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About the Authors

Dr Sarah Myhill MB BS qualified in medicine (with Honours) from Middlesex Hospital Medical School in 1981 and has since focused tirelessly on identifying and treating the underlying causes of health problems, especially the 'diseases of civilisation' with which we are beset in the West. She has worked in the NHS and private practice and for 17 years was the Hon. Secretary of the British Society for Ecological Medicine, which focuses on the causes of disease and treating through diet, supplements and avoiding toxic stress. She helps to run, and lectures at, the Society's training courses and also lectures regularly on organophosphate poisoning, the problems of silicone, and chronic fatigue syndrome. Visit her website at www.drmyhill.co.uk

Craig Robinson MA took a first in Mathematics at Oxford University in 1985. He then joined Price Waterhouse and qualified as a Chartered Accountant in 1988, after which he worked as a lecturer in the private sector, and also in the City of London, primarily in Financial Sector Regulation roles. Craig first met Sarah in 2001, as a patient for the treatment of his CFS, and since then they have developed a professional working relationship, where he helps with the maintenance of www.drmyhill.co.uk, the moderating of Dr Myhill's Facebook groups and other ad hoc projects, as well as with the editing and writing of her books.

Authors' roles

Use of the first person singular in this book refers to me, Dr Sarah Myhill. One can assume that the medicine and biochemistry are mine, as edited by Craig Robinson, and that the classical and mathematical references are Craig's.

Craig has been an essential part of this book. As a doctor, I tend to assume much information. Craig is a First Class Oxford mathematician who thinks logically. He has written out the medico-speak and ensured the writing flows in a biologically plausible and comprehensible way. Thank you Craig!

SM

Morning Surgery at Dr Myhill's

MONDAY

FED-UP PATIENT: 'Just not feeling myself, tired, irritable, foggy brain, can't lose weight, can't get fit.'
Dr M: '…and your diet is…?'
QUIZZICAL PATIENT (thinking, 'This is a bit weird; normally at this point other doctors start writing a prescription'): 'Well, I …er … I eat a normal, healthy, balanced diet…"
Dr M---: '…So breakfast is …?'
SMUG PATIENT (giving confident smile thinking that Dr Myhill will be really impressed): 'Cereal or muesli, with low-fat milk and sweetener, orange juice, toast, margarine and marmalade. Tea.'
Dr M (remember that this old matriarch, Dr M, is becoming increasingly grumpy and, in consequence, even more direct): Flashes smug patient a hot stare.
CRUSHED PATIENT (with weakening voice): '…Sandwiches for lunch, fruit for snacks, pasta for supper …all cooked in sunflower oil, you know!'
Dr M: 'So you have metabolic syndrome. And if you carry on like this you will get diabetes…'
DEFENSIVE PATIENT: '…but I eat my five a day, I've cut out all fat and my cholesterol is good. I have done everything I have been told to…'
Dr M: '…and then you will die prematurely from cancer, heart disease or dementia – no time to explain – read this book!'

TUESDAY

CRESTFALLEN PATIENT: 'I've started the book. And yes, I am a carbohydrate addict.'
Dr M: 'You admit it…and yes…?'
SHEEPISH PATIENT: '…and my diet is abnormal, unhealthy and unbalanced.'
Dr M: 'Keep reading…'

WEDNESDAY

THOUGHTFUL PATIENT: 'Now I understand the "Why"s and "What to do"s…, but the *changes* are so difficult.'
Dr M: 'Keep reading, take a leap of faith and just DO IT.'

THURSDAY

DETERMINED PATIENT (with a steely look in the eye): 'OK, I am going to do it but I will hate you forever.'
Dr M: 'Read the book again!'

FRIDAY

MISERABLE PATIENT: 'I am feeling effing awful!'
Dr M: 'Jolly good – that's really made my day! You have the classic withdrawal reaction symptoms. You will do well. Carry on. Stick with it!'

ONE MONTH LATER

TRIUMPHANT PATIENT: 'I have never felt so well in my life! I have lost a stone in weight. I can go all day. My brain is sharp. I just feel so cheerful. I have horizons and a future.'
Dr M: 'Remember this moment. You will forget. Addicts always do. When you do forget and relapse – read the book again *and* remember this moment!'
CONSPIRATORIAL PATIENT (leaving, with confidential sly glance): '…and the sex is great again…'

Preamble

The word 'diabetes' comes from the Greek meaning 'siphon', illustrating one late-presenting symptom of diabetes – namely, excessive urination and excessive thirst.

There are two main categories of diabetes:

1. Diabetes mellitus (excessive urination caused by sugar in the urine). Here the 'mellitus' is derived from the Latin, meaning honeyed or sweet, and is a reference to the excessive sugar found in urine in this category of diabetes.
2. Diabetes insipidus (excessive urination caused by abnormal pituitary function and therefore kidney function). Here the 'insipidus', deriving again from the Latin, means pale, or tasteless, and refers to the pale urine seen in this category of diabetes.

Further, diabetes mellitus has been split into two types: type 1 and type 2. Both types have to do with the loss of control of blood sugar, but for two different reasons:

Diabetes type 1 is an autoimmune condition which results because the insulin-producing cells of the pancreas have been destroyed. The commonest cause of this is autoimmunity but some other pancreatic diseases will present with type 1 diabetes.

These patients all require insulin by injection because the pancreas cannot produce the amount of insulin they need.

Diabetes type 2 is the loss of control of blood sugar for all reasons other than the loss of insulin-producing cells in the pancreas. This process of losing control starts with what is called 'metabolic syndrome' (page 239) and, given time, inevitably progresses to diabetes. The treatment of both metabolic syndrome and diabetes – namely, to reverse that progression – is the same.

This book is largely about diabetes type 2. However, type 1 diabetes can be greatly improved by all the strategies that are also used to treat type 2 diabetes. If these treatments are put in place, even though insulin will always be needed, blood sugar control will be much improved, and insulin requirements substantially reduced. This, in turn, will reduce the risk of complications. In the not too distant future, type 1 diabetes will be curable with stem cell therapy – roll on that day! Type 2 diabetes can only be cured by restoring evolutionarily correct diets and lifestyles, as detailed in this book.

Chapter 1

Introduction – why this book?

I see many patients with diabetes. It is clear that the conventional advice given to them does not address the causes of their condition and so cannot reverse it or prevent progression. Conventional dietary and medical advice is not just inadequate; by focusing on calorie counting, cutting out fats, eating carbohydrates with every meal, and the taking of prescription drugs, it is also uninspiring and disempowering, and – even worse – it allows the disease to progress. Patients following this advice inexorably move on to more prescription drugs and premature death.

This is because the conventional medical approach fails to address the key issues of carbohydrate addiction (p 29), glycogen sponges (p 225), fermenting guts (p 152), hormonal deficiencies (p 63), the causes of insulin resistance (p 8), how to reverse metabolic inflexibility (p 239) and, also, how to establish keto-adaption (p 66). Without a full understanding of these issues, we have neither the tools, nor the mental, physical and emotional determination, to put into place the necessary lifestyle and dietary changes to reverse metabolic syndrome (p 239) and diabetes.

Already our glorious National Health Service is being overwhelmed by the complications of metabolic syndrome and diabetes. We all have it within our power to reverse this progression. We must wake up to Darwin's 'survival of the fittest'

principle. Those people and families who understand the causes of metabolic syndrome and have the determination to reverse it will be the long-term survivors.

Not only must we understand these causes and put into place the changes to reverse the damage that has already been done, but we must *stick* to these changes – these are lifestyle changes for life. Like Darwin's American Monkey,[1] we must learn from the error of our ways:

> *'An American monkey, after getting drunk on brandy, would never touch it again, and thus is much wiser than most men.'*
>
> Charles Darwin (1809–1882)

The ideas which follow are for the most part based on well-researched science. However, for the reader's information, I have indicated where some are less well researched or even speculative. Even so, all are at least biologically plausible and all come with a sound clinical basis from my practice. In addition, all of these ideas pass the 'Do No Harm' test.

As Linus Pauling famously said, to have good ideas we need to have lots of ideas and then throw away the bad ones.[2] It may be that some of what follows will have to be discarded, but, at least no harm will have been done, and I hope that there are enough good ideas here both to enthuse each and every reader and to motivate you all to carry on through with this difficult evolution of individual discovery.

At the very least, there should be enough in this book to make you think.

> *'I cannot teach anybody anything; I can only make them think.'*
> *'Education is the kindling of a flame, not the filling of a vessel.'*
>
> Socrates, Greek philosopher (470/469–399 BC)

Chapter 2

Sugar – our non-essential and dangerous fuel

For most of us, sugar in the blood is as essential, but also as dangerous, as petrol in our cars. In my clinical practice I spend more time talking about how the body controls blood sugar than all other subjects put together. I came into this subject through my interest in treating patients with chronic fatigue syndrome: blood sugar levels running too high or too low both result in the symptom of fatigue. Indeed, for many, blood sugar levels running too low can result in unconsciousness and death. (See Chapter 6, page 56 for more on this.) Importantly, this problem of low blood sugar is only a problem in people who fuel their body with carbohydrates and who have developing, or established, metabolic syndrome and metabolic inflexibility. The symptoms

of hypoglycaemia (blood sugar that is too low) arise because they cannot switch into the alternative way of fuelling the body – burning fat. Interestingly, once this facility to burn fat has been re-established (called keto-adaptation – see p 66) one becomes much more tolerant of hypoglycaemia simply because the body can happily function on fat in the form of ketone bodies. If the body is happy running on ketones then adrenaline (known as epinephrine in the US) is not poured out – and it is adrenaline that gives us the symptoms of hypoglycaemia. Indeed, Dr Heinz Reinwald reported at a BSEM (British Society of Ecological Medicine) conference how some people can run blood sugars below 1 millimole per litre (mmol/l – conventional [NICE and NHS in the UK] 'normal' is 4 to 5.9 mmol/l before meals and 7.8 90 minutes after)* and not suffer any malign effects. I know this to be the case – sometimes I send off routine blood samples and the report comes back with the blood sugar 'below measurable' – but the patient was completely well at the time of testing.

Over time it has become increasingly apparent to me that this loss of control of blood sugar is driving our modern epidemics of cancer, heart disease and dementia.

Historical note: It was not always so. Maimonides (12th–13th century AD), writing in *Medical Aphorisms*, comments on 'diabetes', in Chapter 8, saying that Galen states that this condition expresses itself through a very heavy thirst and frequent urination but that it is extremely rare in the 'West' and that neither Galen, nor his teachers, had personally come across any cases. He further notes that cases had been reported from Egypt, positing that the cause may be the propensity of the Egyptians, at that time, to take sweet drinks. How right he

* Note: The 'normal' levels given by NICE in the UK are based on a 'normal' population, but we no longer have such as we no longer eat an evolutionarily correct diet. The NICE normal levels are set high, and those for type 2 diabetics are set even higher (4 to 7 before meals and 8.5 90 minutes after) though they should be exactly the same.

may have been in his deductions. Maimonides was an extraordinary person, who prefaced his work on Ethics with the advice: '...one should accept the truth from whatever source it proceeds.'

Sugar is essential in the bloodstream but it is not essential as a food. For millions of years, Man evolved with very low-carbohydrate and sugar diets. He was fuelled by fat, protein and vegetable fibre. Indeed, Dr Heinz Reinwald[3] recognises three ages of nutrition:

1. The Stone Age, of over 2.5 million years finishing about 10,000 years ago, when the diet was ultra-low carbohydrate and largely ketogenic.
2. The Glucogenic Age from 10,000 BC to about 1850, when increasingly humans were fuelled by starches from the Agrarian Revolution.
3. The Glucotoxic Age from 1850 to date, when the Industrial Revolution allowed wholesale access to cheap addictive sugars and refined carbohydrates.

Sugar toxicity problems really came to a head in the 1960s with the great debate[4, 5, 6] spearheaded on the fat side by Dr John Yudkin, Founding Professor of the Department of Nutrition at Queen Elizabeth College London, and on the sugar side by Dr Ancel Keys, American scientist. Keys was backed by the agrochemical industry, the food industry, the pharmaceutical industry, the US Army and the US Government. In such debates, the science is discarded – power and money always trump truth. The Glucotoxic Age took off, consumption of sugar and refined carbohydrates increased exponentially and epidemics of metabolic syndrome and diabetes ensued.

Indeed, it is predicted by some that by the year 2030, up to 50% of some Western populations will have metabolic syndrome and diabetes. My estimate is that over 95% of the current Western population, young and old, already have prodromal

(latent) metabolic syndrome – namely, carbohydrate addiction. This epidemic is a direct result of our modern Western diets and lifestyles, these being diets and lifestyles not experienced or practised by our 12th and 13th century forebears. To understand how to prevent, how to diagnose and, of course, how to treat diabetes we must first understand the mechanisms that are driving this epidemic. Attention to these 'driving mechanisms', applied at any stage of either metabolic syndrome or diabetes, will result in prevention, remission and cure. With that, additionally, comes protection against cancer, heart disease and dementia.

Historical note: Herodotus tells of the difference in longevity of the Persians and Ethiopians. He writes of how the Persians ate bread from grain fertilised with dung and that some lived to an age of 80, whilst the Ethiopians, who lived on boiled meat, regularly lived to 120, and that they (the Ethiopians) attributed the 'low' life expectancy of the Persians to the fact that they ate shit! How right the Ethiopians were. *Herodotus, Histories*, circa 440 BC, and as recently reported in Finch 2009.[7]

What is diabetes type 2?

Diabetes type 2 is the end result of years of metabolic havoc as the body progressively loses control of levels of sugar in the blood. The early phase of this metabolic havoc is called 'metabolic syndrome'.

Sugar in the blood is like the petrol in our cars. It is absolutely essential for the human body to work, just as petrol is essential for the engines of our cars to work. However, sugar *in the diet* is not essential except for the non-keto-adapted. There is an important, yet subtle, distinction here that will become clearer as the biochemistry is discussed in more detail; in short – sugar is essential in the blood but is neither essential nor, indeed, at all desirable, in our diets.

If blood sugar levels fall too low, we fall unconscious and become easy prey for a sabre-toothed tiger – or its modern-day equivalent!

Nature cannot allow the body to run out of fuel, so when things go wrong it errs on the safe side – if we start to lose control of blood sugar, and we cannot correct this by switching into burning fat as an alternative source of energy, then it is preferable to allow blood sugar to run on the high side – short-term gain but long-term pain because, as you will see, high levels of sugar in the blood are horribly damaging to the body. Interestingly, a similar scenario arises in pregnancy – the growing baby is exquisitely sensitive to fuel delivery mechanisms and if sugar levels fall in maternal blood, serious damage to the baby results. So Nature ensures that the mother runs her blood sugars higher than normal to protect the baby. If she has already started to lose control of her blood sugar, then pregnancy may tip her over into frank diabetes (so-called 'gestational diabetes'). What this tells us

is that high levels of female sex hormones, as experienced during pregnancy, allow women to run higher blood sugars and this explains why the Pill and HRT (hormone replacement therapy) are both risk factors for metabolic syndrome and diabetes.

Loss of control of blood sugar levels is the first step towards diabetes and is, as stated earlier, called metabolic syndrome. It is also known as 'syndrome X', 'cardiometabolic syndrome', 'insulin resistance syndrome', 'Reaven's syndrome' and 'CHAOS' (Coronary artery disease, Hypertension, Atherosclerosis, Obesity, and Stroke). These are dreadful names designed to confuse patients and make doctors seem clever; doctors love to use difficult, often foreign, words to describe disease and pathology but in doing so obfuscate the underlying causes.

The preferred language of deception of the medical profession is Latin. Craig studied Latin and remembers the little ditty often murmured by his schoolmates at the beginning of Latin lessons: 'Latin is a language, as dead as it can be; it killed the Ancient Romans, and now it's [insert expletive] killing me.'

The real joke is that most doctors do not know what metabolic syndrome is. Again, let's briefly turn to the wisdom of Maimonides, who states that:

> *'There is one [disease] which is widespread, … I refer to this: that … person thinks his mind … more clever and more learned than it is … They … express themselves [not only] upon the science with which they are familiar, but upon other sciences about which they know nothing … If met with applause … so does the "disease" itself become aggravated.'*

So, for example, having diagnosed metabolic syndrome in one of my patients, his GP referred him to the renal unit for the treatment of his 'metabolic syndrome', clearly showing his

complete misunderstanding of the term. Indeed, a perusal of the obituaries in the *British Medical Journal* (where the cause of death is additionally given) shows that most doctors die from the end result of metabolic syndrome – they too have not understood!

In the 1990s, the *British Medical Journal* made attempts to encourage self-penned obituaries – to be published *post mortem*. The idea was that this would lead to more interesting obituaries, with doctors having more insight into their own deficiencies and failures. It seems that this was a doomed, yet worthy, objective – such insight is clearly missing.

'Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius – and a lot of courage – to move in the opposite direction.'

Internet Meme wrongly attributed to Albert Einstein*

I hope that what follows explains the problems of sugar, the mechanisms by which these problems arise and, most importantly, what must be done to correct the dangers arising from these problems. This will, I hope, provide the intellectual imperative to make the difficult but necessary changes before disease results.

*Note: During the course of obtaining permission to use quotations, Craig contacted the relevant copyrightholders, and for Einstein, this was, for the most part, The Hebrew University of Jerusalem, who kindly replied, stating that, along with virtually every other quote on the Internet attributed to Einstein, the four such quotes contained in this book were wrongly attributed. This is another reminder that one should question everything and not blindly believe all that one reads, or indeed just accept Received Wisdom. In part, this is what this book is about – questioning the accepted practice of the prevention and treatment of diabetes. It is also interesting to note that, in order to give their quotations more gravitas, the Internet Meme'ers added Einstein as originator. This is a common practice also, whereby credence is hoped to be given to an argument or point of view by attaching to it the name of a well-accepted Establishment figure. Again, this tactic has been employed in Established Medicine for centuries.

'There is an old saying that things don't [just] happen; they are made to happen.'

John F Kennedy* (1917–1963)

*We are very grateful to The Textual Archives of the John F Kennedy Presidential Library for helping with this quotation which can be accessed here: http://www.presidency.ucsb.edu/ws/?pid=9430 and, indeed, listened to here: http://www.jfklibrary.org/Asset-Viewer/Archives/JFKWHA-223-001.aspx This quotation was made by John F Kennedy in his Address at the University of North Dakota, 25 September 1963, and is in the Public Domain.