), pp. 78-78; C. Biltekoff, *Eating Right in America: The Cultural Politics of Food and Health*, (London: Duke University Press, 2013), p. 116.

strength.[243] According to Biltekoff, in the 1940s eating right was a patriotic duty and nutrition advice was thus forged according to the dual aims of encouraging populations to consume vitamin-rich, protective foods while also encouraging national unity and social cohesion:

> With its demands for both physical fortitude and social cohesion, the context of war put new pressures on both the empirical and the ethical aspects of nutrition, producing a discourse that seamlessly integrated new facts about the importance of vitamins with home-front ideals of good citizenship.[244]

Nowhere was this more palpable than the presentation of the Basic 7 food guide. Published in 1943 the Basic 7 embodied the 'eat more' narrative of the war years which entwined both the personal, physiological and social significance of healthy eating. In the centre stood an image of a healthy nuclear family framed around the message 'U.S Needs Us Strong: Eat the Basic 7 Every Day', signifying that eating according to these nutritional recommendations was not only beneficial to the individual, but extended to include the family, the nation, and the war effort as a whole.[245] Likewise in Britain during the war, newspapers regularly featured patriotic cartoons and magazines reported how servicemen were risking their lives to guard the food supply, while cookbooks, food pamphlets and radio broadcasts such as the *Kitchen Front* educated the public about food and nutrition that equated eating healthfully with good citizenship.[246]

[243] Levenstein, *Revolution at the Table*, p.59.
[244] Ibid, p. 79.
[245] Ibid, p. 59.
[246] D. J. Oddy, *From Plain Fare to Fusion Food: British Diet from the 1890s to the 1990s*, (Suffolk: The Boydell Press, 2003).

Figure 3.4: USDA Basic 7 Food Guide (1943) [Courtesy of National Archives].

In the context of the war then, nutritional advice for the population, produced by government nutritionists, aimed to produce a winning nutritional formula to yield a fighting fit population. In this context, governments assumed greater responsibility for the nation's health and intervened in new ways including the provision of special precautions and advice for people with chronic conditions to ensure food intake was as adequate as the rest of the population.

By 1939, the Diabetic Association headed by Lawrence and Wells was now well-established and played a key role in shaping diabetic guidelines and highlighting special precautions that were required of the diabetic population during wartime. Working in collaboration with the Ministry of Health, the Association adopted the role of producing special guidelines to ensure both PWD and their physicians knew how to manage diabetes safely in the context of food restrictions, air raids and mounting fears concerning insulin supplies. As the war got underway, the Diabetic Association, in consultation with the Ministry of Health, prepared a pamphlet on 'Wartime Precautions for Diabetics' outlining the need for PWD to carry an identification card noting their condition and emergency information. The pamphlet described the potential challenges war posed to diabetes, outlining how:

> A diabetic, whose life depends on the use of insulin, is liable to special risks during air raids which a normal person does not run. It is, therefore, important that, not only the patients concerned, but also the lay members of the First Aid and A.R.P services, as well as the doctors, should know something about these dangers and how to avoid them. Under normal conditions the diabetic patient looks so well that a stranger would not know that there was anything the matter with him, though he is unfortunately liable to sudden illnesses. It is therefore important that he should carry in his pocket or around his neck or wrist the information that he is a diabetic who is taking insulin. The Diabetic Association has always advised this procedure in peace time, and it is especially necessary in wartime. A suitable card will be sent by the Association upon the receipt of a stamped addressed envelope. The card gives the usual dose of insulin, the treatment of an overdose of insulin and the doctor's name and address. It should be carried inside the National Identity Card.[247]

[247] 'Wartime Precautions for Diabetics', The Diabetic Association in Consultation with the Ministry of Health, Wellcome Library PP/EBC/E.20.

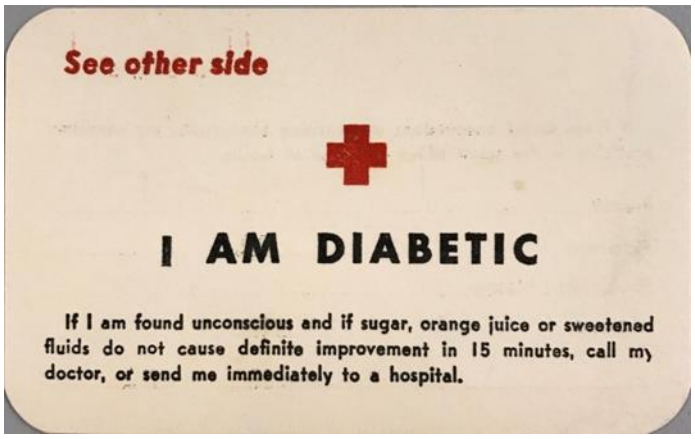


Figure 3.5: Diabetic identification card produced by the BDA and ADA during World War Two [Courtesy of the Joslin Diabetes Centre Archive, Boston].

One of the key objectives of the Diabetic Association during wartime was to provide advice and instructions on how to manage diabetes during times of rationing and disruption to normal life and eating routines. Accordingly, the Association issued a number of advisory precautions that instructed patients how to maintain a careful balance between the amount of starchy foods in the diet and the amount of insulin injected. Wartime pamphlets produced by the Diabetic Association demonstrate the origins of advice for PWD such as carrying extra sugar in the form of sugary drinks or sweets. Such practices stemmed from the Association's concerns that wartime conditions could interfere with the routines of diabetics. Thus carrying something sweet became an important precaution to avoid getting caught short and upsetting the crucial balance of diet and insulin, which was upheld as the key objective of treatment throughout the war.[248] The Association further advised PWD to carry a

[248] Ibid.

spare syringe and insulin so that injections would not be missed and could be carried out at the usual time.[249]

In Britain during the war, special allowances of rations were granted to certain members of the population including expectant mothers, mothers of babies under twelve months, infants and children, as well as those suffering from certain illness such as cancer and diabetes. For individuals with diabetes, special allowances were made in order to ensure both extra rations of food and more nutritious varieties of those available. As late as 1950 when rationing was still in place in Britain, PWD were granted extra rations of butter (3 rations), margarine (3 rations) and cheese (24ozs).[250] Sugar, meat and bacon had also been granted but by 1950 extra rations of these items had ended. Pamphlets such as those pictured here on *Diabetes and Food Rationing* were produced from 1941 onwards in order to assist doctors in treating diabetes during wartime, a resource which proved invaluable for both the medical profession and patients and continued to be used long after the war.

[249] Ibid.
[250] 'Ministry of Food: Arrangements for Granting Special Rations and Priority Allowances to Invalids and Persons on Special Diets', (1950), Joan Walker Collection, GB338 MS238.

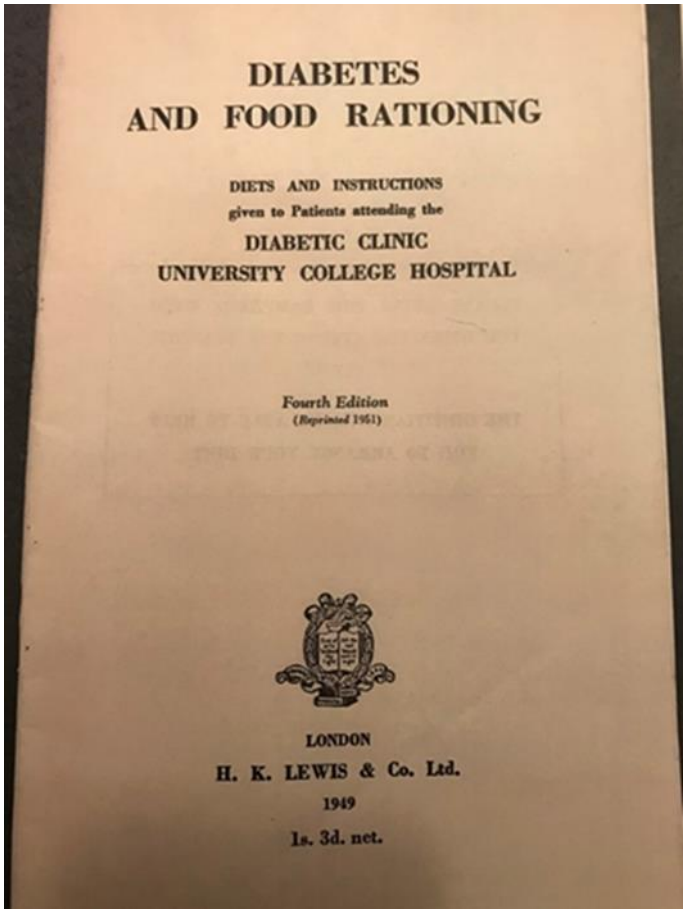


Figure 3.6: Diabetes and Food Rationing pamphlet (1949). [Courtesy of the University of Leicester].

With regards to dietary management and the weighing of foods the pamphlet advised:

> …it is only by such an initial discipline that a patient can gain proficiency in gauging the amount of food he should eat. But once the patient has been stabilised it is justifiable to relax this routine and the patient should be told that, whilst he must continue to measure those foods which consist mainly of carbohydrate, it is permissible for him to estimate approximately the other articles of diet.[251]

[251] *Diabetes and Food Rationing*, Diabetic Clinic of the University College Hospital (London: H. K. & Co. Ltd., 1949).

During the war the debate between weighing foods and strict dietary adherence that had begun in the 1920s with the advent of insulin waged on. In an article in the *British Medical Journal* in 1943, Irish physician Dr R. H. Micks remarked how recent correspondence in the journal had shown some physicians to be 'doubtful about the necessity for accurate dietetic control', noting his own experience of maintaining 'health and vigour' in even the most 'rebellious severe diabetics who refused to follow any regulated diet, no matter how liberal it might be'.[252] Nevertheless, an examination of the available sources suggests that while some physicians doubted the necessity of dietetic control, popular guidance on diet continued to be published. In his seventh edition of the *Diabetic ABC* published in 1941, Lawrence included a special wartime supplement with advice on how to manage diabetes in the context of war.[253] The supplement included a range of wartime recipes suitable for those with diabetes as well as a 'simple unweighted diet card' which could be used by those for whom glycosuria was no longer present. While Lawrence's wartime advice indicates his consent on relaxing the weighing of foods, he nevertheless continued to include carbohydrate among a list 'dangerous foods' and wholly advised against abandoning dietary measures altogether. Likewise, guidelines from hospitals also continued to advise their diabetic patients to measure carbohydrate and control their diet and together with the Ministry of Food, diabetic clinics from around the country joined forces to aid patients in following their usual regimen as best as possible. Pamphlets such as the one pictured here (Figure 2.3) from the diabetic clinic at the University College Hospital in London compiled sample daily diet plans that aimed to provide patients with inexpensive

[252] R. H. Micks, 'The Diet in Diabetes', *BMJ*, 1:4297 (1943), p. 598.
[253] R. D. Lawrence, *The Diabetic ABC: A Practical Handbook for Patients and Nurses*, (London: H.K. Lewis & Co, 1941).

diets made up of the foods and rations available. While the principal aim of the diets provided during wartime were to provide the required nutritional and energy needs for the patients type of diabetes, an emphasis on enjoyment, flexibility and normalcy was also emphasised, indicating that PWD could enjoy a fuller, more varied diet and thus not only endure the war, but contribute to the national war effort, much like the rest of the population. On the advice of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council, the Food Ministry agreed that PWD should be allowed to exchange their rations for those that would suit the diabetic diet, for example from 1941 onwards PWD could exchange their sugar ration for two extra fat rations and two extra meat rations per week.[254] Additionally, an extra cheese ration was granted for all patients and vegetarian diabetics were permitted to exchange their meat rations for extra cheese, granted a certificate was certified by the patient's physician. Extra sugar rations were also permitted in the event of illness.[255]

Oral testimonies provide important evidence of what it was like for people with diabetes during the Second World War, particularly how diet was managed in the context of food restrictions and rationing. A number of interviews suggest that the establishment of wartime measures, particularly extra rations, meant that many people with diabetes fared better during the war. As Margaret Elliot, aged fourteen in 1939 recalled:

> Well, actually, we were better off, because when everything was rationed and we all had our own ration books, and I was allowed double rations of cheese, triple rations of meat, double rations of egg, double rations of milk. And I still had my sweet coupons in the

[254] 'Food rationing and the Special Diet's Advisory Committee: Special diet and cancer', (1942), The National Archives, FD1/5434; 'Ministry of Food: Arrangements for Granting Special Rations and Priority Allowances to Invalids and Persons on Special Diets', (1950), Joan Walker Collection.
[255] 'Ministry of Food: Arrangements for Granting Special Rations and Priority Allowances to Invalids and Persons on Special Diets', (1950), Joan Walker Collection.

> back of the book, so anybody that wanted Mars bars used to use my coupons to get them. But no, actually, we were better off, from the aspect of the amount of food that came into the house because of me.[256]

Similarly, Margaret Williamson from North Yorkshire, diagnosed with diabetes in 1939, remembered being affected 'very generously' by rationing during the war:

> The Ministry of Food had made arrangements for diabetics to forfeit their sugar ration, and in place of that we had, I think I'm right in recalling, three times the amount of meat on ration, three times the amount of cheese, and more butter than normal, it was really very generous indeed.[257]

When asked if there were any concerns about insulin supply during the war, Margaret replied:

> We didn't suffer any problems. The manager of the local Boots made sure that we always had a supply of the insulin that we used. I say we – my mother, who you will recall, was also diabetic, always made sure we had about a three months' supply at home so that we never suffered without it. I think there will have been some hiatuses in supply, but because we had the pharmacies buffer and our own buffer we never suffered.[258]

Overall, the Diabetic Association in collaboration with the Ministry of Health and diabetic departments throughout the country ensured PWD were aware of the extra precautions necessitated by wartime conditions. From carrying a supply of sugar or sweets and advice on how to balance meals and insulin injections for night workers, to what to do in the event of illness, advice on syringes and how to navigate factory canteen facilities while following a diabetic diet, the Association ensured that during the war there was sufficient advice on how to manage diabetes in challenging circumstances. However, despite providing additional allowances and advice

[256] M. Elliot, Interview.
[257] M. Williamson, Interview, 21 May 2004, British Library C1239/07.
[258] Ibid.

tailored to the wartime context, the war provoked changes to everyday routines and lifestyles that meant managing diabetes, in particular calculating and adhering to diets, could be difficult and at times impractical. Consequently, it would be a generalisation to assume all fared as well as those in the testimonies above. Following advice was challenging, and even if the advice was available, prescribed diet plans, while intended to make the patient's life easier, could not only prove socially and economically challenging but also impractical as everyday life and normal routines were liable to disruption. As oral testimonies attest, the demands of everyday life often had more influence over daily practices than the profession's appeals to patients to continue to control their diet without any flexibility.[259] Calculating diabetic meals and nutritional intake against special rations and those for the rest of the household was time-consuming and took a great deal of thought and planning that in busy households simply would not have been possible. One interviewee recalled how, as the war intensified, his home became 'a refuge for all sorts of people' leaving his weary mother to 'do her nut over the cooking'.[260] When the interviewee finally left home and moved to medical school, he ceased weighing food altogether, seeing the practice as impractical. The interviewee further recalled a strict regimen being 'impossible' during the war 'given how school times varied, and given the fact too, I think, that my mother used to have great difficulty over coping with all the assortment of rations'.[261] This testimony illustrates that while following a diabetic diet was still advised, and while some fared better during wartime, wartime circumstances could also prove challenging for some households, provoking individual decision-making based on what worked best for the individual or the

[259] Moore, *Food as Medicine*, p. 160.
[260] Rev. Francis Andrews, Interview, 27 May 2004, British Library C1239/08.
[261] Ibid.

family. While this chapter has focused chiefly on the role of elite actors, such as the Diabetic Association, individuals such as Lawrence, and the role of government via wartime policy makers and nutritionists, a closer look at how rationing impacted PWD in wartime also indicates patient agency in negotiating dietary advice during this period. Therefore it would be erroneous to assume professional organisations and policy elites alone shaped diabetic management in the 1930s and 1940s.[262] As historian Nancy Tomes describes, this period in the history of medicine is one marked by contradictory trends. On the one hand, scientific knowledge and expertise became concentrated in a 'dense network of professional organisations, medical schools, hospitals, government agencies and corporate bodies', seen here in the case of international patient associations. However, despite holding this power and becoming the orthodox view in diabetes care, individuals could and did exert their own agency and decision-making when it came to managing their diabetes, particularly in the case of diet during wartime and rationing. As heard in the testimony above, unpredictable circumstances and changes to work, home life and lifestyle, meant that it was impossible for everyone to follow their diet plan to the letter and therefore, PWD expressed agency by negotiating wartime advice in order to manage their condition within the confines of war. Consequently, while nutritional guidelines continued to recommend dietary regulation and the weighing of carbohydrates, in the context of war and rationing, a flexible approach to diet proved more feasible than rigid eating schedules.

[262] For further assessment on the problems of 'top down' medical histories of the early twentieth century see N. Tomes, 'Medicine and Consumer Culture in the United States, 1900-1940', *The Journal of America History*, 88:2 (2001), pp. 519-547.

In the United States, it was flexibility and a revision of the diabetic diet that won out over the provision of special rations as the means to protecting those with diabetes during wartime. In Britain special rations had been deemed necessary not only for ensuring the maintenance of the diabetic diet, but to maintain morale. In the U.S however, rather than the addition of special allowances, wartime diabetes management instead resulted in a revision of dietary principles. On the one hand this was due to the availability of insulin, which since its isolation and commercial availability had led to the assumption that one could no longer die from diabetes, but rather with it.[263] Yet, wartime medical literature suggests that the decision not to issue special rations was also about promoting the value of the diabetic as a productive and able citizen. While this was also the case in Britain, in the U.S there was an idea among physicians that the provision of special allowances would stigmatise diabetes and would only serve to lower morale. This conviction stemmed from the desire to move away from the pre-insulin assumption of people with diabetes as invalids and had forged the idea that special dietary provisions would work against the social position of PWD as useful to the war effort. In an article discussing food rationing and diabetes in 1943, Mary Tangney, diabetic supervisor of Hartford Hospital in Connecticut explained:

> When one stops to realise that a well-treated diabetic is without symptoms, that he cannot die of diabetes but merely with it – then one must accept him as a useful member of society. Unfortunately, the pre-insulin period still casts its shadow on him, and too frequently the employer turns him aside in favour of the nondiabetic. This present war affords a golden opportunity for the diabetic to assert himself, for he is working side by side with other men in the defence plants of the nation in those positions which are not delegated to the physically inadequate. He is thus given a chance to

[263] M. E. Tangney, 'Food Rationing and the Diabetic', *The American Journal of Nursing*, 43:4 (1943), p. 329.

> prove that his mental and physical acumen are not secondary to those of other men. Because of the valuable place which the diabetic holds in the war effort, his diet must be given complete consideration that he may continue this work in the face of certain food shortages.[264]

Thus, in the context of war, revisions to the diet of the diabetic were not only about nutrition, but about seizing a 'golden opportunity' to reform the public image of diabetes by asserting PWD as capable and valuable citizens. While in Britain this dilemma was solved with the provision of special rations, in the U.S., a revision of the diabetic diet, namely an increase in carbohydrate and a necessary adjustment of insulin, was recommended instead for fear that special rations would suggest an inability of PWD to contribute to the war effort and thus further stigmatize individuals. The rationale for this as Tangney explains had a 'psychologic as well as physiologic basis'. In contrast to Britain where extra rations were welcomed and were implanted, in part, to boost morale, the disapproval of special arrangements in the U.S was on the basis that it would lower morale:

> Reasoning it out, disapproval seems to be based on the fact that any type of special arrangements, whether they are with the Rationing Board or with the members of one's family, tend to lower the morale of the individual; the human equation must be considered. The diabetics themselves heartily disapprove of it. There would be definite stigma attached to government rations which would add to the difficulty in obtaining employment where physical examinations are required. Most diabetics feel that this stigma of inadequacy in their own homes is not conducive to the normalcy we are stressing.[265]

In the U.S. then, the solution to managing diabetic diets in wartime was to revise diets by prescribing more carbohydrate and making 'better use' of insulin to

[264] Ibid.
[265] Ibid.

compensate.[266] While care was taken to stress this was not a 'free diet' and foods high in sugar were still to be avoided, this approach marks the beginning of managing diabetes in the contemporary sense, by allowing more carbohydrate into the diet and a liberal approach which placed greater reliance on insulin to balance blood glucose.

Revising diet on the basis of asserting the value and productive potential of PWD was striking in Britain around this time as well. As health became a national concern, the Association continued to uphold the social position and psychological wellbeing of the diabetic as a key priority. Evident in wartime pamphlets is a clear tension between efforts to portray PWD as being able to live a normal life and contribute fully to social life, and an acknowledgement of the importance of controlling diet, for fear of being too liberal and risking secondary complications in later life. This emphasis on normalcy is particularly striking in a series of broadcasts by the Diabetic Association aired in 1949, in which the presenter, a doctor and member of the Diabetic Association, aimed to assure listeners, and those being interviewed, that diabetes was not an excuse to shirk civic responsibility. The broadcast, titled *In Your Best Form*, began by informing listeners about current incidence rates and other rudimentary information on diabetes in Britain:

> The exact number of diabetics in this country is not known but it is said to be between 150,000 and 200,000. Let's say 150,000. The number is rising, mainly because with modern treatment diabetics live much longer. Intelligent ones who are well treated can indeed expect to live as long as other people, and they can now insure their lives…It concerns everyone, the doctor, the people in the diabetic clinic, the dietician and so on, who have to teach him, and go on

[266] It was decided that the most effective plan was to prescribe patients with a diet containing 200 to 300 grams of carbohydrate with adequate insulin to manage glucose levels. See M. E. Tangney, 'Food Rationing and the Diabetic', *The American Journal of Nursing*, 43:4 (1943), p. 329.

> teaching him, how to manage things. It involves his family whose attitude can help to make him an invalid or a defiant rebel on the one hand or a healthy person on the other.[267]

In the discussion, interviews carried out between the doctor, PWD and dieticians inform listeners what daily life is like for people with diabetes and challenge common assumptions about living with the disease. The discussion is cloaked in an overriding agenda to normalise diabetes and the capacity of individuals with diabetes to contribute to the war effort. This can be heard on a number of occasions when the interviewer emphasises that, despite the war and living with a chronic condition, the nutritional needs of people living with diabetes had continued to be met, and having diabetes had not prevented interviewees from working and managing their condition. In one of the broadcasts, interviewees Mrs Lewis and Mrs Gotts are asked by the doctor if they had ever suffered any complaints throughout their diabetes. Mrs Lewis describes only having been to the hospital once or twice her whole life, to which the doctor exclaims:

> Well that makes diabetes almost sound like a recipe for good health! By the way, Mrs Gotts and Mrs Lewis are living alone nowadays, doing all their own work; giving themselves their own insulin and managing very nicely.[268]

While these broadcasts were carried out with PWD and their family members, and appealed to a similar cohort of listeners, the language used particularly around diet and productivity suggests the talks were also targeted at the general public and aimed to appease concerns that people with conditions like diabetes were unable to contribute towards post-war reconstruction. A clear emphasis is made to ensure listeners and interviewees alike understand that living with diabetes should be no

[267] 'In Your Best Form: A Series of Broadcasts for Diabetics and their Families', (London: The Diabetic Association, 1949), Wellcome Library, WK850 1949.
[268] Ibid.

different to the rest of the population, this can be heard especially in relation to food and eating when the interviewer encourages interviewees to eat as would the rest of the population:

> Doctor: I think that shows you that this diet question needn't keep anyone at home, if he will take some trouble to learn the tricks of dieting. David is a severe diabetic who takes about 140 units of insulin a day. He goes to work, he goes to evening classes, he sat for a chemistry examination last night, and I don't think he misses a party often if there's one going. But he has kept very well, and in the last two years has filled out into a big, well-built young man.
>
> Doctor: The second misconception is about the kinds of food that diabetics can eat. There's a general idea that they can't eat this, that or other foods because it's bad for them. There are really no kinds of food that diabetics can't eat. It's all a question of amounts and of knowing the value of foods in terms of carbohydrates, proteins and fat. What really matters is that the diabetic should eat at the same time, or very nearly the same time and amount of food each day.[269]
>
> Doctor: I wish everybody, who has or is going to have anything to do with diabetes, could have heard those four patients. Notice they were all doing a regular full day's work in their different ways. Notice that they had no more time off for sickness than plenty of other people do, and a good deal less than some. Perhaps you are yourself a diabetic, or perhaps you have a diabetic in your family, or amongst your relations. In any case, I hope you took in what you just heard, and especially the last few remarks. We asked these four people to come along for one main reason and that is to show you that properly treated diabetics should feel quite well and do almost all the things that the rest of us do.[270]
>
> Doctor: We've tried showing you that living on a diet isn't as bad as it sounds, that the business of dieting needn't keep a diabetic at home, and that having a diabetic in the family shouldn't upset the catering too much. All that depends of course on how much the diabetic or his mother or his wife knows about the diet, and how to vary it. This means hard work, but it's worth it. It means the diabetic can be a free man as far as dieting goes, and he can have that freedom without unnecessary risk.[271]

[269] Ibid.
[270] Ibid.
[271] Ibid.

By 1949, as the Ministry of Health and the Diabetic Association sought to dispel the long-held myth of the diabetic as an invalid, a clear shift in the rhetoric around diabetes transpired which resulted in a relaxation of dietary principles in order to reassure the population that in the midst of post-war reconstruction, people with diabetes were as capable at performing their civic duty as the rest of society. Accordingly, by 1949, the Diabetic Association now claimed, as evident above, that no food need be avoided so long as *quantity* was considered. Evidently, the narrative had now shifted towards following a diet and lifestyle more in line with the rest of the population, suggesting that if followed, there was no reason why a full day's work could be avoided. Thus by the end of the war, the rationales provided for relaxing previous dietary ideals now included social and political rationales, such as conforming to the wartime ideal of the valuable and productive citizen, as well as factors such as the economic challenges of the diabetic diet, palatability and mental wellbeing.

When viewed in its historical context, alongside an understanding of the establishment of the Diabetic Association, why it was founded, its original objectives, and the ideas of its founders, these broadcasts provide useful evidence of the evolution of dietary advice in this period, and the rationales provided for change. What this particular source suggests then is that the rationales provided for liberalising dietary regimens over the course of the 1930s and 1940s went beyond the availability of insulin and was instead about the social, psychological and political benefits that a more relaxed approach to diet could yield as well. Thus, in the context of the 1930s and 1940s, reforming dietary guidelines was beneficial not only for the profession, freeing up space in overcrowded hospitals and for patient

wellbeing by allowing greater flexibility, but in times of war, dietary revisions, providing a much-needed boost of morale and greater sociability at a time where those considered to be inefficient or unproductive were seen as shirking their civic responsibilities, aided the state as well. Within the context of post-war reconstruction, which required the involvement of all citizens, a relaxed diet became indicative of 'normal', efficient citizenship in an attempt to uphold morale while also achieving the longstanding objective of the founders of Diabetic Association to improve the social position of people with diabetes.

Conclusion

By the 1930s the landscape of the medical profession was changing rapidly. In British diabetes care, and specifically, overcrowded and insanitary hospitals, had prompted the creation of diabetic outpatient clinics and new authorities such as patient associations took responsibility for the production of guidelines, shaped orthodoxies in treatment, and oversaw the dissemination of advice. This chapter has examined two notable events which shaped the dietary aspect of diabetes care and the rationales provided for revising the diabetic diet over the course of the thirties and forties in Britain. I have argued that the establishment of the Diabetic Association in 1934 and the outbreak of the Second World War are two major events that have been overlooked in the existing historiography as explanations as to why approaches to diet became more liberal in this period. In the existing literature, the chief explanation for the gradual increase in carbohydrates and relaxing of the diabetic diet is one which commonly views the discovery of insulin as having

allowed doctors to relieve their patients of the more stringent diets utilised at the beginning of the century. While insulin allowed management of diabetes to move beyond some of the more draconian, starvation diets, it does not wholly account for the changes made to diet therapy during 1930s and 1940s. As both Chapter two and three have ascertained, physicians did not simply neglect the role of diet merely because insulin was now at their disposal, rather insulin enhanced its importance in treating disease. As an alternative to this narrative, this chapter has demonstrated that a number of previously overlooked factors shaped the rationales for treating diabetes with diet in this period which transcend insulin and the medical management of disease. In the context of interwar health movements and subsequently the Second World War, where health was equated with good citizenship, rationales for liberalising the diabetic diet were linked to ideas about social and productive capacity and were used as a means to assess the value of PWD at a time when civic responsibility was cardinal. Allowing greater freedom and variety in diet thus became beneficial not only to the individual and their physician, but in the context of fears over national efficiency, healthier, energetic citizens benefited the state as well. The establishment of the Diabetic Association, the first patient association for diabetes in Britain, in 1934, was founded with these social and political considerations in mind. As this chapter makes clear, the establishment of the Diabetic Association and its founders played a key role in shaping guidelines and treatment in this period. The Association's response to managing diabetes during wartime was rooted in its founders' ideals of improving the social image of diabetes and ridding society of the long-held stigma associated with the condition. In collaboration with the Ministry of Health, the Diabetic Association initiated the

provision of extra rations as well as special precautions for PWD in order to ensure health and vigour despite nationwide restrictions. Ultimately, as post-war sources suggest, wartime conditions necessitated nutritional policies which would ensure good health, but such policies and advice were influenced by much more than nutritional science and were invariably affected by political concerns such as national efficiency as well. This was particularly true in the case of diabetic guidelines in the United States, where revisions to the diabetic diet, namely the increase of carbohydrate, was favoured over the provision of special rations, for fear that special allowances would further stigmatise PWD among concerns around wartime productivity.

In the period examined here, diabetes specialists, the establishment of a patient association that would champion the rights of patients, as well as the outbreak of a world war, all impacted upon the direction of diabetes care and the nature of advice given to patients in these years. Despite divergent incentives, these developments added to existing rationales that sought to liberalise the diabetic diet. In any given era, there are meanings attached to state endorsed health advice. In the period examined here, where food (and carbohydrates in particular) held a distinct cultural and political resonance, and having a diagnosis of a disease like diabetes was equated with inefficiency and disability, dietary ideals were relaxed in order to facilitate patient productivity and social integration in order to remove the stigma attached to diabetes at a time when tensions were mounting over national efficiency. Accordingly, literature, broadcasts and guidelines on diabetes reiterated the normalcy of diabetes, encouraging a more relaxed approach to management and visible assimilation such as eating out, not only for the psychological benefit of the

individual but also to reform the public image of PWD as being just as able bodied and as hardworking as the rest of the population.

By the end of the war a clear tension had arisen however between a narrative which stressed to patients and their families that a person with diabetes was a 'free man' as far as diet was concerned, and emerging evidence which suggested diet was still the most important aspect in diabetes, not only in management but in preventing the disease altogether.[272] Despite the Association's rhetoric that suggested people could begin to eat more freely than prior to the war, wartime food restrictions reiterated the importance of diet in diabetes and shed light on the importance of good nutrition in preventing both secondary complications and the disease itself. New evidence published in the 1950s appeared to suggest that rationing, which remained in place until 1954, had to some extent prevented overindulgence and acted as a barrier against overweight and diet-related disease. In the immediate years following the war research statistics demonstrated that the only two periods in history where incidence and mortality from diabetes had fallen was during wartime, indicating that food restrictions may have worked as a means of prevention, thereby halting rates of diet-related disease. The profession was thus conflicted between allowing patients a more satisfying diet and more fulfilling life with diabetes by eating what they liked, and evidence which pointed towards an unrestricted diet contributing to later complications. The following chapters explore the fate of these discussions as attention was pulled toward pharmaceutical development and the allure of the first oral hypoglycaemic drugs.

[272] A. Fletcher and J. W. Graham, 'Complications of Diabetes Mellitus with Special Reference to Cause and Prevention', *The Canadian Medical Association Journal,* 41:6 (1939), pp. 566-70.

Chapter Four:

The Development of Oral Hypoglycaemic Drugs and the University Group Diabetes Program

'While it takes a long time to elicit a careful clinical history, to perform a thorough physical examination and to give wise advice, it only takes a moment to write a prescription, and this does please and often satisfy the patient'[273] (Dunlop, 1969)

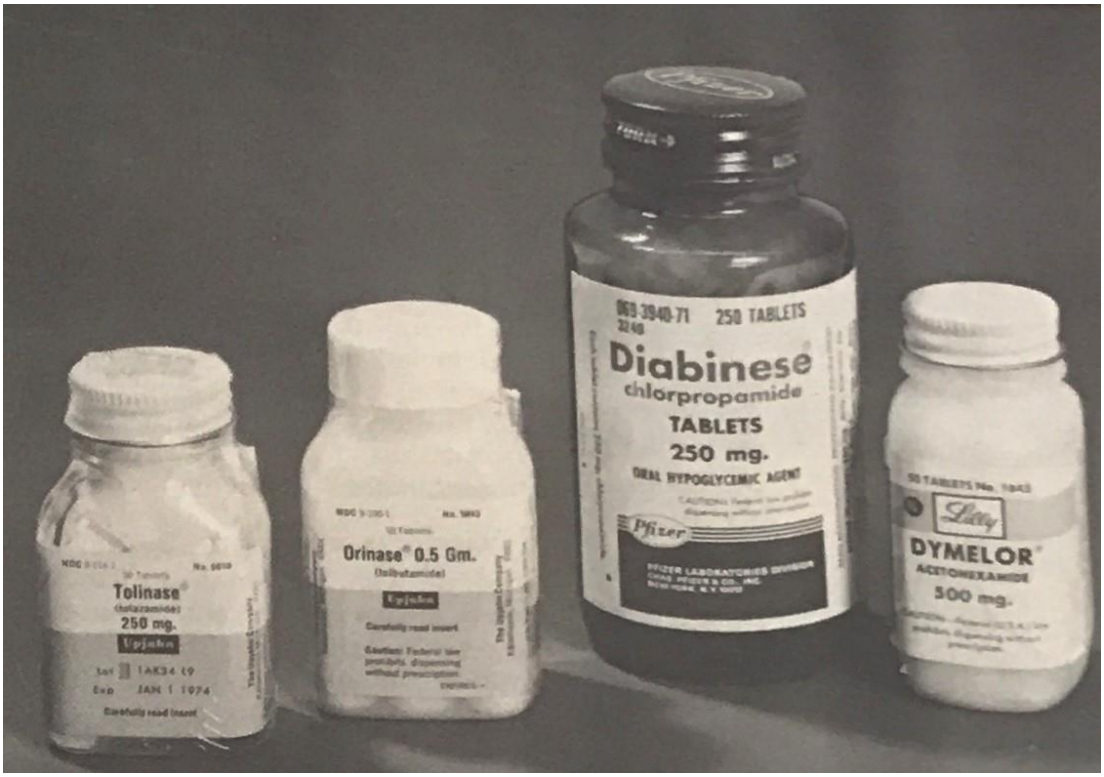


Figure 1.1: Anti-diabetic drug advertisement, *American Medical News* (1970). [Courtesy of the Rockefeller Archive Centre].

[273] D. Dunlop, Draft article on the over-prescription of drugs, Dunlop Papers, Lothian Health Archive, GD4/95.

Gerald Grob described the period which immediately followed the Second World War as one of 'irresistible progress', a time when it seemed science was close to curing all that ailed us.[274] Fuelled in part by the expansion of the pharmaceutical industry and the intensification of drug development during the Second World War, the early 1950s marked a pivotal moment where it appeared science has conquered infectious disease and demand for further new treatments lingered. While this period is often associated with the development of novel treatments which provided more efficient means of treating disease, it was also a time of great interest in the root cause of chronic diseases, and how best to prevent them. Following the publication in 1940 of *The Unseen Plague: Chronic Disease* by American physician Ernst Boas, chronic disease began to be considered as an urgent public health problem, positioning it as a major health policy issue in the aftermath of the Second World War.[275] As Weisz describes, following the National Health Survey on Chronic Disease in 1935, chronic disease catapulted onto the national American political stage, prompting a surge of literature, conferences, committees and commissions all dedicated to the subject.[276] Among this momentum, Weisz maintains, was a consensus that the incidence of chronic disease was not only unacceptable, but preventable.

In November 1946, representatives of the medical care committees of the American Public Welfare Association (APWA), American Hospital Association (AHA) and APHA, and later, the American Medical Association (AMA), met to discuss the

[274] L. Edwards, *In the Kingdom of the Sick: A Social History of Chronic Disease in America* (New York: Bloomsbury USA, 2014), p. 28.
[275] G. Weisz, *Chronic Disease in the Twentieth Century*, p. 99.
[276] Ibid, p.7.

pressing issue of the post-war escalation of chronic disease.[277] The result of this meeting was the formation of the Joint Committee on Chronic Illness[278] and an accompanying policy statement 'Planning for the Chronically Ill', the opening statement of which declared that the 'basic approach to chronic disease must be preventative'.[279] The Joint Committee eventually led to the formation of a larger group, The Commission on Chronic Illness (CCI), out of which came a range of pioneering studies on prevention such as Morton Levin's study on the link between smoking and lung cancer.[280] Following a meeting in 1951, the Commission put together a report which outlined the relatively new distinction between primary and secondary prevention as well as twenty-two public health recommendations.[281] Primary prevention, the report held, aimed to avoid disease outright mainly through initiatives which focused on individual action and healthy living and targeted lifestyle factors such as nutrition, mental hygiene, exercise and rest.[282] According to Edwards, as part of these plans, the CCI aimed to dispel the society's belief that chronic illness was a hopeless scenario by presenting chronic disease as a social issue, not just a physical or semantic one.[283] Yet as Weisz notes, little was said about how primary prevention would actually be achieved: 'a nod was made to social factors like industrial hazards and healthy workplaces, proper housing and personal security, and income maintenance after retirement. But mechanisms for such polices

[277] L. Edwards, *In the Kingdom of the Sick: A Social History of Chronic Illness in America*, (New York: Bloomsbury, 2013), p. 32.
[278] This extended to mental illness as well. In 1955 Congress established the Joint Commission on Mental Health and Illness and from then on this issue was dealt with separately.
[279] 'Planning for the Chronically Ill: A joint policy statement of recommendations by the AMA, APHA and APWA', 37 (1947), pp. 1256-66, See: Weisz, *Chronic Disease in the Twentieth Century*, p. 102.
[280] M. L. Levin et al, 'Cancer and Tobacco Smoking: A Preliminary Report', *JAMA*, 143:4 (1950), pp. 336-338.
[281] Weisz, *Chronic Disease in the Twentieth Century*, p. 110.
[282] Ibid.
[283] L. Edwards, *In the Kingdom of the Sick*, p. 32.

were not discussed'.[284] The Commission identified that for some conditions, i.e. alcoholism, arteriosclerosis and degenerative joint disease, there were no certain methods of primary prevention and thus focused instead on conditions that were easier to target such as dental carries, blindness and cancers.[285] Crucial to understanding the evolution of diabetes management in the post-war period, the CCI's final report, weighing heavy on biological understandings of chronic disease, paid mere lip service to the environmental factors known to cause disease. Accordingly, in the U.S., and later in Britain, the type of prevention efforts which were advocated were those which could emanate from the doctor's office rather than through social change.

The following section of the thesis explores three key historical developments in diabetes management which together aim to shed light on the fate of the post-war interest in prevention outlined above. Through the examination of wider developments, such as the discovery of oral hypoglycaemic drugs (explored here), developments in epidemiology such as the use of mass screening of asymptomatic populations (chapter five), and the wider debates occurring in the field of nutrition (chapter six), the following chapters ultimately seek to demonstrate the three core developments which shifted attention from the primary prevention of illness towards the long-term management of diabetes and its complications. I argue here that these developments are crucial to understanding the contemporary management of diabetes, in particular the marginalisation of diet and hegemony of oral

[284] Weisz, *Chronic Disease in the Twentieth Century* pp. 115-6.
[285] Ibid.

hypoglycaemic drugs that is evident in diabetes care today.[286] The following chapter explores the first of these developments, the emergence of the first oral anti-diabetic drugs and their role in facilitating a focus on secondary prevention and shaping how diabetes was treated and understood. Remarkably, despite becoming the principal form of therapy in the modern treatment of diabetes and consistently ranking among the top ten prescribed drugs globally, little has been published on the history of oral hypoglycaemic drugs over the last decade.[287] Where historians have studied their development, they have focused on either the way drugs are regulated, the relationship between the science and the business of health, or have provided uncritical accounts of anti-diabetic drugs as a progressive development in modern treatment.[288]

In order to fill this gap in the literature and ascertain the role of the new oral drugs which became available in the 1950s and 1960s, this chapter explores the origins of the demand for anti-diabetic agents, their subsequent development and, crucially, the responses of the medical community and debate which ensued regarding their use. By scrutinising the contentions within the medical profession over the use of the new drugs, this chapter challenges the notion that the development and mass availability of oral agents represents a neat tale of medicalisation. While the pharmaceutical industry was undoubtedly aggressive in its attempts to frame diabetes as a disease most amenable to pharmaceutical treatment, this monolithic narrative tends to offer a

[286] Clinical Guidelines for Type 2 Diabetes in Adults, *National Institute for Health and Care Excellence*, (2021), https://bnf.nice.org.uk/treatment-summary/type-2-diabetes.html, accessed 2 December 2020.
[287] A. V. Fuentes et al, 'Comprehension of Top 200 Prescribed Drugs', *Pharmacy (Basel)*, 6:2 (2018), p. 43.
[288] H. Marks, *The Progress of Experiment: Science and Therapeutic Reform in the United States, 1900-1990*, (New York: Cambridge University Press, 1997); J. Greene, *Prescribing by Numbers: Drugs and the Definition of Disease* (Baltimore: John Hopkins University Press, 2007); R. Tattersall, *Diabetes: The Biography*, (Oxford: Oxford University Press, 2009).

simplistic historical interpretation and suggests a consensus to medicalise diabetes by the entire profession. But rather, as this chapter demonstrates, the use of oral agents for diabetes, particularly following the controversy of the UGDP trial and subsequent removal of diabetic medications from the market, aroused considerable suspicion and uncertainty, prompting influential sections of the profession to not only question the rationale behind their use, but their overall safety. Drawing on a range of historical materials relating to this period held within the Joslin Diabetes Archive in Boston, the Rockefeller Archive Centre in New York, and special collections held in the University of Leicester and the Wellcome Library including; clinical archives, physician correspondence, published medical studies, industry correspondence, advertisements and promotional material, this chapter sheds new light on how T2D was transformed into a disease most amenable to pharmaceutical management.

Origins and Demand for Oral Anti-Diabetic Drugs

As outlined in the previous chapters, insulin may have prolonged and saved many lives, but as physicians became more proficient in its administration, they soon recognized that it was neither a cure nor preventative measure against the rising number of new diagnoses. Paradoxically, in the decade following the introduction of insulin, adult-onset diabetes had risen significantly, constituting 80% of all cases.[289] As an article featured in *Time* magazine in 1942 reported, the diabetes death rate was now sixty-eight percent higher than in 1922 when insulin was first discovered and a rise in living standards alongside the mass availability of insulin meant those

[289] C. Feudtner, *Bittersweet,* p. 36.

diagnosed with diabetes were now likely to live significantly longer than their predecessors.[290] However, this extension of life came at a price, for with it came a whole host of new and uncharted complications.[291] Ultimately, these twin developments fuelled the search for an innovative new treatment: an oral agent that could control the blood glucose of the millions of diabetics either resistant to treatment with insulin or who had struggled to manage their condition with dietary measures alone. In the 1950s, then, a concentrated effort in search of an oral hypoglycaemic agent began in hope of finding a new and, arguably, more convenient treatment that would allow the medical profession to control a condition fast becoming endemic throughout much of the world.

In the only existing recording from his life, from a speech given in 1953 on Australian Radio, R. D. Lawrence took stock of this unique moment in diabetes history. Contemplating both the contemporary context in which he was speaking and his thoughts on the future he ruminated:

> That is the picture of the present position, but what of the future? Can we learn the exact cause of this disease? Can we be able to prevent it? Can we cure it? All over the world in I'm sure thousands of laboratories intense research is going on in these points. And I think it is not too much to hope that in the next five or ten years so great will be the new knowledge acquired that if we cannot cure the disease we may find a much better treatment…more simple, more helpful, and happier for the diabetic patient.[292]

Lawrence's thoughts summed up what was a pivotal moment in the history of diabetes management. Within a context of expanding pharmaceutical development, patients who had traditionally relied upon the dietary management of their condition,

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[290] 'Medicine: Diet or Die', *Time*, (31 August, 1942).
[291] A. A. Fletcher and J. W. Graham, 'Complications of Diabetes Mellitus with Special Reference to Cause and Prevention', *Canadian Medical Association Journal*, 41:6 (1939), pp. 566-70.
[292] R. D. Lawrence, Interview.

became the target of an alternative, pharmaceutical, form of treatment. Consequently, by the close of the 1950s, in addition to the existing methods of treatment, diet and insulin, the fruits of this 'intense research' was an extensive array of new 'wonder drugs', the oral hypoglycaemics.[293]

As examined in the preceding chapters, attempts to control diabetes and its symptoms in the late nineteenth and early twentieth centuries had centred primarily on nutritional responses to the disease. However, with the discovery of insulin and the experience of war, a gradual liberalization of previous dietary restrictions had taken place.[294] Nevertheless, despite a sustained emphasis on the importance of diet in controlling symptoms, advances in understandings of diabetes and the wider social and commercial context had stimulated a demand for an oral form of treatment. Initially, demand for oral anti-diabetic agents stemmed from some of the social problems associated with insulin, in particular the stigma which was associated with injecting. Sources from the early twentieth century suggest that by the late 1920s hypodermic syringes had acquired a social stigma producing a demand for an oral alternative that might free patients from the needle.[295] As elucidated in chapter three, one the founding goals of the British Diabetic Association was the removal of the social stigma associated with diabetes and the diabetic's use of the needle. This stigma was particularly striking in the media's portrayal of diabetes and indeed as late as the 1950s, when the first oral hypoglycaemic drugs appeared on the market. Rhetoric around insulin in the media recurrently portrayed people with insulin-

[293] Ibid.
[294] In both the *Lancet* and the *Journal of the American Medical Association* research into the dietary management of diabetes actually peaked in the 1930s and 1940s.
[295] 'Topic of the Times', *New York Times*, 19 November 1957, p. 32.

dependent diabetes as being a 'slave to the needle'.[296] In 1957 the *New York Times*, for example, reported how: 'The development of Orinase, a tablet capable of lowering blood sugar, has brought freedom from the needle to 300,000 of the nation's diabetics'.[297] Similarly in 1959, *Time* magazine reported how the new oral agents had liberated thousands of 'diabetic victims' who until recently were 'slaves to the needle'.[298] Initially then it was hoped that an oral form of insulin would provide an alternative to injections and alleviate the stigma associated with injecting.

The writings of leading diabetologists indicate that demand for oral agents likewise stemmed from the need for an effective, less time consuming means to control the blood sugar of patients for whom diet therapy had failed.[299] While the reasons for this failure could range from a lack of will, socioeconomic position or inadequate patient education, the notion of an oral form of treatment was undeniably appealing to physicians faced with increasing numbers of diabetic patients in the post-war years. This was particularly the case for those doctors with little experience of diabetes but whom were now faced with an influx of referrals from community screening and detection programmes.[300] The challenge of patient adherence to diet prescriptions was likewise significant.[301] For instance, one survey conducted in 1949 in the diabetic clinic of the Leeds General Infirmary found that for a large number of patients the amount of food actually consumed deviated widely from the diets that

[296] 'Pills for Diabetes', *Time*, 20 April 1959, p. 72.
[297] 'Topic of the Times', *New York Times*, 19 November 1957, p. 32.
[298] 'Pills for Diabetes', *Time*, 20 April 1959, p. 72.
[299] R. H. Williams et al, 'Oral Antidiabetic Therapy', *Annals of Internal Medicine*, 51:6 (1959), pp. 1121-1133.
[300] See chapter five.
[301] W. H. Daughaday, 'Present Status of Dietary Treatment of Diabetes', *Nutrition Reviews*, 1:17 (1959), pp. 289-91.

had been prescribed.[302] Moreover, while challenges within the field of diabetes management fuelled the demand for oral agents, their development cannot be fully understood without acknowledging the wider medical and social context of rapidly expanding pharmaceutical expansion during the war and immediate post-war years. With the discovery of anti-bacterials and anti-malarials in the 1930s and 1940s, a new optimism and faith in modern medicine reigned in this period.[303] By the mid-1950s, the world market for pharmaceuticals had increased from $600 million before the war to $4000 million.[304]

It was within this context of dramatically expanding pharmaceutical development that the manufacture of the new, oral anti-diabetic drugs took place. By the late 1950s, the focus of pharmaceutical development had shifted from antibiotics towards the market for chronic disease. When Charles Motley, Chief of Operations for Pfizer, addressed the 51st meeting of the American Drug Manufacturer's Association on 29 October 1957, he led with a discussion on the future of the drug market, noting the increasing prevalence of chronic disease as the perfect opportunity for future development and expansion.[305] The diseases of the middle aged, for which there were few effective drugs available and which patients would likely have for the rest of their life, offered up an attractive opportunity for sustainable growth.[306] Accordingly, preventable chronic conditions offered a gap in the market for pharmaceutical manufacturers, fuelling a search and demand for innovative

[302] K. M. West, 'Diet Therapy of Diabetes: An Analysis of Failure', *Annals of Internal Medicine*, 79 (1973), pp. 425-434.
[303] V. Quirke, 'From Alkaloids to Gene Therapy: A Brief History of Drug Discovery in the 20th Century', in S. Anderson (ed.) *Making Medicines: A Brief History of Pharmacy and* Pharmaceuticals, (London: Pharmaceutical Press, 2005), p. 189.
[304] Ibid, p. 168.
[305] Greene, *Prescribing by Numbers*, p. 2.
[306] Ibid.

therapeutic agents. While the drugs themselves captured the public's imagination with tales of 'miracle cures' and created a context which was ripe for the arrival of new pharmaceutical means of treating disease, further social, economic and political factors likewise drove the demand for an innovative new treatment. As historian Vivian Quirke describes, a number of factors including; the influence of two world wars, the growth of national health systems, the rise in public expectations of health services and drug safety and regulation, further encouraged pharmaceutical responses to disease.[307]

In the field of diabetes, experimentation with oral agents can be traced to the nineteenth century, however many of these, such as the attempts to lower urine and blood sugar with arsenic, uranium and opium, ultimately proved futile.[308] Experimentation with salicylate compounds had begun in 1877 but it was not until Frank et al synthesised the first diguanide, Synthalin, in 1926 that its capacity to reduce blood sugar in certain patients was recognised.[309] Though the hypoglycaemic properties of Synthalin appeared promising, gastrointestinal disturbances and abnormal liver function were observed. Rendered unsafe, Synthalin was removed from the market only two years later. Ideas of practical oral therapy in diabetes were set aside and dietary restrictions and insulin treatment continued to govern diabetes management until 1942 when Marcel Janbon and his colleagues in the Infectious Disease Clinic at the Medical School of Montpellier first discovered the hypoglycaemic effects of sulphonamides during experiments in their patients treated

[307] V. Quirke, 'From Alkaloids to Gene Therapy: A Brief History of Drug Discovery in the Twentieth Century', in S. Anderson, *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals*, (London: Pharmaceutical Press, 2006).
[308] J. W. Presley, *A History of Diabetes Mellitus in the United States, 1880-1990*, (PhD Thesis, University of Texas, 1991), p. 406.
[309] W. J. H. Butterfield, 'The Hypoglycaemic Action of Phenformin: Studies in Diabetics after Short-Term Therapy', *The Lancet*, 278: 7202 (1961), p. 563

with the drugs for typhoid fever.[310] Janbon discovered that in some patients, particularly those who were undernourished, the drug produced symptoms and signs which resembled hypoglycaemia. Two years later, Janbon's colleague, Auguste Loubatieres, discovered that the hypoglycaemia was most likely due to the stimulation of the B-cells of the pancreas.[311] Thereafter numerous oral antidiabetic therapies from these derivatives followed, however questions soon began to arise pertaining to the mode of action of the new drugs and debate surrounding their use slowly began to simmer. In particular, physicians questioned which types of patients would benefit most from the new drugs. In addition to uncertainty regarding patient selection, it was equally unclear whether the drugs should be prescribed alone, as a replacement for traditional therapies, or, as a combined therapy, allowing patients to reduce their dosage of insulin or be less stringent with their prescribed diets. Initial investigation into the mode of action of the antidiabetic compounds released in the late 1950s led investigators to believe that the drugs functioned in a similar fashion to insulin, and thus may allow for either its complete replacement or allow physicians to reduce the insulin dosage requirement in their milder patients. As an article in the *Lancet* in 1959 suggested:

> …the effectiveness of the oral hypoglycaemic agents could be expressed in terms of their insulin equivalence. Beaser reports in detail the results in four diabetics. In three of them there was an additive effect, and in two the previous requirement of insulin was entirely replaced…Such results suggest that a higher proportion of insulin-treated diabetics could be treated effectively by oral agents alone.[312]

[310] H. Thisted, S. P. Johnsen, and J. Rungby, 'Sulfonylureas and the Risk of Myocardial Infarction', *Metabolism*, 55 (2006), pp. 16-19.
[311] A. Loubatières, 'The Hypoglycemic Sulfonamides: History and Development of the Problem from 1942 to 1955', *Annals of the New York Academy of Sciences*, 71:1 (1957), pp. 4-11.
[312] W. P. U. Jackson, 'Combined Treatment for Diabetes', *The Lancet*, 274:7094 (1959), p. 10.

However, writing in the *Lancet* in 1958, Danish researchers noted that although the effects of the oral agents were in many ways similar to small doses of insulin there was not, however, sufficient evidence that the drugs provoked an increase in the production and delivery of insulin from the beta cells.[313] Furthermore, much of the existing research presented conflicting results, with some studies suggesting that oral agents such as carbutamide and tolbutamide had severely damaged the pancreatic alpha cells, those most important for producing glucagon, a hormone imperative for controlling blood sugar levels.[314] A year later, research began to indicate that the drugs should not be seen as a replacement for insulin at all, but that they worked best as a *combined* therapy; the researchers, however, agreed that further research was still required. In a review of the latest findings published in the *Lancet* in July 1959 the authors concluded:

> Such results suggest that a higher proportion of insulin-treated diabetics could be treated effectively by oral agents alone. But, reasonable as this method may seem, its value must be assessed against the success of treatment by insulin. Only long-term studies can establish the place of combined oral treatment.[315]

By 1959, questions regarding efficacy and whether the newly developed drugs would act as a replacement for insulin remained, but a consensus at least appeared to be forming on patient selection, indicating that the sulphonylureas were of most value in the treatment of the elderly, the very mild or pre-diabetic patient, those patients traditionally treated with diet alone.[316]

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[313] K. Lundbaek, K.Nielsen, and O. L. Rafaelsen, 'Mode of Action of Oral Antidiabetic Compounds', *The Lancet*, 271: 7029 (1958), p. 1036
[314] Ibid.
[315] W. P. U. Jackson, 'Combined Treatment for Diabetics', p. 10.
[316] 'Oral Hypoglycaemic Agents', *The Lancet*, 274:7112 (1959), p. 1129

The following section accounts for the historical development, use and controversy surrounding the first anti-diabetic drugs released in the post-war period. In particular, it navigates the debate which erupted over one particular oral agent, tolbutamide (Orinase), which ultimately led to one of the most controversial medical trials in history, the University Group Diabetes Program (UGDP). Examining the dialogue which played out both during and after the trial, this section demonstrates how an overarching focus on the divisive issue of the new oral agents led to significantly less time and attention on the patient's nutrition, summoning the beginning of the end for diet therapy.

Tolbutamide (Orinase)

One of the first drugs to emerge out of the post-war era of pharmaceutical experimentation with oral hypoglycaemic agents was tolbutamide. Tolbutamide originated in the German laboratories of Hoechst, originally marketed in Germany as Rastinon, and belonged to the group of oral agents classified as sulphonylureas which appeared to work by stimulating a release of insulin from still functioning B-cells of the pancreas, thus helping to regulate blood sugar in those with mild diabetes. With the post-war demand for medications targeting chronic disease, American pharmaceutical companies eagerly sought licensing agreements for new therapeutics. It was in the midst of these negotiations in 1950 that Michigan firm Upjohn Company secured the cross-licensing agreement for tolbutamide.[317] Keen to get tolbutamide on the market, between 1955 and 1957 Upjohn tested Orinase in a

[317] Greene, *Prescribing by Numbers*, p. 90.

two year trial, distributing twelve million tablets through an established network between the Joslin Clinic in Boston and New York's Mount Sinai Hospital.[318] After trialling tolbutamide in around five thousand patients, Upjohn found the drug was most effective in newly diagnosed, overweight patients, the same patients traditionally most receptive to controlling their diabetes through diet. Upjohn announced these findings at the first major conference on the drugs held in February 1957 titled 'The Effects of the Sulphonylureas and related Compounds in Experimental and Clinical Diabetes'.[319] The conference was the first major meeting on the new drugs in America and physicians discussed what was heralded 'the most significant advance in diabetes therapy since the discovery of insulin'.[320] It was believed that the advent of the sulphonylureas would open the way to a comprehensive understanding of diabetes aetiology but as this chapter and chapter five on screening collectively demonstrate, attention quickly became limited to the biological aspects. Some of the highlights of the conference included showcasing of reports which demonstrated a 50-75% success rate of Orinase in controlling diabetes and a broad agreement that Orinase was largely nontoxic and appeared 'efficacious in a major group of diabetics'.[321]

[318] Ibid.
[319] R. Levine, 'The Effects of the Sulphonylureas and Related Compounds in Experimental and Clinical Diabetes', *New York Academy of Sciences*, 71 (1957), p. 291.
[320] 'Clinical use of Orinase in Diabetes Highlights Meeting on Sulphonylureas', *Physician News Service Inc.*, 27 February 1957, Joslin Archive.
[321] Ibid.

Figure 4.2: Bottle of Orinase anti-diabetic tablets, Upjohn Company (1957). [Courtesy of the Upjohn Archive at www.upjohn.net].

In *Prescribing by* Numbers, historian Jeremy Greene provides a provocative analysis of the role of Orinase in expanding the pharmaceutical treatment of diabetes, particularly in aiding programmes of pharmaceutical prevention. Greene details some of the early marketing challenges in promoting Orinase, particularly how pharmaceutical firm Upjohn Company initially struggled to convince both patients and physicians of its use. Upjohn was cautious in the early days of marketing Orinase, ensuring promotional material emphasised that, similar to insulin, Orinase

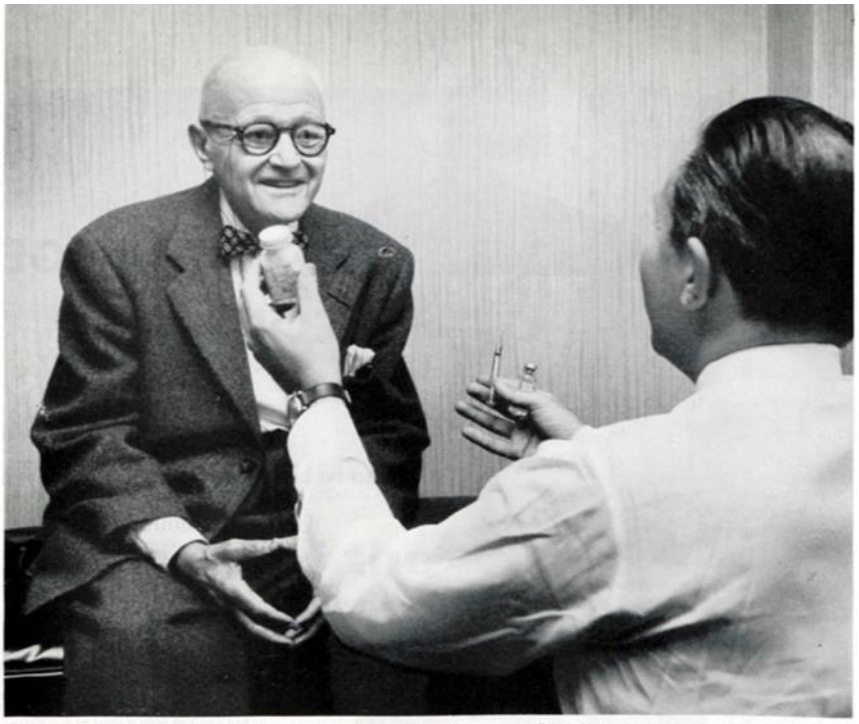
was not a cure, but rather a means of controlling symptoms. In much the same way as following a diabetic diet, Orinase provided an effective means of managing the condition and its symptoms, such as elevated blood glucose, as opposed to eradicating it entirely. As Upjohn's promotional material from the 1950s noted: 'Though a true cure for diabetes is yet to be found; Orinase is an important milestone – a tremendous advance in the management of the disease'.[322] As the main competitor to Orinase was dietary regulation and insulin, early promotional materials further emphasised Orinase's convenience and the appeal of oral medications over the unappealing sight of the needle.[323] To this end, promotional material played into the idea that following a diabetic diet was cumbersome and prevented PWD from living a normal life. As a promotional pamphlet published by Upjohn in 1963 explained:

> Now, more than ever before, medical science is making momentous progress in the control of chronic (long-term) diseases. Of all chronic diseases, diabetes today holds forth the brightest prospect for a happy future. To a great degree, the ultimate course of this disease lies in ones own hands, as its management depends on the individuals observation of the cardinal rules of control. No one can do this for you, your physician can advise but you alone must carry out his instructions. Following these will have its own reward in health, happiness and longevity. For all practical purposes, diabetics can now do the same things as non-diabetics. They perform the same work, play the same games, and eat the same food at the same places….Orinase has improved the control of their disease and has made possible an even more normal life, free from the inconvenience of daily insulin injections.[324]

[322] "Good News for Diabetics: Orinase "The Long-Sought Oral Antidiabetic", *Upjohn News*, January 1957, p. 161.
[323] Greene, *Prescribing by Numbers*, p. 93.
[324] 'You and Diabetes', *Upjohn Company*, (1963), Joslin Diabetes Centre Archive.

The media dutifully aided Upjohn in the promotion of oral hypoglycaemic drugs in terms of their convenience.[325] Mirroring the title of an article in *Upjohn News* in 1957, the *Saturday Evening Post* reported 'Good News for Diabetics' in an article which announced the arrival of a new pill which 'may free thousands of diabetics from their lifelong slavery to the needle'.[326] In the article appeared seventy-nine-year-old Siegfried Fleischer, a diabetic of fifty-five years, being offered the choice of a hypodermic syringe or glass bottle of pills.[327] Despite knowing that the drug's effectiveness was limited to use in mild, adult-onset diabetes, the company's decision to promote Orinase on the basis of its convenience *and* appeal over injections ultimately suggested to readers, rather negligently, that Orinase was an ideal replacement for insulin.[328]

[325] 'Pills May Take Place of Insulin', *New York Times*, 26 February 1956.
[326] M. Silverman, 'Good News for Diabetics', *Saturday Evening Post*, January 1957.
[327] Greene, *Prescribing by Numbers*, p. 95.
[328] H. Schmeck, 'Wider Use of Pill Urged in Diabetes', *New York Times*, 22 June 1964, see also S. Szanto, 'Combined Trial of Acetohexamide and Two Diguanide Preparations', *Irish Journal of Medical Science*,39:1 (1964), p. 3



Good-by needle: Siegfried Fleischer, 79, has given himself 10,000 injections of insulin in his 55 years as a diabetic. Now he can use a new drug, tolbutamide, in pill form.

GOOD NEWS FOR DIABETICS

Dr. Auguste Loubatières. His long-overlooked research in sulfa drugs ultimately gave rise to the new pill.

Now, a new pill may free thousands of diabetics from their lifelong slavery to the hypodermic needle.

By Milton Silverman

In the year 1902, a plump, successful young German building contractor named Siegfried Fleischer called upon a physician in Berlin and described his mild but annoying symptoms.

"So," remarked the doctor. "We will therefore make a few tests."

Within an hour, the tests were completed and the diagnosis was obvious. "Herr Fleischer," said the doctor, "I regret to inform you that you have diabetes."

In those days, more than half a century ago, medical men knew little about diabetes except that it was concerned somehow with the pancreas gland, it produced strange symptoms in many parts of the body, it was marked by high concentrations of sugar in the blood and by the presence of sugar in the urine, and it could not be cured or controlled by any known medicine. The only accepted treatment—more acceptable to doctors than to their patients—was a strictly limited diet essentially free from sugars and starches.

Young Fleischer was put on this kind of semistarvation menu. It took eighty pounds off

Figure 4.3: 'Good News for Diabetics', *The Saturday Evening Post*, January 1957. [Courtesy of *The Saturday Evening Post*].

While both Upjohn and the media confidently promoted Orinase as a new wonder drug, archival evidence suggests that sections of the medical profession were hesitant and continued to uphold the importance of diet as the principle treatment in mild diabetes. In an editorial in the ADA's *Diabetes* journal in 1957, Philadelphia

physician Garfield Duncan warned that the new oral preparations were a matter of 'convenience only' and offered no known advantages, only known disadvantages, over insulin therapy.[329] Moreover, Duncan recommended 'an attitude of caution' toward the older patient, warning the profession that the availability of oral agents did not decrease the need for attention to diet:

> Approximately 80 per cent of adult diabetics are overweight when they seek treatment. Two thirds, at least, of this large group are candidates for oral therapy and spectacular control of the glycosuria and hyperglycaemia with tolbutamide may be expected. But, it is well to sensitize these patients to the fact that no oral therapy is a suitable substitute for an appropriate reduction in weight; that tolbutamide does not increase appetite, hence supplements well the benefits of a reducing regimen for the overweight patient; and that the need for drug therapy decreases and may disappear as the weight approaches the ideal. Knowingly to accept the advantages of tolbutamide and to ignore those of a temporarily reduced diet may be likened to the behaviour of children who accept privileges but shun responsibilities.[330]

At the launch of Orinase in 1957, Henry Ricketts, former president of the ADA, suggested that many physicians felt a deep ambivalence towards the new drug, warning family doctors to think twice before switching their insulin patients to Orinase simply for convenience, noting that 'some diabetics may pay for this convenience later on'.[331] In *Prescribing by Numbers*, historian Jeremy Greene describes how Upjohn began to recognise that an excessive focus on convenience was hindering its efforts to promote Orinase as a legitimate therapy. Consequently in 1959 the company began to modify its promotional materials to convey a message of

[329] G. Duncan, 'What patients should be told about the oral hypoglycaemic compounds', *Diabetes*, 6:6 (1957), p. 534-5.
[330] Ibid.
[331] 'Caution', *Newsweek*, June 10 1957, p. 66 in J. Green, *Prescribing by Numbers*, pp. 94-95.

safety as well as convenience.[332] However, an examination of marketing materials illustrates that Upjohn never discarded entirely the connection between Orinase and ease. Rather, Upjohn continued to produce a range of marketing merchandise that their salesmen could distribute to doctors which subtly reiterated their product's time-saving potential. One such product included a metal paperweight in the shape of a sundial inscribed with the words 'When it's time for oral therapy. It's time for Orinase (tolbutamide)' (Figure 1.2).

Figure 4.4: Upjohn Metal Sundial Advertising Paperweight, *Upjohn Company*, [Image source: *Pinterest*].

Examining how Orinase's rival anti-diabetic agents were marketed around the same time demonstrates the influence of Upjohn's narrative on the oral agent's time-saving potential and expediency. While Upjohn were cautious about over-use of the

[332] J. Green, *Prescribing by Numbers*, pp. 94-95.

rhetoric of convenience, other new drugs on the market continued to emphasise expediency to promote their own products. A pertinent example of this can be seen in 1958 when Pfizer's Diabinese entered the market. Its central claim was that it was even *more* convenient than Orinase because it was taken in a single dose (Figure 4.4).[333] In the 1970s, adverts for Diabinese would eventually move away from this focus on convenience, targeting the individual's failure to diet to sell their product instead. One particular advert for Diabinese (Figure 4.5) featured the image of an overweight man looking down at his stomach with the headline 'Transgressor' accompanied by the text 'Obese. A therapeutic failure on diet alone. Help him walk the straight and narrow with *diet* and Diabinese', implying that diabetics were failing to manage their condition through dieting.[334]

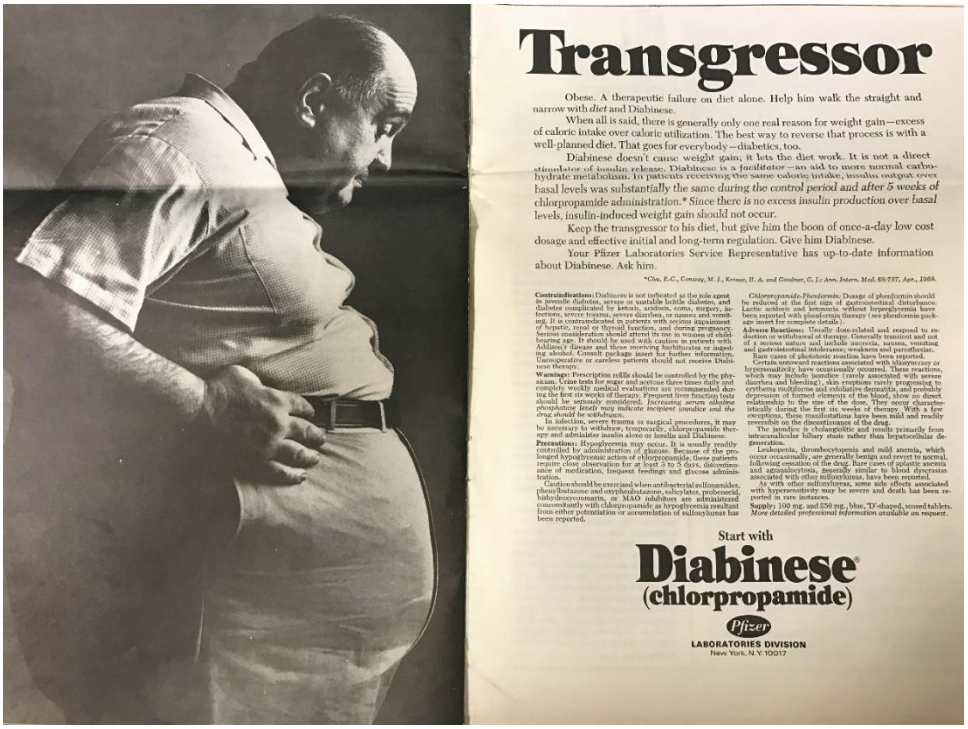


Figure 4.5: Diabinese advertisement, Pfizer, (1970). [Courtesy of: Joslin Diabetes Centre].

[333] Diabinese 'Control When it's Needed' advertisement, *Pfizer*, (1974), Rockefeller Archive Center.
[334] Diabinese advertisement, *Pfizer*, (1970), Joslin Diabetes Center Archive.

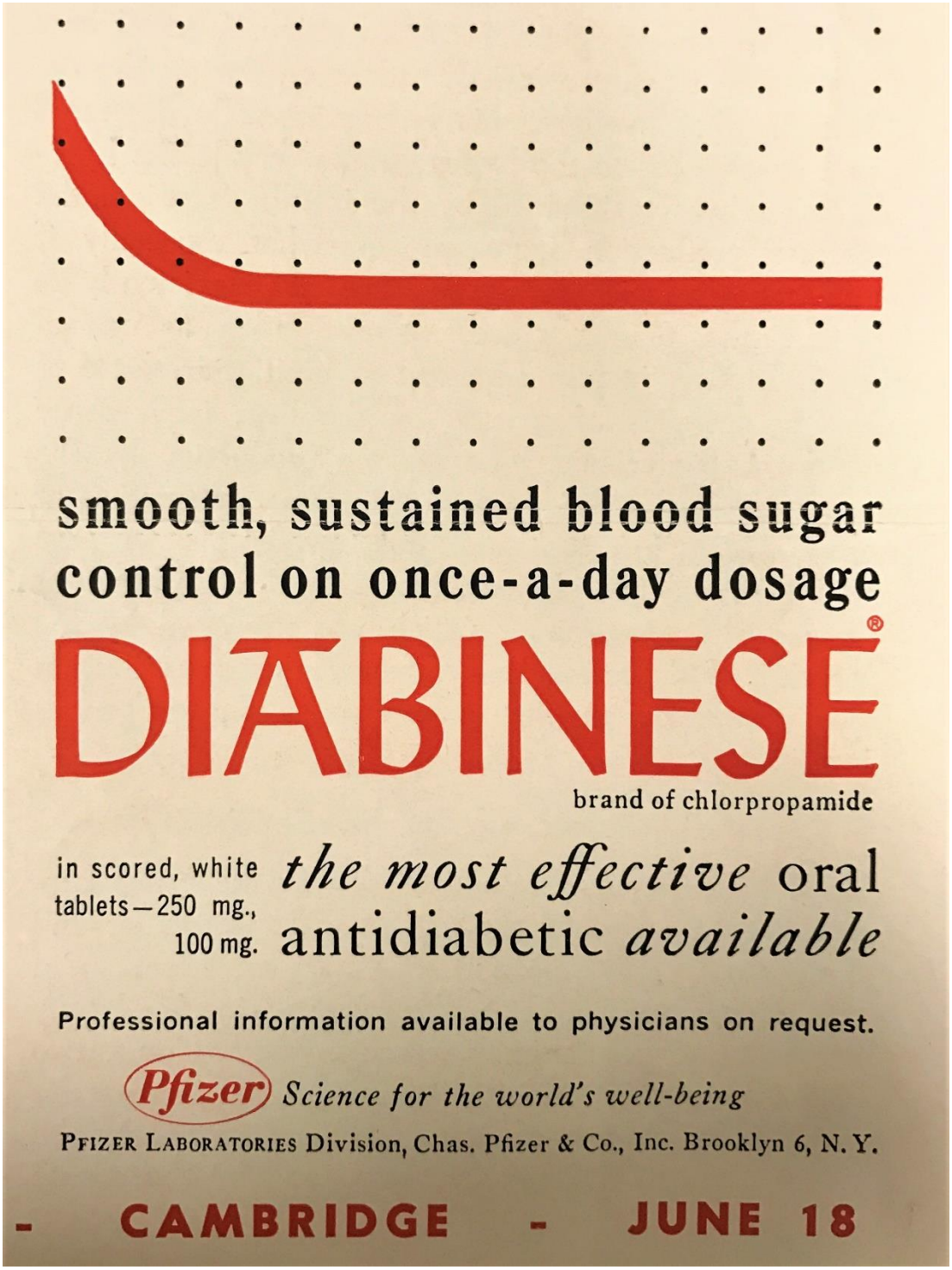


Figure 4.6: Diabinese advertisement (1958) [Courtesy of the Joslin Diabetes Centre, Boston.].

Upjohn's marketing efforts around the 1950s and 1960s were unrivalled. In the summer of 1955 when Disneyland first opened its doors to the public, one of the first sights park visitors were met with was the Upjohn Pharmacy. Designed to resemble a late nineteenth century apothecary, the Upjohn Pharmacy consisted of the main apothecary shop staffed by two pharmacists, and an exhibition space which presented a tale of the drug industry then and now, showcasing the role of Upjohn and their latest products.[335] As part of the company's attempts at branding, Disneyland visitors would leave with a promotional card and a sample bottle of Upjohn's Unicap vitamins.[336] Despite all of these promotional attempts however, by the late 1950s, tentativeness concerning the use of the new oral agents remained. The ADA's Garfield Duncan warned how the patient should be made aware:

> …that we are travelling an uncharted course and must be more alert than ever until the potentials, good or bad, of these drugs, as they affect the great variety of patients, under a great variety of circumstances, are familiar to us…The outlook is favourable but until the mode of action of these drugs is clearly understood, their long-term use is not devoid of apprehension nor should it be without caution.[337]

Similarly an article in the *Lancet* in 1959 began:

> The era of treatment of diabetes by oral hypoglycaemic agents is now well started, and it is appropriate to reflect at this point whether early enthusiasm has made too light of some of the disadvantages of these drugs, the long-term effects of which are, of course, still unknown.[338]

[335] S. Hall, 'The Upjohn Pharmacy in Disneyland', *Blog of the Alcohol and Drugs History Society*, 19 November 2019, available at https://pointsadhs.com/2019/11/19/the-upjohn-pharmacy-in-disneyland/.
[336] Ibid.
[337] G. Duncan, 'What patients should be told about the oral hypoglycaemic compounds', *Diabetes*, 6:6 (1957), p. 534-5.
[338] 'Oral Hypoglycaemic Agents', *The Lancet*, 274:7112 (1959), p. 1129

Citing the example of carbutamide, withdrawn from the market in the United States in October 1956 after several reports of bone-marrow depression and jaundice, the article warned that both tolbutamide and another anti-diabetic agent newly on the market, chlorpropamide, 'were by no means altogether harmless' having shown numerous side effects including: peptic ulceration, anaemia, rashes, fever and gastrointestinal disturbances.[339] The authors further warned of investigations into the use of another of the new drugs belonging to the biguanides, Phenformin:

> With this drug the therapeutic dose is very near the toxic one, which may produce anorexia, nausea, and vomiting and diarrhoea at first, and weakness, lethargy, and weight loss later.[340]

Towards the end of the 1950s then, an increasing number of studies began to appear in medical journals warning of significant problems related to the new oral anti-diabetic agents, drawing attention towards a considerable number of unpleasant side effects which in many cases had proved fatal.[341] Evidence from the medical literature thus indicates that while demand may have lingered for an oral treatment, the drugs initially struggled to garner widespread acceptance and some sections of the medical profession remained cautious regarding their use. In an article published in the *British Medical Journal* in October 1959, researchers argued that although they found tolbutamide overall to be 'well tolerated and safe':

> Nevertheless, it suffers from two disadvantages. First, its effective action is short-lived, and so it has to be given twice daily. Second, it is successful mainly in patients with mild diabetes with onset at maturity…Long-term trials are necessary before the possibility of toxic effects can be eliminated with confidence.[342]

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[339] A. Bloom, M. Crowley and S. Crawfurd, 'Further Experience with Oral Therapy in Diabetes', *BMJ*, 2:5156 (1959), p. 841.
[340] Ibid.
[341] 'Diabetic Drugs Linked to Deaths Banned', *Boca Raton News*, (26 July 1977).
[342] A. Bloom, M. Crowley and S. Crawfurd, 'Further Experience with Oral Therapy in Diabetes', *British Medical Journal*, 2:5156 (1959), p. 841.

In warning against the use of tolbutamide, Bloom and his colleagues further cited the example of carbutamide, which like tolbutamide had been found to be a well-tolerated and effective hypoglycaemic agent, used for over a year in Germany before reports of toxic effects on the blood began to appear. Evidently, in the late 1950s then, many physicians and researchers alike were cautious of the new oral therapies, and thus believed a long-term trial was necessary before confidence could be placed in their use.[343] Naturally however, this placed both doctors and their patients in a dilemma. Anti-diabetic drugs had an obvious appeal; they helped to ease clinical tensions over how best to achieve glycaemic control and made gaining control much simpler for diabetics who had struggled to manage their diabetes through diet. Yet, despite a conscious shift in promotion by Upjohn which now presented Orinase as a drug that was both superior in safety, as well as more convenient, Upjohn struggled to convince the profession as a whole of their use.[344] Moreover, it was becoming increasingly apparent that the drugs had both a restricted target patient population, and were still of limited value in insulin-dependent diabetes, working best in those patients who could be treated by diet alone. As an article in the *Lancet* in 1959 identified:

> While tolbutamide is now firmly established as a useful drug for the treatment of some mild diabetics, it remains difficult to select patients who will respond to it. Tolbutamide is generally agreed not to control diabetics who are liable to ketosis, and it is, therefore, rarely satisfactory for patients who are thin or under 40…Another large group can be controlled by diet alone. It is for some of the intermediate group, who are neither liable to ketosis nor controllable by diet alone, that tolbutamide may be useful; but no reliable criteria have yet been established for their selection.[345]

[343] Ibid.
[344] R. M. Royle, The Orinase Profile, *Upjohn Overflow*, January 1959, p. 4-6.
[345] G. F. Joplin, R. Fraser, and J. Vallance-Owen, 'Tolbutamide Control of Diabetes Mellitus: Selection of Patients and Persistence of Response', *The Lancet*, 274:7103 (1959), p. 582.

In 1958 320,000 diabetics in the United States were taking Orinase and by 1960 five hundred scientific papers had been written on the use of oral hypoglycaemic medications, but evidently unanswered questions remained.[346] Principally, troubled physicians questioned the safety or oral hypoglycaemic agents and were concerned that patients would see a prescription of pills as an easy alternative to a controlled diet. While the adoption of oral hypoglycaemic drugs in clinical practice in the 1960s was rapid, sections of the diabetic community were unconvinced by the logic of asymptomatic diagnosis and the pharmaceutical prevention it supported.[347] As one textbook on the use oral hypoglycaemic drugs asked of its readers: 'today, millions of diabetics are grateful for their existence, yet the question must nevertheless be asked – are they, as drugs, necessary?'[348]

With so many questions and uncertainty remaining over the use of the new anti-diabetic drugs it was thus decided that the only way to determine their value would be to test them against traditional treatment types in a long-term clinical trial. Unbeknownst at the time, the University Group Diabetes Program would become one of the most contentious medical trials of the century.[349]

The University Group Diabetes Programme

As one of the main drugs on the market, now being taken by 320,000 patients in the U.S alone, the UGDP sought to understand if tolbutamide (Orinase) could prevent

[346] Greene, *Prescribing by Numbers*, p. 97.
[347] Ibid, p. 118.
[348] G. D. Campbell, 'Oral Hypoglycaemic Agents: Pharmacology and Therapeutics', (London: Academic Press, 1969).
[349] H. Blackburn and D. R. Jacobs, 'The University Group Diabetes Program 1961-1978: Pioneering randomised control trial', *International Journal of Epidemiology*, 46:5 (2017), pp. 1354-1364.

diabetic complications, particularly cardiovascular disease while also determining how the oral agents fared against insulin and diet. The study aimed to address three questions which beleaguered the diabetic community about mild and asymptomatic diabetes; 1) Did tolbutamide have a favourable impact on vascular disease; 2) Did lowering blood sugar levels help decrease the risks of vascular disease?; 3) What methods were useful in clinical trials for diabetes?[350] The study began in 1961 with patients' allocated one of four regimens; *insulin variable*, *insulin standard*, *tolbutamide* and a *placebo* group (lactose capsules and diet); subsequently in 1962 a fixed-dose Phenformin group was also added.[351] It is worth highlighting here the value placed upon diet in the study. In addition to being used as the placebo, the description of the diet arm of the study was reduced to a mere single line in the discussion, noting simply that: 'The diet was designed to achieve and maintain a body weight within 15% of ideal weight in all patients'.[352] It was predicted that the results of the trial would show mortality to be lower in the insulin and oral groups than diet alone, however, in 1969 the tolbutamide arm of the study was stopped prematurely when a significantly higher death rate in the tolbutamide group was discovered; 12.7% compared with 4.9% in the placebo group.[353] On the evening of 20th May 1970 the ADA received news that the drug might be harmful and from there news spread quickly to the public and unknowing physicians alike via leading newspapers; the *New York Times*, *Washington Post*, and *The Wall Street Journal* all

[350] Ibid.
[351] M. G. Goldner, G. L. Knatterud, and T. E Prout, 'Effects of hypoglycaemic agents on vascular complications in patients with adult-onset diabetes: III. Clinical implications of UGDP results', *JAMA*, 218:9 (1971), pp. 1400-1410.
[352] W. Herman and A. L. Kinmonth (eds.), *The Evidence Base for Diabetes Care* (New Jersey: Wiley-Blackwell, 2010), p. 190.
[353] M. G. Goldner, G. L. Knatterud, and T. E Prout, 'Effects of hypoglycaemic agents on vascular complications in patients with adult-onset diabetes: III. Clinical implications of UGDP results', *JAMA*, 218:9 (1971), pp. 1400-1410.

began reporting on the UGDP's findings, with the *Washington Post* reporting a possible annual death toll from tolbutamide of 8000 patients.[354] In the report, Morgan Mintz reported:

> A massive study of patients with mild diabetes indicates that if they take the most popular antidiabetes pills for more than three years they are much more likely to die prematurely than if they had taken insulin-or no medication at all.[355]

At the time of the report, hundreds of thousands of patients in the U.S and Britain were taking Orinase daily for mild (often asymptomatic) diabetes, largely on the premise that it reduced their long-term risk of diabetic complications, and, ironically, heart disease.[356] Consequently, this raised two important issues; rather than being beneficial, the new drugs appeared to be harmful, and for milder patients at least, appeared to be of no greater benefit to them than diet alone. An executive meeting was held in June 1969 to decide the future course of the study. After two full days of debate and deliberation, the majority of investigators, 21 to 5, voted to stop administering tolbutamide and to notify the FDA and Upjohn of its findings immediately.[357] The tolbutamide arm of the study was formally discontinued on 7th October 1969 but many resigned and the debate raged on internally, leaving both doctors and their patients trapped in a dilemma. In 1970 the ADA provided a long-awaited comment on the trial and stated that in addition to the apparent toxic effect of tolbutamide:

> What is even more arresting is that neither of the insulin treated groups had a lower mortality than the placebo-treated groups. This

[354] Presley, *A History of Diabetes Mellitus in the United States*, p. 423.
[355] M. Mintz, 'Antidiabetes Pill Held Causing Early Deaths', *Washington Post*, 21 May 1970, quoted in H. Marks, *The Progress of Experiment: Science and Therapeutic Reform in the United States, 1900-1990*, (New York: Cambridge University Press, 1997), p. 199.
[356] Greene, *Prescribing by Numbers*, p. 116.
[357] Ibid, p. 122.

> finding carries the broadest implications for the treatment of non-insulin adult-onset diabetes…if insulin – the diabetic's medicinal remedy *sine qua non* - does not permit patients to live longer than does a diet, would not this class of patients, in respect to longevity, be just as well off with diet alone?[358]

In October the same year, the FDA likewise released a statement with their conclusions on the UGDP which stated: 'oral hypoglycaemic agents should be used only in diabetics with adult onset, stable, disease, which cannot be controlled with diet alone and for whom insulin is unacceptable or impractical'.[359]

By the end of the trial however many doctors had become heavily reliant on the new drugs and were now reluctant to abandon them.[360] It was difficult to accept that the drugs they had been confidently prescribing were at best ineffective and at worst harmful. Naturally the pharmaceutical industry, which had been in receipt of $100 million annually from the sale of oral hypoglycaemic agents were likewise concerned with the implications of the findings. With little justification for their use, in October 1970 the ADA, AMA and FDA issued joint guidelines on Orinase that stated rather than remove the drug from the market, that they should instead be considered a 'treatment of last resort'.[361]

But rather than a treatment of last resort, substantial evidence suggests that both while the UGDP trial was ongoing and after the public announcement of its findings, oral agents continued to be prescribed in increasing quantities. In the

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[358] Editorial Statement, *Diabetes*, 19 (1970), p.747 in Tattersall, *Diabetes: A Biography*, p. 132.
[359] 'Oral Hypoglycaemic Agents', FDA Current Drug Information, (1970), Joslin Diabetes Centre Archive. By 'impractical;' here the FDA were referring to a small minority of patients with, for example, a phobia of needles.
[360] H. Schmeck, 'Pills for the Diabetic: Dilemma for Doctors', *New York Times*, June 15 1970.
[361] Sec. 310.517 'Labelling for oral hypoglycaemic drugs of the sulfonylurea class', *United States Food and Drug Administration*, https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=310.517, accessed 1 December 2020.

United States, the National Health Survey from 1968 revealed that over three-quarters of known diabetics were being treated with oral hypoglycaemic medication.[362] In that year alone more than three million new prescriptions were written for oral antidiabetics and Orinase made over $40 million in sales.[363] Internationally, the prescription of antidiabetic drugs likewise soared during the period of the trial. A study of UK diabetic clinics carried out in 1970 found that half of patients were now being treated with the drugs and in Germany it had become the exception *not* to take hyperglycaemic therapy, evident in an advertising campaign of the time which suggested that virtually no dietary control was necessary provided a suitable drug was taken.[364]

An examination of archival sources pertaining to the UGDP demonstrates that those in favour of continuing the use of tolbutamide and other oral agents overwhelmingly comprised the majority. Perhaps unsurprisingly, the bulk of support for the continued use of oral agents came directly from Mount Sinai and the Joslin Clinic, two of the most important sites in the early clinical research into the drug's use and application. The Joslin Clinic in particular produced some of the most visible advocates of oral hypoglycaemic drugs. Alexander Marble, President of the Joslin Diabetes Centre throughout the UGDP, along with Howard Root, President of the ADA (1949-50) and International Diabetes Federation (1961-67), were ardent supporters of tolbutamide and became important historical

[362] 'Who Is a Diabetic? Where Does He Come From? Are We Meeting His Needs?' *Diabetes: Research, Detection, Therapy*, 5:1 (1968), p. 1.
[363] *National Prescription Audit: Therapeutic Category Report, Ten Year Trends* (1968).
[364] P. A Thorn, 'Diabetic Clinics Today and Tomorrow: Mini Clinics in General Practice', *BMJ*, 2:534 (1973), p. 535.

actors in shaping diabetes management.[365] The Joslin Clinic had been at the forefront of testing the new oral agents, administering the first oral medication to treat mild diabetes in 1955, yet despite the Clinic's loyalty to the drug, early results were sketchy. [366] One of Marble and Root's first reports on their clinical experience with tolbutamide for example reported how 'good' or 'fair' control had been achieved in only 48% of patients.[367] Like most clinical research centres, Joslin physicians were involved in testing Orinase at the same time as testing the drug's competitors, such as Lily's Carbutamide, Pfizer's Diabinese and Ciba-Geigy's Phenformin.[368] Despite the results of the UGDP, the Joslin Clinic continued to recommend tolbutamide and other oral agents as legitimate therapies and refused to break ties with either the drugs or their manufacturers.[369]

It is clear that physicians continued to experiment with oral agents in order to try and achieve diabetic control through pharmaceutical means, regardless of the trial results. Strong evidence of this can be found in the case of tolbutamide's rival, Phenformin. Phenformin, or Dibotin or DBI as it was marketed, was promoted for use as either a direct replacement for insulin, as a combined therapy with insulin, or, in the case of sulphonylurea or dietary failure, as a first-line treatment of its own. The drug was used widely in clinics in Britain and the United States throughout the 1960s until its gradual removal from the market in the 1970s due to

[365] Marble continued to support the use of tolbutamide; however Howard Root did not live to see the end of the UGDP as he died suddenly from coronary heart disease in 1967. See P. White, 'Howard F. Root, 1890-1967', *Diabetes*, 17:11 (1968), pp. 708-9.
[366] 'Selected Milestones in the History of the Joslin Diabetes Centre', Joslin Diabetes Center.
[367] A. Marble and H. Root, 'Clinical Experience with Orinase: A Preliminary Report', *Metabolism*, 5:6 (1956), p. 904.
[368] Greene, *Prescribing by Numbers*, pp. 90-92.
[369] Ibid, p. 125-126.

cases of lactic acidosis, of which 552 cases had been identified by 1977 and in many cases had proven fatal.[370]

Figure 4.7: Phenformin advert (1970). [Courtesy of the Rockefeller Archive Centre].

[370] R. I. Misbin, 'Phenformin-Associated Lactic Acidosis: Pathogenesis and Treatment', *Annals of Internal Medicine*, 87:591 (1977), p. 595.

There is clear evidence however which suggests that the harmful effects of phenformin were known prior to its use in the UGDP trial in 1962, evident in reports of lactic acidosis made long before it was withdrawn from the market in the late 1970s. In Britain in 1958, an investigation into the effectiveness of phenformin as an antidiabetic agent was carried out in forty diabetic patients from Whittington Hospital in London. The patients varied in severity: fourteen were newly diagnosed and had received no prior treatment, one had been managed on diet alone and the remainder had all at some time been treated with insulin. The results of the trial, published in the *BMJ* in 1958, concluded that:

> D.B.I (Phenformin) has been demonstrated to be an effective hypoglycaemic agent in mild and moderate diabetes. At a dosage of 50mg. three times a day it has been shown to reduce the blood sugar to normal levels, in some cases even in the presence of ketonuria and in some patients who have failed to respond to tolbutamide. Unfortunately, its administration was accompanied by gastro-intestinal disorders in no less than two-thirds of the diabetics in whom it was used. Nausea, abdominal discomfort, vomiting and diarrhoea were severe enough to necessitate withdrawal of the drug in these patients.[371]

Phenformin was introduced to the UGDP study four years later and reports from the Joslin Clinic indicate it was prescribed to diabetic children until at least 1970.[372] Another study published in the *BMJ* in October 1967 reported fatal lactic acidosis after an overdose of Phenformin and warned against its use in the treatment of diabetes. The patient, a sixty-four year old housewife, had been known to suffer from mild diabetes for four years. Having been treated with chlorpropamide for eighteen months with a 1000 calorie diet she remained more

[371] A. Bloom, M. F. Crowley and G. H. Hall, 'Oral Treatment of Diabetes: Trial of Phenethyldiguanide (D.B.I)', *BMJ*, 2:5088 (1958), p. 73.
[372] 'Diabetic Pills Help Children', Newsclipping, Joslin Diabetes Centre Archive.

than a stone over the standard weight and was subsequently prescribed Phenformin. Following an increase in her daily dosage, the patient mistakenly ingested two tablets in excess of her normal dose and was admitted to hospital with abdominal pain; twenty-eight hours later she suffered a cardiac arrest and died.[373] Nevertheless, despite these cases of fatal lactic acidosis and known problems of toxicity, the pharmaceutical industry found novel ways to ensure continued use of Phenformin in the treatment of mild diabetes. Beginning in 1960, a number of studies funded by the U.S Vitamin and Pharmaceutical Corporation were conducted into the use of timed-disintegration capsules in an attempt to lessen the gastrointestinal side effects of Phenformin and enhance its hypoglycemogenesis in single dose form.[374]

Figure 4.8: DBI-TD advertisement (1971). [Courtesy of the Rockefeller Archive Centre].

[373] D. W. Proctor and J. M. Stowers, 'Fatal Lactic Acidosis after an Overdose of Phenformin', *BMJ*, 4:5573 (1967), p. 216.
[374] R. S. Radding and S. J. Zimmerman, 'Phenethyldiguanide Comparative Study of Tablets and Timed-Disintegrated Capsules', *Metabolism: Clinical and Experimental*, 10 (1961), p. 238.

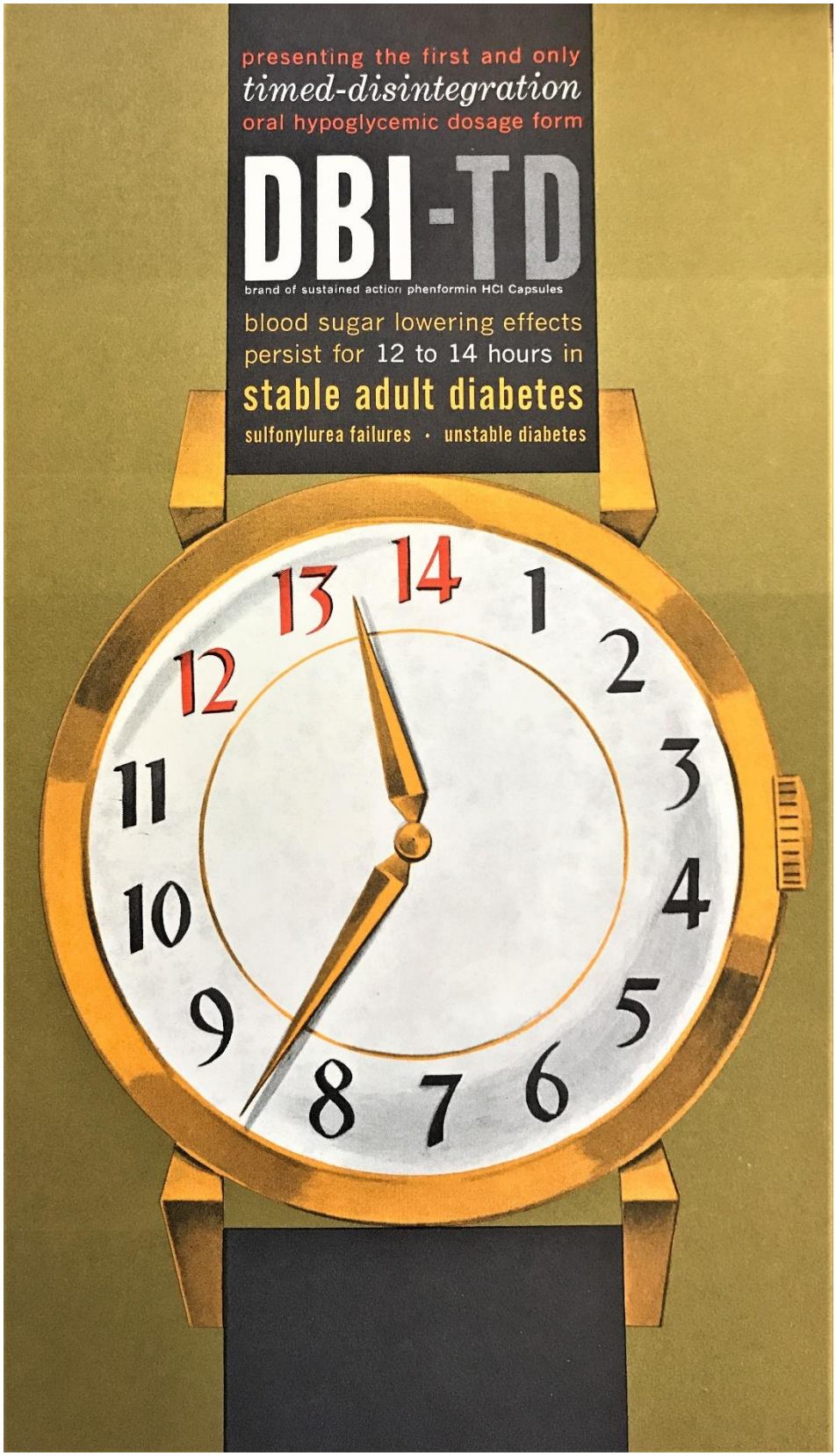
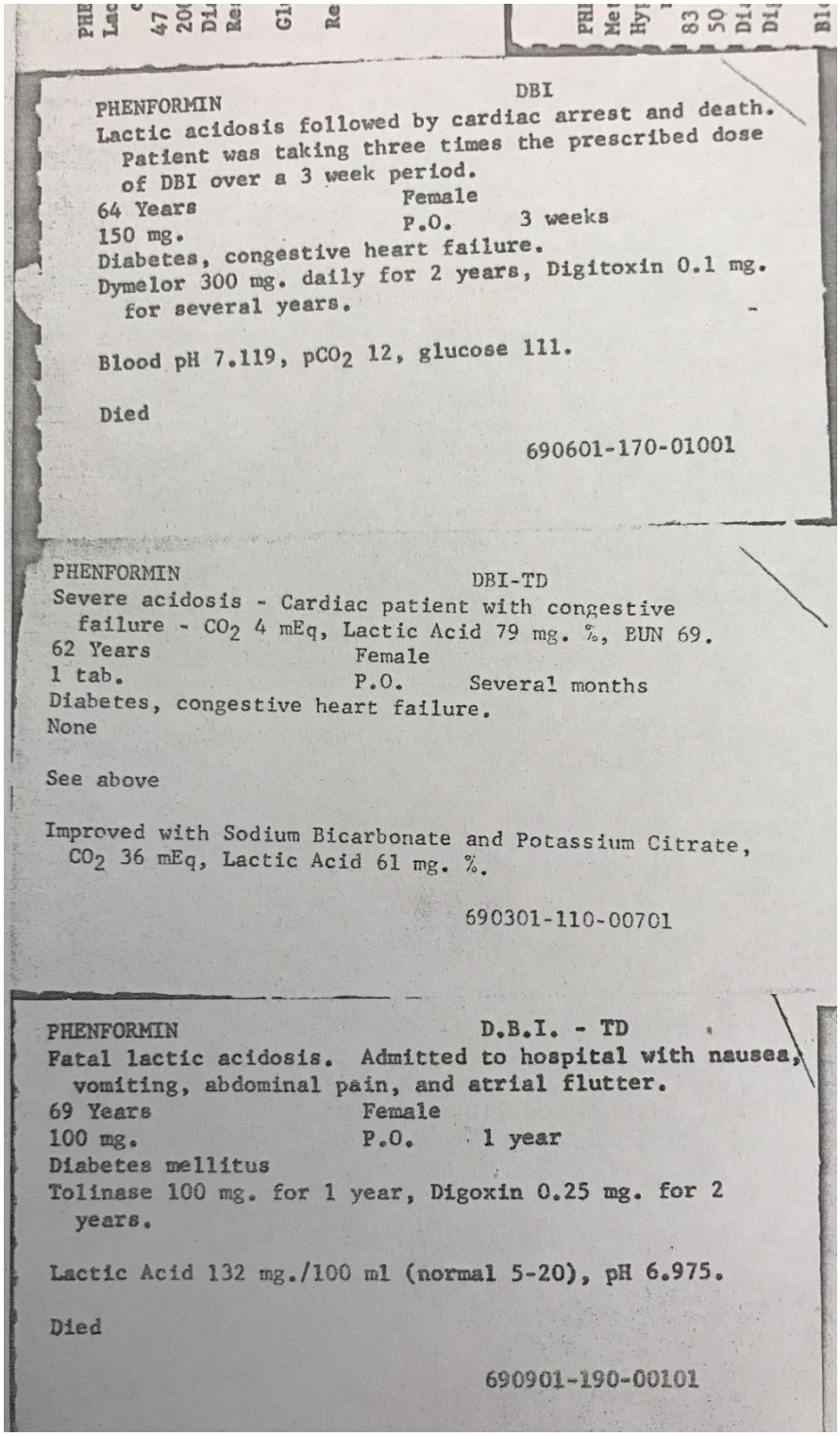


Figure 4.9: DBI-TD (advertisement (1971). [Courtesy of the Rockefeller Archive Centre]

In a new marketing campaign, the DBI-TD capsules were claimed to be a safer method of taking Phenformin while corresponding studies claimed to find no cases of toxic effects or gastrointestinal side effects. Conversely, a significant number of patients, almost twenty percent, had however developed anorexia and suffered extreme nausea.[375] While cases of untoward effects mounted over the late 1960s and early 1970s (Figure 3.3), Phenformin continued to be promoted for use in patients for whom diet and insulin had failed. Placing the decision to use the drug directly in the hands of physicians, one advert for Phenformin from 1971 rather vaguely explained: 'Let's say you've decided that diet, weight loss, and insulin won't work in your adult-onset diabetic. You're considering DBI-TD or a sulphonylurea. Which? For a new patient, it's your choice'.[376] While the DBI-TD campaign had largely reached out to working men in its marketing efforts, Geigy then shifted to targeting overweight women who, similar to Pfizer's Diabinese 'Transgressor' campaign, were presented as being dieting failures. In an era in which dietary advice was confusing, conflicted and often contradictory, Geigy played on the idea of an age-old audience of the unhappy housewife confined by her weight and unable to diet. This can be seen in an advert from 1971 which pictured a woman 'trapped in her own fat cells' with the words: 'If only she would diet, her blood sugar might come down' (Figure 3.2).[377] Yet despite these attempts to aggressively market Phenformin in a myriad of ways, reports continued to pour in, warning of its toxic and often fatal effects until eventually it was finally removed from the market in 1977 following formal FDA proceedings. What the case of Phenformin demonstrates then is that despite knowledge of toxic effects

[375] Ibid, p. 404.
[376] DBI-TD advert (1971), Rockefeller Archive Box 20, Folder 3 (891).

and the debate on oral agents which raged following the UGDP, an aggressive pursuit to find an effective pharmaceutical means of treating diabetes prevailed.



PHENFORMIN DBI
Lactic acidosis followed by cardiac arrest and death.
Patient was taking three times the prescribed dose of DBI over a 3 week period.
64 Years Female
150 mg. P.O. 3 weeks
Diabetes, congestive heart failure.
Dymelor 300 mg. daily for 2 years, Digitoxin 0.1 mg. for several years.

Blood pH 7.119, pCO_2 12, glucose 111.

Died

690601-170-01001

PHENFORMIN DBI-TD
Severe acidosis - Cardiac patient with congestive failure - CO_2 4 mEq, Lactic Acid 79 mg. %, BUN 69.
62 Years Female
1 tab. P.O. Several months
Diabetes, congestive heart failure.
None

See above

Improved with Sodium Bicarbonate and Potassium Citrate, CO_2 36 mEq, Lactic Acid 61 mg. %.

690301-110-00701

PHENFORMIN D.B.I. - TD
Fatal lactic acidosis. Admitted to hospital with nausea, vomiting, abdominal pain, and atrial flutter.
69 Years Female
100 mg. P.O. 1 year
Diabetes mellitus
Tolinase 100 mg. for 1 year, Digoxin 0.25 mg. for 2 years.

Lactic Acid 132 mg./100 ml (normal 5-20), pH 6.975.

Died

690901-190-00101

Figure 4.10: FDA abstracts of reports of Phenformin side effects (1969-70). [Courtesy of the Rockefeller Archive Centre].

Aftermath of the UGDP

In the existing literature on the development of oral anti-diabetic agents and the UGDP, historians have either focused on the way drugs are regulated, the role of clinical research centres such as the Joslin Clinic in providing support for the continued use of drugs like Orinase or have tended to present the history of oral hypoglycaemic drugs as a simple 'tablets at last' moment.[378] While Greene describes the uproar caused by the UGDP results he does so by narrowly focusing on the response of the 'Joslinites' in Boston, while others, such as Tattersall have simply noted how it left American physicians 'sharply polarised'. Nowhere in these existing accounts, however, is there an examination of the sections of the profession which supported the UGDP results and agreed that the use of oral hypoglycaemic drugs should be ceased. Moreover, histories of the UGDP and its legacy often lack a cross-cultural perspective, choosing to focus on diabetes care in the U.S and assume the tolbutamide debate played out similarly elsewhere. While those at the Joslin Clinic were mounting a concerted defence of the continued use of oral agents, going as far as to launch a publicity stunt to publicise their dissent at the extension of the UGDP's results into clinical practice, elsewhere a considerable portion of the medical profession, patients and the media were more willing to heed the UGDP's results and cautioned against the pharmaceutical management of diabetes.[379] Resistance to the continued use of oral agents particularly tolbutamide,

[378] H. Marks, *The Progress of Experiment*; J. Greene, *Prescribing by Numbers.* R. Tattersall, *Diabetes: The Biography*.

[379] Physicians of the Joslin Clinic, notably Robert Bradley, Holbrooke Seltzer and Peter Forsham, recruited 34 leading diabetologists from around the country to sign a statement dissenting from the ADA-FDA decision. The three, along with Cornell's Henry Dolger then held a press conference dubbed 'The Boston Tea Party' to publicise their discontent with federal interference into diabetes clinical practice. Shortly after the group named itself the Committee for the Care of the Diabetic (CDC) who were invited to negotiations with UGDP investigators and the FDA to discuss a potential

came most strongly from physicians at the *Medical Letter on Drugs and Therapeutics*, a respected, peer-reviewed pharmacology journal issued to physicians throughout the U.S which provided evaluations on new pharmaceuticals. Examining the review process of the *Medical Letter's* issue on tolbutamide following the provisional conclusions of the UGDP allows for a new perspective on the controversy, illuminating the heart of the debate through the hundreds of comments and responses to each draft and re-draft of the article by Harold Aaron. The aim of Aaron's article was to simply present the conclusions of the UGDP, that tolbutamide provided no advantage over diet alone in the absence of symptoms, that tolbutamide and other oral hypoglycaemic drugs should not be used simply because of mild elevation of blood sugar and glycosuria and that tolbutamide was associated with higher cardiovascular mortality than diet alone or diet with insulin.[380] While noting how the results of the UGDP had 'evoked an adverse response from many clinicians, on the grounds that it ran counter to their personal experience' with the drugs, consultants at the *Medical Letter*, including statisticians, carefully evaluated the complete report of the UGDP and could find no flaws in the study design, samples or analyses of the data. The *Medical Letter's* conclusion put forth in the article was thus:

> The increased mortality associated with Tolbutamide clearly demands a change in the present management of maturity-onset diabetes. The Medical Letter recommends that 1) when a patient remains symptom-free on diet alone this is the preferred treatment, even if it is associated with mild hyperglycaemia and glycosuria. There is no need to use tolbutamide to maintain the blood sugar in

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warning label for Orinase packaging. As Greene notes, this move and the CDC's dissent delayed the FDA decision to implement labelling changes by five years, taking negotiations all the way to the Senate. See Greene, *Prescribing by Numbers*, p. 130.

[380] H. Aaron, 'Diabetes Therapy: Tolbutamide (Orinase) and Diabetes', Consultants: MD Drafts, issue 310, 12:24 (1970), Rockefeller Archive Box 20, Folder 3 (891).

> the normal range in such patients in view of the increased cardiovascular mortality associated with its use. 2) It is not known that the other oral hypoglycaemic agents are safer; and 3) If a patient's diabetic symptoms cannot be controlled by diet alone, insulin should be used. An oral agent can be prescribed however, for patients who cannot or will not follow a strict diet and who cannot accept injections of insulin. Until the UGDP follow-up report on phenformin appears, that agent may be preferred to tolbutamide or other sulphonylureas.[381]

The responses to the *Medical Letter's* position on the study highlights just how divided American physicians were on the matter. That the *Medical Letter*, considered the mouthpiece on the use of pharmaceuticals for physicians across America, had sided so resolutely with the UGDP's findings and disparaged the use of oral agents, was met with some vehement responses. In a reply to the draft article from Charles Nechemias, then Chief of Mount Sinai Diabetes Clinic, Nechemias contests the *Medical Letter's* position entirely, calling the claim that tolbutamide was no more effective than diet alone 'palpable nonsense'.[382] Like those at the Joslin Clinic, Nechemias and his colleagues at Mount Sinai had been at the forefront of experimenting with oral agents since the mid-1950s. Consequently he shared in their criticisms of the UGDP, in particular the *Medical Letter's* implication that all oral agents be rejected on the basis of tolbutamide's apparent failure. Sharing these sentiments, physician Alvan Feinstein from Yale, commissioned by Upjohn to carry out an intensive analysis of the UGDP, went as far as to say that Upjohn had been the victims of a 'pharmaceutical witch-hunt conducted to mask scientific failure'.[383] Leading diabetologist Rachmiel Levine

[381] Ibid, p.5
[382] Charles Nechemias letter to Harold Aaron at the Medical Letter, 23 October 1970, Rockefeller Archive Box 20, Folder 3 (891).
[383] Letter from A. R. Feinstein to Harold Aaron at the Medical Letter, 3 November 1970, Rockefeller Archive, Box 20 Folder 3 (891).

similarly derided the sweeping condemnation of all anti-diabetic drugs. Having had close ties with the Joslin Clinic and experience of managing diabetes using diet, insulin and oral agents, Levine wrote to Aaron stating that he simply could not support the results nor their conclusion. In his defence of the continued use of tolbutamide, Levine cites 'unexplained circumstances' as having led to a wide difference in mortality between the twelve clinics used in the trial, claiming 'it was hazardous to receive tolbutamide but it was equally (if not more) hazardous to belong to the Minneapolis or Cincinnati clinics'.[384] Levine's comments here represents a commonly cited critique of the trial which saw fault in study design and patient selection. This view was promoted fervently by Upjohn's Chief of Professional Relations James O'Lawrence who maintained that the UGDP results were unreliable based on the fact the baseline health of participants was not assessed at the start of the study, suggesting that the tolbutamide group were simply sicker from the start. O'Lawrence argued that because the study was never established to consider cause-specific mortality, the tolbutamide link to deaths should be ignored.[385] In another response to the *Medical Letter's* position, Eli Lilly's director of communications urged Aaron to delay publication of the article until they could form their own opinion, and likely rebrand their own oral agents in line with the publication's comments.[386] Likewise, Pfizer responded with concerns regarding how the *Medical Letter's* position would harm its own product, Diabinese. In their response to the draft article, Pfizer representatives questioned

[384] Letter from Rachmiel Levine to Harold Aaron at the Medical Letter, 17 November 1970, Rockefeller Archive Box 20, Folder 3 (891).
[385] Upjohn Co. letter to Harold Aaron at the Medical Letter, 4 November 1970, Rockefeller Archive Box 20, Folder 3 (891).
[386] Letter from *Eli Lilly* to Harold Aaron at the *Medical Letter*, 20 October 1970, Rockefeller Archive Box 20 Folder 3 (891).

'the scientific validity of extrapolating the study's findings to Diabinese in view of the notable pharmacological differences between Diabinese and Orinase'.[387]

While this debate was ongoing, Upjohn frantically issued a telegram to physicians concerning the 'inaccurate press reports regarding Orinase' before issuing a press release on 23 October 1970 ahead of the *Medical Letter* report on tolbutamide being published. Upjohn hoped the statement would allay 'the fears caused by misleading reports' and, having by this point read the *Medical Letter's* statement, added that diet alone was the most desirable treatment if it can control the diabetes, but ultimately the choice over treatments should be the 'professional responsibility of the physician' based on the case of each individual patient.[388] In an attempt to alleviate the fears of patients and their physicians the statement further added that there was no plans by the FDA to remove Orinase from the market and that they did not endorse the implication that Orinase is a cause of heart disease.

By this point however the debate raging between those at the *Medical Letter* on the one hand and industry and physicians on the other had gone beyond a private internal dialogue and reached local and national news. An article in *The Washington Post* 'Doctors at Diabetes Centre Move to Refute NIH Study' described how doctors across eighteen diabetes centres had 'combed their records' in an attempt to 'counteract a government-financed study that showed long-term use of the most popular anti-diabetes pill does more harm than good…This action by doctors across the country reflects the refusal of many physicians to accept the study by 13 universities that showed a drug they rely on to treat diabetes has caused

[387] Letter from *Pfizer* to Harold Aaron at the *Medical Letter*, 6 November 1970, Rockefeller Archive Box 20 Folder 3 (891).
[388] Press release by Upjohn Co., 23 October 1970, Rockefeller Archive Box 20 Folder 3 (891).

as many as 8000 excess deaths a year'.[389] The article described how doctors refused to believe the statistics based on their own experience which differed so greatly from the results of the study, a view backed by both the ADA and BDA who stated the results did not warrant a halt in prescriptions of the drug. Later the same year *The Boston Herald* reported:

> The medical director of Boston's famed Joslin Clinic has sharply criticised an authoritative drug publication which recommends a 'marked reduction' in the use of a controversial antidiabetic agent.[390]

The article outlined the crux of the debate for its readers, detailing that what the debate boiled down to was the divide in opinion on how best to manage, or prevent diabetic complications. While Robert Bradley and those at the Joslin Clinic stood firmly in favour of controlling blood sugar by pharmaceutical means, those at the *Medical Letter* held that the UGDP results warranted a marked reduction in the use of oral hypoglycaemic drugs and that diabetes was better managed by diet alone.[391] The article described the verbal accusations from Bradley at the Joslin Clinic who accused the *Medical Letter* of being led by 'pre-existing bias regarding possible benefits of controlling asymptomatic hyperglycaemia' and that the *Medical Letter's* conclusions were merely 'climbing on the bandwagon' of critiques of the UGDP.[392] In a letter to the *Medical Letter* in 1974 however, Bradley clarified his more balanced position which explained his exasperation while inferring at a general lack of consensus within the Joslin Clinic. Writing to Harold Aaron he explained:

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[389] S. Auerbach, 'Doctors at Diabetes Centers Move to Refute NIH Study', *The Washington Post,* 11 July 1970, Rockefeller Archive , Box 20, Folder 3 (891).
[390] J. Langone, 'Joslin Clinic Official Hits Drug Publication', *The Boston Herald,* 21 December 1970, Joslin Diabetes Center.
[391] Ibid.
[392] Ibid.

> I honestly do not know nor am I convinced strongly one way or the other, that oral hypoglycaemic agents pose a significant cardiovascular hazard to patients with adult-onset diabetes. I am responding as an individual in my role here at the Joslin Clinic and not as the Chairman of the Committee on the Care of the Diabetic. Frankly, I believe the Medical Letter can and should do more to guide physicians rather than merely fan the flames of old controversies. If anything, these recent controversies may have blunted the efforts of good scientists to keep physicians from carelessly prescribing and maintaining oral hypoglycaemic agent therapy. I think it is time to come down hard on the issue as I have tried to outline it above, so that physicians will look harder at their objectives in prescribing oral agents. Hopefully this will lead them to delay longer before they give up on dietary trial, evaluate response to oral agents by means of blood sugar determination, and in every patient consider discontinuing oral hypo agents if response is inadequate or is subsequently lost. For those who are not at all convinced of the need to lower blood glucose levels in asymptomatic individuals, it should then be made clear that there are no benefit in the use of these drugs. The symptomatic diabetic not responding to diet rarely responds to sulphonylureas and/or phenformin.[393]

Despite receiving such a wave of opposition however, physicians at the *Medical Letter* stood by their original statement and when the article finally reached publication, their position on the importance of diet as the principle method of treatment and warning against the use of oral hypoglycaemic drugs remained. Those at the *Medical Letter* were not the only ones concerned about the drugs. An increasing number of reports and clinical alerts began to appear that raised concerns about tolbutamide's side effects and urged physicians to keep in mind that oral agents should be secondary to diet and insulin.[394] In a letter to Paul Lavietes at the *Medical Letter*, a concerned physician from Cleveland wrote how:

> I am greatly concerned about the action, or rather inaction, of the FDA regarding the labelling for Orinase. The pressure of the drug

[393] Letter from Robert Bradley to the Medical Letter, 15 August 1974, Rockefeller Archive Box 311, Folder 10.
[394] 'Clini-alert', *Science Editors*, 2 October 1970; 'Council urges Tolbutamide curb', *American Medical News*, 2 November 1970, Rockefeller Archive Box 20, Folder 3 (891).

> companies and clinicians like the Joslinites has apparently been effective in delaying and weakening the change in labelling.[395]

By the mid-1970s, reports were also beginning to appear in the media which reflected the unease at the rate at which tolbutamide and other diabetic medications were being prescribed. As an article which appeared in the *Boston Herald* reported:

> We are all witness these days to one of the most infuriating situations in modern medical practice. And many of us may well become its victims. The case in point concerns the stubborn refusal of many physicians to stop or cut back on their prescriptions of certain oral, antidiabetic medicines, until they see incontrovertible proof that these drugs might hurt someone. This attitude persists despite considerable circumstantial evidence that users of these drugs have a significantly higher death rate than diabetics who don't use them.[396]

The article warned that for diabetes specialists and family doctors alike, the drugs had become an easy-to-prescribe staple in their therapeutic cupboards, particularly for elderly and mild patients for whom 'a proper diet that they can understand and adhere to is the only necessary treatment'.[397] Ultimately the article decried the over-prescription of anti-diabetic drugs and argued that the physician's time would be better invested in constructing and explaining an appropriate diet prescription to their patient rather than a quick prescription of potent and potentially dangerous drugs.[398] Unsurprisingly, patients also expressed their concerns about continuing with their prescriptions. Between the 20th October and the 12th November 1975, the FDA received more than two hundred letters from anxious patients and family members of those whom had died of heart disease while taking oral hypoglycaemic

[395] Letter to Paul Lavietes from Ohio physician, Rockefeller Archive Box 20, Folder 3 (891).
[396] J. Rodgers, 'Doctors, patients 'in middle' in row over anti-diabetic medicines', *The Boston Herald*, 26 October 1975, Joslin Diabetes Center.
[397] Ibid.
[398] Ibid.

medication.[399] Notwithstanding such unwavering support for oral agents, by 1970 even Joslin himself remained devoted to traditional treatments of diet and insulin. In an article published in 1971, Joslin warned that despite other advances, insulin and diet were still the safest methods of treatment:

> For some people, the pills works quite well. Other patients, possessing great willpower and self-control, are able to handle their condition by diet alone. But if you want to be absolutely sure – insulin is the safest.[400]

British Diabetic Management and Response to the UGDP

In the existing literature, accounts of the development of oral agents for diabetes primarily account for the North American experience of the new drugs and responses to the tolbutamide debate within the United States. Yet the wider impact of the UGDP debate and how physicians and diabetes specialists responded to its conclusions elsewhere has yet to be assessed. In Britain, archival sources suggest that on the whole the results of the UGDP were disregarded and similarly to the United States, anti-diabetic drugs continued to be prescribed during and after the trial. Experimentation with oral agents in Britain from the 1950s can be assessed by looking at the case notes of prominent British diabetes specialists, their correspondence and published medical literature. The case notes of the British diabetes expert Joan Walker, founder of the first diabetic clinic in Britain and leading diabetes specialist in Britain at the time provides a rich collection of first-hand experience with the new drugs and the role they came to play in British

[399] Greene, *Prescribing by Numbers*, p. 141.
[400] 'Dr Joslin Warns: Despite other advances, insulin still safest', *The Boston Daily Advertiser*, 8th August 1971, Joslin Diabetes Center.

diabetes management. In correspondence with a colleague, dated 25 February 1963, three years into the UGDP trial, Walker writes of one of her patients who had been admitted to the Leicester Royal Infirmary, describing his state as one of 'recurrent hypoglycaemic attacks and his general condition very poor'.[401] Having been diagnosed in 1953 aged thirty-nine Walker had placed him on insulin but after ten years of hypoglycaemic attacks, she described how 'An attempt was made on one occasion to take him off insulin and put him onto tolbutamide, but immediately his blood sugars rose and he felt very ill'.[402] The patient's notes indicate that he died suddenly two weeks after his admission to hospital. In the letter Dr Walker appears confused as to the death of her patient, explaining 'It is rather difficult, even now, to fit the whole case together'.[403]

Experimentation with the use of oral hypoglycaemic agents, particularly with dosage, can be detected in many of the case notes. In a subsequent file, from one of her patients, Robert, a farmer from Devon, dated February 27th 1970, Walker writes:

> Early treatment was by diet alone but soon increased and Chlorpropamide as Diabenese 250mgm, was prescribed. The patient understands from his own experience, that intercurrent illness, trauma or anxiety increases his glycosuria. This occurred when he was admitted to hospital 18 months ago for multiple fractured ribs. Recently his diabetic control has been impaired and this may have been associated with a cold. He had increased the number of Diabenese tablets taken up to as much as six a day. Epigastric pain and nausea followed and was not relieved until he reduced the

[401] Patient case notes on James Fitzgerald, 'Case Histories of Certain Diabetics, 1945-1970' - MS lettered folders containing correspondence (Bay 27, shelf 9), Joan Walker Collection.
[402] Ibid.
[403] Ibid.

> Diabenese to 2 tablets in the 24 hours. He was surprised to find that on the lower dosage his glycosuria diminished.[404]

After some rumination Walker later noted:

> Oral hypoglycaemic drugs seem to have a threshold for their action and beyond this dose no further reduction in blood sugar will occur. They then cause symptoms of intolerance such as epigastric pain. I would think that 250mgm Chlorpropamide after breakfast and a careful diet should be satisfactory here.[405]

In another of Walker's patient case notes, she describes her experience of an elderly patient named Arthur. In the file she describes his initial treatment as diet alone, however complications began soon after, noting 'in 1956 a gross oedema of the ankles, March 1956 a perforated ulcer under his toe and in April 1956 severe back pain'.[406] Walker wrote of his deteriorating condition:

> He kept at work regularly but at times he felt well and at other times complained of severe back pain. Diuretics and the oral hypoglycaemic agent carbutamide were used…Admitted in May 1961 on account of congestive cardiac failure…August 1962, proteinuria first noted. Subsequently admitted twice more with hypoglycaemia, heart failure and sudden death.[407]

While the case is described here in association with a pituitary tumour, Walker ultimately concludes that the cause of death was multifactorial:

> In my opinion death was due to bronchopneumonia; myocardial ischaemia and arteriosclerosis; diabetes mellitus and pituitary tumour. Retinal and cardiorenal failures developed after eleven years duration of diabetes only partially controlled by diet and oral hypoglycaemic drugs…this was followed by a phase of insulin

[404] Patient case notes of Robert Dowell, 'Case Histories of Certain Diabetics, 1945-1970' - MS lettered folders containing correspondence (Bay 27, shelf 9), Joan Walker Collection.
[405] Ibid.
[406] Patient notes on Arthur Oldham, 'Case Histories of Certain Diabetics, 1945-1970' - MS lettered folders containing correspondence (Bay 27, shelf 9), Joan Walker Collection.
[407] Ibid.

> resistance and large doses of insulin were required…attempts to use steroids caused vomiting and further loss of control.[408]

Patient case notes taken by health visitors during this time provide further evidence of the continued use of tolbutamide and other oral agents during the period of the UGDP trial. As one of Walker's health visitors working in the Leicester area of England in the 1950s and 1960s wrote in her diary:

> In June, 1959, when 74 years of age, Mrs G was referred to the diabetic clinic with a history of thirst, polyuria and fatigue, but for over six months she had been subject to attacks of vertigo and falling – symptoms which are more common in undiagnosed diabetics than usually realised. Her mother had probably died of diabetes at the age of 50. This patient was small – she was only 4ft 7 and 7stone 2lb in weight. An unsuspected carcinoma of the right breast was found with a mass of involved oxillary glands. In consultation, it was decided to treat her by stilboestrol and tolbutamide, but vomiting ensued, which necessitated admission and she settled well on dinoestrol and insulin…she died two and a half years later[409]

Additionally, oral testimonies conducted with PWD diagnosed with diabetes around the time the first oral agents became available further demonstrate the experimental nature of their prescription. George Saunders from Birmingham, diagnosed with T2D in 1964 recalled:

> Not at the time, they didn't tell me the type of diabetes. They put me on some tablets for a few months and asked me to come back to see them, which then I did do, and when I went back to see them, they increased the tablets. And after another six months or so I went back to see them again, and there and then it seem as though the diabetes wasn't being settling down properly, so therefore they introduced me to insulin.[410]

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[408] Ibid.
[409] Patient case notes of 'Mrs G', 'Case Histories of Certain Diabetics, 1945-1970' - MS lettered folders containing correspondence (Bay 27, shelf 9), Joan Walker Collection.
[410] G. Saunders, Interview, 14 May 2004, British Library, C1239/06.

Colin Gates from Surrey, diagnosed in 1979 recalled a similar experience with oral medication:

> From day one that I was told I was diabetic, they put me on one tablet per day, which was no... seems to be not much bigger than a pin head. And I sometimes make meself look a fool on these names, but I think they called it a Glibenclamide, or something like that - all the medical people will laugh now - but it was very, very tiny and I just had to take one a day. And I took this for quite some time - I can't remember exactly - on its own. But, after further check-ups, after some time had gone by, they said this wasn't quite doing the trick, so we had to take an extra one a day - one in the morning, one in the evening; same tablet, but twice. And then, after a course of time, it didn't seem to be getting to grips with it. Me readings weren't coming down as low as they'd hope, so they said 'take two little ones in the morning and one at night'. And this process went on months in and month out, so, you know, I could tell I was getting proper treatment; they was looking after me serious enough. But me blood sugar levels just wasn't behaving, so they put me down, then, to two little ones in the morning, two at night. And the story went on and on, and still it kept slightly rising. So, then I came to an extra big one, besides all the two little ones in the morning and two in the evening, one big one - big one being called Metformin. And then this had to increase again to one big with the two little ones in the morning and the same again in the evening. And then came the day - this was the end of '93. I started tablets, one a day, in '79, tablets going on till the end of '93 - so they decided in February '94, how did I feel about having an injection? And, I must admit, it sort of threw me back a bit. I thought 'injections'... I wasn't too... I think it was mind over matter, really. I think it sounded worse than it was going to be. And they said 'well, these tablets are just not controlling your diabetes, and it's important that we get it controlled'. And, of course, I found out since, control is the essence. So, I said 'well, I'm willing to give it a go'. You're not cheating on anybody; you're cheating on yourself if you cheat. And I said 'well, we'll give it a go', and they said 'well, let's give it a try'.[411]

What can be inferred from these patient case files and oral testimonies is a sense of uncertainty surrounding the use of oral hypoglycaemic drugs and their efficiency, both during the period of the trial and continuing into the 1970s. The futility of

[411] C. Gates, Interview, 13 May 2005, British Library, C1239/47.

oral anti-diabetic agents, which was occasionally fatal, moreover refutes the idea that the oral agents were 'wonder drugs' that made treatment much simpler and easier for the diabetic patient, as was portrayed by the drugs manufacturers. Rather, what is evident here is that the treatment of diabetes remained a complex terrain and physicians in Britain, grappling with increasing diabetes diagnoses, often prescribed them without absolute certainty of their safety and effectiveness. Scottish physician and pharmacologist Derrick Dunlop was one the most prominent voices on the over-prescription of drugs in Britain during the 1960s. Dunlop warned that while the establishment of the NHS in 1948 was 'a social advance of great magnitude', eliminating the financial barrier between the physician and the patient, it could not solve all of society's problems.[412] Chiefly, he was concerned that it had encouraged over-prescribing and vastly increased the national drug bill. In an article on the over-prescription of drugs from 1969 Dunlop laid out a number of factors which he believed had led to the over-prescribing of medicines being 'rife in my country as I believe it all over the civilised world':

> Firstly, there are the insistent demands of the public whose insatiable desire to take medicine is the chief thing which differentiates man from the lower animals. While it takes a long time to elicit a careful clinical history, to perform a thorough physical examination and to give wise advice, it only takes a moment to write a prescription, and this does please and often satisfy the patient (even if it does not do too much). Faced with fantastically over-crowded offices in practice or out-patient clinics is all we have, then over-prescribing results.[413]

For Dunlop then, the place of oral agents in the management of diabetes was limited. Reflecting a similar outlook as those in the U.S who struggled to see their

[412] D. Dunlop, 'Drug Control and the British Health Service', *Annals of Internal Medicine*, 71:2 (1969), pp. 237-244.
[413] D. Dunlop, Draft article on the over-prescription of drugs, Dunlop Papers, Lothian Health Archive, GD4/95.

merit, especially with evidence of harm, Dunlop maintained that for mild, adult-onset cases of diabetes whom were overweight, dietary restriction was sufficient, arguing that to treat these cases even with insulin would only increase their weight further.[414]

Yet in spite of these corners of the profession who were wary about the increasing overuse of oral medications in diabetes, ultimately the official line on the use of drugs was to carry on prescribing them. In 1970, the British Diabetic Association (formerly the Diabetic Association), released an official press release on its position on the UGDP:

> The British Diabetic Association wishes to reassure diabetics in the United Kingdom about the results of the United States University Medical School's trials of tolbutamide. We are very grateful to our American colleagues for sending us advance detailed information of their results, and we certainly support their move to set up a special committee of enquiry. However, the patients involved in the trials should not be regarded as representative of the British diabetic population and it is, moreover, clear that the results vary considerably between the different United States centres so there is, not surprisingly, a divergence of American opinion on this matter. Trials in Britain since the 1962 Bedford survey, and in Scandinavia, come to quite different conclusions and indicate that tolbutamide protects against vascular complications in mild diabetes. Diabetics taking Rastinon and Artosin tablets are advised to continue their treatment without alteration.[415]

In Britain then, the BDA's position on the UGDP results offered a clear and outright rejection of the study's findings, accordingly, patients were advised to continue their prescriptions of tolbutamide and other oral agents. A number of British physicians shared the Joslin Clinic's disdain for the UGDP conclusions, reflected in responses sent to the *Medical Letter's* statement examined earlier.

[414] D. Dunlop, 'Clinical Use of Oral Hypoglycaemic Agents', *Clinical Endocrinology*, 1 (1960), Lothian Health Archive GD4/1/149.
[415] UGDP Press Release, *British Diabetic Association*, 2 November 1970, Rockefeller Archive Box 20, Folder 3 (891). Rastinon and Artosin were the British tradenames for Tolbutamide/Orinase.

Harry Keen, one of the chief investigators of the Bedford Diabetes Study in 1962, wrote to Aaron and his colleagues with a particularly scathing response, describing the *Medical Letter's* statement on the UGDP as 'a most biased and partisan presentation of the situation with regard to tolbutamide'.[416] Keen lamented his disappointment with the publication stating:

> I would like to make it clear that although, obviously, my personal feelings are somewhat ruffled by this account of yours, I am most seriously concerned about what I consider to be a most unbalanced statement of opinion in what I understand to be a fair and reputable organ.[417]

Though it is clear that British diabetes specialists were 'ruffled' by the UGDP's conclusions and its implication for one of their most prescribed drugs, the BDA's decision to ignore the study's results allowed physicians to retain tolbutamide in their therapeutic arsenal. The hesitancy among Aaron and other opponents of tolbutamide's continued use makes sense given the UGDP's results, but why the profession and regulatory bodies were not more concerned as a whole is surprising, particularly given the UGDP's proximity to the thalidomide tragedy in the 1950s. Historians John Abraham and Courtney Davis explain that 'contrary to public expectation and perception' the aftermath of thalidomide did not give rise to the level of strident drug control and safety standards that would be expected.[418] Rather, 'there existed a culture of reluctant regulation that was characterised by continued optimism about, and trust in the purported benefits of new drugs'. In Britain in particular, a commitment to protecting the pharmaceutical industry and

[416] Letter from Harry Keen to Harold Aaron, 23 October 1970, Rockefeller Archive Box 20 Folder 3 (891).
[417] Ibid.
[418] J. Abraham and C. Davis, 'Testing Times: The emergence of the Pactolol disaster and its challenge to British drug regulation in the modern period', *Social History of Medicine*, 19:1 (2006), pp. 127-47.

its support for the medical profession, allowed new drugs to enter the market, despite regulators being aware of uncertainty about their safety. This confliction of industry interests as outlined but Abraham and Davis can perhaps explain why, particularly in Britain, many supported the continued used of tolbutamide despite evidence of harm.

Moreover, it is likely that there was less concern regarding the UGDP in Britain because unlike in the United States, metformin (Glucophage) was also available. Now the primary oral diabetic treatment worldwide, metformin was available in Britain since 1958 and unlike phenformin and tolbutamide had proven to be better tolerated with more tolerable side effects.[419] Despite studies from the early to mid-1960s that had demonstrated that metformin carried considerably less risk and side effects than its rivals, it was not approved for use in the United States until 1994.[420] What is interesting about Metformin however, given the context of the failure of other oral agents and a trial that had shown drugs were no better than diet alone, metformin was marketed as a drug 'for patients who have received no previous treatment' at all.[421] Consequently, metformin encouraged the utilisation of drugs as a first line therapy before trialling the patient with diet, which alongside further developments, as will become evident in the remainder of the thesis, would soon

[419] 'Some notes on the differences between Phenformin and Metformin', (1967), Joan Walker Collection (GLU/33)
[420] B. Gottlieb, 'Metformin in Treatment of Diabetes Mellitus', *BMJ*, 1:5279 (1962), p. 680; B. Clarke et al, 'Combined Metformin-Chlorpropamide Therapy in Diabetic Sulphonylurea Failures', *The Lancet*, 285:7398 (1965), pp. 1248-1251.
[421] Glucophage (metformin): The Oral Anti-Diabetic Diguanide,(Rona Laboratories: London, 1958), Joan Walker Collection GLU/33.

form the basis of the contemporary management of diabetes, much to the detriment of diet.[422]

Conclusion

As the tolbutamide controversy unfolded over the course of the 1970s it came to involve a set of congressional hearings, an FBI investigation and a court ruling which went all the way to the Supreme Court.[423] One of the most heated and drawn out conflicts in the history of medicine, the debate over the use over tolbutamide lasted until 1984 and never truly reached a resolution. The nearest the debate got to a conclusion came in 1974 when the ADA concluded that the UGDP *had* demonstrated that blood sugar ought to be controlled in order to avoid future complications, but failed to provide a conclusive statement on whether antidiabetic drugs generally should continue to be prescribed.[424] In Britain, the BDA was significantly less compromised by the UGDP's findings having a much wider range of drugs available which were safer and more effective than tolbutamide and thus decided the drugs could still be taken. By the time the ADA and FDA confirmed that tolbutamide was harmful, its patent had expired and a new generation of antidiabetic drugs had been developed which quickly took its place.[425]

As this chapter has demonstrated through a thorough examination of industry marketing, correspondence and medical literature, a determined perseverance to

[422] As chapter seven demonstrates through the use of oral testimonies, none of the participants interviewed for this research had received formal dietary education or advice and the majority recalled metformin being prescribed at their first appointment/diagnosis.
[423] Greene, *Prescribing by Numbers*, p. 117.
[424] R. F. Bradley, H. Dolger, and P. H. Forsham, 'Settling the UGDP Controversy?', *JAMA*, 232:8 (1975), pp. 813-817.
[425] While tolbutmiade was on trial Upjohn released Tolanase which was also being marketed for use in maturity-onset diabetes. Much like metformin it was targeted at recently diagnosed, previously untreated patients. For a full list of the second generation of drugs approved by the FDA in 1984 see 'Joslin Special Report on Type 2 Diabetes', Fall 1986, Joslin Diabetes Centre.

control diabetes through pharmaceutical means occurred throughout the 1950s to 1970s even if the drugs were not always effective or safe. Yet, this chapter has challenged the notion that the development and use of oral hypoglycaemic drugs represents a neat tale of medicalisation; to do so overestimates the influence of the pharmaceutical industry and suggests a consensus among the profession that the oral agents were necessary and were superior to dietary methods. Rather, this chapter has demonstrated, through an examination of physician, industry and media responses of the UGDP, that the history of the use of oral anti-diabetic drugs was complex. Rather than comprising a concerted strategy, the increasing use of drugs, particularly in mild or asymptomatic patients, was turbulent, highly divisive, and met with resistance in surprising corners of the medical profession.

The trial and the controversy it generated have influenced medical practice to this day and both scholars and physicians alike continue to debate its legacy.[426] For Greene, since Orinase was eventually replaced by newer generations of oral antidiabetic agents, the issue has become largely irrelevant. However, as this thesis attests, in terms of prevention efforts and the rise of diabetes globally, the history of oral diabetic drugs and how they came to be the principal method of treatment, is more relevant now than ever. After the Second World War, when interest in chronic disease mounted, the overall feeling was that the basic approach to chronic disease must be preventative. Out of these discussions however, was a form of primary prevention which targeted the individual and individual behaviour change and failed to come up with the means of prevention which targeted the social

[426] T. B. Schwartz and C. L. Meinert,'The UGDP Controversy: Thirty-four years of contentious ambiguity laid to rest', *Perspectives in Biology and Medicine*, 47:4 (2004), pp. 564-74; M. N. Feinglos,'Therapy of Type 2 Diabetes, Cardiovascular Death, and the UGDP', *American Heart Journal*, 138:5 (1999), pp. 346-352.

causes of diabetes. Within a context of pharmaceutical growth and expansion, the focus of primary prevention was lost and measures which allowed for secondary prevention through pharmaceutical means appeared more achievable. In the field of diabetes management this saw prevention take the form of warding off diabetic complications with new drugs. Ultimately, a focus on the pharmaceutical treatment of diabetes placed a heavy emphasis on biological understandings of diabetes rather than those known to be social or environmental, as will be examined in the next chapter.

As this thesis argues, three significant post-war developments coalesced to thwart primary prevention efforts and minimise the role of diet in diabetes, this chapter has described the first of these developments, the discovery of oral diabetic drugs. While oral drugs for diabetes were intended as a treatment of last resort, a number of wider factors occurred simultaneously which created a context which facilitated greater use of antidiabetic drugs despite evidence suggesting they were ineffective, and in many cases harmful. It is to these two developments that this thesis shall now turn. The first of these considers the emergence of population screening for diabetes and the move towards identifying 'hidden' asymptomatic diabetes among the population and an emphasis on genetic risk. The second considers the nutritional debate between dietary fat and sugar and the major reversal of dietary guidelines for diabetes. Together with this chapter on the development of anti-diabetic drugs, this section of the thesis ties together both the fate of post-war prevention and diet therapy in the context of an increasing reliance on drugs.

Chapter Five

Prevention through Detection: Population Screening and the Search for the 'Hidden Million'

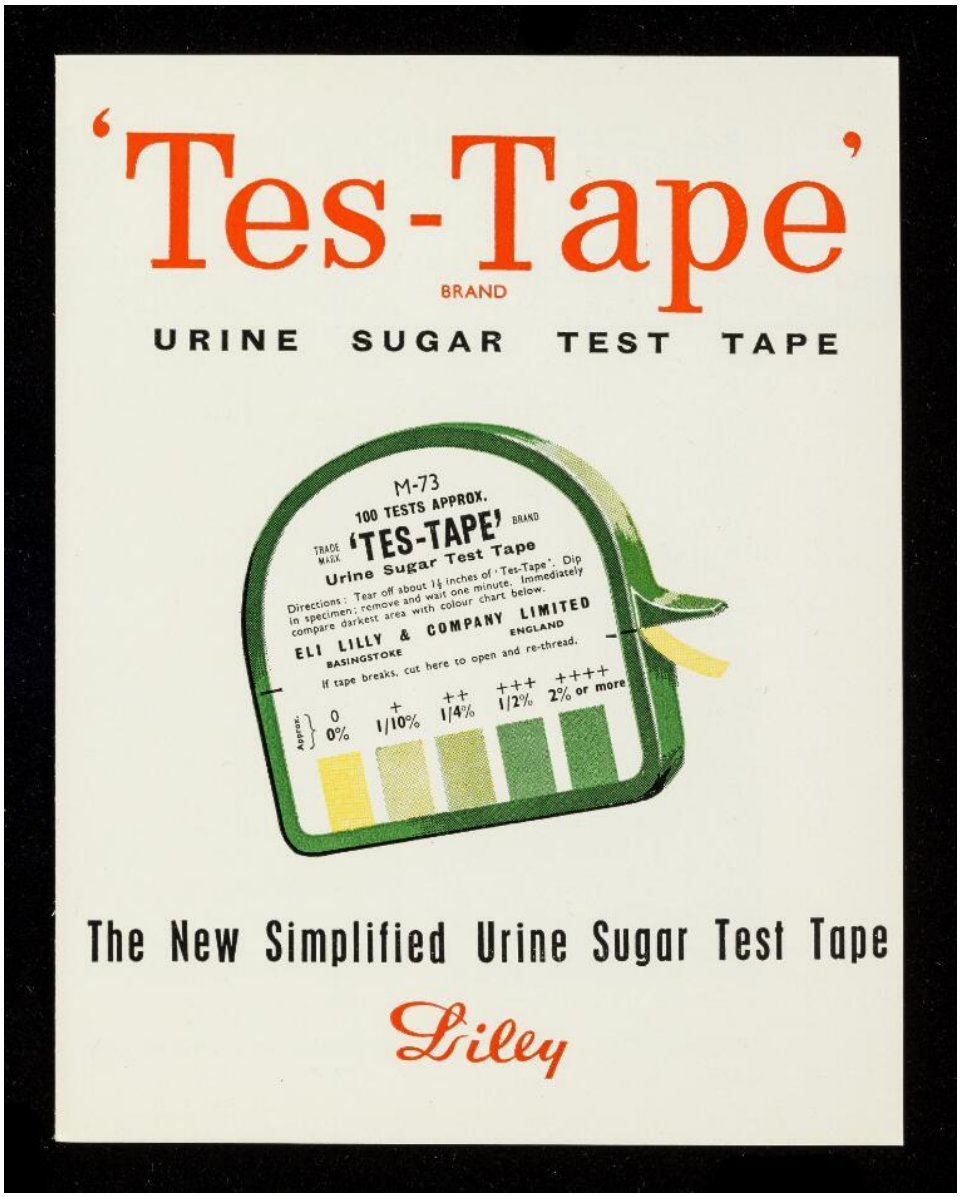

Figure 5.1: 'Tes-Tape' urine sugar analysis tape, Eli Lilly and Company (1963). [Courtesy of Wellcome Images].

Introduction

By the end of the Second World War a clear tension had arisen between the relaxation of former dietary ideals on the one hand, and evidence which seemed to suggest that moderation in eating was the greatest aid in preventing diabetes altogether. Statistics published towards the end of the war had indicated that rationing had inadvertently halted the pre-war trend of rising diabetes mortality, leading to the assumption that overeating, and attendant obesity, constituted the prime factors in the causation of the disease.[427] Consequently, the decline in diabetes incidence and mortality during the war raised concerns about protective measures in diabetes and stimulated somewhat dormant discussions regarding prevention. At the forefront of this debates was American physician and member of the ADA, Dr Henry John, who called upon the profession to pay greater attention to the potential of prevention, not only in terms of preventing later complications but in the primary prevention of the disease. In his presentation at the Annual Meeting of the Ohio State Medical Association in Cleveland in 1947, John remarked how:

> Moderation in eating is a great aid in preventing diabetes, and conversely, overeating and its attendant obesity constitute prime factors in the causation of the disease. Clinical findings reveal that an exceedingly high percentage of diabetic patients are overweight, not only at the time they are first seen, but especially before that, when there were no symptoms of diabetes. Often moderation in

[427] Mortality statistics provided in the records of the Registrar-General for England and Wales for the years 1936-9 indicate that while insulin had markedly decreased the death rate of younger diabetes, for those aged forty-five and over the death remained constant, or in the case of the over sixty-five age bracket, continued to increase as it had done in the pre-insulin period. What this arguably demonstrates is that in the years leading up to the Second World War death rates of those with noninsulin-dependent diabetes, what we know today as Type 2, were increasing. However, wartime reports and statistics suggest that rationing had a significant impact on diabetes and appears to have interrupted this trend. The years 1940-41 witnessed a sharp fall in diabetes deaths for both males and females over the age of forty-five, approximately a year or two since the commencement of rationing. See P. Stocks, 'Diabetes mortality in 1861-1942 and some of the factors affecting it', *Epidemiology and Infection*, 43:4 (1944), p. 242.

> eating, causing weight reduction, leads to a remarkable improvement in insulinogenic function. In this connection, it is interesting to note the effect of war on diabetes. Statistics in both world wars show that the incidence and mortality from diabetes dropped conspicuously during the war years and for a year or two afterward, with a subsequent rise. This simply means that the scarcity of food during the war automatically led to a restricted diet for the population generally, which protected many so called pre-diabetics sufficiently that they did not develop the disease.[428]

In an address before the Royal Society of Medicine in 1948, British scientist Harold Himsworth, like John, called attention to the wartime decline in diabetes incidence and mortality, and the importance of rationing and changes to the national diet. According to Himsworth the remarkable correlation between the death rate from diabetes and the composition of the national diet provided a more plausible explanation for the decline in cases than did heredity. According to Himsworth, changes to the national diet had prevented diabetes from developing in those who, in his opinion, would have had likely developed diabetes, had their diet not been restricted due to rationing:

> It seems reasonable to suppose that if such patients had never become obese they would not have developed diabetes, accordingly it was food rationing , by reducing the weight of, and by preventing obesity in potential diabetics, that inadvertently reduced the incidence of diabetes in general in the country.[429]

The impact of war on diabetes incidence and mortality had therefore prompted a greater consideration of primary prevention in diabetes, drawing attention in particular to the benefits of a restricted diet in preventing adult-onset diabetes. While genetic discourses and the idea of hereditary predisposition had convinced early twentieth-century specialists that the development of diabetes in family members

[428] H. John, 'The Diabetic Patient', Presented at the Annual Meeting of Ohio State Medical Association at Cleveland, Ohio, (May, 1947), courtesy of the Joan Walker Collection, GB 338 MS238.
[429] H. Himsworth, in F. G. Young and K. C. Richardson 'Discussion on the Cause of Diabetes', *Proceedings of the Royal Society of Medicine*, 321 (1948), p. 330.

was somewhat inevitable, the wartime decline in diabetes and its complications during a period of food restrictions led a number of physicians to believe that much could be done to prevent, or at least postpone, the onset of diabetes in susceptible individuals. By the end of the war and beginning of the 1950s, then, prevention of complications through moderation in eating and weight loss became a key focus in diabetes management, leading influential sections of the profession such as John, Himsworth and others to believe that if only the nation's diet could be regulated, then there would be no need for medical intervention. Discussing the treatment of diabetes by diet in 1947, John upheld that:

> Many patients can be treated by diet alone; in fact all patients can be treated by diet alone…the mild diabetic, the old person, the arteriosclerotic diabetic can often be managed on a mildly restricted diet alone. If so, then all is well and we can proceed along those lines and with a periodic check-up make sure that he is controlled on such a routine. If he can be, then this is the easiest way out of the difficulty.[430]

While those who advocated the dietary management of diabetes remained clear that a cure for diabetes had yet to be developed, the war years provided evidence that controlling the condition through a moderate diet and weight loss was the key to prevention. Complementing the previous discussion of the development of oral antidiabetic drugs, the following chapter examines the historical developments which shaped understandings of diabetes and its management in the post-war period, in particular, the fate of the post-war interest in diet and primary prevention outlined above. Specifically, the chapter explores the history of population screening for diabetes and the role of detection studies carried out in the U.S and Britain in the late 1950s and 1960s in shaping aetiologies of diabetes and how it should be treated.

[430] Ibid, p. 38.

Alongside the discovery and utilisation of the new oral drugs, this chapter demonstrates that the roll-out of mass screening campaigns and, crucially, the focus that they placed on familial risk and genetics, played a key role in generating support for the pharmaceutical management of diabetes, further relegating diet therapy to a minor key in the post-war decades. Coinciding with the availability of the new oral anti-diabetic drugs, detection campaigns for diabetes aimed to uncover 'hidden diabetics' among the population. Originating in the 1930's debate regarding complications, the search for hidden diabetes stemmed from the belief among certain parts of the profession in a 'pre-diabetic' state that, if treated early enough with the new oral agents, could halt the progression of the disease from developing into its symptomatic state.[431] While existing histories of this period, notably Greene, have correlated these twin developments as an attempt by industry to expand the market for the new oral agents, this chapter focuses instead on what the renewed interest in genetics, which accompanied detection campaigns, meant for holistic aetiologies and traditional treatments like diet therapy in the subsequent decades. Tracing the history of screening for diabetes from the late 1950's onwards, the following chapter examines the key historical figures in Britain and the U.S. who orchestrated detection campaigns and the principles that guided their efforts. With a key focus on aetiology, this chapter considers the role of diabetes detection campaigns in shifting understandings of diabetes from the psychosocial explanations present in the first half of the twentieth century, towards a firmly biomedical approach in which heredity resurfaced as the most viable explanation behind the rise in new cases. Examining the history of screening campaigns and the shifts in theories of aetiology

[431] M. Moore, 'Food as Medicine: Diet, Diabetes Management, and the Patient in Twentieth Century Britain', *History of Medicine and Allied Sciences*, 73:2 (2018), pp. 150-167.

which accompanied them, ultimately provides a new lens through which to better understand the transformation of diabetes in this period into a typically genetic disease, one which was paired with pharmaceutical interventions as the most effective form of management.

The history of screening and its development in the post-war years is, as Morabia and Zhang identify, 'short, but very rich and mostly still to be written'.[432] In recent years a number of historians, notably Greene, Tuchman and Moore, have provided wide ranging analyses of the history of screening, providing disparate interpretations of the impetus behind diabetes detection campaigns and the key actors who drove the expansion of screening in the post-war period. For Greene, screening and the diagnosis of 'hidden' patients with diabetes among the apparently healthy was part of the logic 'preventative pharmacology' and directly linked with industry efforts to expand the markets of their latest products. According to Greene, the development of drugs such as Orinase and Diuril, an anti-hypertensive, fuelled a movement to make the screening and treatment of 'hidden patients' into a public health priority.[433] Greene's analysis situates the search for 'hidden diabetes' as part of Upjohn's efforts in the late 1950s to market Orinase in a way that would actively increase the number of individuals diagnosed with diabetes. In order to achieve this, ADA detection campaigns accepted funding from Upjohn and other pharmaceutical companies to allow for the manpower that mass screening campaigns required.[434] From Greene's perspective, that Upjohn and other manufacturers funded much of the ADA's screening efforts in the United States, attests that the drugs themselves were used as

[432] A. Morabia and F. F. Zhang, 'Screening: From Concepts to Action', *Postgraduate Journal of Medicine*, 80 (2004), p. 463.
[433] Greene, *Prescribing by Numbers*, p. 84.
[434] Ibid, p. 98.

an argument for expanded detection programmes. However, while these groups were central, both in funding and organising diabetes detection campaigns in the United States, Greene's account overlooks the diversity of actors involved in the history of screening, in particular, those such as minority groups, women and patients themselves. Providing another perspective on the role of diabetes detection campaigns, historian Arleen Tuchman describes how screening programmes in the United States revealed diabetes to be a disease of minority groups, exposing the extent of racial and ethnic incidence and the vast inequality of care present compared to the white diabetic population.[435] According to Tuchman, not only did detection drives reveal the true incidence of diabetes among black and Mexican American communities, but resulted in a significantly increased knowledge of diabetes, and the potential consequences and complications without treatment, within these communities. Thus, rather than a tool to medicate largely healthy populations, Tuchman demonstrates how population screening to find 'the hidden million' was taken up by black communities and civil rights leaders in a bid to achieve equal health care and eradicate racial health injustices. Incorporating the agency of black leaders into histories of screening, Tuchman explains:

> That so many of those million were found among populations that were neither white nor middle class can best be explained by the civil rights movements battle to get the nation to recognise - and then to eradicate – racial and economic injustices.[436]

Tuchman explains that as the ADA expanded the number of detection drives around the United States, the civil rights movement began targeting inequality in health care by participating in the search to find 'hidden diabetes' within black and ethnic

[435] A. M. Tuchman, *Diabetes: A History of Race and Disease*, (New Haven: Yale University Press, 2020).
[436] Ibid, p. 147.

minority communities. As the civil rights movements took on issues relating to inequality in health care, black physicians began to take on rising cases within their communities by recommending routine examinations as a way of detecting diabetes before it progressed to unwarranted complications.[437] In identifying a range of actors involved in the history of screening in the U.S., Tuchman demonstrates the central role of black leaders and physicians in establishing diabetes as a civil rights issue. In doing so she illustrates the complexities of this period in the history of diabetes which have hitherto been overlooked, revealing a history of screening intimately linked to poverty, race and health disparities. The following chapter thus contributes to the existing literature outlined above, examining further aspects within the history of screening which have yet to be examined, such as the role of female physicians in the history of detection campaigns and the aetiological shift which resulted from the expansion of screening. Moreover, as much of the existing literature has concentrated on the United States, this chapter fills a significant gap in the literature by accounting for the development of screening in Britain, drawing particular attention to the role of historical actors which have hitherto been overlooked, such as British diabetes expert Dr Joan Walker. Ultimately, the role of actors such as Walker highlights the significance of screening programmes, and female physicians, within a narrative which has predominantly portrayed post-war changes in diabetic management as being driven by industry, the reorganisation of health services, or male-dominated research clinics.

[437] Ibid, p. 151.

Origins of Post-war Population Screening

The origins of population screening for diabetes lie in the development of urine analysis for life insurance purposes and the invention of the risk factor.[438] The presence of sugar in the urine as an indicator of diabetes had been known since antiquity but it was not until the nineteenth century that the first chemical tests for detecting glucose in the urine were devised.[439] Shortly after, around 1885, urine analysis became a standard part of medical examinations carried out by life insurance companies in order to predict the development of life-threatening diseases in apparently healthy applicants.[440] According to Rothstein, urine analysis was a 'revolutionary advance in life insurance medicine', allowing life insurance companies to identify disease in its latent stages. Rather than a tool to improve public health however, screening for diabetes in the early twentieth century was largely concerned with improving the process of selecting policyholders. As Louis Dublin, chief statistician of the Metropolitan Life Insurance Company observed when he joined the company in 1909; the company's statistics on diseases like diabetes were 'constructed for financial purposes primarily, and for checking on the rates of premiums charged. There was little if any interest in the social data'.[441] Around 1900, life insurance companies in New York performed urine tests on 71,729 insurance applicants in order to identify, and prevent, those with diabetes from

[438] W. G. Rothstein, *Public Health and the Risk Factor: A History of an Uneven Medical Revolution*, (New York: University of Rochester Press, 2003), p. 63.
[439] Ibid.
[440] Ibid.
[441] L. Dublin, *After Eighty Years: The Impact of Life Insurance on the Public Health*, (Gainesville, FL: University of Florida Press, 1966), pp. 39-40. Quoted in W. G. Rothstein, *Public Health and the Risk Factor: A History of an Uneven Medical Revolution*, (New York: University of Rochester Press, 2003), p. 63.

obtaining life insurance.[442] Only a few years later, tests and screening began to be carried out on potential military recruits in order to reject those with diabetes from entering the military during the First World War.[443] In the inter-war years population screening was subsequently adopted by the education system in the form of the school health examinations which sought to identify early signs of disease and abnormality which could be ameliorated in line with the new knowledge of nutrition.[444] This strategy was then extended to new recruits during the Second World War when screening for specific diseases, such as tuberculosis, syphilis and psychiatric disorders, as well as diabetes, was carried out in order to prohibit those with a chronic illness from entering the military.[445] By the late 1940s screening was held to be the most effective means of surveying whole populations in order to identify the diseases of later adult life that may lie hidden in middle age.

In the early post-war period, a transition from degenerative to preventable understandings of chronic disease had prompted further examination of disease in terms of risk. Accordingly, the traditional view of chronic disease as an inevitable part of ageing began to be replaced by a public health focus on screening and the treatment of risk factors.[446] While the invention of risk factors in disease had likewise emerged from the life insurance industry's focus on the prediction of mortality, the post-war rise in chronic disease, as Armstrong identifies, 'heralded the emergence of a new form of clinical practice concerned with the surveillance of

[442] A. Morabia and F. F. Zhang, 'Screening: From Concepts to Action', *Postgraduate Journal of Medicine*, 80 (2004), p.465.
[443] E. P. Joslin, 'Diabetes and Military Service', *JAMA*, 121 (1943), pp. 198-200.
[444] J. L. Barona, 'Nutrition and Health: The International Context during the Inter-War Crisis', *Social History of Medicine*, 21:1 (2008), pp. 87-105.
[445] D. Armstrong, 'Screening: Mapping Medicine's Temporal Spaces', *Sociology of Health and Illness*, 34: 2 (2012), p. 177
[446] Greene, *Prescribing by Numbers*, p. 13.

'healthy' patients within the context of new temporal spaces of illnesses'.[447] Within this context, screening, though unpopular with both the public and physicians, gained new life and the identification of diseases in their earliest stages became the public health approach of choice.[448] As Weisz describes, looking for early stage cancers for example had become a routine activity and, by 1950, 250 cancer detection centres were functioning across the U.S.[449]

In the immediate aftermath of the Second World War, diabetes was one of the chief conditions rumoured to be 'hidden' in large numbers among apparently healthy populations. In order to investigate this supposition, researchers Leo Krall and Hugh Wilkerson conducted the first largescale community diabetes study in the U.S., in Elliot Joslin's hometown of Oxford, Massachusetts. Supported by the United States Public Health Service, Krall and Wilkerson's 1946-7 study aimed to; determine the prevalence of diabetes in a typical American community; to evaluate the techniques and methods of largescale diabetes diagnosis; to instil in members of the public a realisation of the need for periodic examinations for diabetes; and to discover every case of diabetes and provide prompt treatment in order to avoid further progression and complications.[450] Having surveyed three quarters of the town's 4983 inhabitants using urine and blood glucose testing, the results of the study found diabetes to be prevalent among 1.7% of the population, a total of 466 undiagnosed cases.[451] Krall and Wilkerson used this figure to conclude that one million Americans had

[447] D. Armstrong, 'Screening: Mapping Medicine's Temporal Spaces', *Sociology of Health and Illness*, 34: 2 (2012), p. 177.
[448] Weisz, *Chronic Disease in the Twentieth Century*, p. 159.
[449] Ibid.
[450] H. Wilkerson and L. Krall, 'Diabetes in a New England Town: A Study of 3516 person in Oxford, Massachusetts', *JAMA*, 135 (1947), pp. 209-216.
[451] Ibid.

undetected diabetes, ultimately giving rise to the notion of 'the hidden million'.[452] Those who supported the notion of diabetes as a public health problem, which warranted early medical treatment in order to avoid progression of the disease and future complications, began to quote this figure to mobilise efforts for widespread screening of asymptomatic populations.[453] In the U.S., physicians at the Joslin Clinic were at the centre of these efforts. In 1951, Joslin diabetologists Harry Blotner and Alexander Marble published an article in the *New England Journal of Medicine* advocating for greater community detection, early detection and the medical management of diabetes:

> The earlier diabetes is discovered the easier it is to control, the less likelihood there is of complications and the better is the prognosis. Among serious diseases, few are more responsive than diabetes to specific medical management, which, even in the absence of cure, prolongs life, increases efficiency, protects earning power, minimises disability and adds to the joys of living. However, today there are many diabetics, roughly estimated at a million, who are not under treatment because their condition is undiagnosed.[454]

The importance of finding the hidden diabetic, they argued, was a matter of urgent importance. Consequently, by 1948 the ADA had declared its first National Diabetes Week followed by a series of national diabetes detection drives commencing in October 1949.[455] Aiding these screening efforts further, in 1957 the Miles-Ames Laboratory developed the Clinistix, a more convenient and accurate urine reagent strip which was later found by Kohn to also provide accurate results for blood glucose, leading to the development of the first blood glucose test strip, the

[452] Greene, *Prescribing by Numbers*, p. 98.
[453] Ibid.
[454] H. Blotner and A. Marble, 'Diabetes Control: Detection, Public Education and Community Aspects', *New England Journal of Medicine,* 245 (1951), pp. 567-75.
[455] Greene, *Prescribing by Numbers*, p. 98.

Dextrostix, in 1965.[456] By 1958, the ADA had distributed 1.5 million urine test kits and had forty-two diabetes screening drives in progress in cities across the U.S.[457] By 1963, the Upjohn Company had pledged their support in the search for 'hidden diabetes', providing financial support to the ADA to allow for the expansion of their diabetes detection drives, as well as providing material support in the form of advertising, films and the distribution of test kits.[458] Soon, hundreds of diabetes detection drives were underway in both the U.S. and in Britain, resulting in the discovery of thousands of new cases, many of which were found among ostensibly healthy people within the population. As diabetes screening efforts were expanded throughout the 1960s, events like National Diabetes Week transformed into month long events, increasing public awareness of the disease, and consequently transformed diabetes from a disease 'spoken of in hushed terms, if at all' to a condition that had ceremoniously entered the national stage.[459]

Screening in Britain: Joan Walker and the Diabetic Survey

As discussed above, historians have outlined some of the key groups and individuals who were instrumental in driving the search for 'hidden diabetes' in the post-war period. However, little has been written about the history of screening in Britain nor how British attempts to uncover undiagnosed diabetes shaped contemporary understandings of diabetes and its management. While detection programmes in the United States were fuelled by industry and the availability of new medications to

[456] S. F. Clarke and J. R. Foster, 'A history of blood glucose meters and their role in self-monitoring of diabetes mellitus', *British Journal of Biomedical Science*, 69:2 (2012), p. 85.
[457] Ibid.
[458] Ibid.
[459] C. Feudtner, *Bittersweet*, p. 211.

manage chronic conditions, archival evidence suggests that screening in Britain evolved from an altogether different political and disciplinary context. Driven by the creation of the welfare state and reorganisation of British social medicine, Moore describes how social researchers and the medical profession, motivated by the need to plan services and utilise the research opportunities offered by the welfare state, began to survey the population which led to extensive detection studies of allegedly healthy communities.[460] In accounting for the United Kingdom's experience of screening, Weisz has described the debate around the usefulness of mass screening programmes and the feeling among the Ministry of Health that screening would be incompatible with the structure of medicine in Britain. The British medical profession, Weisz describes, were bitterly divided between those who supported screening programmes and those who maintained: 'The time of doctors is too valuable to waste on examining the transparently hale and hearty when there is an unfailing supply of those who are really sick'.[461] While some sections of the British medical profession quarrelled over the merits of population screening and responsibilities of GPs, others embraced the new research opportunities presented by a new National Health Service and the chance to carve out their position in the post-war medical landscape.

[460] M. Moore, *Managing Diabetes, Managing Medicine: Chronic disease and clinical bureaucracy in post-war Britain*, (Manchester: Manchester University Press, 2019).
[461] R. W. Elliot, 'The Prevention of Illness in Middle Age', *Public Health*, 79 (1965), p. 324. Quoted in Weisz, *Chronic Disease in the Twentieth Century*, p. 198.

Figure 5.2: Joan Walker (left). [Courtesy of Leicester Special Collections].

At the forefront of diabetes screening campaigns in Britain was Dr Joan Walker, a pioneer in diabetes research based in the Leicester area from the 1950s onwards. Walker established the Leicester Diabetes Clinic, Britain's first community diabetes clinic, where she introduced the idea of a 'diabetes team'. Alongside her introduction of specialist diabetes nurses, Walker's ideas and their implementation elicited a major shift in diabetes care nationally and gained worldwide acclaim.[462] Born in 1902, Dr Walker had been a physician at the Leicester Royal Infirmary during the Second World War, a period in which women were underestimated and underrepresented in medicine.[463] Remembered as an example of a 'forward-thinking individual', Joan's obituary describes how it was her initial struggle to gain physical space and resources in the hospital after the war and the return of male staff members

[462] Obituary: Joan Walker', *Practical Diabetes International*, 12:5 (1995), p. 226.
[463] Ibid.

that encouraged her to develop new approaches to the medical management of child and adult diabetes.[464] While Walker's approach, which incorporated both clinic and community care, has since become standard practice in diabetes management in Britain, at the time her approach was considered both innovative and heretical.[465] Among many of the firsts achieved over the course of her career, including being the first female President of the Leicester Medical Society and the first woman to give the Banting Memorial Lecture in 1966, with her study of diabetes prevalence in the Leicester village of Ibstock, Walker was one of the first, and the first female researcher, to undertake a population survey in Europe.[466] Walker's interest in undiagnosed diabetes was sparked by several early studies in the U.S and Wales which had indicated the presence of as many undiagnosed cases among the population as there were known.[467] Having observed diabetes detection drives and events such as Diabetes Week in the U.S, Walker remarked how 'very little has so far been done in Britain to obtain a precise picture of the diabetic problem'.[468] While three small studies had been carried out in England and Wales, they had fallen short of compiling a complete census of individuals diagnosed with diabetes and other details about their lives that might aid an explanation of their diagnoses. In

[464] Ibid.

[465] Walker doubted that physicians could keep up with all that was required in the care of diabetic patients and therefore suggested the need for diabetic nurses to assume the role of teaching and caring for those newly diagnosed with the disease. However, as Tattersall points out, prejudice against women and the fact Walker was trespassing into the territory of paediatricians meant her ideas were considered 'too revolutionary for the times and often fell on deaf ears'. See R. Tattersall, 'Women of the right personality: development of diabetes nursing', *Journal of Diabetes Nursing*, 7:2 (2003), pp. 71-75.

[466] Ibid.

[467] The results of the first diabetic survey by Krall and Wilkerson in 1947 in Oxford, Massachusetts, were confirmed in a survey by Kenny, Chure and Best in their surveys of three Canadian communities in 1951 and 1953 and then by Cochrane and Miall in similar surveys carried out in South Wales in 1956. Two smaller studies were then carried out in England, see J. I. Burn, 'A Diabetic Study', *The Medical Officer*, 96:5 (1956) and C. T. Andrews, 'A Survey of Diabetes in Cornwall', *BMJ*, 1:5016 (1957), p. 427.

[468] J. Walker, 'The Detection of Latent Diabetes', *Postgraduate Medical Journal*, 35:403 (1959), p. 302.

December 1947, Stocks had found 98,208 diabetics on Food Office Registers in England and Wales, an increase from 91,897 in December 1945, while the Survey of Sickness had found an incidence of 239 per 100,000 in 1946-7 and 370 per 100,000 in 1950.[469] By 1956 the BDA estimated that there were around 200,000 people diagnosed with diabetes in Britain however this figure was largely an estimation based upon the statistics found by Krall and Wilkerson in the U.S.[470] Thus, while it was indisputable that cases were rising, in Britain there was little knowledge or accurate figure of the number of people with a diagnosis. Accordingly, Walker decided to carry out the first thorough population study of diabetes in the English town of Ibstock. Having founded the first diabetic clinic in Britain in nearby Leicester, the town provided a practical choice of location for the study. In addition to the proximity to her diabetic clinic in Leicester where both samples and patients could be referred, Walker explained in a letter to her colleague, Dr Fletcher that it provided a diverse sample of occupations, including; mining, agriculture, and light industry, domestic and clerical employment. This was important to Walker as she had been drawn to the findings in Wales which indicated a clear association between diabetes, occupation and body weight.[471] Based upon both her own interests and previous findings, Walker aimed to establish:

> …exactly the number of undiagnosed cases of diabetes, to correlate the families and investigate possible hereditary factors, to investigate possible aetiological factors of a) stress b) diet and c) occupation, and to begin a follow-up survey and repeat the survey every 20 years.[472]

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[469] P. Stocks, *Sickness in the Population of England and Wales, 1944-1947*, (General Register Office, 1949).
[470] Letter from J. P. McNulty to Dr Joan Walker, 6 January 1956, Joan Walker Collection.
[471] A. L. Cochrane and W. E. Miall, 'The Epidemiology of Chronic Disease in South Wales', *Proceedings of the Royal Society of Medicine*, (1956), pp. 261-262.
[472] J. Walker, 'The Detection of Latent Diabetes', *Postgraduate Medical Journal*, 35:403 (1959), p. 302.

Walker's intentions for the study elucidate her early interests in aetiology and the range of potential causes for the onset of diabetes. As is evident here in 1959, when Walker set out to study the rate of undiagnosed cases in Ibstock, she was interested in a multifactorial aetiology of diabetes, both those which lay in the individual's physiology as well as those triggered by psychosocial and environmental factors. An examination of Joan's early publications demonstrate this clearly. Writing in 1959 on the detection of latent diabetes, Walker describes her interest in what she termed the 'trigger mechanism' in diabetes, wide-ranging factors, including; rapid childhood growth, obesity, infection or severe and sustained emotional stress. Of these factors Walker was particularly drawn to the role of stress, evident from her research published in the 1950s as well as the literature she collected privately.[473] Over the course of the twentieth century, the concept of stress became a popular means of explaining the onset of many illnesses, but the impact of the Second World War in particular highlighted the myriad ways stress could manifest both physically and mentally in the body. Walker's interest in the role of stress in diabetes were thus gathering at a time when wider concerns over the health and productivity of a 'stressed nation' were already mounting.[474] As Jackson describes, peace following the Second World War brought little immediate relief from stress and the perpetuation of global instability during the Cold War further amplified the anxieties and cumulative stress experienced by already vulnerable populations.[475] Walker's personal papers illustrate a modest body of literature on the role of stress in diabetes published prior to the 1950s. While much of this research was, as Walker acknowledges, buried in journals of psychiatry, it demonstrates the wide range of

[473] J. Walker, 'Stress and Diabetes', *The Practitioner*, 178 (1957), pp. 590-599.
[474] M. Jackson, *Stress in Post-War Britain*, (London: Routledge, 2015), pp. 1-5.
[475] Ibid.

influences which were considered to be of aetiological significance in explaining the onset of diabetes prior to the hegemony of the biomedical model.[476] Included among this literature on the role of stress in diabetes was the work of William Menninger, an American psychiatrist and co-founder of the Menninger Foundation in Kansas who was among a group of psychiatrists who supported a psychological aetiology of diabetes. Studying patients at his family's sanatorium, the Menninger Clinic, Menninger and his colleagues had found a particularly strong link with patients with diabetes who were diagnosed with depression and anxiety.[477] Menninger noted the difficulty in noticing the link between diabetes and mental disorders during diagnosis due to the physician's lack of questioning about the patient's mental health, meaning that an investigation into a potential link between the two conditions was rarely carried out. Nonetheless, Menninger's observations of patients at the clinic led him to conclude that psychological influences may be of aetiological significance in diabetes, in both the onset of the condition as well as greatly influencing the condition's ultimate course.[478] In 1935, Menninger published an article on this connection, describing how an 'emotional flattening' and signs of apathy and indifference were not uncommon among diabetic patients.[479] Menninger's observations thus led him to conclude that psychological factors not only greatly influenced the patient's ability to manage their diabetes, but that psychosocial factors could produce diabetes as well. Indeed the idea that diabetes was psychosomatically

[476] Walker was among a small number of physicians who supported the 'iceberg theory' of diabetes developed by W. P. U. Jackson which considered diabetes a latent condition which could be made visible by certain stressors i.e. pregnancy, infection or other shocks to the system. The idea that diabetes can be triggered and lay dormant in the form of pre-diabetes is often traced to Jackson but the origins of the term can be traced further still to Basu in 1916 (see chapter two). W.P.U. Jackson, 'Present State of Prediabetes', *Diabetes*, 9:5 (1960), pp. 373-8.
[477] W. Menninger, 'The Inter-Relationships of Mental Disorders and Diabetes Mellitus', *Journal of Mental Science*, 81:333 (1935), p. 333.
[478] Ibid.
[479] Ibid.

induced held considerable traction during the 1920s to the 1940s; Savage and Maudsley likewise believed that emotional stress could produce diabetes; Emerson observed that diabetes often followed intense emotional crises, while Nielson viewed diabetes as a neurological disease which could be initiated by emotional upset and severe mental strain.[480] The feeling that diabetes could be brought on by stress, shock or anxiety is reflected in a number of oral testimonies of patients diagnosed with diabetes in these years. An example of this can be heard in an interview with Margaret Elliot from Sidley, diagnosed in 1930. Margaret recalled the time of her diagnosis:

> We just used to live a normal village life - you know, go out to play on the green and skipping and running and all the rest of it, until I developed scarlet fever. That was the beginning of my downfall that was. I came out from the isolation hospital and then was knocked over by a car, and they think the shock of the two things possibly brought the diabetes onto me…there was no sign of it in my family behind me at all, so I suppose it was possibly the shock that brought it out on me.[481]

The notion that emotional stress caused by shock could explain the onset of diabetes can be heard again in an interview with Ann from London, diagnosed in 1946 she reflected:

> I've often wondered why it should be me out of a vast family. I have, well, about forty or so cousins, no-one else has it. I believe a great aunt had it in India, but I should imagine it was type B because she was, it was in her old age, and she couldn't have lived because this was the pre-insulin date. So all I can think of is that it was the shock of coming back to England really. It could have started from

[480] G. H. Savage, 'Glycosuria, Diabetes and Insanity', *Tans. Med. Soc.* (1891), pp. 91-98; C. H. Nielson, 'Emotional and Psychic Factors in Diabetes', *JAMA*, 6, (1927), pp. 1020-23; C. P. Emerson, 'The Emotional Life and its Importance in the Production of Pathological Conditions', *Journ. Indiana State Med. Assoc.*, 12, (1926), pp. 475-477.
[481] M. Elliot, Interview.

> the death of my father when I was five because we were very close.[482]

Consequently, prior to the post-war period then, multiple narratives were available in order to explain the aetiology of diabetes and much like Menninger et al, Walker believed stress could both induce diabetes as well as disturb good control in patients.[483] Walker cited a number of examples of physiological factors that could influence the emotions and psychological outlook, such as puberty, menopause, pregnancy and menstruation. The latter, Walker argued, was a particularly important consideration, as variations in control brought on by physiological imbalance could be the result of pre-menstrual tension and monthly hormonal fluctuations.[484] Evidently then, Walker had wide ranging interests in the aetiology of diabetes which accounted for a vast range of social, environmental and physiological factors which could both cause diabetes and affect good management and control. Walker's Ibstock study, a population survey of diabetes and its causes, reflected this range of influential factors. Thus in addition to studying the possible heredity foundations of latent diabetes, the study set out to survey the incidence of obesity among the affected population, as well the individual's history of stress, such as personal or family illness, experiences of domestic or financial anxiety, or other taxing experiences such as trouble at work. With the support of the BDA and a team including field workers, health visitors and dieticians, the Ibstock study began in May 1957.[485] Writing in 1959 Walker described how:

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[482] A. Walton, Interview, 8 August 2002, British Library C1239/01.
[483] J. Walker, 'Stress and Diabetes', *The Practitioner*, 178 (1957), pp. 590-599.
[484] Ibid.
[485] In order to obtain the co-operation of local residents, the BDA delivered a flyer through every door in the town, explaining to the local population that 'medical research is not only carried out in the laboratory or in hospital' but sometimes had to be carried out under 'natural conditions with normal

> Preliminary contacts were made in the village, and leaflets explaining the project were taken home by the school children, handed out by the doctors in their surgeries, and also distributed through the district nurses and local health visitor, through the Miners' welfare Association and Townswomen's Guild. The fieldworkers inevitably called twice a day at every house, using the complete electoral roll as their target. Everyone was asked to pass urine before the tea meal and discard it, to add two extra teaspoonful's of sugar to the meal and save the specimen passed an hour later in the labelled bottle supplied. When the field worker returned the next day, she tested all the specimens in view of the family by an enzyme method (Clinistix). The final details were entered on the form and, if sugar was present, the individual was asked to attend at a centre in the village for a standard glucose-tolerance test.[486]

Walker's study of Ibstock confirmed the results of North American studies that suggested there was a large number of unknown diabetics 'hidden', or living asymptomatically, among the population. Prior to the study there had been thirty-three 'known diabetics' in Ibstock, however after surveying 5406 inhabitants of Ibstock using the Clinistix method to analyse the urine of the local population, a further 167, 4% of the population, were identified to have glycosuria, an excess of sugar in the urine.[487] The results of the Ibstock study indicated considerable prevalence of diabetes in cases where a family member was already diagnosed. Moreover, the results also indicated a high frequency of diabetes in cases where stress, obesity or 'parity of women' were present.[488] Following the results of Walker's Ibstock study, screening for 'hidden diabetes' in Britain proliferated and inspired further diabetes prevalence studies in larger cities such as Birmingham and

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people in their homes', see 'Medical Research and Good Health', *British Diabetic Association* (1957), Joan Walker Collection.

[486] J. Walker, 'The Detection of Latent Diabetes', *Postgraduate Medical Journal*, 35:403 (1959), p. 302.

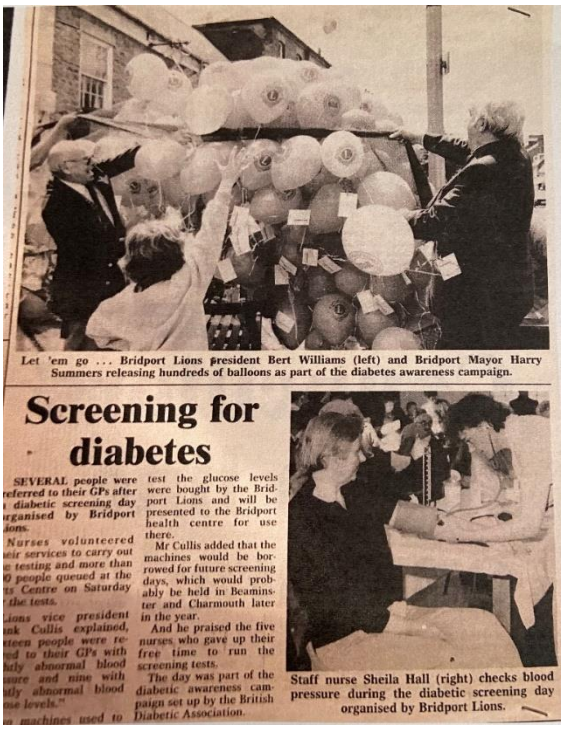
[487] J. Walker, 'Early Diabetes: A Five Year Follow-Up of Diabetes in an English Community', *The Lancet*, 284:7353 (1964), p. 246.

[488] Draft of J. Walker 'A Study of the Natural History of Diabetes in an English Community', Joan Walker Collection.

Bedford.[489] These studies confirmed the results of Walker's Ibstock study and those carried out in the U.S and Canada and projected that the national prevalence of diabetes had increased from 0.3% of the population in 1953 to around 1.2% in 1959.[490] Such findings attracted considerable attention in the medical and lay press which swiftly declared diabetes and other non-infectious maladies to be medicine's immediate public health threat.[491] Newspapers reported on what was now being referred to by practitioners as 'the existence of the clinical "iceberg" of undetected and untreated disease'. The *Guardian* reported on 'the disquieting conclusion that there are about 300,000 undetected cases of diabetes in Britain' while the *Observer,* reporting on the 'dangers of hidden diabetes', pledged their support in the search for hidden diabetes by announcing its participation in a survey of its employees in order to 'uncover hidden diabetics'.[492] Consequently, the results of British diabetes surveys carried out by Joan Walker and others fuelled a nationwide search for undetected diabetes which saw not only researchers but employers and voluntary organisations contribute toward the search for latent cases of diabetes. Within Walker's personal correspondence can be found a letter from the Chief Medical Officer in charge of the Ford Motors factory in Southampton which details a survey carried out on their 3000 employees. The letter describes how employees were issued a Clinistix enclosed in a small envelope bearing the employees name and works number, together with the instructions on how to carry out the sample. Of those issued, 465 employees returned their envelopes, 107 employees reported that

[489] C. L. Sharp, 'Diabetes Survey in Bedford 1962', *Proceedings of the Royal Society of Medicine*, 57:3 (1964), pp. 193-195; Birmingham Diabetes Survey Working Party, 'Five Year Follow-Up Report on the Birmingham Survey of 1962', *BMJ*, 3 (1970), p. 301.
[490] Moore, *Managing Medicine*, p. 59-60.
[491] 'Diabetes as a Public Health Problem', *The Medical Officer*, 106:94 (1961), Joan Walker Collection.
[492] 'Undetected Cases of Diabetes', *Guardian*, 1 January 1960; 'The Danger of Hidden Diabetes', *Observer*, 17 April 1960.

the Clinistix had changed to blue indicating signs of glycosuria, 12 employees were later referred onto their doctors, who according to a letter to the BDA were 'delighted that an early diagnosis had been made'.[493] In addition to employers, voluntary organisations such as the Lions took up the search for hidden diabetes by facilitating diabetes awareness campaigns throughout the UK.



Let 'em go ... Bridport Lions president Bert Williams (left) and Bridport Mayor Harry Summers releasing hundreds of balloons as part of the diabetes awareness campaign.

Screening for diabetes

SEVERAL people were referred to their GPs after a diabetic screening day organised by Bridport Lions.

Nurses volunteered their services to carry out the testing and more than 70 people queued at the Centre on Saturday for the tests.

Lions vice president Frank Cullis explained, fifteen people were referred to their GPs with highly abnormal blood pressure and nine with highly abnormal blood sugar levels."

The machines used to test the glucose levels were bought by the Bridport Lions and will be presented to the Bridport health centre for use there.

Mr Cullis added that the machines would be borrowed for future screening days, which would probably be held in Beaminster and Charmouth later in the year.

And he praised the five nurses who gave up their free time to run the screening tests.

The day was part of the diabetic awareness campaign set up by the British Diabetic Association.

Staff nurse Sheila Hall (right) checks blood pressure during the diabetic screening day organised by Bridport Lions.

Figure 5.3: Screening for diabetes as part of the Bridgeport Lions diabetes awareness campaign (1968). [Courtesy of the University of Leicester].

[493] 'A Voluntary Diabetic Detection Survey', letter from Ford Motors factory in Southampton sent to the British Diabetic Association, undated, Joan Walker Collection.

Figure 5.4: Screening for diabetes as part of the Bridgeport Lions diabetes awareness campaign (1968). [Courtesy of the University of Leicester Special Collections].

Population studies of diabetes prevalence, most notably Walker's Ibstock study, not only propelled the search for hidden diabetes in Britain but also played a key role in shaping understandings of diabetes as an inherited disorder. Prior to these studies and the media's publication of their findings, sources suggest that the British public's knowledge of the causes of diabetes around this time was limited. A study of lay knowledge and understandings of diabetes carried out in Dundee in 1960 for example found that only 0.4% of 250 participants understood diabetes to be caused by heredity, while the majority, 66.8% were unaware of the causes and a further 18.4% cited 'sugar' or 'blood'. The researchers concluded that:

> It was thus clear that the great majority had little or no idea about the nature of diabetes or about the types of persons most likely to develop the disease. It was interesting to find that only about a third knew of the relationship between diabetes and obesity and that, on

> direct questioning, only 10 per cent were aware of the hereditary aspect of its aetiology.[494]

Accordingly, with little public knowledge of the aetiology of diabetes around the time of diabetes detection campaigns, the elements of the survey's results which were underscored by both the medical profession and the press were incredibly influential in shaping public understandings of the nature of diabetes, particularly in terms of whether it was considered an environmental or inherited disease. The Ibstock study had not only found a high frequency of incidence where a family member had been previously diagnosed with diabetes, but also a significant incidence of diabetes where stress, obesity or 'parity of women' were present.[495] Despite her early interests in the link between stress and diabetes, it was the heredity link however which captured Walker and her colleagues' attention. Observing the material obtained from the survey, Walker singled out the results between family members as the priority of future research in order to: 'find out more about the genetic pattern of inheritance, to observe whether time alone turns diabetes into the irreversible condition'.[496] Consequently, while the Ibstock study had set out to study wide-ranging factors involved in the onset of diabetes, and indeed had found a significant correlation between diabetes and stress, it was the heredity component of the study's findings which captured medical and lay attention and became the focal point of research and prevention efforts thereafter.[497]

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[494] J. J. A. Reid, 'Public Knowledge of Diabetes Mellitus', *The Medical Officer*, 103 (1960), pp. 325-28.
[495] Draft of J. Walker 'A Study of the Natural History of Diabetes in an English Community', Joan Walker Collection.
[496] Ibid.
[497] J. Walker, 'The Detection of Latent Diabetes', *Postgraduate Medical Journal*, 35:403 (1959), p. 302.

‘It Takes Two to Make a Diabetic’: The ‘Geneticisation’ of Diabetes

In the 1990s, Canadian feminist and epidemiologist Abby Lippmann defined the term ‘geneticisation’ to describe: ‘The ever growing tendency to distinguish people from one another on the basis of genetics; to define most disorders, behaviours, and physiological variations as wholly or in part genetic in origin.’[498] With its roots in the older critical term ‘medicalisation’ developed in the 1970s by critical theorists Irving Zola and Ivan Illich, geneticisation similarly attacks medical practice suggesting that modern medicine has done little to improve the health of populations.[499] In applying this term to diabetes, Hedgecoe traces the geneticisation of diabetes to the 1970s when the division of diabetes into ‘types’ on the grounds of aetiology took place.[500] As I demonstrate here, however, there is substantial archival evidence which suggests that genetic theories of diabetes rose to prominence alongside diabetes detection programmes at least a decade earlier.

Following the Ibstock study, Walker travelled to the United States where she met with American colleagues working on diabetes detection programmes, including those at the Joslin Clinic. In her private notes, Walker explains how the trip allowed her ‘to assess medical opinion on my work and acted as a stimulus after I returned and recovered to take breath’.[501] From examining Walker’s personal correspondence and research collection, Walker’s trip to the U.S, it can be argued, reinforced her

[498] A. Lippmann, ‘The Geneticization of Health and Illness: Implications for Social Practice’, *Endocrinologie*, 29:1 (1991), pp. 85-90.
[499] A. M. Hedgecoe, ‘Reinventing Diabetes: Classification, Division and the Geneticisation of Disease’, *New Genetics and Society*, 21:1 (2002), p. 7.
[500] Ibid.
[501] Correspondence relating to Walker’s plans for the second Ibstock survey (1960-1962), Joan Walker Papers, University of Leicester Special Collections, GB 338 MS238.

interests in the heredity component of diabetes aetiology and bolstered her ideas for a subsequent study which would focus solely on the genetic link. This can be identified in correspondence to colleagues following her visit concerning her arrangements to repeat the Ibstock survey in 1962, in which she describes her plans to study 'the genetic aspects rather than the stress factors this time'.[502]

Physicians at the Joslin Clinic such as Joslin, Marble and Root were at the forefront of genetic research and, as seen in chapter four, were formidable advocates of the use of oral hypoglycaemic drugs in the treatment of the new cases identified by detection efforts.[503] Considering the focus of diabetes research at the time of Walker's trip to the U.S, there is a strong likelihood that her time spent among her American counterparts strengthened her interests in screening to uncover hidden cases of diabetes, in particular her interests in studying the nature of diabetic inheritance. While visiting the U.S., Walker attended the 1960 annual symposium of the New York Diabetes Association on the 'Genetic Aspects of Diabetes Mellitus and Prediabetes'. Typical of the times, the symposium featured a number of panels dedicated solely to the genetic aspects of diabetes and the use of new drugs like tolbutamide in the diagnosis of diabetes. Walker's visit to the U.S also coincided with a burst of encouragement for the detection of diabetes. The development of oral hypoglycaemic agents alongside the manufacture of screening devices had allowed for the mobilisation of mass screening programmes and diabetes detection events sprung up in town's cities across the country.[504] In the U.S., as Greene has

[502] Letter from Dr Joan Walker to Dr Clarke, 18 April 1961, Joan Walker Collection, University of Leicester Special Collections, GB 338 MS238.
[503] See the previous chapter for the Joslin Clinic's defence of the use of oral agents despite the results of the UGDP.
[504] R. Lackey, 'Selective Screening for Diabetes in East Orange, New Jersey', Annual Conference of State and Local Health Officials of New Jersey', 31 March 1966; D. R. DeFanti, 'Diabetes Detection

recounted, diabetes detection campaigns were closely linked to the availability of new drugs and medical technologies such as urine and blood glucose test kits. As new drugs such as Orinase came on the market, advertisements and news reports rarely failed to mention the 'hidden diabetics' they were hoping to treat and the new drugs were often used as a justification for the expansion of detection programmes.[505] This can be identified in many pharmaceutical advertisements from the 1960s, particularly those for Pfizer's oral diabetes medication Diabinese which consolidated the need to uncover the '1,600,000 Americans with hidden diabetes' with the need for pharmaceutical treatment with their latest product.[506] Pfizer were not alone in using the rhetoric around hidden diabetes to promote their products; around the same time Upjohn Company distributed a film titled 'Finding the Hidden Diabetic' which featured speakers including Alexander Marble from the Joslin Clinic who stressed the importance of guiding individuals from screening programmes into full clinical diagnosis and long-term anti-diabetic therapy.[507]

Programme in Rhode Island', *The Apothecary*, October 1967, Joslin Diabetes Archive; T. Millington and C. A. Tinsman, 'Diabetes Screening in Pennsylvania', *The Apothecary*, October 1967, Joslin Diabetes Center.

[505] Greene, *Prescribing by Numbers*, p.99.

[506] '1,600,000 Americans have 'hidden diabetes', Diabinese Advertisement (1960), Joslin Diabetes Archive.

[507] Greene, *Prescribing by Numbers*, p.102.

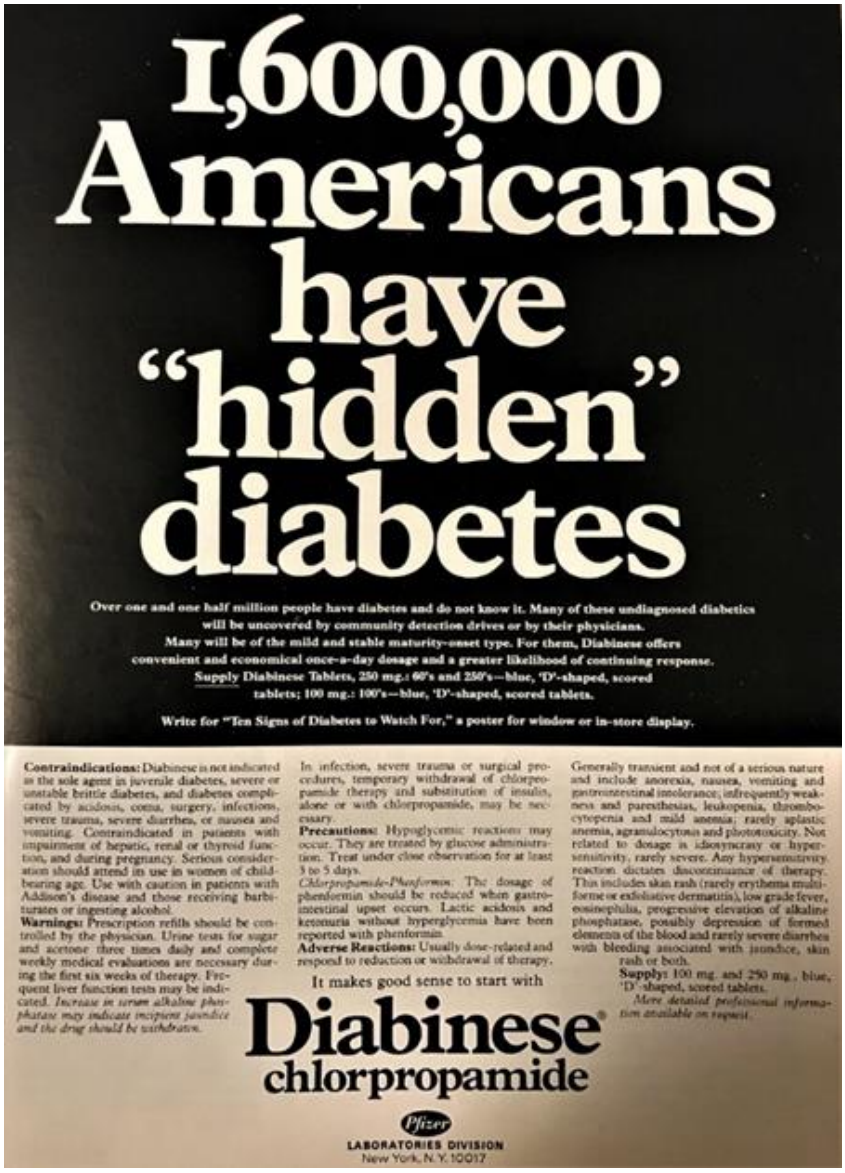

Figure 5.5: Diabinese Advertisement (1960). [Courtesy of: Joslin Diabetes Center, Boston].

Figure 5.6: Ames 'Diastix' used to analyse sugar in the urine (1965). Alongside other new detection devices such as the Clinistix and Tes-Tape, these new medical technologies enabled the mass screening and diagnosis of diabetes and were integral to early detection efforts. [Courtesy of Joslin Diabetes Center, Boston].

Figure 5.7: 'Tes-Tape' urine sugar analysis paper (1963). [Courtesy of the National Museum of American History].

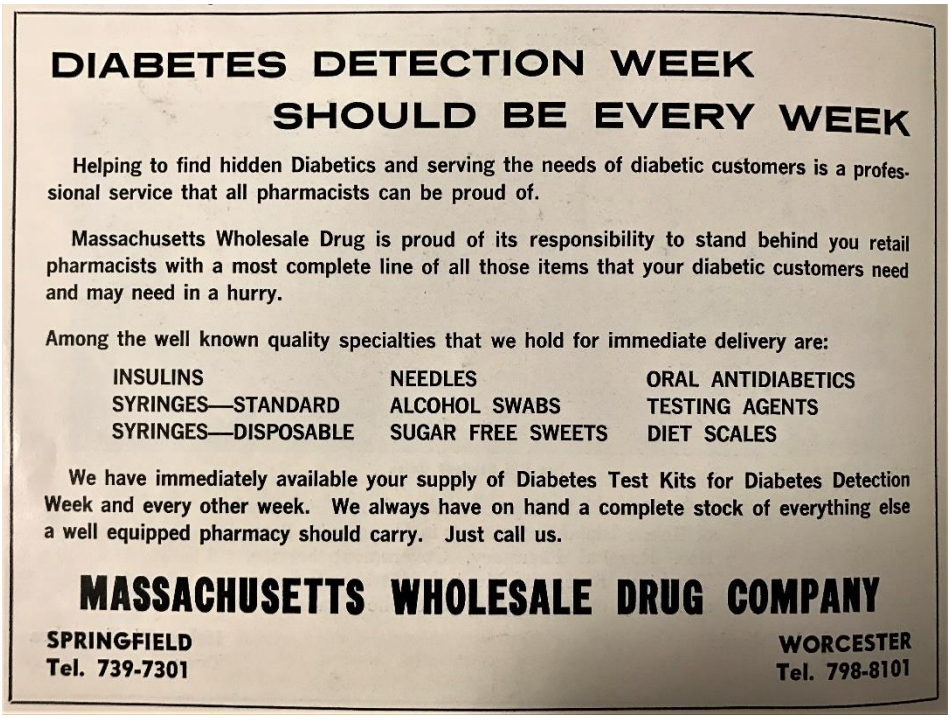

Figure 5.8: 'Diabetes Detection Week', *The Apothecary*, (1967). [Courtesy of the Joslin Diabetes Archive, Boston].

Evidently then, at the time of Walker's visit to the U.S. there was great enthusiasm for the detection, and medical treatment, of 'hidden' or undiagnosed diabetes. While the connection between the development of new anti-diabetic medications and the expansion of diabetes detection campaigns has been well-documented, the shift in language around aetiology as a result of these developments has received less attention. The international research context from this time, as well as the language used to explain the rising incidence of diabetes which resulted from detection efforts, demonstrates a situation in which individual-level explanations for diabetes such as heredity were frequently favoured while the role of diet and social factors such as poverty were overtly dismissed. Examining the language used to report and explain diabetes incidence in the 1960s thus aids a clearer understanding of the influence of U.S. detection efforts on screening campaigns in Britain, and can help to explain what drove physicians like Dr Joan Walker to narrow their attention on genetics in favour of their earlier interests is psychological and social factors such as gender, poverty and stress.[508]

Evidence that screening for diabetes through the use of detection campaigns generated a renewed interest in genetics and the hereditary nature of diabetes can be found in a range of sources from the 1960s. Medical literature, conference proceedings, news reports and Walker's personal collection of correspondence from the 1960s, as Walker herself noted, provide a clear 'illustration of the times'.[509] Evident in many of the reports of the emergent public health threat of 'hidden

[508] 'Genetic Aspects of Diabetes Mellitus and Prediabetes', The Clinical Society of the New York Diabetes Association, 11 November 1960, University of Leicester Special Collections, GB 338 MS238

[509] Correspondence relating to preparation for the second Ibstock Survey, Joan Walker Papers, University of Leicester Special Collections, GB 338 MS238.

diabetes' was a narrative which looked to individuals and their family members as both the origins of the condition, and as the targets of long-term treatment with the new oral medications. A typical example of the reporting on efforts to locate those with asymptomatic diabetes can be seen in an article published in the *Wall Street Journal* in May 1965. The article, entitled 'Defeating Diabetes', detailed the latest developments in attempts to identify the 'two million unsuspecting victims' who will develop diabetes and explained to readers how they should be treated. Describing diabetes as 'incurable', the article assured its readership that 'efforts are increasing to diagnose the disease in two million or so Americans who are unaware they are victims' and that early diagnosis was key to ensure control of the disease. The article further emphasised the genetic foundation of diabetes and the need for prompt pharmaceutical management with the new oral hypoglycaemic drugs if individuals wished to live a normal life. Pointing to PWD and their family members the article claimed:

> One of the major reasons that diabetes remains prevalent is that, except in rare cases, it is an inherited disorder. The hereditary pattern works like this: If both parents are diabetics, all children will become diabetics, if they live long enough…[510]

Moreover, in emphasising the hereditary foundation of diabetes, reports began to spread concerns about relationships between PWD, suggesting that reproduction between diabetics was contributing to the rise in new cases and was a significant cause for concern:

> Although diabetes could be eliminated through selective mating, doctors see little hope in this direction. 'It is almost futile to warn young people to check the diabetic 'pedigree' of their intended' says one medical specialist. Once married, couples often unknowingly

[510] C. Brumley, 'Defeating Diabetes: Rising Efforts Turn up Fresh Clues to Conquest Disease', *Wall Street Journal*, 7 May 1965.

> produce potentially diabetic children before the disease strikes the parents in middle age. Even if a woman has diabetes, she now often risks becoming pregnant because improved methods of care now make it more probable she will give birth without complications…In the distant future, diabetes may be prevented by control of heredity. Scientists recently have begun to decipher the genetic code…it is reasonable to believe that someday it may be possible to correct the heredity defect in the genetic code that causes diabetes and thus prevent it.[511]

The 1960s thus marked a significant turn towards prevention strategies that controlled the body of the diabetic, as oppose to formulating progressive policies aimed at the socioeconomic structures which were also fuelling rates of the disease. At the pinnacle of this ideology, Joslin and Marble suggested that the solution to preventing diabetes lay with PWD themselves, urging individuals to abstain from reproduction in order to avoid the birth of another diabetic:

> Diabetes is hereditary and one cannot pick one's ancestors. Granted, but one can pick out one's descendants. It takes two to make a diabetic. If you have diabetes, don't marry another diabetic but seek a partner in a family which the disease does not exist. Positively two diabetics should not marry and have children. This brings us to another rule for prevention of diabetes which is absolute but by no means a sure preventative. A relative of a diabetic should never be fat.[512]

What these sources demonstrate is that, as screening and detection efforts began to identify many new cases of diabetes, aetiology and prevention efforts turned increasingly towards individual-level accounts of the disease which focused on the body of the diabetic and eugenic solutions of how to control it.[513] Both the media and pharmaceutical companies reinforced this rhetoric by emphasising the role of genetics and, in some cases, overtly downplaying the role of socioeconomic and

[511] Ibid.
[512] E. Joslin and A. Marble, 'Prevention', Joslin Diabetes Center.
[513] A number of sources such as this one explicitly emit eugenicist ideas about diabetes, yet it does not appear that this was challenged or questioned at the time.

environmental factors in the onset of the disease. As an article in the *Boston Traveller* on the new anti-diabetic drugs reported:

> In this day and time, what makes the difference between one person being healthier than another isn't so much adverse surroundings, plagues and pestilence, as it used to be, but who he is and what he has inherited.[514]

Similarly, an article from the *New York Times*, printed in 1964 ahead of Diabetes Detection Week, described diabetes as a 'familial condition' for which rising rates could partially be explained by diabetic women living long enough to reproduce. In the article, Joslin Clinic's Howard Root outlined three, largely biomedical, explanations for the rapid increase in diabetes:

> First diabetes is hereditary. Second, as the population and the percentage of older people in it increase, the number of diabetics grows because the chances of diabetes increases with age. Third, diabetic women who have the disease before they are 13 years old show high rates of fertility and childbearing.[515]

[514] 'New Diabetes Drug Reported Tried', *The Boston Traveller*, 20 May 1958, Joslin Diabetes Archive.
[515] H. A. Rusk, 'Gains against Diabetes', *New York Times*, 24 May 1964.

Figure 5.9: 'Diabetes runs in families' Upjohn Company, 1967. [Courtesy of: The Joslin Diabetes Center, Boston].

Evident in pharmaceutical advertising from the 1960s, the connection between genetics and the development of diabetes was the primary focus of research efforts at the height of diabetes detection campaigns and by promoting the connection between heredity and diabetes, manufacturers of anti-diabetic drugs such as Upjohn reinforced the idea of diabetes as primarily genetic in origin. While diabetes detection studies in both Britain and the U.S had revealed a clear link to a multifarious number of factors in the onset of diabetes, it was genetics that became the central focus of research in clinics in both Britain and the U.S. From the late

1960s to early 1970s, the Joslin Diabetes Foundation carried out a series of studies on heredity using twins at its Pre-Diabetes Clinic in Boston which led researchers to conclude the presence of a strong link between genetics and the milder form, T2D. One particular study in 1968 on diabetic twins had shown T2D to be present in both identical twins over 90% of the time, while in twins with T1D the other twin did not necessarily develop diabetes.[516] Crucially, Joslin's Howard Root and Marise Gottlieb interpreted these findings to mean that environment played a much greater role in T1D than it did in T2D, which as they remarked 'was surprising because maturity-onset diabetes is more correlated in large populations with obesity and over-nutrition'.[517] Owing to these findings, as well as the identification of a strong pattern of hereditary in newly identified cases of diabetes, research centres such as the Joslin Clinic, as well as leaders of British detection efforts such as Joan Walker, dedicated much of 1960s and 1970s to the role of genetics in the development of diabetes, side-lining attention from the social, economic and psychological causes of the disease.

Sources relating to diabetes detection campaigns of the 1960s demonstrate that accompanying the search for 'hidden diabetes' was a concerted shift from understanding diabetes as a disease often triggered by psychosocial factors, towards seeing the condition primarily in genetic terms. The results of diabetic surveys highlighted the need for prevention, however, as the model of 'prevention through detection' became paramount, the focus of prevention efforts turned towards PWD and their family members and positioned long-term medical management as the most viable solution. Consequently, throughout the 1960s diabetes management

[516] H. Root and M. Gottlieb, 'Diabetes Mellitus in Twins', *Diabetes*, 7:11 (1968), pp. 693-704.
[517] The Joslin Diabetes Foundation Bulletin, Fall Issue 'Heredity and Diabetes', (1975), Joslin Diabetes Center.

increasingly turned toward individual-level explanations such as lifestyle, behaviour change and the individual's 'genetic code', at the expense of investigating structural explanations such as poverty, poor nutrition and stress. As historian Jill Kirby has pointed out, despite the work of Hans Selye, Richard Lazarus and others to popularise the concept of stress from the 1950s, by the 1970s there was 'a surprising lack of awareness of stress'.[518] As discourses on how to prevent diabetes began to focus on individual-level solutions, people with diabetes, women in particular, found themselves the targets of prevention efforts as physicians suggested regulating the individual and their reproductive capabilities as a means to curbing rates of the disease rather than tackle its psychosocial basis.

While the renewed interest in genetics led to important findings on the hereditary nature of diabetes, the profession's focus on genetics led to a narrower understanding of diabetes. This thwarted primary prevention approaches inspired by an earlier model which had presented the causes of diabetes in a more holistic manner. Not all of those in the medical profession supported a narrow focus on inheritance, however. The report of a working party appointed by the College of General Practitioners published in the *British Medical Journal* in 1965 highlighted the importance of environment in the causation of diabetes, particularly for elderly patients for whom the report found purely genetic explanations of the disease 'rather unsatisfactory'.[519] Writing in the *BMJ* in 1965, Draeger explained:

> To clinicians, diabetics form a heterogeneous group, and most would agree that the disorder runs in families. But when we try to analyse what these familial aggregations mean we get into difficulties, and it

[518] J. Kirby 'Working Too Hard: Experiences of worry and stress in post-war Britain' in M. Jackson, *Stress in Post-War Britain*, (London: Routledge, 2015), p. 59.
[519] J. Draeger, 'Inheritance of Diabetes Mellitus', *BMJ*, 1:5440 (1965), pp. 940-941.

> has perhaps been insufficiently appreciated that environmental factors as well as genes can produce a positive family history.[520]

While Draeger's report pointed out the limitations of genetic explanations, its sentiments were ignored by those within the field of diabetes who favoured the biomedical model. Discussions around the psychosocial aspects of diabetes, however, did not disappear entirely. A small number of medical experts, namely psychologists, continued to support psychological and social aetiologies of diabetes. In his book *The Psychological Aspects of Diabetes* published in 1964, Californian psychologist Harold Geist echoed Menninger and his colleagues' theories of the 1930s and Walker's early research published in the 1950s, and suggested a strong correlation between emotional stress and conflict and the onset of diabetes. Heist contended that the role of psychological factors in diabetes were being grossly neglected, urging physicians to pay greater attention to the relationship between diabetes and various aspects of the patients life such as socioeconomic status, sex, diet and occupation.[521] Ultimately however, the voices of those who stressed the role of psychological and socioeconomic factors in the onset of diabetes largely went unheard during this period. In contrast, many sought to preserve the traditional view that diabetes was a disease found 'among men of enterprise, executives, soldiers and officials', purporting the view that 'among the poor, there are few diabetics'.[522]

[520] Ibid.
[521] H. Geist, *The Psychological Aspects of Diabetes*, (Charles C Thomas, Illinois: 1964).
[522] J. A. Landa, 'Social and Medical Problems', *The Apothecary*, 1967, Joslin Diabetes Archive.

Individual-Level Aetiologies and Diabetes Management in the 1960s

This chapter has largely considered the influence of screening and diabetes detection campaigns in shaping aetiological understandings in the post-war period. In order to understand how this contributes to the thesis as a whole, however, it is crucial to examine the overall bearing of these shifts upon diet therapy. While existing histories tend to suggest that the lack of dietary interventions in the post-war period was simply due to a lack consensus over what constituted the ideal diet, this chapter has demonstrated how wider developments in diabetes such as the discovery and mass use of oral hypoglycaemic drugs, as well as the aetiological shift driven by the results of detection programmes, steered attention away from dietary interventions towards individual-level explanations and the medical management of disease. While the results of the first Ibstock study had stated there was no connection between diet and the onset of diabetes, in a five year follow-up of Walker's *Diabetes in an English Community* published in the *Lancet* in 1964, she found that the rate of progression in the early stages of abnormality *were* influenced by diet and exercise, and in some cases the diabetes was reversible.[523] Despite these findings, which suggested the progression of diabetes could be halted or reversed by dietary measures alone, those working on 'prevention through detection' continued to focus on patterns of inheritance and uphold the need for long-term, medical management. Oral testimonies provided by patients diagnosed in Britain during the 1960s at the height of diabetes detection drives provide vital evidence that as greater attention

[523] J. Walker, 'Early Diabetes: A Five Year Follow-Up of Diabetes in an English Community', *The Lancet*, 284:7353 (1964), pp. 246-248.

was placed upon the role of genetics in the 1960s, patients began to receive a fraction of the dietary instruction received by their pre-war counterparts. Joy, a dietician born in Manchester in 1949 who began work with a diabetic clinic in the 1960s recalled that while there was considerable interest in diet and its role in health, the dietary advice offered to patients was often limited, with no guarantee of seeing a dietician:

> Well, initially I took a post in South Essex, and used to work with the diabetic consultant there, and we used to go to the different hospitals doing diabetes clinics. At that time, as I said, there weren't that many dietitians in the country, as a whole, and what many consultants had had to rely on, until that time, were diets that they had brought from what was then the British Diabetic Association, which they kept in a drawer in the consulting room. And newly diagnosed diabetics, if they were not fortunate enough to have a dietitian on hand, were just given a diet sheet that had been purloined from the BDA, and told to get on with it, basically.[524]

As Joy describes, those fortunate enough to see a dietician upon being diagnosed would receive a consultation in which their diet would be assessed and instruction received on any necessary changes.[525] However according to Joy's testimony, not all patients received a consultation with a dietician and in those cases it was more likely that a generic diet sheet was provided by their GP that patients were expected to interpret themselves. Subsequent oral testimonies add that this advice could often be outdated and could contravene the latest nutritional recommendations. June Hill from Birmingham, diagnosed with Type 2 diabetes in 1960, recalls receiving the then outdated, Lawrence-style ration sheets:

> I went back to the GP, and he obviously had letters from the hospital, and he said that it was more marginal than anything to worry about. And so he gave me two cardboard sheets, and he called them red and

[524] Joy, Interview, 16 November 2007, British Library, C1239/88.
[525] The British Dietetic Association was first established in 1936, thus at the time of Joy's training and employment the field was a modern profession. Still in its infancy dieticians were still few at this time.

> green points, and he said I was to have so many of the red points each day - these were foods on these, listed rather like diet sheets - and so many of the green points. Now, I can't remember anything more than that, except for looking through these sheets.[526]

Upon showing these sheets to the diabetic nurse June recalls her rather abrupt response: 'they ought to be in a museum!'[527] For June, the sheets were little help in managing her diabetes and despite keeping healthy, eating 'not too many sweets' and exercising, June's story presents an all too common narrative whereby she was no longer able to manage her condition by dietary means and was eventually prescribed oral medication in 1983, followed by insulin the early 1990s. Further oral testimonies suggest that during the 1960s and 1970s there remained a lack of consensus on what constituted the 'ideal' diabetic diet, which often resulted in patients experimenting with a multitude of regimens recommended by their physician. James Jones was diagnosed with T2D in 1968 after falling unwell and being admitted to a local psychiatric hospital where he received ECT and remained for a year with an unclear diagnosis. It was while in hospital that James discovered he had diabetes and recalls being placed on Chlorpropamide, marketed as Diabinese by Pfizer, as well as trialling a wide range of diets to ascertain which worked best:

> They tested different diets on me to see which one was more suitable, 'cause there's lots of things they gave me, there was no stayin' on them. They put me on these pulse… a pulse diet - beans - all sorts of beans: red kidney beans, butter beans, mung beans; all those kinds of things, and I really enjoyed them. And they said 'well, that's good', he said 'because', he says 'you're the only one that's ever said they liked them'…[528]

[526] J. Hill, Interview, 1 October 2004, British Library, C1239/19.
[527] Ibid.
[528] J. Jones, Interview, 19 November 2004, British Library, C1239/27.

Others diagnosed with T2D during the 1960s recalled receiving neither dietary advice nor a clear idea of what type of diabetes they had been diagnosed with. George Saunders from Birmingham, diagnosed in 1964 recalled:

> They didn't tell me the type of diabetes. They put me on some tablets for a few months and asked me to come back to see them, which then I did do, and when I went back to see them, they increased the tablets. And after another six months or so I went back to see them again, and there and then it seem as though the diabetes wasn't settling down properly, so therefore they introduced me to insulin.[529]

Further evidence that less time was being granted to dietary advice in this period can be found in the testimonies of physicians who trained in the 1960s, which provides an important insight into what medical students were being taught about diabetes and the orthodoxies in treatments at the peak of the detection campaigns. Retired physician Kenneth Collins studied medicine at Glasgow University between 1966 and 1972 and later worked alongside diabetes specialist John Ireland. When asked about the orthodoxies in diabetes management during his medical training, Kenneth recalled:

> So if you were overweight you would go onto either Metformin or Phenformin and if you were on other oral agents, the sulphonylureas, I think Tolbutamide had already been cast aside and Chlorpropamide was *the* drug of choice.[530]

When later asked what he recalled being taught about diet and diabetes Kenneth replied:

> In general it was just weight reduction. It was nothing really specific. Obviously carbohydrate reduction was mentioned so you cut out sugar and even get people to remove added sugar from the

[529] G. Saunders, Interview.
[530] In-person Interview: Rachel Meach with Kenneth Collins, 25 January 2017.

> diet was something really significant. And that was the emphasis so cut out added sugar…[531]

Kenneth graduated medical school and began working as a GP in Glasgow in 1972. Describing the type of dietary instruction patients would receive upon diagnosis he describes how, with the establishment of diabetic clinics in larger cities such as Glasgow, most newly-diagnosed patients would be sent to the diabetic department at the hospital where they would receive formal instruction, in the meantime it became the norm for GPs to issue patients with a simple diet sheet, however as Kenneth recalled:

> Sometimes these were promotional diet sheets issued by drugs companies who actually made the diabetic drug, so it was in their interest I suppose to have compliant patients. And they made, they printed some of them…em…but at the same time because there was usually advertising round it we usually thought it was better getting the diabetic clinic at the hospital and we would get samples of their stuff. These were the days before we even had photocopiers in the practice, but they had them in pads or whatever…[532]

What these testimonies suggest, is that during the period in which new oral agents for diabetes were now available, and mass screening was being deployed in order to find 'hidden' cases of diabetes among the population, the place of diet therapy within diabetes was precarious. A lack of consensus among professionals regarding the most effective dietary interventions, the ease and growing confidence in prescribing oral anti-diabetic medications, as well as shifting social and scientific discourses around diabetes aetiology, all contributed towards holistic approaches to managing diabetes, in particular the patient's diet, receiving considerably less attention in this period.

[531] Ibid.
[532] Ibid.

As diabetes detection efforts expanded and more cases were identified, and discourses around diabetes aetiology moved further away from psychosocial explanations, prevention efforts looked increasingly toward the long-term, medical control of diabetes instead of targeting socio-environmental factors which could prevent the disease altogether. This is significant given that when anti-diabetic drugs were developed in the 1950s, they were only intended as an initial stabilising measure to bring blood glucose levels down to a level safe enough for patients to then return to controlling their diabetes with dietary measures alone. However, tracing the development of discussions regarding control of diabetes with the use of oral hypoglycaemic drugs throughout this period illustrates that by the 1960s these discussions increasingly turned towards talks of 'long-term control' instead.[533] Arguably then, the staggering number of new cases that were revealed due to detection campaigns had made more time-consuming treatments such as diet therapy now seem unfeasible in most patients. Consequently, screening for 'hidden' diabetes facilitated the transition of the need for oral hypoglycaemic drugs as a short term to long term measure. Accordingly, by the mid-1960s an interest in the heredity nature of diabetes coupled with the enthusiasm for the new oral hypoglycaemic drugs saw drugs which were later found to be harmful such as Phenformin, recommended as a preventive measure not only in those with mild diabetes, but for use in family members and children as well.[534]

[533] G. F. Joplin, R. Fraser and J. Vallance-Owen, 'Tolbutamide Control of Diabetes Mellitus', *The Lancet*, 274:7110 (1959), p. 1034; W. G. Tomhave et al, 'Oral hypoglycaemic agents', *JAMA*, 106:3 (1960), pp. 345-353; A. Marble et al, 'Nine years' experience with tolbutamide therapy in the treatment of diabetes', *Metabolism*, 15:11 (1966), pp. 957-970.
[534] D. L. Wilansky, I. Hahn, R. Schucher, 'The Influence of Phenformin (DBI) on 'Prediabetes', *Metabolism*, 14:7 (1965), pp. 793-799; G. R. Fearnley, R. Chakrabarti and E. D. Hocking, 'Phenformin in Rheumatoid Arthritis', *The Lancet*, 288:7467 (1966), pp. 757-761.

Conclusion

This chapter has explored the history of population screening for diabetes and the role of post-war detection studies carried out in Britain and the U.S in shaping understandings of diabetes and how it should be treated. Alongside the availability of oral anti-diabetic drugs, mass screening programmes, and crucially the focus researchers placed on familial risk and genetics, played a key role in generating support for the long-term, pharmaceutical management of diabetes. As a result, social and environmental understandings of diabetes received considerably less attention during these decades. Consequently, patients began to find themselves offered the new drugs and a fraction of the dietary education and advice received by their pre-war counterparts. Rooted in debates dating to the 1930s about the control of diabetes to avoid later complications, detection campaigns aimed to root out 'hidden diabetics' living asymptomatically among the population. With the help of new medical technologies used to analyse urine and blood sugar, community studies were able to identify a high number of new cases and individuals with glycosuria that had the potential to develop into over diabetes in later life. This chapter has highlighted the role of previously overlooked historical actors instrumental in this period of diabetes history such as the British physician and founder of the first diabetic clinic, Dr Joan Walker. Inspired by detection efforts in the U.S, as well the need to carve out her position in the British medical profession, this chapter has highlighted Walker's role in British screening efforts and the 'geneticisation' of diabetes in the post-war period. Walker's Ibstock study propelled the search for hidden diabetes in Britain, and her decision to hone in on the study's hereditary findings rather than those which stressed a psychosocial basis such as stress,

fundamentally shifted ideas about the nature of diabetes in the post-war period, contributing significantly to the treatment options available to patients.

Coinciding with post-war debates regarding nutrition and the 'ideal' diet for weight loss, as the next chapter addresses, these corresponding developments helped to create a context where the most convenient method to treat an influx of new cases was with oral anti-diabetic drugs. As oral testimonies from this period attest however, this often meant considerably less time on dietary advice and education. As genetic explanations resurfaced to explain the rise in new cases, individual-level solutions, such as those which suggested selective mating, were promoted as the primary means of curbing rates of the disease. Ultimately this placed responsibility for preventing diabetes on individuals and their family members, diverting attention away from socioeconomic factors which were likewise contributing to rising incidence such as poverty, stress and inadequate nutrition. The incorporation of screening campaigns into the history of diabetes, as carried out here, provides a new perspective on the transformation of diabetes in this period into a classically genetic disease, one that ultimately became paired with long-term pharmaceutical interventions as the most effective form of management.

Chapter Six:

A War of Nutritional Ideology: Fat, Sugar and Post-War Dietary Guidelines for Diabetes

Figure 6.1: 'The Bitter Truth about Sugar', *New York Times*, (1976). [Courtesy of the *New York Times*].

Introduction

In recent years, sugar has come under fire by public figures such as Robert Lustig in the United States and celebrity figures like Jamie Oliver in Britain. Among these discussions of the role of sugar consumption in contributing to chronic disease has been a resurgence of interest in the diet-heart debate, the post-war debate over whether fat and sugar contributed most to coronary heart disease and other chronic ailments. Within these contemporary discussions on the relationship between diet and disease, particular interest has been drawn to the otherwise dormant ideas of the British nutritionist John Yudkin, leading to the republication of *Pure, White and Deadly* (1972).[535] Although he had been labelled a heretic by the 1970s, Yudkin's admonishment of sugar has now been hailed a 'prophecy' which foretold the consequences of sugar consumption long before the evidence was available.[536] At the height of the post-war diet-heart debate, Yudkin insisted that refined carbohydrates, especially sugar, were an important cause of a host of chronic diseases. While recent accounts of the diet-heart debate have described the anti-sugar sentiment of the 1970s as a 'new theory', Yudkin's cautionary tale about sugar was not a new one. Indeed, sugar's place at the table has long been disputed.[537] As a commodity once only afforded by the rich, sugar was held in high esteem and its whiteness seen to symbolise its purity, healthfulness and superiority over other sweeteners. However, as historian Sidney Mintz identifies, when the price of sugar declined, leading to its wide consumption, ideas about sugar and its nutritional status

[535] J. L. Smith, 'John Yudkin: The man who tried to warn us about sugar', *Independent*, 22 February 2014.
[536] R. Lustig, 'Prophecy and Propaganda' in J. Yudkin, Pure, White and Deadly: How Sugar Is Killing Us and What We Can Do To Stop It, (London: Penguin Books, 2012), p.2
[537] M. Easter and S. Wrench, 'Are saturated fats still bad for us?' *Men's Health*, 26 May 2021.

were challenged.[538] Historians, the medical profession and epidemiologists maintain that the link between sugar consumption and chronic disease has corresponded with its development and increased presence in Western diets. Denis Parson Burkitt, the late surgeon renowned for his research on cancer and nutrition, remarked of the association between refined carbohydrates and disease that 'the fear that sugar may be injurious is as old as the written history of this sweet food'.[539] Burkitt traced concerns surrounding sugar's nutritional value to India around 100 AD, when soon after the importation and cultivation of sugar cane from New Guinea, Charake Samhita ascribed both obesity and diabetes to this 'new article of diet'.[540] In the twentieth century, American physicians Emerson and Larrimore, having traced the reported rise in diabetic mortality in New York since 1866, ascribed their findings to changes in dietary habits, especially the rise in sugar consumption. Emerson and Larrimore were the first researchers to draw a definite correlation between the influence of social and environmental factors such as diet and the incidental rise of diabetes.[541] In Britain, statistician Percy Stocks, having studied the increase in diabetic mortality in England and Wales from 1861 to 1942, drew attention to the marked decline in diabetic mortality during the two world wars; this he believed was due to wartime rationing and reduced consumption of sugar.[542] These findings, along with those of Himsworth were reassessed further by British surgeon Thomas Cleave in his book *The Saccharine Disease*. A keen purveyor of the damaging health consequences of sugar consumption, Cleave drew a convincing link between

[538] S. Mintz, *Sweetness and Power: The Place of Sugar in Modern History*, (New York: Penguin, 2008), xxix.
[539] D. P. Burkitt, *Refined Carbohydrate Foods and Disease*, (London: Academic Press, 1975), p. 37.
[540] Ibid.
[541] H. Emerson and L. D. Larrimore, 'Diabetes Mellitus: A Contribution to its Epidemiology Based Chiefly on Mortality Statistics', *Archives of Internal Medicine*, 35:5 (1924), pp. 585-630.
[542] P. Stocks, 'Diabetes mortality in 1891-1942 and some of the factors affecting it', *Epidemiology and Infection*, 43:4 (1944), pp. 242-247.

the decline in sugar consumption during both world wars and the corresponding decline in diabetes mortality and the overconsumption of refined carbohydrates, notably sugar and flour, and the increase in many prevalent chronic diseases.[543]

During the 1970s no one generated as much controversy over sugar as the late British nutritionist John Yudkin. Towards the end of the 1950s, heightened fears of coronary heart disease fuelled a search for the dietary components responsible for the dramatic rise in cardiovascular mortality and other diet-related diseases. During the surge in nutrition research that followed, nutritionists polarised into two distinct groups. On one side of the debate were those who followed American nutritionist Ancel Keys and believed dietary fat was responsible; while on the other were those who aligned with British nutritionist John Yudkin who believed carbohydrates, primarily refined sugar, were to blame. In a series of publications written during the 1950s to 1980s, Yudkin maintained that a host of chronic conditions, from diabetes, obesity and heart disease, to asthma, dermatitis and Crohn's disease, could be attributed to high consumption of sucrose. Yet, despite this periodic connection between sugar consumption and disease outlined here, Keys and his critique of fat won the debate, resulting in the dominance of 'low-fat' dietary guidelines, evident in the manufacture of low-fat products which proliferated in the ensuing decades, the shift in official dietary guidelines towards a recommended high-carbohydrate/low-fat diet, and the suppression of Yudkin's warnings about sugar, which lay dormant only until recent years.[544]

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[543] T. L. Cleave, *The Saccharine Disease: Conditions caused by the taking of refined carbohydrates, such as sugar and white flour*, (Bristol: John Wright & Sons, 1974).
[544] R. Meach, 'From John Yudkin to Jamie Oliver: A Short but Sweet History on the War against Sugar', in M. Smith and D. Gentilcore (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2019).

The emergence of the diet-heart debate at the end of the 1950s has been well documented.[545] Historian Ann La Berge has examined how a series of scientific studies from the 1940s, which had shown a correlation between high-fat levels and high cholesterol levels, led to low-fat diets being advised not only for high-risk patients, but also the general population. By the 1980s and 1990s, support from the scientific community, governments and the food industry saw 'low-fat' become the dominant dietary discourse, consuming the 'hearts and minds' of the medical community and feeding into popular diet culture.[546] Elsewhere, medical historians such as Harry Marks have examined the diet-heart debate within the wider context of the development of the randomised control trial (RCT) and mid-century attempts to monitor dietary changes and cardiac problems in Americans.[547] Others such as Maiko Spiess and Peder Clark have considered the relationship between science, politics and economics in the emergence and evolution of the public debate on dietary recommendations that followed the Framingham Heart Study. Moreover, Rothstein has provided a critical account of the reductionism inherent in the risk factor model of disease causation and the interest groups, such as the food industry, who have benefited from this model of preventative programmes and treatments.[548] More recently, I have examined the role of the late British nutritionist John Yudkin

[545] A. La Berge, 'How the Ideology of Low Fat Conquered America', *Journal of the History of Medicine and Allied Sciences*, 63:2 (2008), pp. 139-77; H. Marks, *The Progress of Experiment: Science and Therapeutic Reform, 1900-1990*, (Cambridge: Cambridge University Press, 1997); W. Rothstein, *Public Health and the Risk Factor; A History of an Uneven Medical Revolution*, (New York: University of Rochester Press, 2003).
[546] A. La Berge, 'How the Ideology of Low Fat Conquered America', *Journal of the History of Medicine and Allied Sciences*, 63:2 (2008), pp. 139-77
[547] H. Marks, *The Progress of Experiment: Science and Therapeutic Reform, 1900-1990*, (Cambridge: Cambridge University Press, 1997).
[548] M. R. Spiess, 'Food and Diet as Risk: The Role of the Framingham Heart Study', in M. Smith and D. Gentilcore (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2019); W. Rothstein, *Public Health and the Risk Factor: A History of an Uneven Medical Revolution*, (New York: University of Rochester Press, 2003); P. Clark, *Lifestyle, Heart Disease and the British Public c.1950-2000*, (PhD thesis, LSHTM, 2019).

in the diet-heart debate, considering how those at the forefront of the debate disseminated dietary advice to the public, what this can tell us about where nutritional advice comes from, and the wider social and cultural context - in particular traditional notions and ideals regarding gender - in which the diet-heart debate unfolded.[549]

The following chapter builds on this historiography by considering the influence of the diet-heart debate and the reign of the 'low-fat' diet on dietary advice for diabetes. It traces the revision in diabetic guidelines which occurred, as I argue here, as a result of the debate, and the overall implications for diabetic management and treatment. The chapter describes how wider events occurring in nutrition science impacted the diets of diabetic patients in the same decades as the search for 'hidden' diabetes and the proliferation of the newly developed oral hypoglycaemic drugs. Examining medical literature and industry advertisements from the height of the diet-heart debate alongside diabetic guidelines from this period, the chapter sheds further light on the social, political and cultural factors that have influenced the post-war management of diabetes, and, critically, the role of wider nutritional discourses in shaping dietary recommendations provided to people with T2D.

Yudkin, Keys and the Diet-Heart Debate

Refined sugar found its place as a crucial ingredient in a range of new foods during the 1950s, as the manufactured food industry expanded. It was vital in creating the

[549] R. Meach, 'From John Yudkin to Jamie Oliver: A Short but Sweet History on the War against Sugar', in M. Smith and D. Gentilcore (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2019).

image, particularly in the United States, of a consumer paradise with an abundance of ready-made, convenience foods.[550] Yet, as sugar was being added to an increasing range of foods, rates of diabetes, obesity and heart disease were quietly escalating. By the 1960s, concerns about chronic disease, smoking, environmental degradation and the safety of the food supply had brought health to the centre of American culture and politics. Increasing anxiety over the rise of cancer, diabetes, obesity and cardiovascular disease thus saw the focus of the health community shift away from infectious diseases and toward chronic disease. With this came an understanding that health had become deeply influenced by social and environmental issues such as nutrition.[551] As it became apparent that most Western nations were over-nourished, the focus of research and dietary advice thus shifted from nutritional deficiencies and encouraging the population to eat *more* nutritious foods towards a focus on the prevention of chronic disease that encouraged the public to *reduce* their intake of certain foods. In the post-war period, the idea of obesity as a major national health crisis propelled this transition. Concerns about obesity as a public health problem had been mounting throughout the 1950s, evident in an article in the *New York Times* which declared obesity 'the greatest single hazard to human life in the nation today'.[552] In 1951 the results of a MetLife study, that drew a significant correlation between weight and mortality and buttressed the notion of an ideal body weight, further heightened concerns around body fat and the health problems caused by

[550] R. Meach, 'From John Yudkin to Jamie Oliver: A Short but Sweet History on the War against Sugar', in M. Smith and D. Gentilcore (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2019), p. 97.
[551] C. Biltekoff, *Eating Right in America: The Cultural Politics of Food and Health*, (Durham: Duke University Press, 2013), p. 90.
[552] 'Overeating Called 'Compulsive': Diet Held Only Way to Reduce', *New York Times*, October 21 1950.

obesity and overweight.[553] By 1952, the *New York Times* was describing excess body fat as a 'devastating nutritional disorder' that was fast becoming the nation's primary public health problem.[554] This anxiety regarding the relationship between diet and disease was heightened further in 1952 when the U.S. president Eisenhower suffered a heart attack, an event which thrust the issue of coronary heart disease into the public domain and sparked an international search for the dietary component responsible.

In 1958, American physiologist Ancel Keys brought together researchers from all over the world and launched his Seven Countries Study, the first major survey of the potential risk factors associated with cardiovascular disease.[555] Keys' findings across the seven countries led him to assert that dietary fat was to blame for the rise in heart disease and that only a diet low in fat could prevent it.[556] Around the same time, British nutritionist John Yudkin found that sugar also appeared to correlate with heart disease in several countries and thus contended that high sugar consumption was a key cause of heart disease. By the end of the 1960s, a war of nutritional ideology was in full swing, as Keys, Yudkin and their followers debated which nutrient was responsible. Absent in much of the literature on the diet-heart debate is a consideration of why fat *and* sugar could not both be feasible as mutual dietary explanations. Initially, Yudkin seemed more agreeable to the idea that both were somehow implicated as mutually confounding variables, present in equally high

[553] Biltekoff, *Eating Right in America,* p. 115.
[554] H. Rusk, 'Overweight Persons Termed Top Health Problem in U.S.', *New York Times,* April 17 1952.
[555] Seven Countries Study, https://www.sevencountriesstudy.com/about-the-study/.
[556] A. Keys, 'Diet and the Epidemiology of Coronary Heart Disease', *JAMA*, 164:17 (1957), pp. 1912-19.

levels in the diets of those he had observed. Writing in the *Lancet* in 1957 Yudkin claimed:

> A consideration of some of the more readily available data on the incidence of coronary deaths and on food consumption make it difficult to support any theory which supposes *a single or major dietary cause* of coronary thrombosis.[557]

Unlike Yudkin, Keys was unwavering in his belief that the escalation of heart disease was being fuelled by a single nutrient: fat. Agitated by this, Yudkin took to the *Lancet* to accuse Keys and his colleagues of using 'awkward facts' and 'cherry-picking only the data which supported their views'.[558] Despite his initial reluctance to support the idea of a single nutritional cause of heart disease, by the time he published the controversial *Pure, White and Deadly* in (1972), Yudkin too had subscribed to the idea of a single dietary cause of disease. For him, refined carbohydrates, in particular sugar, were responsible for a whole host of conditions, ranging from obesity, heart disease, cancer and diabetes to hyperactivity, eczema and arthritis.[559] Yudkin's demonization of sugar provoked heated responses from those who aligned with Keys' fat hypothesis, evident in the fierce commentaries in medical journals that followed. As English physician, Henry Speedby remarked in the *Lancet* in 1964:

> Sir, - Professor Yudkin's tentative conclusions on the relation between ischaemic heart disease and the consumption of sugar add to our burden. We have hardly got used to the view – wholeheartedly subscribed to by the ADA – that increased consumption of saturated animal fats, which constitute 35-40% of the diet of contemporary Western societies, is the basic cause of the alarming rise in coronary heart disease. Now Professor Yudkin invites us to cut our sugar intake drastically, since 'we think it likely

[557] J. Yudkin, 'Diet and Coronary Thrombosis', *Lancet*, 273 (1957), p. 162.
[558] Ibid, p.155.
[559] J. Yudkin, *Pure, White and Deadly: How Sugar is Killing Us and What We Can Do To Stop It*, (London: Penguin, 1998), foreword.

> that we are dealing with a *primary causal relationship* between sugar intake and arterial disease'. Elsewhere in the same paper he treats this assumption as only a hypothesis at present. In other words, sugar – historically the latest edition to the list of our nutrients – has become the newest fashionable villain in our affluent society.[560]

Ultimately, both sugar and saturated fat were associated with the risk of heart disease, yet Keys and Yudkin's hypotheses were situated as competing single-nutrient explanations.[561] The possibility that both fat *and* sugar were mutually responsible for the rise in chronic disease in this period was never seriously entertained, evident in the very public dismissal of Yudkin's ideas by most nutrition experts at the time and the deriding of his career by his contemporaries.[562] The possible explanations for this are both personal, reflecting the private ambitions of individual nutrition scientists, as I have documented elsewhere, and political, shaped by changes in the formation of official dietary guidelines and the increasing influence of the food industry and government in their formation.[563] Gyorgy Scrinis concept of 'nutritionism' is particularly useful for understanding the latter. Beginning in the 1960s, a new tendency towards a reductive understanding of nutrients saw a number of foods reframed as either 'good' or 'bad', ushering in a new nutritional era characterised by 'nutritional determinism', whereby nutritionists became wholly obsessed with individual nutrients.[564] Scrinis maintains that the

[560] H. J. Speedby, 'Letters to the Editor', *Lancet*, 284: 7356 (1964), p. 412.
[561] Scrinis, *Nutritionism*, p. 83.
[562] The deriding of Yudkin's career has attracted substantial attention recently with the renewed sugar debate; see, for example, I. Leslie, 'The Sugar Conspiracy', *Guardian*, 7 April 2016; G. Taubes, 'What if It's All Been a Big Fat Lie?', *New York Times*, 7 July 2002.
[563] In my publication on John Yudkin I delve further into the possible reasons why Yudkin was derided by many of his contemporaries but the reasons why fat won the debate are more complex than Yudkin's career. The power and influence of the food industry and the sugar lobby who funded influential research during the 1960s to downplay the relationship between sugar and coronary heart disease, contributed significantly in turning attention away from sugar and toward fat. See R. Meach, 'From John Yudkin to Jamie Oliver: A Short but Sweet History on the War against Sugar', in M. Smith and D. Gentilcore (eds.), *Proteins, Pathologies and Politics: Dietary Innovation and Disease from the Nineteenth Century*, (London: Bloomsbury, 2019).
[564] Scrinis, *Nutritionism*, p. 83.

narrow focus on fat, and later the different types of fat, served to focus the attention of the public and nutrition experts on the presence or absence of fat in foods, rather than on the processing techniques and other ingredients, notably refined sugar, used in production.[565] Within this context, the overall attention of nutritionists, the wider medical community and public health experts unquestionably became focused on fat. Correspondingly, the food industry, heavily influenced by the powerful sugar lobby, fuelled this significantly by translating the findings of Keys et al. into an enormous array of low-fat products.[566]

As nutritionists debated the role of individual nutrients in escalating rates of chronic disease, wider events fuelled the public's anxiety about diet and disease and what not to eat. In 1969, the White House Conference on Food, Nutrition and Health produced the first significantly revised dietary recommendations since the introduction of the first Recommended Daily Allowances (RDA) during the Second World War. This new set of recommendations embodied the language of negative nutrition, differentiating foods between good and bad and for the first time urging the population to 'decrease', 'limit', 'avoid' and 'reduce' foods high in calories, fat, cholesterol, salt, and sugar.[567] The new guidelines signalled a major reversal from the advice of wartime reformers which had encouraged the population to '*eat more',* towards a narrative that food could be injurious and contribute to the onset of chronic

[565] While some popular health writers and nutritionists from this time, for example Adelle Davis, also drew attention to the role of food production techniques, additives or the metabolic interaction of different nutrients, the key figures at the forefront of the diet-heart debate chose to focus on single nutrients. See C. Carstairs, 'Our Sickness Record is a National Disgrace': Adelle Davis, Nutritional Determinism, and the Anxious 1970s', *Journal of the History of Medicine and Allied Sciences*, 69:3 (2014), p. 462.
[566] A. La Berge, 'How the Ideology of Low Fat Conquered America', *Journal of the History of Medicine and Allied Sciences*, 63:2 (2008), p. 150.
[567] M, Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health*, (London: University of California Press, 2003), p. 39.

illness. The ideas underlying 'negative nutrition' were at the heart of the diet-heart debate, as a result the language and nature of dietary advice shifted considerably in the ensuing decades, fuelling the public's anxiety around eating and feeding concerns that, as the cover of *Time* in 1972 expounded: 'Eating May Not Be Good For You'.[568]

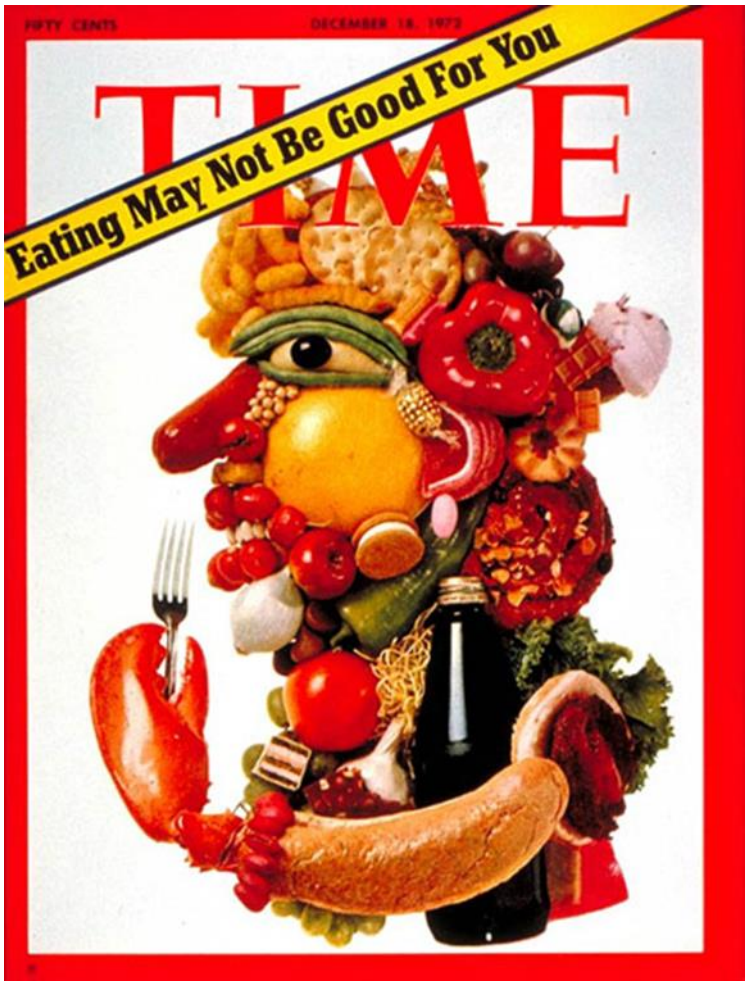

Figure 6.2: 'Eating May Not Be Good For You', *Time* (1972). [Courtesy of *Time* magazine].

[568] 'Eating May Not Be Good For You', *Time*, 18 December 1972. Another response to these fears was *Panic in the Pantry* by Whelan and Stare (1975). E. M. Whelan and F. J. Stare, *Panic in the Pantry: Facts and Fallacies about the Food You Buy*, (New York: Prometheus Books, 1992).

As Carstairs describes in her work on nutritional determinism, the early 1970s were a frightening time to eat in America. The consumption of processed foods had risen dramatically, triggering concerns about artificial sweeteners and cancer, carcinogenic nitrites in processed meats, mercury levels in fish, the use of pesticides and food additives, and the deleterious effects of the spoonful's of sugar served up with packaged breakfast cereals.[569] Despite attempts by the American Heart Association to demonize Yudkin following his critique of sugar, many shared his concerns that sugar was not only 'empty calories', but addictive and potentially hazardous to health. In 1969, Robert Choate, consultant to the White House and the Department of Health, Education and Welfare, conducted an analysis of the nutritional content of breakfast cereals. When Choate discovered how little nutrition and how much sugar the cereals contained, he charged the food industry with deliberately replacing nutrients with sugar in order to hook young children to their product.[570] The notion that consumers were being programmed to crave sugar led to an outpouring of what Levenstein has referred to as 'sucrophobia' throughout the 1970s: Franco-American scientist Jean Mayer warned how sugar could be as addictive for the young as alcohol, Californian allergist Ben Feingold linked its consumption to hyperactivity, and nutrition scientist Michael Jacobson, founder of the Center for Science in the Public Interest (1971), likened sugar consumption to drug addiction, highlighting the origins of the population's penchant for sweetness in sweetened baby foods and sugar-laden breakfast cereals.[571] Amidst the counterculture's natural and whole foods movement and growing concerns about food quality and safety, American

[569] C. Carstairs, 'Our Sickness Record is a National Disgrace': Adelle Davis, Nutritional Determinism, and the Anxious 1970s', *Journal of the History of Medicine and Allied Sciences,* 69:3 (2014), p. 462.
[570] H. Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America*, (Berkeley: University of California Press, 2003), p. 192.
[571] J. Mayer, 'The Bitter Truth about Sugar', *Pennsylvania Dental Journal*, 44:3 (1977), p .24.

writer William Dufty consolidated these fears in *Sugar Blues* (1975) by describing sugar as the 'white plague' and likening sugars' addictive qualities to heroin.[572]

In 1973, the U.S. Senate Select Committee on Nutrition and Human Needs was established to focus attention on the 'overnourished' and what to do about the rising rates of chronic disease. The committee spent the next four years looking into aspects of the American diet that had been linked to the leading killer diseases and concluded that too much fat, sugar, cholesterol, salt and alcohol were linked to cancer, cardiovascular disease, diabetes, coronary heart disease and cirrhosis of the liver. While both fat and sugar were listed as contributing to these diseases, the panel's final set of dietary goals, issued in December 1977, 'Dietary Goals for the United States', also referred to as the McGovern Report, concentrated on low-fat, high-carbohydrate recommendations.[573] In addition to warning the public about obesity, the guidelines advocated increasing carbohydrate consumption to 55 to 60 per cent of total daily intake while reducing fat from 40 to 30 per cent.[574] However, not only did the new recommendations apply to the general population, they were also quickly incorporated into the nutritional recommendations provided by governments and patient organisations for those with chronic, diet-related diseases such as diabetes. In order to understand how the diet-heart debate shaped diabetic management in the post-war period, the following section examines how advice for diabetes altered to accommodate the new low-fat recommendations. It pays particular attention to how the new guidance changed dietary guidelines for milder

[572] W. Dufty, *Sugar Blues*, (New York: Warner Books, 1975); W. J. Belasco, *Appetite for Change: how the Counterculture Took on the Food Industry*, (New York: Cornell University Press, 2007).
[573] US Senate Select Committee on Nutrition and Human Needs, *Dietary Goals for the United States*, 2nd edition (Washington, DC: US Government Printing Office, 1977), p. 4.
[574] Ibid.

diabetics, as well as examining how the debate inspired greater patient agency and the defence of the diabetic diet, seen in particular around questions of the safety and healthfulness of artificial sweeteners.

The Diet-Heart Debate and Diabetes: Revising Recommendations

Prior to the publication of *Dietary Goals*, most diabetic patients in the United States managing their condition through dietary restriction calculated their diabetic diet by following the 'Exchange Lists' system. In 1950, a lack of uniformity in prescribing diets to diabetic patients had led the American Dietetic Association to call for standardisation of the diabetic diet.[575] In a paper presented at their annual meeting, diabetologist Frank Allan, a renowned advocate of carbohydrate-restricted diets in diabetes, expressed the need for uniform, simplified dietary material. According to Allan, as many as two million PWD in the U.S. received little or no dietary treatment due to both inadequate dietary material that involved 'formidable' methods of dietary calculation, as well as a fundamental lack of time for detailed dietary planning and instruction in private practice. Concurrently, in the early 1950s physicians continued to debate the merits of the so-called 'free' diets versus those that were controlled. In 1950, a study carried out by Scottish physician Derek Dunlop sought to settle the debate. The study tested a number of diabetic regimens ranging from diets considered 'free' which allowed for a liberal intake of carbohydrate and total calorie intake, to those which followed a strict regime in which calories and all other

[575] E. K. Caso, 'Calculation of Diabetic Diets', *Journal of the American Dietetic Association*, 26:8 (1950), p. 575.

principles were meticulously prescribed.[576] The study concluded that patients with a history of obesity prior to the onset of their diabetes were likely to become more overweight with the high-carbohydrate, 'free' diet model, precisely that which would become formally in entrenched in nutritional guidelines in the 1980s. Dunlop and his colleagues in Edinburgh, and many others including those at the Joslin Clinic, thus concluded that patients, in particular those with a history of obesity, should be prescribed a controlled, carbohydrate-restricted diet. Nevertheless, while the debate between 'free' and controlled diets waged on amongst certain diabetologists, notably Dunlop in Scotland and the Joslin Clinic in Boston, the remainder of the profession, presented with an increasing number of milder patients, demanded tools with which to prescribe diets with uniformity and simplicity. In order to meet these demands, the ADA invited the American Dietetic Association to form a select committee in 1947 to work jointly with its Committee on Education to prepare a set of standard values suitable for use in dietary calculation and to develop a simplified method for diet planning, including 'exchange lists' of foods with similar values.[577] The Exchange List diet management system, revised in 1976 and again in 1986 to reflect the move towards low-fat, high carbohydrate guidance, aimed to provide a universal system for the nutritional management of diabetes that would allow patients to select appropriate foods and amounts to develop a meal plan.[578] The system classified all foods into six groups based on their basic composition, provided a few basic sample menus and instructed diabetics how to exchange single-portion servings of various

[576] D. Dunlop, C. C. Forsyth and T. W. G. Kinnear, 'Diet in Diabetes', *BMJ*, 1:4715 (1951), p. 1095.
[577] E. K. Caso, 'Calculation of Diabetic Diets', *Journal of the American Dietetic Association*, 26:8 (1950), p. 576.
[578] The current edition continues to emphasize a high carbohydrate, low-fat diet and is widely used by people with diabetes and diabetes educators. See H. J. Holler, 'Understanding the use of the exchange lists for meal planning in diabetes', *Diabetes Education*, 17:6 (1991), pp. 474-84; https://www.diabetes.co.uk/diabetic-exchange.html

foods within each food group.[579] According to some historians, following a diabetic diet became easier in the post-war period, an assumption often drawn by comparison to the earlier era of starvation diets and the meticulous weighing of foods. As Feudtner explains: 'the daily chore of figuring out what to eat became less burdensome after 1950 when the U.S. Public Health Service, the American Diabetes Association and the American Dietetic Association published a pamphlet titled *Exchange List for Meal Planning*'.[580] However, while the process of choosing the right type and amount of food may have become simpler over the second half of the twentieth century, adhering to dietary guidelines within the context of increasing food choice, new convenience foods and packaged foods which contained numerous perplexing additives and ingredients, remained a challenge.[581] Given these changes in food choice and production, devising the first exchange lists was an arduous task. Food variability and fluctuations in food values between different products, as well as variations in bodily reactions and metabolism proved challenging, as did the task of forming a consensus on the basic constitution of the diabetic diet amidst ongoing debates over the use of 'free' or restricted diets to control blood glucose and prevent complications.[582] Moreover, a prevailing assumption that only educated, intelligent patients could follow and adhere to dietary instructions lingered on, evident in how patients who did not adhere to dietary instructions were described as 'rebellious

[579] Feudtner, *Bittersweet*, p. 99.
[580] Feudtner, *Bittersweet*, p. 98.
[581] In a public meeting held by the Boston Diabetes Society in 1964, organisers attempted to tackle the topic of the changing food environment by hiring nutritionists to talk to patients about 'Facts and Fiction in Packaged Foods'. The meeting aimed to discuss 'the overwhelming supply of new packaged convenience foods' and to 'present the facts and figures concerning packaged foods so that some of them may take their place in the diabetic diet'. 3rd Public Meeting of the Boston Diabetes Society, 24 March 1964. Joslin Diabetes Archive.
[582] E. K. Caso, 'Calculation of Diabetic Diets', *Journal of the American Dietetic Association*, 26:8 (1950), p. 575.

spirits' and of 'subnormal intelligence' in certain studies.[583] Nevertheless, it was hoped that exchange lists, believed to be easier to follow, would allow the patient greater variety in his or her diet, allowing patients to select foods from different groups to suit their needs. Consequently, the medical consensus of the time held exchange lists to be the easiest and simplest means of calculating diet prescriptions, subsequently, by the 1960s, exchange lists for meal planning had become a prized resource among general practitioners for the calculation of diabetic diets. With the growth of dietetics as a profession in the post-war period, dietary matters were increasingly taken up by dieticians within diabetic clinics and as such many physicians began to lack the specialist nutritional knowledge of diabetes of their forebears. As late as the 1984, only 20% of general practitioners had access to a dietician within their practice and, consequently, pamphlets and exchange lists prepared by patient organisations, and increasingly by the pharmaceutical industry, became indispensable tools for the profession.[584]

[583] D. Dunlop, C. C. Forsyth and T. W. G. Kinnear, 'Diet in Diabetes', *BMJ*, 1:4715 (1951), p. 1095.
[584] 'The Provision of Medical Care for Adult Diabetic Patients in the United Kingdom', Report prepared by the British Diabetic Association and the Royal College of Physicians of London Committee on Endocrinology and Diabetes Mellitus (1984). Joan Walker Collection.

Figure 6.3: Portable diabetes education kit prepared by the ADA (1955). [Courtesy of: University of Leicester Special Collections].

Figure 6.4: Exchange List pamphlet used in general practice and diabetic clinics (1950). [Courtesy of: University of Leicester Special Collections].

With the publication of *Dietary Goals* in 1974, commentators were quick to announce that the Golden Age of the 'special diet' was over. As Samuel Vaisrub - then senior editor of *JAMA* described - while low-calorie diets may still be prescribed for the obese, low-carb or low-fat diets for the diabetic, and salt-free diets for the hypertensive, enthusiasm for the dietary prescription was at a 'low ebb'.[585] Vaisrub targeted the dietary regimens of PWD in particular, calling time on the 'mercifully, scrupulous compliance to a rigid diabetic diet' that was in his opinion, due to the ever-expanding possibilities of pharmaceutical preparations, not always necessary.[586] The publication of *Dietary Goals* reflected the federal government's official support of the low-fat approach. While the guidelines recommended that fat, sugar, salt and alcohol all be consumed less, it was the reduction of fat in particular which was emphasised continuously thereafter. Between 1978 and 1979, the American Society of Clinical Nutritionists, the American Heart Association and the National Cancer Institute all fell in line and produced their own low-fat recommendations and by 1980 a scientific consensus was emerging which promoted a low-fat diet as the most healthful diet not only as a preventable measure for those at risk of heart disease and cancer, but also for the entire population.[587]

In 1984, the UK government issued its first set of national dietary guidelines based on the American model, recommending the adult population should get less than 35% of their dietary energy from fat, a decision that the British Nutrition Foundation has periodically reviewed and continually supported.[588] In breaking with decades of

[585] S. Vaisrub, 'Dietary Prudence', *JAMA*, 229:6 (1974), p. 691.
[586] Ibid.
[587] La Berge, *How the Ideology of Low-Fat Conquered America*, p. 149.
[588] 'Dietary fat recommendations in the spotlight', British Nutrition Foundation, 10 February 2015, www.nutrition.org.uk, accessed 10 February 2016.

low-carbohydrate recommendations for diabetes, the American Diabetic Association (ADA), Canadian Diabetic Association (CDA) and the British Diabetic Association (BDA), in line with the changes made following the McGovern Report, increased the carbohydrate allowance for people with diabetes. Moving towards a diet similar to that of the general population, people diagnosed with T2D were now recommended to consume a high-carbohydrate diet.[589] Patient organisations in both Britain and the United States fell in line with the McGovern Report and published new low-fat dietary recommendations for patients which expressed the view that the historic restriction of carbohydrate was unnecessary. As the BDA's 'Dietary Recommendations for the 1980s' stated:

> Dietary measures are important in the management of diabetes mellitus in order to optimise control of blood glucose levels, to minimise the risk of hypoglycaemia in those treated with insulin and to achieve weight loss in the obese. Yet while current dietary measures are to some extent successful in all these respects, recent evidence suggests that other dietary strategies may be more effective, particularly in the long-term. It has also become apparent that many of the traditional beliefs concerning the diabetic diet are, at least, unproven and, at worst, misconceived.[590]

Spurred by the ADA's review and new recommendations, the Nutrition Sub-Committee of the BDA reconsidered their dietary polices for British diabetic patients, thus concluding that:

> The traditional view that restriction of carbohydrate is an essential part of the dietary management of diabetes can no longer be regarded as correct. Provided that the energy content of the prescribed diet

[589] While carbohydrate intake had been slowly increasing since the advent of insulin, the McGovern report marked the formal manifestation of low-fat/high-carbohydrate recommendations into the diabetic diet and suggested to patients, after decades of weighing and measuring carbohydrates that they were now safe to consume much more liberally.

[590] Dietary Recommendations for Diabetics for the 1980s' (1979), Report by the Nutrition Sub-Division of the Medical Advisory Committee, *British Diabetic Association*, (Joan Walker Collection, University of Leicester).

> does not exceed individual requirement, the proportion of energy consumed as carbohydrate is immaterial to diabetic control.[591]

Although maintaining that the *type* of carbohydrate consumed remained significant, the BDA's committee avowed that provided individual energy intake and energy expenditure was considered, it made little difference to diabetic control whether a diabetic diet contained a low or high proportion of its energy from carbohydrate. Moreover, the BDA considered a diet high in carbohydrate to contain many hitherto overlooked advantages including a reduction in sodium intake and saturated fat.[592] Accordingly, the revised BDA dietary guidelines for diabetes recommended a maximum of 35 per cent of dietary energy from fat and 55 per cent from carbohydrate, representing a significant reversal from former guidelines which had stressed the importance of 'protective foods', including fat, and years of research on nutrition and diabetic diets that stressed the importance of controlling carbohydrate in order to control blood sugar and prevent complications.[593] Joy, a dietician from Manchester at the time the new guidelines were brought in, recalls her feelings towards the BDA's reversal:

> Well, certainly things were becoming much more structured, and in 1983, the British Diabetic Association published dietary guidelines for diabetes for the eighties. And this was quite interesting, because we had been taught at college about carbohydrate exchanges - ten gram exchanges - and the new idea of the eighties was that diet and carbohydrate should not necessarily be quantitative, but qualitative. And a lot of research that had been done in America, up to this time, had shown that as long as carbohydrate was of a high fibre, slowly digested form, that it would not affect blood glucose very much, and

[591] Ibid.
[592] Ibid, p. 6.
[593] D. M. Behrman, *A Cookbook for Diabetics*, (New York: American Diabetes Association, 1959); 'Instruction for Diabetic Patients', Royal Free Hospital: London, 3 (1943), Joan Walker Papers; R. D. Lawrence, 'The Diabetic Life: It's Control by Diet and Insulin', in *A Precise Practical Manual for Practitioners and Patients*, (London: J & A Churchill, 1955).

> that the emphasis on exchanges was possibly inappropriate, although patients should still avoid sugars and sugary foods. I have to say, I didn't necessarily concur with this, but that may have been my own personal view, having watched my mother and some of her family cheat, shall we say - or not cheat - on the number of slices of bread or potatoes they took with the meal. Certainly, as far as I was concerned, there was an effect, not only in quality but quantity of carbohydrate taken. However, one is required to play it by the new rules, and those were the rules which we then followed.[594]

Calling for the 'normalisation of post-prandial glycaemia' and 'a more rational attitude to dietary carbohydrate' the BDA's dietary recommendations for the 1980s, mirroring those of the ADA, moved towards emphasising a 'balanced' diet and the importance of total energy intake and the glycaemic effects of food and meals in their entirety, rather than on the basis of sucrose or total carbohydrate alone.[595] In conjunction with this new outlook, patient organisations began to stress the importance of fibre in the diet. Within the new guidelines which stressed increasing carbohydrate intake, fibre, due to its value in slowing the rate of carbohydrate absorption from the small intestine, thus became one of the key components of dietary advice for diabetics from the 1980s onwards, with some research studies suggesting that a diet high in fibre could produce a remission of maturity-onset diabetes within fourteen days.[596] Moreover, the new guidelines produced by the BDA advocated tailoring dietary advice to 'individual needs, circumstance and

[594] Joy, Interview.
[595] Dietary Recommendations for Diabetics for the 1980s' (1979), Report by the Nutrition Sub-Division of the Medical Advisory Committee, *British Diabetic Association*, Joan Walker Collection.
[596] H. C. Trowell, 'Diabetes mellitus and dietary fibre of starchy food', *American Journal of Clinical Nutrition*, 31:10 (1978), pp. 53-57; H. C. Trowell, 'Recent developments in the dietary-fibre hypotheses', *Journal of Plant Foods*, 3:1 (1978), pp. 1-8; M. Cohen et al. 'Role of guar and dietary fibre in the management of diabetes mellitus', *Medical Journal of Australia*, 1:2 (1980), pp. 59-61

preferences' and the avoidance of the traditional, and long relied upon, standardised diet sheets.[597]

One of the implications of this reversal, which advocated the removal of dietary fat from the diet, meant that people with diabetes were now encouraged to consume the vast range of new 'low-fat' products available in supermarkets. In recent years, health writers and nutritionists have highlighted how this move may have been problematic, given the low-fat alternatives recommended to diabetics and dieters often compensated for the loss of fat in foods by adding large amounts of refined sugar.[598] Dietician Joy recalled how:

> For many diabetics diagnosed through the eighties, certainly those which were not insulin-dependent, these new rules seemed to hold good. As long as you told someone to eat wholemeal rice not white rice, and wholemeal bread rather than white bread, then their blood glucose measurements seemed to be quite acceptable.[599]

According to Joy, however, the new guidelines became problematic once they were used to justify the consumption of foods that contained higher amounts of sugar such as low-fat products or products containing a large amount of 'hidden' sugar such as table sauces and other processed and packaged foods. In the 1990s, as Joy explained, the BDA revised their dietary guidelines to allow for even greater freedoms with carbohydrates, in particular sugar:

> Subsequently, in the early nineties, the BDA put out another policy statement, whereby sugars, to a certain extent, were allowed in the diet, up to twenty five grams a day. And I can remember many a conversation I had with diabetics, who said 'does that mean I can

[597] Dietary Recommendations for Diabetics for the 1980s' (1979), Report by the Nutrition Sub-Division of the Medical Advisory Committee, *British Diabetic Association*, Joan Walker Collection.
[598] G. Taubes, 'What if it's all been a big fat lie?' *New York Times*, 7 July 2002; A. Aubrey, 'Why we got fatter during the fat-free food boom', *NPR*, 28 March 2014.
[599] Joy, Interview.

> have a teaspoon of sugar in every cup of tea I have for the day?' And I said 'no, not necessarily'. But at least it meant that some of the old school ideas about: you are not allowed thickened sauces, and you cannot have tomato ketchup, went by the board. And we tended to encourage people that if you wanted a bit of tomato ketchup on your chips, for goodness sake, that was okay. My concern was, probably: should they be having chips at all, because maybe they were obese Type 2s, and seeing me as a way to get to the chip shop, because 'the dietitian says it's all right now' was another trauma that we had to live through.[600]

As Joy described, by the 1990s nutritional advice for T2D was becoming increasingly more liberal, and while dieticians expressed their concerns around the new carbohydrate allowances, they provided a gateway for patients trying to understand and navigate their diet alongside other treatment methods. Yet, as can be felt by Joy's concerns, the new low-fat products which were marketed as healthier options (and continue to be recommended to people with T2D today) often contained more sugar than their full-fat counterparts.[601] As the BBC asked in an inquiry into the sugar content of low-fat foods in 2018:

> For years, low-fat food was seen as the right choice for those watching their weight, managing cholesterol levels or eating for a healthy heart. But are they as good for us as we originally thought?[602]

While the McGovern Report had emphasised the difference between natural and refined sugars, by the time the report's recommendations manifested into the new dietary guidelines published as *Dietary Guidelines for Americans* in 1980, the recommendations pertaining to sugar had become decidedly vague, making no

[600] Ibid.
[601] P. K. Nguyen et al, 'A systematic comparison of sugar content in low-fat vs regular versions of food', *Nutrition and Diabetes*, 6:1 (2016), p. 193.
[602] K. Torrens, 'The Truth about Low-Fat Foods', *BBC Good Food*, https://www.bbcgoodfood.com/howto/guide/truth-about-low-fat-foods, accessed 12 December 2018.

distinction between sugars and nutritional quality. Additionally, while the McGovern Report had urged that the reduction of sugar should be applied to the entire population, *Dietary Guidelines* stressed that only certain groups were at risk of disease from consuming sugar.[603] Moreover, the new recommendations had replaced the language used in the McGovern Report which had urged Americans to 'decrease' and 'reduce' their sugar consumption, for more ambiguous phrases such as 'avoid too much'.[604] By embodying the wisdom of the nutritional determinism characteristic of the 1970s, *Dietary Guidelines for Americans*, and the British organisations which adopted the same recommendations, tended toward nutri-centric advice, referring to specific nutrients – fat, salt and sugar – rather than to foods themselves.

For PWD managing their diabetes through dietary means in this period, the lack of transparency in dietary advice that resulted from the diet-heart debate was at best confusing, and at worst seriously hazardous to patients' attempts to manage their blood sugar, many of whom were now consumers of the new low-fat, higher sugar products that flooded the market in the 1980s.[605] Moreover, while some historians have argued that following a dietary regimen in the post-war decades was simpler

[603] In 1988, the Surgeon General's Report on Nutrition and Health was published in an attempt to summarize the entire body of research linking dietary factors such as fat, saturated fat, cholesterol, sugar, salt and alcohol to chronic diseases. Marion Nestle, who worked on the report in Washington, describes how she was under strict orders not to include the words 'eat less' or suggest restrictions on intake of food. Instead, restrictive advice about food was to contain a 'positive spin', for example 'eat less sugar' which was the advice of nutritionists was changed to 'choose a diet moderate in sugar'. When released in 1988 the report's advice on sugar was barely existential, suggesting it should be only be limited in people particularly vulnerable to dental cavities. See M. Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health*, (London: University of California Press, 2003).

[604] *Dietary Guidelines for Americans*, Washington, (1980), http://health.gov/dietaryguidelines/1980thin.pdf.

[605] As Pollan has identified, the vague advice to 'avoid too much sugar' did little to reduce America's sugar consumption in this period, evident in the increase in sugar consumption of all kinds in 1985 from 128 to 158 pounds per person. See M. Pollan, *The Omnivore's Dilemma*, (Oxford: Penguin Books, 2006), p. 104.

due to exchange lists and more liberal recommendations, this assumption ignores the growth and complexity of the post-war food industry and nutritional landscape, in which dieting become more complicated than ever. As *New York Times* health columnist Jane Brody described in 1970:

> Nutrition, once a subject relegated to grade-school 'health' classes, has emerged as a household word and become the subject of national concern and intense controversy…Between a growing 'health' foods and vitamin industry, a national epidemic of obesity, soaring food prices and a steady stream of books and articles recommending this, that or the other diet or nutrient, the public is being showered as never before with advice and counter-advice about what to eat, and how and when to eat it.[606]

Within this context, alongside the new oral hypoglycaemic drugs, people diagnosed with Type 2 diabetes from the 1970s to 1990s were increasingly advised to consume a similar, low-fat diet to the rest of the population, however, as oral testimonies attest, the revised recommendations did not necessarily make weight loss and blood glucose control easier.[607] As Christina, diagnosed with T2D in the 1980s after years of dieting through weight loss clubs like Weight Watchers and Slimming World, described:

> Well, Dr Briggs said at the time, you know, when I went to him, he said 'it's not really a diet, as such, it's just like everybody should eat like this'. And I thought 'oh'. It is right, I mean, I can understand that, but even when I did eat sort of smaller amounts, I never seemed to lose the weight, you know, so. But they did say at the time, also, that insulin puts weight on. You can't lose with – I'm not quite sure why or how it works - but if you're on insulin, you don't sort of seem to lose weight, you know. Or else, if you do, it's very, very difficult, you know, so you sort of lose heart a bit, you know.[608]

[606] J. E. Brody, 'Nutrition is Now a National Controversy', *New York Times*, 27 August 1973.
[607] Christina, Interview, 5 November 2004, British Library, C1239/23.
[608] Ibid.

Thus, in the same decades as both nondiabetic diabetic populations were recommended to consume a diet low in fat for the avoidance of heart disease and weight loss, losing weight did not necessarily become easier, nor did dietary advice become more straightforward. By the early 1980s, the idea of diet as the cornerstone of diabetic treatment was still being touted, but by then this was more rhetoric than reality. Despite the promise that a low-fat diet was sufficient to manage milder diabetes, many of the leading medical journals reported its failures and urged physicians to prescribe an oral hypoglycaemic agent for use in overweight patients where diet had failed.[609] Moreover, reports from the 1980s indicate that despite the importance of diet in the management of diabetes, many GPs lacked confidence in instructing their patients on nutrition or the time required to follow up with patients about their diets, a job increasingly handed to diabetic clinics. However, many such clinics in the UK still lacked access to a dietician.[610] In a UK report of the provision of medical care for adults with diabetes in 1984, a review of facilities available to patients found only 20% of patients had access to a dietician in their local clinic. 80% of patients were therefore reliant on the dietary advice provided by the GP, which was often in the form of simple diet sheets produced by pharmaceutical companies.[611] Within this context, patients and their physicians increasingly relied on the new oral hypoglycaemic drugs to bridge the gap between the relaxation in dietary ideals, higher carbohydrate allowances, and the patient's ability to lose

[609] P. J. Watkins, 'ABC of Diabetes', *BMJ*, 284: 19 (1982), p. 1853.
[610] J. G. Mellor, 'Questionnaire Survey of Diabetic Care in General Practice in Leicestershire', *Health Trends*, 17 (1985), p. 60.
[611] 'The Provision of Medical Care for Adult Diabetic Patients in the United Kingdom', Report produced by the Royal College of Physicians of London Committee on Endocrinology and Diabetes Mellitus and the British Diabetes Associate, (1984).

weight and adhere to a restricted diet.[612] As seen in Chapter 4, despite the results of the UGDP, anti-diabetic drugs continued to be prescribed in increasing numbers during the trial and proliferated in the decades after. Yet diabetes management remained a complex terrain and physicians in Britain and the U.S. alike, grappling with increasing diabetes diagnoses which surfaced as a result of the detection campaigns described in chapter five, often prescribed the new drugs, alongside a generic low-fat diet, without absolute certainty of their effectiveness. In their efforts to expand the market for medical means of weight loss and the pharmaceutical management of diabetes, the pharmaceutical industry exploited patients' weight loss struggles to expand the market for their products. In the 1960s, for example, 'Eskatrol' entered the market, an amphetamine weight loss agent aimed at overweight patients 'particularly those who depend on eating for psychologic release'.

[612] In-person Interview: Rachel Meach with Kenneth Collins, 25 January 2017.

Figure 6.5: 'Eskatrol' sustained release capsules (Smith Kline and French, 1961). [Courtesy of Joslin Diabetes Centre Archive, Boston].

Eskatrol not only claimed to control the appetite but provide relief from the emotional stress associated with overeating: 'Patients, particularly the so-called 'compulsive eaters' feel better and are able to adjust to their weight-reducing program'.[613] Befitting an era in which dieting amidst abundance proved challenging and convenience reigned supreme, as well as the creeping medicalisation of everyday problems, Eskatrol promised to provide a simple, medical solution to the social and emotional issue of overeating.[614] However, with side effects including nervousness, insomnia, hypertension and 'extreme excitability', Eskatrol was removed from the

[613] *Eskatrol* advertisement (1961), Joslin Diabetes Center.
[614] B. Jackson, 'White-collar Pill Party', *The Atlantic*, August 1966.

market in 1981 after a long battle to prove any therapeutic effectiveness.[615] In a similar attempt to provide a medical solution to weight loss and exploit the challenges of following a diabetic diet in the 1970s, Geigy, in their latest advertisement for Phenformin, featured a 'trapped' overweight woman, disparaging: 'The overweight diabetic…trapped by her own fat cells. If only she would diet her blood sugar might come down'.[616] But as the advert by Geigy proposed, the post-war diabetic patient *was* trapped, not by fat cells, but a complex web of dietary revisions and increasingly ambiguous nutritional advice. As well as navigating the conflicting advice on oral agents in the wake of the UGDP and an overwhelming influx of new, packaged convenience foods in supermarkets, the diet-heart debate and the resultant reversal of dietary recommendations presented PWD with yet another dilemma in the day-today management of their condition, one that would be questioned and overhauled again in the new millennium.

[615] H. M. Schmeck, 'U.S. Sets Diet Drug Recall In Drive on Amphetamines', *New York Times,* 2 April 1973.
[616] Phenformin advertisement, Geigy Pharmaceuticals, (1974).

Figure 6.6: Phenformin advertisement, Geigy Pharmaceuticals, (1974). [Courtesy of the Rockefeller Archive Centre].

Diabetic Foods and the Saccharine Saga

While nutritional debates pertaining to dietary fat and sugar had forced a reappraisal of the diabetic diet, solidifying the gradual post-war increase in carbohydrate intake, the influence of the diet-heart debate and its manifestation in the diets of PWD can further be seen in the discourse around the use of artificial sweeteners. While it appeared that Yudkin and Cleave's warning about sugar had failed to achieve the same level of recognition as that of Ancel Keys' warning about fat, one subsequent

event demonstrates a lesser recognised effect of the diet-heart debate on diabetic diets, and that, on some level, concerns about sugar took hold. The debate surrounding the banning of artificial sweeteners, particularly cyclamate and saccharin, and the protest against the ban, demonstrates the substantial demand for a low-sugar alternative. According to De La Peña, for consumers, artificial sweeteners have provided a means to enjoy pleasurable foods and drinks while reducing total calorie intake, enhancing what would otherwise be 'bland food landscapes'.[617] For PWD, she argues, sweeteners 'have made the difference between a life with very few sweets and constant sugar vigilance to one where a craving for sweetness can be safely indulged'.[618] However, as De La Peña notes: 'consumers have walked a fine line between feeling empowered by the calorie control sweeteners have provided and feeling anxious about sweeteners' safety and possible health risks'.[619] In the midst of the diet-heart debate and the implantation of low-fat guidelines into dietary regimens for diabetes however, the safety and nutritional status of sweeteners was challenged. In 1977, the same year as the McGovern Report had been published and low-fat became the dominant nutritional consensus, contention arose over the use of artificial sweeteners in foods following the results of a study in 1970 by the Canadian government which found saccharin as a potential cause of bladder cancer in rats.[620] In response to the study, the FDA considered labelling saccharin as a drug, making it only obtainable in pharmacies. The proposal was met with considerable protest from

[617] C. De La Peña, *Empty Pleasures: The Story of Artificial Sweeteners from Saccharin to Splenda*, (Chapel Hill: University of North Carolina Press, 2010), p. 4.
[618] Ibid.
[619] Ibid.
[620] J. M. Price et al, 'Bladder Tumours in Rats Fed Cyclohexylamine or High Doses of a Mixture of Cyclamate and Saccharin', *Science*, 167:3921 (1970), pp. 1131-32.

food manufacturers, consumers and lobbyists alike.[621] While naturally cautious, the diabetic community in particular disapproved of the suggestion, which would result in a diet devoid of the sweetness that they had grown accustomed to with the availability of special diabetic foods (see Figure 6.1). The ADA commented on the FDA's decision, warning that the unavailability of sugar substitutes could have 'very grave' effects for the 10 million Americans with diabetes, 'making it more difficult for these individuals to control their condition by dietary means'.[622] Until this point, cookbooks for diabetics had often featured a section on 'Sugar Substitutes' and advocated the use of artificial sweeteners, including saccharin and cyclamate, as a sugar replacement in a wide range of recipes. From 1955, consumers had further been encouraged to accept chemical substitutes for sugar as a 'modern' means of calorie control.[623] But like sugar, this debate was not a new one; rather, it had its origins in the 1960s health food movements which, alongside evidence of toxicity and hyperactivity in animals, roused suspicions about its safety.[624]

In Britain, the debate concerning the consumption of artificial sweeteners can be traced a decade earlier to 1967 when the Ministry of Agriculture published a report on food additives and contaminants that drew particular attention to the use of cyclamates, a key ingredient in many special diabetic and slimming foods.[625] The report prompted a discussion of their use which can be seen in a series of letters between physicians and leading British diabetologists throughout 1967 and 1968. In

[621] L. K. Altman, 'Listing Saccharin as Drug Considered', *New York Times*, 11 March 1977, p. 18.
[622] Ibid.
[623] D. M. Behrman, *A Cookbook for Diabetics*, (New York: American Diabetes Association, 1959); De La Peña, *Empty Pleasures*, p. 8.
[624] D. Stone, 'Hyperactivity in rats bred and raised on relatively low amounts of cyclamates', *Nature*, 224: 5226 (1969), pp. 1326-8; P. H. Abelson, 'Chemicals and Cancer', *Science*, 166: 3906 (1969), p.693.
[625] 'Food Additives and Contaminants Committee Second Report on Cyclamates', Ministry of Agriculture, (London: Her Majesty's Stationary Office, 1967).

1967 Harry Keen, Secretary of the Medical Advisory Committee of the BDA, wrote to Dr Joan Walker to ask her opinion on cyclamates, concerned that since accepting their use, the BDA had been made aware of subsequent research that suggested, in some people, the way cyclamates metabolised could be toxic.[626] This new information raised logical concerns among patient organisations, given that PWD were particularly likely to consume larger quantities of artificially sweetened foods. Keen suggested that while they wait for confirmation of cyclamate's toxicity, advertisements for cyclamate and cyclamate-containing products be withheld from *Balance*, the BDA's monthly patient magazine, which instead enclosed a statement in the subsequent issue to inform patients of their current position. In 1968, following meetings organised by the Consumer Council, attended by manufacturers, the BDA, the Ministry of Health, Ministry of Agriculture, as well as consumers, and PWD, the Committee reached a decision that cyclamates posed no risk to health and reaffirmed 50mg as an acceptable daily intake.[627] The BDA, which had temporarily withheld advertising material for cyclamate-containing products, approved of the Committee's decision and resumed the advertising of artificially sweetened diabetic foodstuffs in the February 1968 issue of *Balance*.[628]

The BDA's chief concern in the debate on cyclamates was the possibility that PWD, among the first consumers of artificial sweeteners, consumed more - and sometimes considerably more - cyclamate that the rest of the population. While the BDA did not explicitly condone the consumption of special diabetic foods, the pressure from patients against the ban suggests that by now they were highly prized foodstuffs in

[626] Letter from Harry Keen to Joan Walker, 25 October 1967, Joan Walker Collection.
[627] The Consumer Council Press Notice - 'Meeting on Cyclamates', 1 November 1968, Joan Walker Collection.
[628] Ibid.

their sugar-free diets. Cyclamates were used by PWD in the form of artificial sweeteners, such as 'Sweetona', 'Sweet n' Easy' and 'Sweet n' Low', as well in a range of canned fruits, sweets and soft drinks. PWD had become accustomed to such products after decades of diets devoid of sweetness and amidst fears of sugar popularised by figures such as John Yudkin and Thomas Cleave. The BDA, caught between safety concerns and patients' demands to retain artificial sweeteners in their diets, opted for a equivocal response and published a statement advising PWD to keep to a daily maximum of three grams of cyclamates while also putting pressure on manufacturers to print the quantity of artificial sweeteners contained in foods clearly on packaging, which until then food manufacturers had refrained from explicitly stating.[629] In the U.S., cyclamates enjoyed a much wider use than in Britain, prompting a similar reconsideration by the FDA. However, unlike Britain, the Delaney Amendment - which stated any substance shown to be cancer-causing in animals was not fit for human consumption – meant that evidence of carcinogenic effects in cyclamates led to the ban of their unrestricted usage. Consequently, in 1969, all beverages and medicines containing cyclamates were withdrawn from the market. Exceptions were made, however, and cyclamates continued to be allowed in certain dietary foods, as well as in concentrated liquid and tablet form and as non-prescription drugs, so long as their cyclamate content was clearly labelled on packaging.[630] The story of artificial sweeteners demonstrates that amidst fears of high-fat and sugar-laden products, and pressure from the diet industry to slim, U.S. consumers, PWD and slimmers alike, defended their use of zero-sugar alternatives.

[629] 'Cyclamate, A New Sweetener', Statement by the British Diabetic Association (1968), Joan Walker Papers.
[630] H. C. Knowles, D. M. Kipnis and H. T. Ricketts, 'Cyclamates and Artificial Sweeteners', *Diabetes*, 18:12 (1969), p.867.

By 1970, despite the ban on cyclamates, roughly 75% of the U.S. population were now consuming artificial sweeteners.[631]

Figure 6: 'Wander's Diabetic Chocolate'. Advertisement featured in supplement of the Chemist and Druggist (1979). Courtesy of the Wellcome Library, London.

[631] De La Peña, *Empty Pleasures*, p. 71.

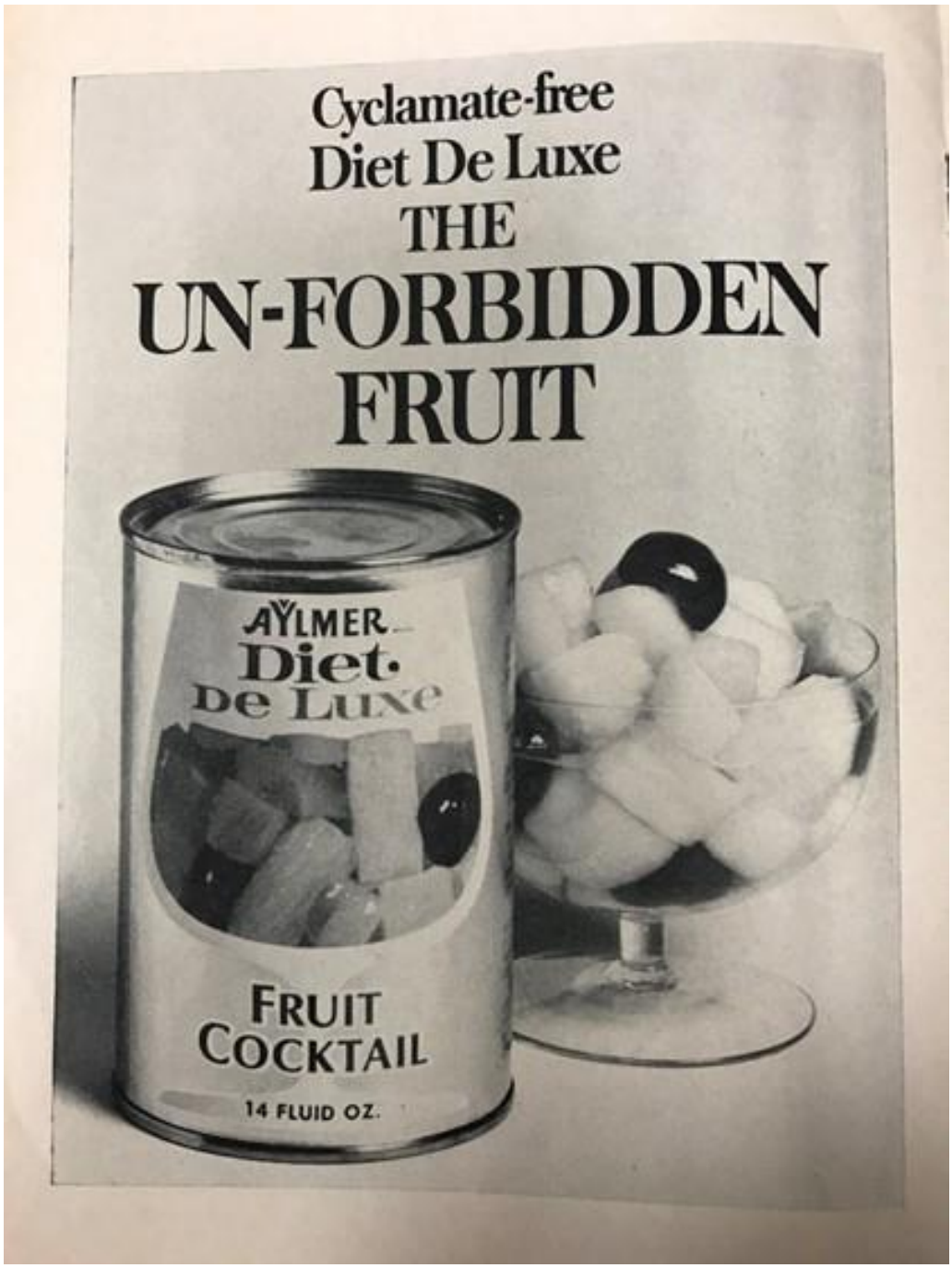

Figure 6.8: 'Diet de Luxe Fruit Cocktail'. Advertisement featured in quarterly newsletter of the Canadian Diabetic Association, Vol. 20, No. 1 (1979). [Courtesy of the Joslin Diabetes Centre, Boston].

Unwilling to part with the chemical means of calorie control, consumers fought the ban against saccharin in 1977, sending roughly one million letters to the FDA and Congress defending the place of artificial sweeteners in their diets.[632] The *New York Times* reported how the FDA's two-day public hearings into its proposal to limit the use of saccharin were met with 'a mass outpouring of protest' as 'eight witnesses representing patient organisations testified that the FDA proposal would undermine the efforts of 10 million diabetic Americans to stick to their sugar-free diets'.[633] In an article in the *Boston Herald*, an FDA official reported how: 'All day long we've been taking calls from people, some of them in tears, demanding that we leave saccharin alone'.[634] President of the Joslin Diabetes Foundation, Alexander Marble, defended these demands, denouncing the discontinuation of saccharin based on the possibility of bladder cancer when it had been used by millions for decades. Describing the ban as 'unfortunate' he maintained that 'common sense would prevail'.[635] Banning artificial sweeteners he added, would leave his patients as well 'countless others' without any calorie-free sweetening agent. According to De La Peña, the response to the FDA's attempts to ban saccharine illustrates that 'while consumers recognised the scientific evidence that saccharin could be dangerous, many felt they had more to gain by consuming it than they had to lose'.[636] With mounting pressure from the public, diabetic associations and lobbyists, coupled with the fact cyclamate had already been banned the decade prior and there were no 'no-sugar' alternatives, the FDA eventually reversed its decision, settling on warning labels on food packaging instead. While a joint FAO and WHO Expert Committee

[632] De La Peña, *Empty Pleasures*, p. 8.
[633] R. D. Lyons, 'Plans to Restrict Saccharin Debated', *New York Times*, 19 May 1977, p.8.
[634] J. M. Langone, 'Joslin chief deplores saccharine ban', *Boston Herald*, 11 March 1977.
[635] Ibid.
[636] De La Peña, *Empty Pleasures*, p. 9.

on Food Additives had recommended a reduction in the Acceptable Daily Intake (ADI) of saccharine from its previous level of 15mg to 2.5mg, a level exceeded by many consumers, the BDA continued to defend its use and expressed doubts over toxicity. Opting instead to keep the ADI under review, in its updated dietary recommendations for diabetics for the 1980s, the BDA, with sustained pressure from patients, continued to endorse the consumption of saccharine as an acceptable sugar substitute and refrained from placing limits on the amount of artificial sweeteners PWD should consume, ultimately upholding their place in a balanced diet.[637] The food industry responded to the backlash against artificial sweeteners by marketing their products in such a way as to emphasize their safety as well as playing on the notion of 'banned' or 'forbidden' foods. This can be seen in an advert for 'Diet de Luxe' the 'cyclamate-free' canned fruit (Figure 6.8). Marketed as 'the unforbidden food', a nod to foods forbidden to diabetics in the old exchange lists systems, Diet de Luxe was marketed as both an enjoyable *and* safe sweet treat that PWD could enjoy:

> A strict diet and tempting desserts. They just didn't go together until the advent of sugar-reduced Diet de Luxe diet fruits…Now with Fruit Exchange Levels on the level they're safe for even the strictest diabetic diet.[638]

Ultimately, the reaction of the diabetic community to the debate over artificial sweeteners, in particular their reluctance to give up artificial sweeteners as a substitute to sweetness, demonstrates the influence of the diet-heart debate on the public's feelings towards sugar. While government dietary guidelines had

[637] The guidelines did however warn against the misconception among diabetic patients that diabetic food contained less energy than conventional products and were useful for slimming purposes and thus urged patients to eat mainly 'ordinary' foods. See 'Dietary Recommendations for Diabetics for the 1980s' (1979), Report by the Nutrition Sub-Division of the Medical Advisory Committee, *British Diabetic Association*, Joan Walker Collection.
[638] Diet de Luxe advertisement, *The Apothecary*, October 1967.

manifested Keys' doctrine of low-fat, the consumer battle to preserve artificial sweeteners demonstrates that anti-sugar exponents such as Yudkin and Dufty had, on some level, managed to influence the public's ideas about sugar consumption, in particular its association with obesity. Moreover, the diabetic community's defence of artificial sweeteners illustrates the role of PWD themselves in shaping diabetic diets in the post-war decades and suggests that many were attempting to manage their condition through dietary means when drugs were being marketed as a possible alternative. Despite the ban of cyclamate in the U.S in 1969, and the temporary ban of saccharin in 1981, the number of artificially sweetened products increased, reflecting a steadfast demand from PWD and those looking to slim without foregoing sweetness.[639] While artificial sweeteners may have made sweetness possible for PWD, increasing the palatability, variety and much needed pleasure of their diet, much like the removal of fat and addition of sugar to many food products in the same era, this dietary addition may have likewise proved injurious to both health and efforts at weight loss. In recent years the consumption of artificial sweeteners has been questioned again, prompted by concerns that sugar substitutes can paradoxically lead to weight gain by increasing the appetites of its users and, in particular, make consumers crave 'sweet calories' after eating.[640]

[639] De La Peña, *Empty Pleasures*, p. 9.
[640] D. Benton, 'Can artificial sweeteners help control body weight and prevent obesity?', *Nutrition Research Reviews*, 18:1 (2005), pp. 63-76; M. Wisniewska, 'Artificial sweeteners may make you fat', *The Conversation*, 19 March 2018.

Conclusion

By examining medical literature, food advertisements and news reports from the height of the diet-heart debate, this chapter has considered how mid-century nutritional warnings about fat and sugar not only forged new dietary recommendations for the general public, but also filtered into advice for those with diabetes in Britain and the U.S. as well. Amidst a rapidly changing food environment and expanding food industry that increasingly used sugar in food production, alarming rates of coronary heart disease and obesity spurred nutritionists, the media and the public to consider the connection between diet and disease and the role of single nutritional components in fuelling the emerging epidemic. As dietary advice for the general population was overhauled, nutritional recommendations for those with diet-related diseases such as diabetes followed similar revisions, reversing years of low-carbohydrate dietary advice for a diet low in fat. Accordingly, diabetic nutritional guidelines became more relaxed, focusing on the idea of 'balance', at a time when incidence was increasing, justifying the expanded use of oral medications in the treatment of mild, non-insulin dependent cases. Moreover, the debate between sugar and fat, and the reductive focus on single nutrients that it fostered, prevented a wider examination of the multifactorial dietary factors which contribute towards diabetes and other chronic disease. The latest war against sugar, led by figures such as Robert Lustig in the United States and celebrity figures like Jamie Oliver in Britain, has witnessed a resurgence of interest in the diet-heart debate, particularly Yudkin's views concerning sugar. Reprinted in 2012, the previously banned and somewhat dormant ideas in *Pure, White and Deadly* have been hailed a 'prophecy' which foretold the consequences of our increasing consumption of sugar long before

the scientific evidence was available. While this has drawn due attention to the growing amount of sugar in our modern diet, these new debates have tended toward the same narrow focus as the ideological war between Keys and Yudkin, rather than the production and processing of foods, the interaction of combinations of different nutrients, or the overconsumption of food generally. Recent research suggests that both Yudkin and Keys could have been right – that neither sugar or fat alone can lead to heart disease or diabetes, but a combination of them together as 'sweet fat' in packaged foods could be more problematic. Nevertheless, a narrow preoccupation with single nutrients has avoided, or at least stalled, research investigating this in a more holistic manner.

This chapter has drawn attention to the consequences of these debates for the dietary management of diabetes in the second half of the twentieth century. By entering into the diet industry and infiltrating guidelines for chronic conditions, and with significant coverage in both the popular press and public health media, the diet-heart debate penetrated the public sphere and influenced ideas about diet and health much greater than any previous nutritional debate. Accordingly, the high profile of these debates helped to influence official dietary guidelines and nutritional recommendations for both the general public and those with diet-related diseases. The result has been decades of nutritionally reductive, nutricentric guidelines and food aisles with an abundance of low-fat products, both of which have ultimately failed to curb rates of diet-related diseases, including diabetes. The diet-heart debate, and the revision in dietary recommendations for diabetes that it prompted, not only transformed the diabetic diet from one of restricted carbohydrate to a low-fat and liberal carbohydrate diet, but compelled PWD to defend the place of artificial

sweeteners in their diet due to the concerns regarding sugar consumption that were likewise raised. As seen here, when the nutritional status of sugar and the safety of artificial sweeteners were challenged, the diabetic community provided a steadfast challenge to attempts to ban saccharin and cyclamates, defending their right to consume a low-sugar alternative. Their intervention demonstrates that, on some level, concerns about sugar had taken hold among slimmers and PWD alike. In the midst of the diet-heart debate and the implantation of low-fat guidelines into diabetic guidelines, many diabetics were willing to risk the safety and nutritional status of sweeteners to maintain sweetness in their diets.

Chapter Seven

Diabetes Narratives: Making Sense of Illness

Figure 7.1: Nineteen scenes depicting popular disillusionment with doctors and medicine. Coloured wood engraving by Henriot, ca. 1900. Text reads 'No more flour, no more sugar, and don't drink ... especially don't drink ... it's all there. After all, there are so many people who don't die of diabetes…like Cornelius'. [Courtesy of Wellcome Images].

In *Oral History Theory*, oral historian Lynn Abrams described the value of the oral history interview as a source of historical information as follows:

> Conducting an interview is a practical means of obtaining information about the past. But in the process of eliciting and analysing the material, one is confronted by the oral history interview as an event of communication which demands that we find ways of comprehending not just *what* is said, but also *how* it is said, *why* it is said and *what* it means.[641]

Using oral history, this chapter examines the stories of those living with T2D today, how they have understood the nature of their condition and its causes, and what patient perspectives of aetiology can reveal about ongoing debates about the causes of T2D. In addition, the chapter further considers the role of stigma in diabetes, its historical origins, and its consequences for the successful management of the disease. The primary source material for this chapter is derived from oral history interviews conducted as part of this research. These primarily include interviews carried out with PWD, as well as two Scottish GPs, the first diabetic nurse in Scotland, and Dr Karen Collins, a U.S. health policy maker. Additionally, the oral histories examined here include a number of oral testimonies carried out in England and Wales as part of the *Diabetes Stories* project carried out by Oxford University in the early 2000s. The interviews are split equally in terms of gender with respect to both PWD and health care professionals. While the participants interviewed for this research largely reflect the experiences of PWD diagnosed in the last twenty years, the testimonies from the *Diabetes Stories* project complement the former by providing testimonies of diagnoses which cover each decade in the post-war period. Nevertheless, the experiences of diabetes examined here still remain a relatively small sample and it is important to acknowledge that that these testimonies cannot be used to make

[641] Lynn Abrams, *Oral History Theory*, (London: Routledge, 2010), p. 1.

sweeping generalisations about the lived experience of diabetes. Nonetheless, the information gleaned from this sample, such as patient perspectives of aetiology and treatment, has provided new and important evidence of twentieth-century experiences of diabetes and ongoing debates surrounding stigma, the use of oral medications and the expectations of patients reliant on self-management practices.

Since diabetes is a condition largely managed by patients themselves, their experiences make a vital contribution to the historical record. The use of oral history here allows for a novel analysis of how PWD have conceptualised their experiences, allowing new ways to comprehend not just what is said, but to demarcate the importance of how it is said, why it is said and what it means. In accordance with Abrams, this chapter utilises oral history interviews with PWD not only as a source of historical information, but also for the meanings attached to their experience of diabetes. The chapter is divided into sections which reflect the main themes covered in the thesis. The first section considers patient experiences of diagnosis and treatment to evaluate how T2D is treated today and the contemporary significance of the historical developments covered throughout the thesis. This section considers how PWD have negotiated the advice they have received about diet, as well as their experiences of oral medications and their efficacy. The second section considers how PWD have understood the nature of diabetes, its causes and their responses to their diagnosis. This section applies the theoretical perspectives and narrative analysis techniques developed by Catherine Riessman and Mike Bury to analyse what, or who, individuals regard as responsible for their condition and how they view themselves in relation to their illness. The final strand of the chapter reflects on the stigma attached to diabetes and the connection between language, aetiology, stigma

and self-management. This section contemplates what oral history can tell us about some of the contemporary barriers which impede successful self-management and the relationship between diet and diabetes in the twenty-first century.

Diagnosis and Management

Throughout the time period explored in this thesis, the management of diabetes has transformed in line with the development of new medications, which as the previous chapters have shown, have radically altered the dietary management of diabetes. Oral history offers the insight required to truly grasp the significance of these developments for people managing their diabetes today. Specifically, the interviews carried out for this research confirm the notion that as new drugs became available for T2D, less time, care and education was dedicated to managing the condition with diet. Dr Joan McDowell, one of the first diabetes specialist nurses in the UK recalled that while, in theory, diet was supposed to be the first line of management, by the 1980s interest in diet was beginning to wane. Consequently many patients, considered 'dietary failures', would inevitably be prescribed medication instead. As she recalled of her time as the first diabetes nurse specialist at the Southern General Hospital in Glasgow:

> They'd be sent to the dietician and they'd be given this two pages of A4 folded and it had on the front, it was the TSN diet - 'Thou Shalt Not'. So this was just at the Southern General and probably the Royal might have used the same. It was the Thou Shalt Not…so thou shalt not…eat sweets, eat cake, don't fry, so it was a very, very negative sort of connotations of diet. The carbohydrate counting was kept for people with Type 1 who were on insulin and the other ones it was a case of they were to try the diet for maybe three to six months and at that point they only came back to hospital maybe once

> or twice a year at the most. And they weren't really managed by the GP at all. The GP left it up to the hospital. So after six months they'd come back having not lost anything and their blood sugars would still be high and then either a sulphonylurea or metformin would be introduced because of that.[642]

As can be heard in Joan's interview, in the 1980s patients referred to a diabetic clinic were encouraged to manage their diabetes with diet as a first point of call. However, as she recalls of the orthodoxies in treatment at this time, the reality was that the vast range of new medications flooding the market often allowed pharmaceutical approaches to supplant the use of dietary regimens. As Joan recalled of the orthodoxies in treatment in the 1970s and early 1980s:

> I suppose for the Type 2's it used to be diet and if they were overweight it was diet and Metformin and if they were underweight it was diet and a sulfonylurea like Gliclazide and that was all we really had. Then eventually they started to move into things like Acarbose which is something that helps to even out your blood sugar. Its major side effect was wind and diarrhoea which wasn't very nice and really we've just had a plethora of drugs now over the pasty thirty years. We've got *so* many drugs to choose from. But…because the aetiology is different you can then have drugs that tackle different aspects along that biochemical chain and that's what I see as happening now. From the minute you eat the sugar there will be a drug to stop you absorbing it. There will be a drug if I do absorb it, to stop it peaking too high, there will be a drug that stops me absorbing all of it.[643]

Reflecting on how diabetes is managed today, Joan ruminated:

> There has been a lot more in the way of drug treatments. A lot has increased, from different ways to administer insulin, I'm not just talking about injections and pumps but there's inhaled insulin, they've looked at suppository insulin, that didn't get off the ground, and there's lots and lots of drugs for Type 2 diabetes I mean and given that most people with Type 2 diabetes will be obese and will

[642] Joan McDowell, In-person interview with Rachel Meach, 6 October 2017.
[643] Ibid.

> probably have cardiac problems you've got all those drugs as well. It's a real cocktail. Which you can hear in my voice I just think we've got to sort out what's going on this is just ridiculous.[644]

The patient testimonies carried out for this research corroborate Joan's statements here regarding the increasing reliance on drug therapy and the waning attention granted to diet in managing T2D. Moreover, the testimonies highlight the extent to which people with T2D have been prescribed what Joan refers to as a 'cocktail' of medication that in many cases has led to a host of side effects ranging from mild to severe. Diana Chalmers, a retired nurse and health visitor from Dingwall in the Highlands of Scotland, was diagnosed with T2D after noticing trouble with her vision. Although Diana's brother, also diagnosed with T2D, had managed to control his condition with diet and exercise, Diana was prescribed several medications including metformin, lantis, insulin and statins, which she feels have contributed to a number of health problems which have occurred since her diagnosis including pericarditis, osteoarthritis and breast cancer. Diana describes how she was diagnosed at age sixty and started on 'the usual regime of grotty tablets' starting with Metformin until:

> They gradually sort of piled in the next one and then the next one. But I've forgotten which ones they were because some I've been kicked off or still working. Some were better than others.[645]

Of all the medication she has been prescribed, Diana's narrative expresses particular disdain towards the use of statins in diabetes:

[644] Ibid. The tone of Joan's voice here is clearly alarmed at what she considers an unnecessary 'cocktail' of medication for patients today diagnosed with T2D.
[645] Diana Chalmers, In-person interview with Rachel Meach, 3 August 2016.

> They…big government…thought that all diabetic people should have statins and they decided we ought to have blood thinners as well for cardiac help, which wouldn't help at all…Statins…the first low dose was ok but as soon as they put it up, total rigidity and screaming muscle pains. 'No, no it's all in the mind'…for the first eight years. They did not believe that statins caused any side effect at all and the doctor didn't want to stop them because they get paid for giving them and the drug companies pushed it. When I first started diabetes a cholesterol of seven was counted as quite nice then the pharmacist decided you could get it lower and lower and lower. They kept lowering the table of it until it hit rock bottom which meant those of us who were disturbed by it were in screaming pain… it was only about five or six years ago they believed it and started me very gradually on Almotriptan at that stage...and then I reacted heavily to the blue in it so we changed to Nortriptyline because I've also had colour allergies since about the 1970s. Which is another fun element of pharmaceuticals. And during this time Metformin was still being absolutely horrendous, you literally had a packet of pants on your weekly purchasing because you just have no bowel control whatsoever with it.[646]

As well as her evident resentment at what Diana refers to here as 'big government' and the decision to both increase the number of drugs prescribed to PWD, Diana's testimony further reveals the tension between patients and health care professionals from having to endure the medications side effects for eight years, only to be told it was 'all in the mind'. Overall, Diana described having received little information regarding how to manage her diabetes with diet, due in part to being a nurse herself and the assumption that, having the same qualifications, she might as well teach herself. In later years Diana visited a dietician in Inverness to ask for advice about how to control her cholesterol through diet, however, 'she just had booklets and she hadn't a single answer…so that wasn't much use and an expensive trip'.[647]

[646] Ibid.
[647] Ibid.

Due to what a number of interviewees describe as inadequate nutritional and weight loss advice from their GPs, and without access to a dietician, some of the narratives express a degree of patient agency in the form of creating their own diet plans. Iain Aitkin from West Lothian was diagnosed with T2D in 2007 after a routine check-up with his GP. After gaining weight, Iain was prescribed metformin but, like Diana, received little dietary advice to aid his weight loss. After reading about the Newcastle University Study in the news Ian contacted his GP to request a referral to the dietician but was disappointed when his GP declined due to his case not being 'bad enough':

> I decided to contact the GP and asked them to refer me to a dietician. He refused because he said I wasn't bad enough to see a dietician so I went myself to try and get the dietician and told them I wanted to go on this, they explained that they didn't have any system in place at the moment because there wasn't enough results from the test they did and there was another one taking place, but it would all have to wait until then. So I decided to go on my own 800, do an 800 calorie diet.[648]

After researching the Newcastle study on the internet Iain began to formulate his own plan, experimenting with recipes and creating a diet which consisted of healthy meals that comprised 800 calories a day. Despite subsequently losing two stone in eight weeks, Iain's GP was reluctant to stop his medication and he continues to take both a blood thinning agent and metformin. For Iain, diet is key to controlling diabetes, and echoing many who protested the use of oral agents in the wake of the UGDP, he regards dietary measures as the mainstay of diabetic treatment. When asked what advice he would give to someone diagnosed with T2D now, Iain commented:

[648] Iain Aitkin, In-person interview with Rachel Meach, 19 September 2016.

> Find out all the information they can about going on a diet. To stop any advance of diabetes. If there was more emphasis put on exercise and diet I believe that a lot of people wouldn't need the medication that's being used. They seem to be quite happy to prescribe tablets or insulin and that's their way of controlling it but if people took more involvement in themselves there's a possibility they wouldn't need all this…drugs.[649]

In an interview carried out with husband and wife Graham and Kari Smith from Glasgow similar frustration and perplexity at being kept on medication can be heard. Kari, diagnosed age 40 in the 1980s was immediately placed on insulin, a decision which she still does not understand, whereas husband Graham, despite never being overweight or having any major symptoms of diabetes was prescribed metformin as well as Gliclazide some years later. In the 1980s, Kari's treatment centred on controlling her symptoms with insulin and she recalls receiving no advice at the time about how to manage her diet. Graham however recalls mainly being told to avoid sweet things and presented a diet sheet produced by Pfizer that contained a list of foods to avoid and advice that encouraged the consumption of low-fat alternatives. When asked about his experience with medication Graham explained:

> Now I don't know, erm, there are times that I wonder if I should be taking medication. Um…I don't measure myself perhaps as regularly as I should but occasionally I feel like I'm going hypo and I will go and measure myself and sure enough my sugar level is low. When I go and eat something I have to eat it fairly quickly because you have that feeling. And I sometimes wonder, that's even after having eaten a hearty breakfast, maybe even a few hours later I'm getting that condition. So…I think to myself now does that mean the medication has done something and used up the nutrition that I should of got from my breakfast. So it's something I'm going to discuss with my diabetic nurse next time I see her.[650]

[649] Ibid.
[650] Graham Smith, In-person interview with Rachel Meach, 21 September 2016.

Many of the interviewees express a frustration at the lack of time granted in general practice to educating patients about diet and the difficulties of coming off medication having been prescribed it. Pauline from Dumbarton was diagnosed with T2D at the age of 59 in 2000. Despite managing her condition well by following a healthy diet for three years, Pauline was eventually put on Metformin, Forxiga and a number of different statins. At several points in the interview Pauline referenced her mental health and described feeling depressed because of her diabetes, referring to the condition as one that is progressive and would only get worse. While the majority of interviewees interviewed for this research felt they had received inadequate dietary advice, Pauline's narrative provided a different perspective, explaining that there was plenty of dietary advice but individuals lacked the willpower to follow it and could all too easily rely on medication to counter unhealthy eating:

> There probably is yes. But then again you do know that you shouldn't be eating biscuits and cakes and all these kinda things. And chocolate. I mean I'm not saying you can't eat them, you can in moderation. And I'm not talking about every day or once a day or even every week. If you feel like a piece of chocolate as long as you don't sit and eat a whole box of chocolates you're not going to, you know, make a big difference. And if you eat it after a meal…I do know that…that if you eat a sweet after your main meal it kind of absorbs better. So if I do decide to have something sweet I have it after my evening meal and then I take my two Metformin's. I always think well that should help.[651]

For Pauline, the most challenging element of her diagnosis of diabetes has been the psychological effects on her overall mental wellbeing:

> The depression is a big part of it. When you're initially diagnosed you can get very down about it and 'why me?' about it so and every now and again…and I am sixteen years down the line you do feel down about it and you know that it's down to you to watch what

[651] Pauline Smylie, In-person interview with Rachel Meach, 21 September 2016.

> you're eating and exercise but if you haven't got the energy and it hurts too much to do the exercise then you can't do it. But just try not to get depressed, I know that's easy to say but if you feel like you were getting down about it, do something about it. It is very easy to get depressed with yourself. And thank goodness I'm not…I mean you'd kill yourself. And thank goodness I don't smoke or drink heavy…[652]

While Pauline does not overtly express the specific elements of living with diabetes which she feels have contributed to her depression, at key points in her narrative she expresses how the condition comes as a weighty responsibility. This can be heard, for example, where she states 'and you know that it's down to you' and earlier in the interview where she explains:

> I think what's happened now is because there are so many diabetic people that they just haven't got the resources, you know. And it is up to you, yourself, you're the one that controls it, there's no one else that can do it for you.[653]

Pauline's feelings of responsibility towards her condition perhaps stems from an encounter with her doctor who told her 'it's because of all these overweight people and obesity, that's the cause of this epidemic in diabetes' to which Pauline, feeling affronted, remembers thinking:

> …she was sitting there and her hips were hanging over the chair she was so big and she wasn't apple shaped she was pear shaped and I thought 'oh my god you're someone to say that!' And I didn't say anything because I knew you'd just get scored off their list if you answered them back, you know.[654]

[652] Ibid.
[653] Ibid.
[654] Ibid.

Responsibility for the disease is a theme that can be heard in many of the interviewee's responses. Alan Cairns, born in Glasgow in 1945 was diagnosed with T2D at the age of 63, not long after retiring from his career as a chemistry teacher. Following his diagnosis, Alan describes how he took a proactive approach to his condition by researching diabetes and by volunteering with Diabetes Scotland at his local support group. When Alan was asked about changes in attitudes towards diabetes he replied:

> The number of people diagnosed in Scotland with Type 2 diabetes has increased quite dramatically since I've been diagnosed, in the last eight years. There is a perception that we did it to ourselves, that it's self-inflicted. Is that true? Yes and no. I was never particularly overweight so I'm quite resentful of this: 'you did it to yourself'.[655]

Alan's resentment towards the notion of diabetes as self-inflicted can be heard again in an interview with retired Chief Inspector Ian Millar from Glasgow. Diagnosed in 2013 after what he describes as the end of a 'busy and stressful' career in the police force, Ian ruminates:

> I think there's still an idea…I've got a friend and his brothers got type 1 diabetes and I don't know if this is a fair reflection of folk with type 1 diabetes but he didn't have a high opinion of people with type 2, like it was self-inflicted. Through probably bad lifestyle. And I think there's still perhaps a bit of that in society as well. You know if you've got type 2 diabetes they've got a mental image of someone with a grossly large waist line who just lies around watching TV and eating chocolate and crisps and doesn't walk the length of themselves. I think there's still an element of that. But when I first got diagnosed I had a look and my BMI was just thirty, just into the obese, but people can get it when it's only twenty-two. And some people don't get it until they're away over forty, forty-five. So I mean there's an element of it being your lifestyle but also some of its just bad luck. We could all get it. And from not really knowing my family history because they died, perhaps of a diabetes-

[655] Alan Cairns, In-person interview with Rachel Meach, 20 November 2015.

> related ailment, so there could well be a family history but I'm not aware of it.[656]

The responses examined here reveal a clear awareness of the cultural stereotypes and depictions of people with T2D, particularly those associated with obesity such as laziness, gluttony and apathy.[657] Similar to Alan's response, Ian's acceptance of this explanation is somewhat tentative as he ruminates over possible causes for his diabetes, for example 'bad luck' or genetics. This can be heard again in an interview with May Millward, secretary of the West Lothian diabetes support group. Although May acknowledges the role of the wider food environment and changes to eating habits, ultimately she situates the individual as responsible for the disease and its management, saying 'I think it's down to the individual but it's hard and it takes a lot of willpower'.[658] This tentative acceptance of lifestyle explanations ultimately stems from popular understandings of diabetes as a disease associated with individual responsibility and its accompanying stigma. As a result of this stigma, many interviewees admit having hid their diabetes from relatives or work colleagues. Edward from Oxford, diagnosed in 1994 discusses his father's concealment of his diabetes, and later his own:

> HL: You say he was secretive, was he embarrassed about having diabetes?
>
> EW: Yes, I think he was. I think he was embarrassed about being ill at all. He didn't like…it was almost I think seen as a weakness. Erm…so he wouldn't give into anything really. All the time I can remember, right up until he was diagnosed with the diabetes that was the only time he had off work. He didn't have time off work even

[656] Ian Millar, In-person interview with Rachel Meach, 21 September 2017
[657] Ibid.
[658] May Millward, In-person interview with Rachel Meach, 19 September 2016.

> with colds or anything like that he just went to work and he worked, that's the way it was to him.[659]

When asked about his reaction to his own diagnosis of diabetes Edward replied:

> I wouldn't say I was ashamed of it but I certainly kept it to myself, there wasn't many people who knew I had diabetes…it wasn't really one of those things you felt comfortable with; it was something you kept secret. And I suppose to a certain degree I did that for quite a long time, even up until fairly recently until I went on insulin and then I told one or two people at work, just in case you know. It's the first time in my life I've ever had anything major so there was a degree of apprehension about it, and so you don't really tell anyone. I suppose I can understand my father thinking it was probably a little bit of a weakness.[660]

Later in the interview when asked about changes in attitudes at work towards diabetes Edward replied:

> Certainly in the past I've been aware of firms having not always a helpful side to the diabetes and some prejudices. I've seen it…I haven't suffered it because I kept it quiet, that's another side to the diabetes in keeping it quiet, especially in a male-orientated and dominated area. I noticed it in one way…a colleague became ill and was diagnosed with diabetes in the workplace while he was at work and he was fairly open about it but the attitude towards him was not helpful…But it's very difficult especially when you're in that type of environment. It's now getting on for eight or nine years ago I think. Now the firm I work for is a smaller firm and to be quite honest they're amazing…but having said that there's more women working there and women are much more open about their problems than men are. If you're in an all-male environment you tend to keep it quiet. You don't say anything. As soon as you switch to a female environment, even men switching to a female environment it's different. I'm not saying that all males suddenly open up but you are able to talk about certain things and you get a much more positive result.[661]

[659] E. Walsh, Interview, 16 May 2005, British Library, C1239/48.
[660] Ibid.
[661] Ibid.

As well as drawing attention to the stigma experienced by PWD, Edward's testimony highlights the importance of gender, particularly notions relating to masculinity, health and disease, in how PWD have experienced the condition. As can be heard in Edward's narrative, gender has shaped his experience of his diagnosis as well as impacted upon his identity by forcing him to conceal his condition around male colleagues. Only when Edward moved to a new workplace where he was among a greater number of female colleagues does he express feeling comfortable enough to reveal his condition. Oral historians Arthur McIvor and Ronald Johnston's work on the occupational health of workers in Glasgow revealed how 'macho cultures' framed interviewees self-identities and responses to ill-health associated with occupational health hazards. A similar experience of health, gender and stigma can be heard here in Edward's account where he describes the shame experienced by PWD and a feeling, especially among older males, of a need to conceal their condition in order to preserve their masculinity.[662]

Understanding the roots of this stigma and internalised responsibility requires viewing diabetes in historical perspective to examine how it and other chronic diseases, as elusive entities, have been framed throughout the twentieth century. According to Rosenberg, beliefs about a particular disease are formed in line with social attitudes.[663] The disease framework, encapsulating wider cultural attitudes, ultimately structures both popular beliefs about aetiology, as well as public health responses, stigma and ideas relating to responsibility. As Rosenberg explains, the naming, or framing, process of a disease determines not only how the disease is

[662] A. McIvor and R. Johnston, *Lethal Work: A History of the Asbestos Tragedy in Scotland*, (East Linton: Tuckwell, 2000), p. 220.
[663] C. Rosenberg and J. Golden (eds.) *Framing Disease: Studies in Cultural History*, (Rutgers University Press: New jersey, 1997), p. xi.

treated, but how it is viewed and conceptualised by wider society.[664] Historically, obesity and diabetes have been framed, by the medical profession, public health experts and the media, in such a way that positions the individual as responsible for their own health, thereby framing disease as self-inflicted. The origins of this can be traced to the nineteenth and early twentieth-century when health and disease were commonly explained in terms of the individual's character, behaviour or lifestyle. The moral dimensions of ill-health are evident in popular publications from this time, for example Nietzsche's *Will to Power* (1901), in which disease is presented as a judgement against the sick, a physiological state confirming individual weakness, cultural exhaustion or decadence.[665] Historians debate the roots of these moral undertones in diabetes. According to O'Donnell, the concept that irresponsible or debauched behaviour could trigger diabetes appears in textbooks as early as the thirteenth century, whereas Furdell traces the connection between diabetes and the character of the individual to the seventeenth and eighteenth centuries, when disease was believed to be caused by excessive eating, drinking and sex, and individuals were required to atone for their sins.[666] In the time period and sources explored in this thesis, the most striking examples of the moralism attached to diabetes management appear in the writings of Boston diabetologist Elliot Joslin who exerted a paternalistic approach to his patients and, along with others such as Alexander Marble, produced a set criteria for the 'ideal patient'. Writing in *Women's World* in 1924, Joslin set out the key to preventing diabetes as follows:

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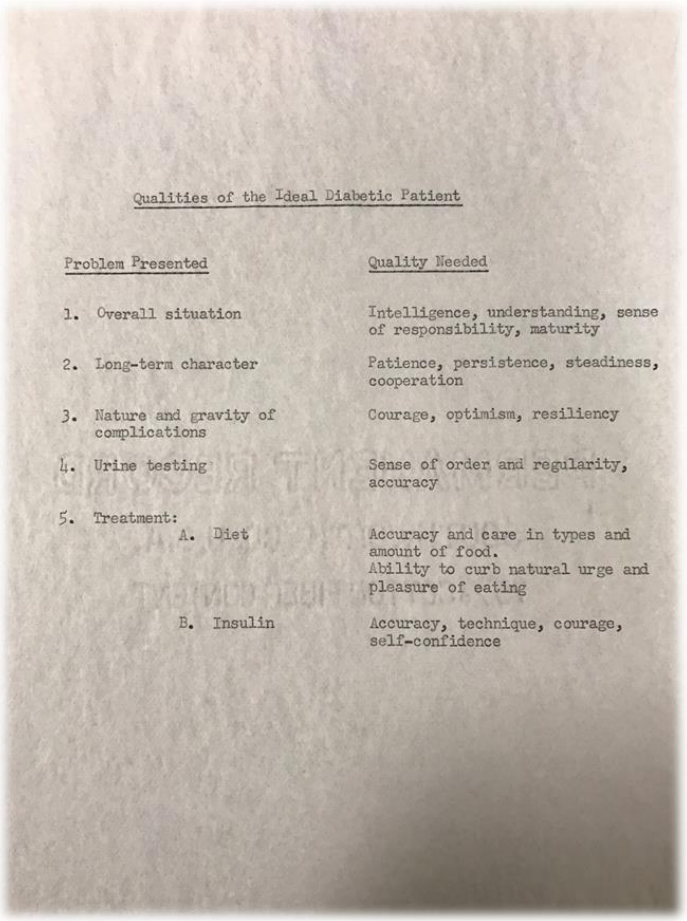
[664] Ibid.
[665] F. Nietzsche, *The Will to Power*, (London: Penguin Classics, 2017) cited in Susan Sontag, *Illness as Metaphor and Aids and its Metaphors*, (New York: Penguin Books, 1978), p. 7.
[666] S. O'Donnell, 'Changing Social and Scientific Discourses on Type 2 Diabetes between 1800 and 1950: A Socio-Historical Analysis' in *Sociology of Health and Illness*, 37 (7), (2015), p. 1102; Elizabeth Furdell, *Fatal Thirst: Diabetes in Britain until Insulin*, (Boston: Leiden, 2009), p. 83.

> Diabetes is common in the fat, but rare in the thin. If the people in the United States would only accept as their standard of form and figure the slender ladies and agile gentlemen which serve as fashion's models in our newspapers the Diabetic Club of America would have but a hundred thousand instead of a million members…Who wants to be fat after reading the newspapers? The good which newspapers and designers of styles of men's and women's clothes accomplish by their portrayal of slim models of grace and beauty in their columns may not be entirely altruistic, but it is nonetheless philanthropic. Yet how few of the public realise that all these lithe creatures are examples of how to prevent the development of the disease, obesity and its offspring, diabetes.[667]

In later publications, Joslin suggested it may be necessary to stigmatise the obese person in a similar fashion 'that the drunkard is looked upon with pity and contempt'.[668] For Joslin, and his successor Alexander Marble, successful diabetes management hinged on the personal traits and character of the patient. Writing in 1970, Marble described the 'ideal patient' with diabetes as having such qualities as intelligence, a sense of responsibility, maturity, steadiness, cooperation, resilience and 'a sense of order'.[669] Of all of these traits, responsibility stands out clearly in the published patient education material which followed. From the 1970s, a steady move towards greater self-management increased the profession's expectations of patients, and thus in addition to the aforementioned qualities, patients were expected to be educated and self-informed in order to self-manage their condition alone. Those who did not possess such qualities were routinely described as 'wayward' or 'careless'.[670] By the mid-1970s, creating the 'responsible patient' through patient education material had emerged as a key priority for diabetes specialists, as a White

[667] E. P. Joslin, *Diabetes: Its Prevention and Treatment*, (Boston, 1924) printed in *Women's World* July 1924 and reprinted as a pamphlet by the AMA and Eli Lily thereafter. Joslin Diabetes Center, Box 1, Folder 8.
[668] Shane O'Donnell, 'Changing Social and Scientific Discourses on Type 2 Diabetes between 1800 and 1950: A Socio-historical analysis' in *Sociology of Health and Illness* 37 (7), (2015), p. 1112.
[669] A. Marble, 'Qualities of the Ideal Diabetic Patient', c.1970, Joslin Diabetes Centre, Box 2, Folder 12.
[670] A. Marble, 'The Management of Diabetes in Office and Home', undated, Joslin Diabetes Centre, Box 2, Folder 12.

Paper on patient health education asserted: 'Patient education reinforces the patient's responsibility for his own health, and self-responsibility is crucial for the ultimate effectiveness of health care'.[671]



Qualities of the Ideal Diabetic Patient

Problem Presented	Quality Needed
1. Overall situation	Intelligence, understanding, sense of responsibility, maturity
2. Long-term character	Patience, persistence, steadiness, cooperation
3. Nature and gravity of complications	Courage, optimism, resiliency
4. Urine testing	Sense of order and regularity, accuracy
5. Treatment: A. Diet	Accuracy and care in types and amount of food. Ability to curb natural urge and pleasure of eating
B. Insulin	Accuracy, technique, courage, self-confidence

Figure 7.2: 'Qualities of the Ideal Diabetic Patient', Alexander Marble c.1970 [Courtesy of: Joslin Diabetes Centre].

The emphasis on personal responsibility can be seen in patient education material for newly diagnosed patients from the 1970s and 1980s, many of which began by asking patients: 'Who is responsible for your diabetic control?'[672] In a formal statement on patient education issued by the American Hospital Association in 1974, this sentiment resounds clearly:

[671] White Paper: Patient Health Education, (1974), Joslin Diabetes Centre, Box 2, Folder 6.
[672] 'Review Questions', c.1970, Joslin Diabetes Centre, Box 2, Folder 1.

> Every individual shares a responsibility to protect his own health, and proper discharge of the responsibility will reduce the incidence of illness, disease and injury. In order to encourage individuals to take care of themselves to the maximum extent possible, programs of education to teach people how to exercise this responsibility must be developed, conducted, evaluated and maintained.[673]

By the late 1970s, the formalisation of self-management saw the responsibility to manage diabetes firmly shift from physicians to the patients themselves, as a handbook by Eli Lilly reiterated to patients:

> The future is in your hands…until you learned you had diabetes, you probably relied entirely on your physician to control the course of any illness you might have. Now however, your physician will rely on what *you* know and do also, for there are few conditions in which you can help yourself so directly. By following a few elementary rules and methods, by learning to perform some simple tests, by balancing your daily diet, by acquiring the skills for injecting insulin, by knowing how to avoid the pitfalls and slips which can cause serious trouble, you can lead a normal, healthy, productive life.[674]

Mirroring this shift towards greater responsibility on individuals to manage their condition was a concerted effort to frame the aetiology of diabetes as being rooted in the individual. As described in chapter five, around the same time as self-management programmes encouraged PWD to be more responsible for managing their condition, mass screening programmes and the detection of thousands of potential new cases of diabetes reasserted individual-level factors such as familial risk, genetics and individual behaviours, while downplaying social and environmental explanations such as poverty for its cause. This trajectory mirrored a broader political shift from a social democratic to a neoliberal consensus in modern welfare capitalist states. Characterised by an emphasis on individual responsibility,

[673] 'Implementation of Patient Education in Health Care Facilities, Statement by the American Hospital Association approved by the General Council, (21 April 1974), Joslin Diabetes Centre, Box 2, Folder 6.
[674] 'A Pocket Reference for the Diabetic', Eli Lilly, 1979. Joslin Diabetes Centre, Box 2, Folder 6.

consumer choice, market rationality and growing socioeconomic inequality, the ideology of neoliberalism has facilitated a growing dependence on inward-looking treatment programmes reflected in contemporary chronic disease self-management models.[675] According to Rogers et al one of the features of this shift, particularly relevant here, was to reduce the responsibility of the state and to assert a moral philosophy that reassigned the responsibility for wellbeing from the collective to the individual.[676] Within this context, where greater onus has been placed on the individual, language inferring individual responsibility and the inherent moralism within, has not only thrived but continues to pervade public health discussions and campaigns.[677] A recent example of this can be seen in the public debate which ensued following British cancer charity Cancer Research UK's campaign which attempted to target prevention. As part of the campaign, Cancer Research UK commissioned a set of billboards with the message 'obesity is a cause of cancer', the aim of which was to alert the public to recent evidence suggesting that after smoking, obesity is the second biggest preventable risk factor associated with cancer.[678] The charity was quickly condemned for the message and stood accused of both fat-shaming and promoting an individualistic account of disease which overlooked the structural and environmental factors which contribute to obesity and chronic disease, as seen in the graffiti which appeared on one of the billboards: 'poverty, inequality and austerity' (Figure 7.1).

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[675] A. Rogers, I. Vassilev, E. Todorova, A. Kennedy, P. Roukova, 'The Articulation of Neoliberalism: Narratives of Experience of Chronic Illness Management in Bulgaria and the UK', *Sociology of Health and Illness*, 39:3 (2017), p. 349.
[676] Ibid. p. 350.
[677] 'A Century of Public Health Marketing: Enduring Public Health Challenges and Revolutions in Communication', *Public Health England*, 22 November 2017, https://publichealthengland.exposure.co/100-years-of-public-health-marketing, accessed 1 March 2019.
[678] A. Therrien, 'Is it wrong to be blunt about obesity? , *BBC News*, 3 March 2018, www.bbc.co.uk/news/amp/health-43240986, accessed 12 August 2018.

Figure 7.3: Cancer Research UK Advertising Campaign (2018), [Image: Twitter].

An analysis of the historical origins of the language used by the medical profession in relation to their diabetic patients, alongside contemporary examples of public health campaigns which have situated the individual as responsible for disease, helps to explain the resentment heard in the oral testimonies towards the notion that PWD are responsible for their affliction. In the following section the chapter returns to these oral testimonies to examine how PWD have constructed a version of 'the self' in response to this narrative. Utilising narrative analysis techniques advanced by oral historians Catherine Riessman and Mike Bury, this section considers how PWD today negotiate these stereotypes, the influence of gender on how people narrative their experience of diabetes, and the way in which stigma can act as a barrier to the effective management of diabetes.

The Self and Diabetes: Narrative Analysis

To return to Lynn Abrams, oral historians must be aware that:

> …in the process of eliciting and analysing the material, one is confronted by the oral history interview as an event of communication which demands that we find ways of comprehending not just *what* is said, but also *how* it is said, *why* it is said and *what* it means.[679]

What is evident from the interviews carried out for this research, is how people living with diabetes today have received significantly less dietary advice than would their counterparts prior to the advent of new, medical means of management. Ironically however, what can also be recognised in these testimonies is that despite receiving less dietary instruction to allow individuals to manage their condition by regulating their diet, PWD report feeling the weight of social attitudes and assumptions that their condition is something they have self-inflicted upon themselves through poor diet, laziness or apathy. This can be heard overtly as examined above and represents the 'what is said' as outlined here by Abrams. By applying narrative analysis techniques to these testimonies, what can further be discerned is how PWD themselves have likewise absorbed these social and cultural narratives, and, perhaps in resistance to these stereotypes, constructed a version of 'the self' to protect themselves from it.[680] This section is thus an attempt to connect the history of diabetes explored in this thesis with present lived experiences of the condition by drawing attention to not only what is said, but how it is said and what this means. The themes explored in these testimonies reveal a 'construction of the Self' in

[679] Lynn Abrams, *Oral History Theory*, (London: Routledge, 2010), p. 1.
[680] For more on the power of 'cultural circuits' see P. Summerfield, 'Culture and Composure: Creating Narratives of the Gendered Self in Oral History Interviews', *Journal of the Social History Society*, 1:1 (2004), pp. 65-93.

contemporary illness narratives that provides an important window into better understanding how people diagnosed with diabetes today have responded to and negotiated their diagnosis and the language surrounding aetiology and self-management.

In the interviews, all interviewees expressed knowledge of the multifactorial causes of diabetes, ranging from genetic and hereditary inheritance to lifestyle explanations such as poor diet and lack of exercise. In their responses however was a clear articulation of antipathy towards the notion that their diabetes had been self-inflicted through their lifestyle choices.[681] To counter this, interviewees often discussed lifestyle causes in relation to others, to demarcate the stigmatised 'other' from themselves, and often signalled toward genetics as a more comfortable explanation for their own diagnosis. This can be heard in Alan's interview. When asked how his diagnosis came about he replies with an account of that of his brother:

> I started medication with Metformin. My brother had been diagnosed quite a few years earlier with type 2 diabetes but I never really got to know what his symptoms were because he died within three months of a heart attack at fifty-four. So, there were other factors in his case…he did not lead a healthy lifestyle and had other serious problems relating to alcohol and chain-smoking for forty years.[682]

Later in the interview, Alan distinguishes between his own diagnosis and that of others again when asked about the changes in attitudes toward diabetes:

> The number of people diagnosed in Scotland with Type 2 diabetes has increased quite dramatically since I've been diagnosed, in the last eight years. There is a perception that we did it to ourselves. That it's self-inflicted. Is that true? Yes and no. I was never

[681] This runs parallel with McIvor and Johnston's work on occupational health and disease whereby occupational injury and disease victims prioritised structural factors and management over personal responsibility and agency. See A. McIvor and R. Johnston, *Lethal Work: A History of the Asbestos Tragedy in Scotland* (East Linton: Tuckwell, 2000).
[682] Alan Cairns, In-person interview with Rachel Meach, 20 November 2015.

> particularly overweight so I'm quite resentful of this 'you did it to yourself'…but there are people who…I've never been in the obese category in my BMI, there are many people who are who don't have type 2 diabetes. So at the beginning, the genetic component was played down and it was sort of your fault that you've got diabetes, more recently I think more recognition is given to the fact there is a genetic factor involved.[683]

By replying to the question about his own diagnosis with an account of his brothers, Alan deflects from considering the roots of his own condition by demarcating his diabetes with that of his brother which he strongly associates with lifestyle, namely heavy drinking and smoking. His tone here is striking. His feelings towards his brother's lifestyle are clear and suggest that he thinks that in this instance the disease was self-inflicted. By later mentioning the 'genetic factor', however, he also suggests that, for himself, heredity was a more suitable explanation. When Alan then ruminates whether diabetes is self-inflicted he pauses before responding 'yes and no' as if toying between aetiological theories of hereditary and society, or nature and nurture. Alan resents diet and lifestyle as a suitable explanation for his own diagnosis, viewing his health in stark contrast to that of his brother's, for whom he believes the prevailing cultural stereotypes of 'you did it to yourself' is a more suitable fit.

Similarly, Ian's account describes the story of his time in hospital by portraying the other patients on the ward. In doing so he deflects from his own experience by describing that of others, particularly those which fit Joslin's notion of the 'wayward diabetic':

> When I was in hospital I saw people who had come in to the ward and they had diabetes too but their lifestyle was chaotic. Certainly one chap came in and he was obviously an alchy, an alcoholic, which is no gonna help ye. And I got the feeling from the staff that

[683] Ibid.

> he was a frequent flyer, he would crash and come in and I don't know what would prompt him to come in but they would sort him out but the thing is he would just go back and fall back into that lifestyle. And there was a woman on another ward and I think she was in because of her diabetes and again she was heavily obese, I remember one of the nurses giving her a row because one of the consultants had made time to see her and she'd disappeared downstairs to try and tap cigarettes. And it's kinda infuriating because they're not doing anything about it. And there may be a deeper reason why they're not looking after themselves.[684]

Another salient example of responding to these stereotypes by demarcating the self from others can be found in Graham and Kari's interview. Born in 1936, Graham was diagnosed at the age of 75, somewhat older than the rest of the interviews. While his wife Kari has lived with diabetes for much of her adult life, Graham's diagnosis came as a shock after having lived what he describes as a very healthy life with mostly home cooked meals, plenty of exercise and very little packaged foods or sweets. When Graham is asked whether he made any changes to his lifestyle as a result of his diagnosis he replied:

> Nope, because I was always very active. When I was diagnosed I was active swimming and golfing and gardening and they were very pleased with what I was able to tell them. I don't abuse alcohol. I made no bones about it I have a glass of red wine everyday day, whether that was going to shock them or not…I'm sure they must have been confused because I'm not the typical person who gets it as far as I understand, unless it's a hereditary thing. So no, I think I broke the rules.[685]

Graham's narrative demonstrates a similar tension to Alan's surrounding questions of aetiology and the factors responsible for his diabetes. In both interviews there is a sense of hostility towards the lifestyle narrative, with both responses echoing a similar sentiment that diet and lifestyle is both an unfit and unjust explanation for their diabetes. This is heard quite clearly when Graham refers to himself as having

[684] Ian Millar, In-person interview with Rachel Meach, 21 September 2017.
[685] In-person Interview: Rachel Meach with Graham Smith, 21 September 2016.

'broken the rules'. What is striking, however, is that when interviewees were asked about the rise in diabetes in general, all interviewees noted diet and lifestyle as the most likely explanation. In Alan's response to this question he described:

> The preponderance of rubbish food…I mean I live in what's quite a good area, now on the main road in Giffnock there are, I think, four fast food outlets. The nearest schools are a good ten minutes' walk away and yet every lunchtime the kids have walked to stuff themselves on burgers. Its diet and obesity. When I was at school wee boys were skinny! They had mince 'n' potatoes and sweeties were a luxury. Burgers were unknown. There's also the fact that there's less physical labour now. If you do heavy manual labour you're less likely to develop type 2 diabetes. So the shipyards have closed, manual labour is a rarity these days. So diet and the way people work. And then life expectancy has increased quite a bit as well so you're more likely to live long enough to develop Type 2 diabetes. And I suppose it's politically incorrect but there's now the Asian population who add to the statistics because their likelihood of developing Type 2 diabetes is so much higher. So they will skew it a wee bit. But our diet I think is probably the main factor.[686]

A demarcation or comparison to others is also present in May's interview when she discusses changes to eating habits and the food industry, as well as mentioning the café where the interview took place and the cakes on display, May remarks:

> It's not just temptation it's a different way of eating. I mean my nephew and his wife are in their forties and they are very well off and they don't cook, I mean their kitchen is as clean as the day they bought it. They live on going out for meals and carry outs, you know.[687]

These examples reveal how lifestyle explanations of diabetes, and its associated language, have been negotiated by people living with diabetes and subject to these stereotypes today. Interviewees recognise the multifaceted nature of T2D, while at the same time allude that there are people for whom the condition has been self-inflicted by their lifestyle choices, demarcating themselves as not falling into the

[686] In-person Interview: Rachel Meach with Alan Cairns, 20 November 2015.
[687] In-person Interview: Rachel Meach with May Millward, 19 September 2016.

same category. This can be discerned in narrative structures where the interviewee discusses aetiology and the possible explanations for their diabetes, followed by an account of their healthy and vigorous lifestyle (Graham, Valerie), those who cite the possibility of genetics as the root of their condition (Alan, Ian) and again where interviewees expound expert knowledge of the condition and discuss their voluntary positions within patient organisations (May, Alan). This can also be heard by interviewee's use of 'they' rather than 'I' or 'we' used to demarcate the narrator from the 'other', 'self-inflicted diabetic'. In doing so this allows the narrator to actively construct a positive identity in response to having received a diagnosis of a condition associated, in culture and society, with a debauched and irresponsible lifestyle.

The construction of a positive identity in response to a diagnosis of diabetes was prevalent in many of the narratives, especially in accounts which emphasise civic duty such and Alan and May's involvement with Diabetes Scotland, as well as interviewees' reflections of coming to terms with the diagnosis itself. Reflecting upon his diagnosis and the progress of his condition, Ian replied:

> It's not the end of the world. It's not the end of the world. My initial reaction was probably as if someone had punched me in the gut. Because I knew enough at that stage to know you get it, you don't get cured of it. Although that might not be strictly true nowadays. So when the guy said I've got a lifelong condition, I knew I had a lifelong condition but I didn't know how far the prognosis would go. But I'm kinda an optimistic character and I bounce back quite quickly. I thought well I've got it now, no point greetin' about it so just gotta get on with it.[688]

Similarly, in an interview with Colin from Oxford, diagnosed in 1979, when asked the question 'what keeps you going?' Colin replied:

[688] In-person Interview: Rachel Meach with Ian Millar, 21 September 2017.

> Amusement I think. I've always been somebody who laughs and likes a joke. I can never take things seriously not even now. My sister says we're built like our father, my sister is riddled with arthritis and various things but she's always laughing and neither of us knows when we've got a pain. You just need to enjoy life it's as simple as that.[689]

The construction of a positive identity in resistance to the stigma of diabetes is also apparent in Diana's interview. At the end of the interview when asked for any final thoughts, Diana falls into a discussion of the historical changes to eating habits and nutritional knowledge, referencing her knowledge of unhealthy foods from a young age and presenting herself as someone who is knowledgeable about healthy eating:

> When I was at school I was Head Girl and I was allowed to use an information board for whatever I wanted and I waged war on the tuck shop because they were selling sweets…and that's when I was seventeen. Always been one of those people. So did I really need advice?[690]

The construction of a positive identity is a common feature within personal accounts of chronic disease, particularly those where the condition is associated with cultural stereotypes and carries a weighty stigma. In his research on illness narratives, Mike Bury explains the need to maintain a sense of identity as a reaction to adversity, particularly in the case of illnesses where the condition constitutes a major biographical disruption and inevitably comes to dominate the individual's everyday life.[691] According to Bury, in response to feeling as though their everyday lives have been threatened, individuals often feel a need to re-examine and re-fashion their personal narratives in an attempt to maintain a sense of their identity. In order to achieve this, narrators will often use virtue, seen for example in Diana's story about

[689] C. Gates, Interview.
[690] In-person Interview: Rachel Meach with Diana Chalmers, 3 August 2016.
[691] Mike Bury, 'Illness Narratives: Fact or Fiction?', *Sociology of Health and Illness*, 23:2 (2001), p. 264.

being head girl and waging war on sugar at the tuck shop, as well as in Alan and May's detailing of their respective voluntary roles as patient representatives and organisers of their local support groups as a means to convey their connection between the self and society. According to Bury, this is most apparent in responses which express fear of social judgement such as the fear of being a burden, being seen as lazy or having 'let themselves go', a palpable apprehension for people with T2D. Written in 1963, *Stigma: Notes on the Management of Spoiled Identity* by sociologist Erving Goffman was the first to note the connection between stigma and the need for virtue through the means of becoming immersed in voluntary service:

> A comment here is required about those who come to serve as representative of a stigmatised category. Starting out as someone who is a little more vocal, a little better known, or a little better connected than his fellow sufferers, a stigmatised person may find that the 'movement' has absorbed his whole day, and that he has become a professional…A new career is likely to be thrust upon him, that of representing his category. He finds himself too eminent to avoid being presented by his own as an instance of them.[692]

Here, Goffman explains stigma as the result of a 'spoiled identity' suffered at the hands of cultural stereotypes pertaining to disability or disease. While written in the 1960s, Goffman's notion of the spoiled identity is useful for studying contemporary accounts of diabetes, in particular to observe how PWD present themselves in relation to their condition and how they construct their sense of self in spite of evidence of despair. By immersing themselves in their local diabetes support networks and taking up the roles of patient representatives, May, Alan and Ian's narratives provide examples of what Goffman would refer to as the management of a spoiled identity. Similarly, by applying Bury's analysis, these testimonies provide

[692] Erving Goffman, *Stigma: Notes on the Management of Spoiled Identity*, (New Jersey: Penguin Books, 1963), p. 38.

examples of the ways in which people living with diabetes today have made sense of their illness and their attempts to preserve their identity in the face of adversity. To what extent interviewees are conscious of self-construction within their narratives is uncertain and will undoubtedly be shaped by intersubjectivities between interviewer and interviewee as well.[693] Others, such as Catherine Riessman, suggest that there is a degree of conscious self-construction in accounts of illness. In her study of Burt, a recently divorced, working class man with advanced multiple sclerosis, Riessman demonstrates how his narrative features a concerted attempt to construct a positive, masculine identity in spite of his recent divorce and the disability caused by his MS.[694] According to Riessman, Burt develops this positive self-identity by using a number of narrative strategies, particularly the way he structures his testimony which begins with stories of being a good husband and father, a positive sense of self he is comfortable with, in order to guide the impression formed of him.[695] Thus in spite of being left by his wife and being confined to a wheelchair, Burt creates a positive image of himself as having been a good father and husband, projecting a favourable image of himself which attests to his resilience and portrays a strong masculine identity, as opposed to one of weakness or rejection.[696] According to Riessman, where the interviewee inserts these stories in the narrative is strategically significant because of the way it draws the listener into the narrator's world and point of view. These can typically be heard at moments which are critical to shaping the narrator's sense of self, for example, when Alan details the deterioration of his brother's

[693] With the age gap between myself and interviewees as well as not having diabetes myself, it is possible that these factors as well as my position as a researcher, shaped the narratives provided.
[694] Catherine Riessman, 'Strategic Uses of Narrative in the Presentation of Self and Illness: A Research Note', in *Social Science and Medicine*, 30 (11), (1990), p. 1195.
[695] Ibid.
[696] Ibid.

diabetes rather than his own diagnosis. Similarly, this can be observed in Ian's narrative where, to protect his identity from being tarnished by cultural stereotypes, and to protect his masculinity, he describes himself as someone with a positive outlook who will not let diabetes, nor its stereotypes, affect him: 'I'm kinda an optimistic character and I bounce back quite quickly…no point greetin about it'. It is also seen in the repetition of statements such as 'I'm fine actually' and in spite of his references to poor mental health, his assertion that 'to be honest the diabetes has never really had any effect on me'. The influence of gender on how people narrate their experience of illness is important here. Arguably, Ian's response, similar to Burt's narrative, can be read as an expression of masculinity, his articulation of the need to 'just get on with it' being a typical cultural response by men to illness. Ian's narrative attests to the characteristics associated with 'macho cultures' in much the same way as Edward and his father were shaped by their gender in the way they felt compelled to conceal their condition from friends and colleagues in case it was seen as a sign of weakness. This can be seen when Ian tells the interviewer there is no point in crying and, attesting to his resilience and strength, that you 'just gotta get on with it'. Ian and Edward's narratives thus demonstrate not only how different men and women's experiences of diabetes can be, but also how interviewee's narratives can be shaped by prevailing ideas of gender-appropriate values and behaviours. In addition to Ian and Edward, a number of further testimonies conducted for this research demonstrated the ways in which gender can intersect with both culture and memory in oral history.[697] In female responses, women tended to insert more stories about home and family into their narratives as well as reference women's health

[697] C. Daley, 'He would know, but I just have a feeling': Gender and oral history', *Women's History Review*, 7: 3 (1998), pp. 343-59.

issues as having attributed to their diabetes. Valerie Moffat, a retired teacher from the Highlands of Scotland, for example, began her narrative with an account of her position as the eldest of five children, who from the age of eight helped her mother with housework, shopping and childcare, and how she later worked evenings to supplement the family income. Triumphing over this difficult start in life, Valerie's narrative goes on to recount her career as a teacher and her love for hillwalking, telling the interviewee of her accomplishment of having climbed every hill in England and Wales as well as all of the Scottish Munro's. Like many of the interviewees Valerie explicitly attempts to distance herself from the lifestyle narrative of diabetes, but in doing so draws upon gender-specific explanations for her diagnosis. When asked if she had ever read into the condition Valerie described:

> Yes, I spent a lot of time on line researching the condition. I learned that there was no cure and that it was a lifestyle condition. I was very angry. I didn't think it was fair that as a person who did more exercise than most and ate a very healthy vegetarian diet I should have a 'lifestyle disease'. I did in the course of my research learn that one cause of diabetes could be lack of sleep. I have suffered with menopausal sweating since I was just turned 40, not long after my hysterectomy. I didn't have my ovaries removed but the sweats resulted in so many broken nights.

Similarly, when asked about her health prior to her diabetes diagnosis, Pauline from Dumbarton replied:

> Well I was always very thin and then when I was about thirty-one I took an overactive thyroid. And I didn't know at the time that an overactive thyroid could be associated with diabetes. My mother also had an overactive thyroid and diabetes and after I had the treatment I immediately began to put on weight.[698]

[698] In-person Interview: Rachel Meach with Pauline Smylie, 21 September 2016

In her work on gender and oral history, historian Caroline Daley reflects on how women more often have stories to tell about home and family, religion, and community, whereas men were much more likely to talk in long bursts, see themselves as natural storytellers and tend to place themselves as 'heroes of the tale'.[699] In the interviews carried out for this research, women were considerably more likely to have attended weight loss and support groups, and sought out not only information but a sense of belonging and community. Rosemary Thompson from Dunfermline, for example, described being a member of both her local Slimming World group and Diabetes Scotland support group, crediting the support she received at these groups as having been much greater than that of her GP.[700] By contrast, only one male interviewee, Alan Cairns, mentioned having attended a diabetes support group and in his narrative describes himself, in Daley's terms, as the 'hero of the tale' by recounting how he quickly became the group's leader. According to historian Penny Summerfield, the challenge for the oral historian 'is to understand the cultural ingredients that go into accounts of a remembered and interpreted past'.[701] In other words, the historian needs to understand not only the narrative that is offered 'but also the meanings invented in it and their discursive origins'.[702] This can be seen, for example, in the gendered narration of diabetes, particularly within interviewee's accounts of diagnosis and how they narrate their ability to cope with the condition.

[699] C. Daley, 'He would know, but I just have a feeling': Gender and oral history', *Women's History Review*, 7: 3 (1998), pp. 343-59.
[700] In-person Interview: Rachel Meach with Rosemary Thompson, 23 May 2016.
[701] P. Summerfield, 'Culture and Composure: Creating Narratives of the Gendered Self in Oral History Interviews', *Journal of the Social History Society*, 1:1 (2004), pp. 65-93.
[702] Ibid.

To return to the notion of the 'spoiled identity', with diabetes this takes on a particularly moralistic dimension due to its association with lifestyle and the heavy expectations placed on patients to manage it. As Broom and Whitaker explain:

> Firstly, diabetes is frequently represented as a self-induced 'lifestyle' condition, a disease of excess suffered by those who have overindulged. In lay discourses, it is commonly attributed to people who lack 'self-control', who eat to excess and who are overweight. This view is then reinforced by health promotion which emphasises one should avoid diabetes through a 'sensible' diet and exercise. People with diabetes are thus frequently blamed for their disease, for 'not looking after themselves' and failing to take proper responsibility for their health.[703]

Another means by which interviewees resisted this narrative was to use their testimony to draw attention to factors within their social environment which could likewise have triggered their diabetes, i.e. workplace conditions and stress. George Saunders, born in St Kitts in 1931 and diagnosed in Birmingham in 1964, explains his diabetes as a result of his working environment in a biscuit factory in Birmingham during the 1960s:

> My first job, as you know I am a tailor. I tried to get work as a tailor without success, so I got my first job at Cape Hill Brewery, Mitchells and Butlers, as a cooper's labourer. I stuck it for about six months, and then I went off to work at Geoffrey Hughes biscuit factory making cream that was put into the biscuits…Yes, I did eat quite a lot of the biscuits because, as you know, you can eat as much as you want, but you couldn't take them out. So I think there is where my diabetes has started, because I was dealing with a lot of sugar and fat, and you've got to taste the cream to find out if it was sweet enough or whether you wanted to put any more sugar in or whatever, and probably there's where my diabetes started.[704]

[703] D. Broom and A. Whittaker, 'Controlling Diabetes, Controlling Diabetics: Moral Language in the Management of Diabetes Type 2', *Social Science and Medicine*, 58 (2004), p. 2373.
[704] G. Saunders, Interview.

For George, the root cause of his diabetes was his employment in a biscuit factory. In other testimonies however, interviewees describe psychosocial factors such as stress as having brought on their diabetes. This can be discerned in Ian Millar's interview where he details a string of ill health prior to his diabetes caused by workplace stress:

> I…and this is just my take on it…I was a police officer and I finished as an inspector although I also did a spell as a chief inspector for a time and the stress piled onto us around 2012 onwards, it was massive. When I was doing my bit as chief inspector, which I did form November 2011, to May 2012, em…I mean I was getting up…I was arriving into work at half five in the morning and getting home at five o'clock at night. Getting no breaks, just getting absolutely hammered. And it was very mentally draining. And that was in the run up to Police Scotland. And it's hard to say…it's not that the work didn't care but it did seem to me like they didn't care. It was like…well I mean there was quite a lot of my peers who went off with depression or burn out. But myself, when I reverted back to being inspector I went to a role which was community policing so effectively what happened was I ended up being the deputy chief inspector and it just had a massive workload as well and eventually I just kinda crashed. I mean I didn't go off sick but eh…I remember getting home one day and I woke up twenty-nine hours later. And I was struggling a wee bit at work and I eventually got brought in to be spoken to and I just told them what had happened. Now they did refer me to occupational health and they were actually quite surprised that I was still working but I had it in my own mind Rachel that if I'd of gone off sick I would of never gone back… there was a lot of pressure. And I think that's what triggered the shingles. I know the nurse at my practice…I think when I was diagnosed with diabetes there was a recognition that 'you've probably had this a wee while'. You've had this for a wee while and something has triggered it. And I know I can never say with any definition that it was pressure at work…I'm pretty sure it was. It was either pressure at work or pressure at home or a combination.[705]

This 'third narrative', which draws attention to the social and psychological basis of diabetes, demonstrates that while these explanations may have been replaced by the

[705] In-person interview: Rachel Meach with Ian Millar, 21 September 2017.

biomedical model, for PWD themselves these remain rational explanations for the onset of their condition. In his work on narrative reconstruction, oral historian Gareth Williams contends that an individual's belief about the aetiology of their condition must be understood as an 'imaginative enterprise', within which the cases identified act as a narrative reference point between society and the individual.[706] Williams' study of arthritis identified how narrative construction could be utilised as a form of political criticism by interviewees, allowing them to make a connection between some aspect of their social environment and their condition. One of his participants, Bill, does this by connecting his arthritis to his working conditions in the factory in which he was employed. Similarly to George and Ian, this connection, much like the construction of a positive identity, allows the interviewee to move away from individual-level explanations of their disease which are rooted in stigma, toward a discussion of their social environment in which their condition transpired.

Conclusion

This chapter has sought to synthesise the themes uncovered throughout this thesis with contemporary lived experiences of diabetes. By exploring the origins of responsibility and the inherent moralism attached to diabetes self-management alongside oral testimonies, the chapter has demonstrated how PWD have understood and contended with the pressure of responsibility for a disease which is frequently represented as a self-induced 'lifestyle' condition. What can be identified in the testimonies examined here is a pervasive stigma which has become firmly rooted in

[706] G. Williams, 'The Genesis of Chronic Illness: Narrative Re-construction', *Sociology of Health and Illness*, 6:2 (1984), p. 175.

both lay and medical discourse which depicts the diabetic as someone who is obese, lazy, weak-willed and apathetic. In response to these cultural stereotypes, the oral testimonies examined here suggest that people living with diabetes today resist this narrative in numerous ways, such as citing genetics and their hereditary as a possible explanation for their condition, by differentiating themselves from others deemed 'self-inflicted', and by constructing an identity which attests to the historical model of the 'ideal patient', someone who is knowledgeable about the condition and participates in voluntary work within the diabetic community. Arguably, what this achieves is the acquittal of blame or responsibility placed on the individual which stems from aetiological theories and self-management frameworks that have positioned the individual as both the cause and solution to the disease.

While the number of examples examined here may be limited, they do express an important and all too often overlooked facet of living with diabetes and how people with the condition today have made sense of their diagnosis. Together, these testimonies reveal the lack of attention granted to the dietary management of diabetes, the increasing reliance on oral hypoglycaemic drugs, and also the weight of stigma and the moral accountability attached to diabetes which, arguably, can be said to derive from expectations of patients to achieve perfect control and a society which stigmatises the overweight. Without the use of oral history, the psychological impact of living with diabetes and the relationship between food, the body and the self, unavailable in traditional sources, would remain hidden from history. Oral history allows a unique opportunity into the world view of the afflicted, demonstrating the ways in which people have attempted to understand their condition, drawing

attention to the social mechanisms of disease which can be revealed through the process of an interview.

Conclusion

When diabetes was first recognised by the Egyptians it was recorded as being a condition that was 'fortunately very rare'.[707] The same cannot be said today, as an estimated 463 million adults worldwide are living with diabetes, a figure expected to reach 700 million by 2045.[708] The purpose of this thesis has been to analyse the fate of diet therapy as a first-line treatment for managing T2D. By placing the epidemic in historical perspective, this thesis has illuminated the ways in which medical advice and treatment are shaped by the social, cultural and political context in which they are delivered. For people with T2D, a good or 'balanced' diet has been the mainstay of treatment for over a hundred years, and in the absence of a cure, has been the key to controlling symptoms and warding off long-term complications and death. Yet, as this thesis has demonstrated, the history of diet and diabetes has been fraught with periodic revisions and overhauls which progressively led to diet losing its status as a first-line therapy for mild diabetes as it has been side-lined in favour of oral hypoglycaemic drugs. By providing a contextual analysis of diabetic management throughout the twentieth and early twenty-first century, this thesis has illustrated the medical and non-medical forces that have shaped the history of diabetes and determined the course of contemporary understandings and treatment models as they exist today. Through the use of oral history testimonies, the thesis has contributed the perspectives of patients, policy makers and the medical profession to articulate how these shifts have been received by both medical and lay communities.

[707] J. A. Reed, 'Aretaeus, the Cappadocian', *Diabetes*, 3 (1954), pp. 419-21.
[708] J. Guo and M. S. Smith, 'Newer drug treatments for type 2 diabetes', *BMJ*, 373 (2021), p. 1171.

This thesis has determined how the history of diabetes is much more complex than 'the history of insulin' provided in much of the existing literature. Moving away from this narrative, each chapter of the thesis has demonstrated key events and individuals, which alongside the manifold interactions of ideology, science and industry, coalesced to alter the course of diabetes and its management. In the years following the availability of insulin, rather than being replaced, the importance of diet was reinforced as physicians upheld the importance of a controlled, low-carbohydrate diet as the most effective means of managing diabetic symptoms and avoiding future complications. Over the course of the 1920s and 1930s, epidemiological research reported how insulin had failed to curb diabetic mortality, reinforcing the view that the use of diet in managing diabetes could not be wholly disregarded. Unlike other chronic conditions in the 1930s such as cancer where the link between diet and disease was conceived as heresy, the historical connection between diet and diabetes, reinforced and strengthened through the creation of new dietary methods such as Lawrence's Line Ration Diet, ensured that diet was not abandoned, but remained a viable means of treating diabetes throughout the interwar period.

By the 1930s the landscape of the medical profession had changed rapidly. Prompted by overcrowded and insanitary hospitals, diabetic outpatient clinics were established which altered the sites of diabetes care, while the growing number of cases ushered in new authorities, such as patient associations, to assume responsibility for the production of diabetic guidelines and orthodoxies in treatment. After the discovery of insulin, the establishment of the Diabetic Association in 1934 and the outbreak of the Second World War were the next two major events which

altered diabetic management and shaped the rationales for managing diabetes with diet. Contrary to traditional histories of diabetes, such as Feudtner's *Bittersweet*, which suggest that insulin marked the end of diet therapy, chapters two and three contend that physicians did not neglect the role of diet merely because insulin was now at their disposal, rather insulin had enhanced its importance in controlling diabetic symptoms. By applying a contextual analysis to this period, this thesis contends how wider events, in addition to insulin, such as war and fears over national efficiency, necessitated a more relaxed approach to dietary ideals, increasing the carbohydrate allowances of PWD in both Britain and the United States. As health became equated with good citizenship, the diabetic diet was thus liberalised as a means to normalise diabetes and ensure PWD were provided with a diet that would meet their nutritional needs whilst ensuring their contribution to the war effort as well. In the context of the 1930s and 1940s, dietary ideals were therefore relaxed, not only because insulin was available, but in order to facilitate patient productivity and social integration at a time when tensions were mounting over national efficiency. By the end of the war a clear tension had arisen however between a narrative which stressed to patients and their families that a person with diabetes was much like the rest of the population as far as diet was concerned, and emerging evidence which suggested diet was still the most important aspect in diabetes, not only in management but also in preventing the disease altogether.[709] New evidence published on diabetes rates in the 1950s suggested that rationing, which had remained in place in Britain until 1954, had prevented overindulgence and acted as a barrier against overweight, thus concluding that food restrictions had worked as a

means of prevention. By the end of the Second World War, diabetes specialists were thus conflicted between allowing patients a more satisfying diet, and evidence which pointed towards an unrestricted diet contributing to later complications. However, just when these discussions around prevention were taking hold, the medical profession's attention was pulled abruptly toward the allure of pharmaceutical development and the first oral hypoglycaemic drugs. In the 1950s, a concentrated effort in search of an oral hypoglycaemic agent began in hope of finding a new, and arguably, more convenient treatment that would allow the medical profession to control a condition fast becoming endemic throughout much of the world. The result was the development of a number of oral hypoglycaemic drugs, antihyperglycaemic agents that could alter glucose levels in the blood. The new oral agents, in particular tolbutamide, marketed as Orinase by Upjohn Company had been intended as a 'treatment of last resort', however, a successful marketing campaign which promoted the new drugs in terms of their convenience meant that rather than a treatment of last resort, the new oral hypoglycaemic drugs became a first line therapy for many doctors and their diabetic patients. By 1958 nearly 400,000 individuals diagnosed with mild diabetes in the United States had been prescribed tolbutamide. However, many physicians expressed concerns over their effectiveness and whether they were truly necessary in milder patients who could be controlled by diet alone. Uncertainty around patient selection and the new drugs efficacy against traditional treatments methods of diet and insulin thus led to the UGDP, a long-term clinical trial that sought to evaluate the effectiveness of long-term drug therapy.[710] Despite the UGDP's findings, that tolbutamide increased cardiovascular mortality and was no

[710] H. Blackburn and D. R. Jacobs, 'The University Group Diabetes Program 1961-1978: Pioneering Randomised Control Trial', *International Journal of Epidemiology*, 46:5 (2017), pp. 1354-1364.

more effective in mild patients than diet alone, a determined pursuit to control diabetes through pharmaceutical means meant that oral agents continued to be prescribed in the absence of firm evidence that the drugs were effective or safe. Alongside the discovery of oral hypoglycaemic drugs, developments in epidemiology such as the use of mass screening of asymptomatic populations, as well as wider debates occurring in nutrition, further served to challenge the status of diet therapy and shift attention towards long-term, pharmaceutical, solutions to diabetes and its complications. This thesis has demonstrated the importance of these three developments for understanding the contemporary management of diabetes, in particular the marginalisation of diet therapy and ascendancy of oral agents as a first-line therapy that is evident in diabetes care today. As chapters five and six contend, in the post-war period a number of forces coalesced which facilitated greater use of antidiabetic drugs despite evidence suggesting they were ineffective, and in many cases harmful. Moreover, the emergence of population screening for diabetes and the move towards identifying 'hidden' asymptomatic diabetes among the population generated a renewed interest in heredity and placed a greater emphasis on genetic risk, which further generated support for the long-term, pharmaceutical management of T2D. Detection campaigns, aimed to root out 'hidden diabetics' living asymptomatically among the population, identified a high number of new cases and individuals with glycosuria that had the potential to develop into diabetes in later life. Driven by the interests of diabetes specialists such as Dr Joan Walker, detection programmes, aided by the media, portrayed diabetes as a typically genetic disease and encouraged the notion that the most viable solution to the new cases was to treat newly diagnosed diabetics, and in some cases their family members, with the new

oral anti-diabetic drugs. While existing histories suggest that the lack of dietary interventions in the post-war period was simply due to a lack of consensus over what constituted the ideal diet, this thesis has demonstrated how wider developments in diabetes such as the discovery and mass use of oral hypoglycaemic drugs, as well as the aetiological shift driven by the results of detection programmes, steered attention away from dietary interventions towards individual-level explanations and the medical management of disease. Moreover, by examining the role of previously overlooked individuals such as Dr Joan Walker, this thesis contributes the first history of diabetes to incorporate the role of female physicians and their contributions to how diabetes has been managed in the twentieth century.

By the 1970s, as physicians began to rely on the new drugs, newly diagnosed patients with mild diabetes were more likely to be prescribed an oral anti-diabetic agent and began to receive a fraction of the dietary education and advice received by their pre-war counterparts. However, at the same time as the shift towards a greater reliance on oral agents, dietary advice for both the general population and for PWD was likewise changing. Amidst a rapidly changing food environment and expanding food industry that increasingly used sugar in food production, alarming rates of coronary heart disease and obesity, spurred nutritionists, the media and the public to reconsider the connection between diet and disease and the role of single nutritional components in fuelling the emerging epidemic. As dietary advice for the general population was overhauled, nutritional recommendations for those with diet-related diseases such as diabetes followed similar revisions, reversing years of low carbohydrate dietary advice for a diet low in fat. Accordingly, nutritional guidelines for PWD became more relaxed, focusing on the idea of 'balance', at a time when

overall incidence was increasing. The result was an increase in patients deemed 'dietary failures' which then justified the expanded use of oral medications in the treatment of mild, non-insulin dependent cases. The diet-heart debate, and the revision in dietary recommendations for diabetes that it prompted, not only transformed the carbohydrate and fat ratio of the diabetic diet, but by raising concerns about sugar consumption, encouraged consumers, most of whom were diabetic, to defend the place of artificial sweeteners in their diets. As chapter six contends, when the nutritional status of sugar and the safety of artificial sweeteners were challenged, the diabetic community challenged attempts to ban saccharin and cyclamates, defending their right to consume a low-sugar alternative. As a result of these events, PWD continued to consume artificial sweeteners, as well as a range of new low-fat products. In recent years the safety and healthfulness of low-fat foods and artificial sweeteners for people with T2D has been questioned, prompted by concerns of 'hidden sugars' in low-fat foods and evidence which suggests consuming sugar substitutes can lead to weight gain.[711] This area of the thesis thus provides a new perspective on the diet-heart debate, demonstrating not only how it manifested in the dietary guidelines for the general population, but how it impacted those with diet-related diseases like diabetes as well, providing a much needed historical perspective on recent nutritional debates pertaining to refined sugar and critiques of the reign of 'low-fat'.[712]

[711] D. Benton, 'Can artificial sweeteners help control body weight and prevent obesity?', *Nutrition Research Reviews*, 18:1 (2005), pp. 63-76; 'Are artificial sweeteners making you fat?', *Glamour*, March 2007, p. 146.
[712] I. Leslie, 'The Sugar Conspiracy', *Guardian*, 7 April 2016; Z. Williams, 'Robert Lustig: The man who believes sugar is poison', *Guardian*, 24 August 2014.

Through the use of oral history, this thesis has further contributed lived experiences of diabetes. Using narrative analysis techniques, this thesis has demonstrated the ways in which the developments explored throughout the thesis have impacted people living with the condition today. Exploring the legacy of such developments, the oral testimonies carried out for this research attest that today, oral hypoglycaemic agents have become the cornerstone of diabetes treatment in both Britain and the United States which has contributed to newly diagnosed patients receiving considerable less advice and education about nutrition and how to achieve weight loss by altering their diet. While the thesis overall demonstrates how this occurred, the oral testimonies elicit the implications of an overly biomedical model of diabetes which has neglected the social and environment factors known to contribute to its onset such as poverty, nutrition, a sedentary lifestyle and stress. The testimonies reveal a grave irony for those living with diabetes today; on the one hand the preponderance of oral medications has resulted in the majority of newly diagnosed patients receiving minimal nutritional advice about how to manage their diabetes with diet, while also reporting a social stigma attached to the condition which has framed the disease as self-inflicted through poor lifestyle choices. In response to this narrative, this research has established the need for people living with diabetes today to construct a positive identity which attests to the 'ideal patient' in order to resist cultural stereotypes and to unburden themselves of the moral accountability of a disease for which, throughout history, they have been made to feel responsible for. This history of diabetes as narrated by patients and physicians themselves suggests that the medicalisation of diabetes has not been universally accepted. Historically, this can be seen in responses to the results of the UGDP, particularly those who

upheld the study's results that tolbutamide was dangerous and no more effective in managing milder diabetes than diet alone. Likewise, the oral histories provided by both patients and health care professionals for this research express similar concerns regarding the over-prescription of medication for T2D diabetes as well as their antipathy at the lack of support to control diabetes with diet. Apart from Jeremy Greene's history of Orinase, the history of oral hypoglycaemic drugs has yet to feature in any existing histories of diabetes. This thesis thus contributes significantly to the existing literature by outlining both the development of anti-diabetic drugs, as well as how they were received by the medical profession. This contributes to the existing literature by demonstrating that the medicalisation of diabetes was not a unanimous process nor universally accepted, but rather, the introduction of oral hypoglycaemic drugs was fraught with contention as many questioned the need for drugs in patients they knew could be treated with diet alone. Finally, the use of oral history here has shown that rather than passive recipients of medical knowledge and decisions, PWD have, and continue to, express patient agency in negotiating dominant medical discourses and approaches to treatment. The testimonies examined here have shown that when faced with little or no access to dietary advice and barriers to patient education, while some have become apathetic, others demonstrate a proactive approach to their condition and have devised their own, as well as defended the right to certain components of their diet such as artificial sweeteners.

This history of diabetes thus demonstrates that diet was not disregarded after the development of insulin, but rather, insulin reinforced the importance of adhering to strict dietary principles in order to improve health, prolong life, and ward off

secondary complications. Attention to diet and dietary instruction only began to wane from the 1960s onwards with the development of the first oral hypoglycaemic drugs and the increasing tendency to medicalise mild diabetes and centre explanations on individual-level accounts such as hereditary. As the thesis contends however, the history of diabetes does not represent a simplistic tale of the medicalisation of disease, rather, in the wake of the UGDP and what was considered an over-prescription of drugs, sections of the medical profession resisted attempts to medicalise mild diabetes and upheld the importance of diet as a first-line therapy in their patients. Ultimately, the discovery of oral hypoglycaemic drugs led to the dominance of the biomedical model in both understanding and controlling diabetes, yet as this thesis has shown, this was not a definitive, nor linear process and has been contested at many levels. As the oral testimonies carried out for this research suggest, psychosocial explanations were never fully supplanted, but continue to sit alongside biomedical explanations as a 'third narrative' to explain the onset of the disease. This history thus contributes new understandings of how patients themselves have understood aetiology and the ways in which narrative structures can be utilised to challenge aetiological explanations that place the individual at the centre of both cause and solution to the disease. Focusing specifically on Type 2 diabetes and placing the experiences of PWD at its centre, this thesis constitutes the first history of its kind. As opposed to existing histories such as those by Feudtner, Bliss and Tattersall, which have overwhelmingly focusing on Type 1 diabetes, this thesis has contended that in order to understand changes to diabetes management and the fate of diet therapy in managing T2D, it is essential to analyse the broader historical contexts in which medical treatments and ideas have emerged. It is hoped

that this history of diabetes not only provides a case study of diet and chronic disease in the twentieth century, but highlights the implications of the reliance on medical solutions for those living with diet-related ailments today.

In 2014, an article in the *New York Times* reported on the 'flood of drugs and tests' faced by people with type 2 diabetes. The report described an ADA travelling EXPO at which:

> Many exhibitors have their eye on the prize: people with type 2 diabetes. Clinilabs offer such patients more than $3,500 dollars to join a drug trial. Sanofi-Aventis has 10-foot-tall insulin pens on display. Walgreens offers a free test to check long-term blood sugar levels, a promotion for a new home-testing kit. Type 2 diabetes, which afflicts an estimated 25 million Americans, is one of the new frontiers for drug and device makers. As more and more people are given the diagnosis, more products are being developed to tap into this multibillion-dollar market. But some experts say that for many patients the profusion of choice has often led to confusion, not better treatments, as well as skyrocketing costs.[713]

Despite a decades-long strategy of strict glycaemic control with oral agents to mitigate the risks associated with T2D, a recent article in the *BMJ* admitted 'that such glucocentric strategies have, at best, only a tenuous causal effect on reducing diabetes related cardiovascular disease and death'.[714] The solution according to the article was to refocus efforts on even greater drug development. Despite the results of the Diabetes Prevention Program (1996-2001) which found diet and exercise to be more effective at preventing the onset of T2D than metformin, sections of the medical profession continue to single-mindedly search for a pharmaceutical solution to the rise of diabetes and its complications.[715] Elsewhere however, recent research

[713] E. Rosenthal, 'Type 2 Diabetics Face a Flood of Drugs and Tests', *New York Times*, 22 May 2014.
[714] J. Guo and M. S. Smith, 'Newer drug treatments for type 2 diabetes', *BMJ*, 373 (2021), p. 1171.
[715] Diabetes Prevention Program Research Group, 'Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin', *New England Journal of Medicine*, 346:6 (2002), pp. 393-403.

suggests that the dietary management of diabetes has experienced somewhat of a revival. In light of the failure of anti-diabetic drugs to curb rates of diabetes and evidence, such as the Diabetes Prevention Program, that diet remains more effective at preventing the onset of diabetes, has encouraged a reappraisal of the merits of diet and its potential to 'reverse' the disease. In 2014, a study by Roy Taylor, Professor of Medicine and Metabolism at Newcastle University, and Mike Lean, Professor of Human Nutrition at the University of Glasgow, on the role of diet and diabetes transformed modern understandings of T2D from an incurable, lifelong condition, to one which can be reversed.[716] The Newcastle study, which placed 298 adults aged between 20 and 65 from Scotland and Tyneside on a low calorie, approximately 800 calorie diet, demonstrated that diabetes could be reversed or forced into 'remission' through diet and weight loss.[717] The trials results, published in the *Lancet* and presented at the International Diabetes Federation Congress in 2017 confirmed that after only one year participants had lost an average weight of 10kg and approximately half had reverted to a non-diabetic state. Moreover, with such significant change produced by dietary measures, participants no longer required their previously prescribed medication.[718] Taylor's 'Newcastle diet' has since been hailed a proven method of reversing Type 2 diabetes and at the time of writing is currently being rolled out, albeit gradually, through the NHS.[719] While many diabetes specialists in the UK now accept Taylor's programme and its effectiveness,

[716] S. Boseley, 'Radical diet can reverse type 2 diabetes, new study shows', *Guardian*, 5 December 2017.
[717] M. Lean, R. Taylor, W. Leslie et al, 'Primary care-led weight management for remission of type 2 diabetes: An open-label, cluster-randomised trial', *Lancet*, 391:10120 (2018), pp. 541-551.
[718] In an interview carried out for this research with U.S health policy maker Karen Collins in 2018, the idea that diabetes could be reversed was considered unthinkable and was wholly dismissed as a possibility. See also D. Ferguson, 'How to cure type 2 diabetes – without medication', *Guardian,* 15 May 2021.
[719] 'Shake diet offered on NHS to fight type 2 diabetes', *BBC News*, 1 September 2020, https://www.bbc.co.uk/news/health-53983095, accessed 19 October 2021.

in May 2021 the *Guardian* reported how many doctors in the U.S and Europe remain unconvinced.[720] Indeed during the initial proposal stages for the Newcastle study, Taylor recalls how only one member of the research committee meeting supported his proposal, who convinced fellow committee members by explaining that although 'it might sound crazy', if Taylor was right, 'it might be really important'.[721] The notion of diabetes being reversible with dietary changes was completely unfathomable up until this point, particularly in the United States, where the reply to this question in the interviews carried out for this research were met with replies such as that heard from Dr Karen Scott Collins, former Chief Medical Officer of New York City Health and Hospitals Corporation, who asked 'but could it? I mean can it? Be reversed to the point where you wouldn't need medication?'[722] While American physicians were initially unreceptive to the idea of remission in diabetes, in the years since Taylor's study, the ADA and the international diabetic community have begun to recognise remission as not only a possibility but a clinical goal in patients with T2D.[723] In 2021, in their acceptance of Taylor's evidence of remission, the ADA reported the new diagnostic criteria produced by international diabetes experts which describes 'remission' in T2D patients as someone who has sustained normal blood glucose levels for at least three months without taking diabetes medication.[724]

[720] Ibid.
[721] Ibid.
[722] In-person interview: Rachel Meach with Karen Scott Collins, 2 August 2018.
[723] J. Kelly, M. Karlsen and G. Steinke, 'Type 2 Diabetes Remission and Lifestyle Medicine: A Position Statement from the American College of Lifestyle Medicine', *American Journal of Lifestyle Medicine*, 14:4 (2020), pp. 406-419; ADA Press Release 'International Experts Outline Diabetes Remission Diagnosis Criteria', *ADA*, 31 August 2021, https://www.diabetes.org/newsroom/press-releases/2021/international-experts-outline-diabetes-remission-diagnosis-criteria, 18 October 2021.
[724] Press release: International Experts Outline Diabetes Remission Diagnosis Criteria, ADA, 30 August 2021.

The lack of faith in the notion that diet could reverse T2D, a disease implicated with diet for over a century, not only reveals the erosion of traditional health principles, but a gross unawareness of the origins of diabetes and its historical connection with diet. With the reappraisal of diet's role in diabetes by Rob Taylor and his colleagues at Newcastle however, diabetes, believed until recently to be irreversible and progressive, can now not only be controlled, but reversed through food restriction and with no need for medication.[725] This thesis has been an attempt to shine a light on the current enthusiasm for heterodox medical solutions such as diet, highlighting how such solutions are not 'novel', but were simply overlooked due to the fervour for today's biomedicine. Current and ongoing medical discussions about diet and diabetes would benefit from a greater engagement with the history of these debates. As this thesis has shown, diet was once the cornerstone of diabetic management until a combination of historical forces served to diminish its value. Instead of asking whether oral anti-medications are effective, this thesis has questioned the historical context and wider developments which allowed them to become first-line therapies in managing cases of T2D. As the role of diet in diabetes has its revival, it would be of great value to policy makers and the medical profession to consider this history and the testimonies expressed therein.

Finally, this thesis has highlighted a number of potential avenues for future research. One such avenue would entail the exploration of intersectionality, namely class, race and gender in order to explore how these factors have impacted both the type of care received and the patient's ability to manage their condition. Recent research suggests that patients today find it difficult to follow dietary instructions, a problem

[725] R. Taylor et al, 'Nutritional basis of type 2 diabetes remission', *BMJ*, 374 (2021), p. 1449.

which is even more pronounced among low income communities with problems with health literacy and access to affordable healthy food.[726] The oral histories carried out for this research have highlighted the stigma attached to diabetes, the psychological weight of responsibility and the burden of obesity stereotypes for those living with the condition today. Research into the role of stigma as a barrier to self-management, as well as the connection between diabetes, responsibility and mental health conditions such as depression, would provide further important avenues for future research. The results of recent research on lay understandings of aetiology suggests that what individual's perceive to have caused their diabetes directly impacts approach to management, engagement with health services and overall success at controlling their condition.[727] Using ethnomedical interviews with female diabetic patients in the U.S, one study found a direct correlation between aetiological beliefs and adherence to a prescribed dietary regimen. Central to this research, interviewees who attributed the onset of their diabetes to non-biomedical factors such as poor food choices, were significantly more likely to follow the dietary recommendations prescribed to them, whereas those who attributed their diabetes to factors consistent with biomedical explanations such as heredity, age and ethnicity were significantly less likely to adhere to dietary changes. A study in the 1990s carried out with Mexican-Americans with T2D found similar results; people who cited 'behavioural provokers' were more likely to be self-active in treatment,

[726] S. Vijan et al, 'Barriers to following dietary recommendations in Type 2 diabetes', *Diabetic Medicine*, 22 (2005), pp. 32-38.
[727] J. Lawton et al, 'Shifting Accountability: A longitudal qualitative study of diabetes causation accounts', *Social Science and* Medicine, 67 (2008), pp. 47-56; N. E. Schoenberg, C. H. Amey and R. T. Coward, 'Stories of Meaning: Lay Perspectives on the Origin and Management of Non-Insulin Dependent Diabetes Mellitus among older women in the United States', *Social Science and Medicine*, 47:12 (1998), pp. 2113-2125 cited in J. Lawton et al, 'Conceptualising Account of Illness: Notions of responsibility and blame in white and South Asian respondents accounts of diabetes causation', *Sociology of Health and Illness*, 29:6 (2007), p. 892.

whereas those who considered their diabetes to have a genetic basis tended to be passive and less active in managing their diabetes.[728] The suggestion in these results, that patients are more likely to follow dietary guidelines when they are believed to have been caused by social factors which could be remedied, as oppose to individual, fixed causes such as genetics, suggests that there are complex physical, socioeconomic and emotional barriers, such as stigma and perceptions of aetiology, which shape patient approaches to self-management that are worthy of future research. Finally, this thesis has drawn attention to the multiple explanations for diabetes which until the rise of biomedicine co-existed harmoniously, of particular interest and worthy of future research is the history of psychosocial explanations such as trauma and stress. While chapter five provides a brief overview of medical interest in these explanations and their waning with the renewed interest in genetics in the 1960s, further research to better understand the historical connections between mental wellbeing and diabetes could contribute to contemporary discussions on the mind-body connection and the physical manifestations of stress.

'A Spoonful of Sugar' has argued that diabetes, through a range of events, influential groups and institutions, as well as scientific advancements, has become a disease which is considered as most amenable to pharmaceutical treatment. By exploring how diabetes has been experience, treated and understood, it has also provided much-needed historical context for renewed debates about the role of diet and the limits of modern drug therapies for diet-related conditions. Moreover, this thesis demonstrates the potential for history to shape contemporary health policy and the

[728] L. M. Hunt, M. A. Valenzuela and J. A. Pugh, 'Porque Me Tocoa a Mi? American Mexican Diabetes Patients' Causal Stories and their Relationship to Treatment Behaviours', *Social Science and Medicine*, 46:8 (1998), pp. 959-969.

use of patient narratives to challenge the stigma associated with ‘lifestyle’ diseases such as Type 2 diabetes.

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