

The Female

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they can be yours too.'

JUDY MURRAY,
tennis coach

A Revolution in
Women's Health
and Fitness

'You need
this book!'
MAISIE HILL,
author of
Period Power

Body Bible

Dr Emma Ross, Baz Moffat
and Dr Bella Smith

The Female Body Bible

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A Revolution in
Women's Health and Fitness

Dr Emma Ross,
Baz Moffat and
Dr Bella Smith

The Well HQ



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*For those who want to forge a better
future for girls and women everywhere
– in sport, in health, in life.*

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Prologue

How We Became The Well HQ

The Female Body Bible is the result of a collaboration between three women: Dr Emma Ross, Baz Moffat and Dr Bella Smith; a scientist, a fitness coach and a doctor – experts in our respective fields in women’s health and fitness, and fervent practitioners who believe that body literacy is something every woman is entitled to.

Our mission is to ensure that everything that makes us extraordinarily female shouldn’t be medicalized or considered niche, but be fully considered in making us fitter, healthier and happier humans. We want to make sure the conversation about women’s experiences of their bodies, across their lives, goes mainstream. We want accessible, engaging information to reach all women, as well as everyone who supports, teaches, manages, trains or treats women. We want to overcome stigmas, reduce health inequities, address taboos and empower women to become architects of their own wellness, happiness and physicality.

Emma Ross is a PhD in exercise physiology who, after a decade as a science educator and researcher, became the Head of Physiology at the English Institute of Sport (EIS) and led the sports scientist team throughout the Rio and Tokyo Olympiads.

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It was in this role that she launched the SmartHER project in 2016 to improve the support of female athletes within the high-performance sports system and was awarded the *Sunday Times* Sportswomen of the Year Changemaker award in 2021 for her work to improve sport for girls and women. Baz Moffat has a first class degree in sports science and a Masters in health-related behaviour change. She spent four years on the British Rowing team and after retiring, trained as a women's health coach, developing specialist expertise in pelvic health. Dr Bella Smith has been an NHS doctor for over twenty years, is a practice partner, and has qualified with specialisms in dermatology, women's health and menopause. She is an Ambassador for the Eve Appeal, the UK's Gynaecological Cancer Research Charity. Each of us has led a successful career in women's health for many years and is absolutely passionate about what she does. When mutual friends introduced us to each other, we soon realized our common goal – a desire to tackle the off-limits topics around women's health while educating and empowering women and those who support them. We all wanted to reimagine a future where no woman lacks knowledge and understanding of her body, across all her life stages, or lacks the confidence to use that knowledge to advocate for her own health and well-being. The Well HQ, as we call ourselves, is built on foundations of knowledge, credibility, science and experience, to support women on their journey from puberty to postmenopause.

This book, *The Female Body Bible*, is a distillation of what we've learned, giving you the tools you need to really understand your body, take control of your health and well-being, and harness your physiology and psychology to thrive in every aspect of your life. We've put our decades of experience of working with real women in the real world into these pages and we'd love to help you on your life journey, so read on to inform and empower yourself, and join in the conversation at www.thewell-hq.com.

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Chapter 1

Mind the Gaps

‘I will not take off my lipstick.’

It's 1967, and Kathrine Switzer is about to run the Boston Marathon by stealth. They don't allow women to run, because such a distance is thought to be too much for the fragile female body. Her coach is worried that she's put on earrings and lipstick, which will draw undue attention to the fact that she is female and get her dragged off the starting line. Kathrine Switzer doesn't remove her earrings, or her lipstick. But she does nearly get dragged from the marathon that day. At mile four, the race director Jock Semple tried to physically manhandle her out of the race. He failed, and Switzer went on to become the first woman to officially complete the Boston Marathon, which she did in four hours, twenty minutes.¹ In her account of that day, she recalls that as she ran, she wondered why more women had not tried to race before her.² She thought it was because they just didn't get the attraction of physical activity. But as she ran, she realized it wasn't that women didn't want to move, it was that they believed all the old myths, like that running ruined your reproductive organs or that it wasn't ladylike. She had a point: women had been discouraged from physical activity because

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medical professionals thought it dangerous, and the feminine ideal of the day didn't include such a sweaty and solitary habit as jogging. Our differences from men had been used to discourage us from moving our bodies. From that moment on, Switzer was determined to continue to break down the barriers to exercise for women.

But in the decades that followed, as women started to do more exercise and to compete, the differences that originally stopped them from taking part instead became overlooked and ignored completely.

The legacy of this oversight and the omission of understanding the female body has caused a significant issue in our health-conscious society: we have developed an enormous amount of information about training and exercise without taking into account the female-specific factors that are fundamental to every active woman getting the most out of her body and enjoying a dynamic, healthy life. Because for a long time, those features that make us biologically female have been regularly unspoken, ignored or dismissed. This information isn't being taught to girls in schools, it's not being taught to people who go on to work as health professionals, nor is it included in coaching or teaching qualifications.

While the identity of being sporty or active means different things to different people, our definition of being an active woman is someone who enjoys moving their body for health, fitness or performance reasons. It applies to someone who goes for regular walks, practises yoga at home, goes to gym classes, swims or works out at a health club, plays a team sport, is a CrossFitter or pursues ambitious endurance challenges. Anything that gets your heart rate up and makes you sweat a few times a week.

This disparity in knowledge when it comes to men's and women's health is what we're determined to change, through this book and in our work. We believe that everyone deserves to know more. That's why this isn't just a book, it's a movement – a

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call to action. Every woman deserves to know more about her body and everyone, regardless of their sex, needs to know more about women's bodies to remove the vestiges of secrecy and shame once and for all.

To kick off our journey through healthy, active womanhood we'd like you to join us in a pledge. It's a pledge that challenges the status quo for women. It's a commitment to refuse to accept systems that simply weren't designed for us to get the best out of ourselves.

Language

Vagina, periods, prolapse, menopause: as long as people wince at these words, women's issues will be discussed quietly in dark corners. But our bodies and their functions aren't embarrassing. There's a rich vocabulary around the female body, and it's high time it went mainstream.

Education

Women often don't know enough about their bodies and what to expect through various life stages. This leads to unease and a chronic lack of confidence. Greater understanding of your body and what you are likely to experience at certain points will help you identify issues and take appropriate action.

Perception

Health and fitness are not the same as aesthetics and being photogenic. Instead of prioritizing how a body looks, we need to focus on how it feels and functions. How it works. When we listen to the body, embrace it and nurture it, health and fitness will follow.

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Women's welfare

We need a new rulebook – a cultural framework that supports, nurtures and empowers women. It needs to make knowledge about the female body – what's normal and what's not, what's appropriate and what's not, what's acceptable and what's non-negotiable – not just for women, but for everyone. We need to demand more of our employers, our institutions, our doctors, our coaches and trainers, our equipment and facilities, our gyms and our public toilets. OK is no longer OK. No more 'that's just the way it is'. We're tired of making do, it's time to make change.

Training

In sports science and medicine, as little as 6% of research is conducted exclusively on women.³ Rewriting best practice for women will improve our health and fitness, and reduce the risk of injury. It will also improve our experiences of exercise and slash the dropout rate for women in sport. Big gains are achieved when women work out in tune with their bodies, rather than against them.

Not an exclusive club

This book is for any woman who moves her body; who aims to be fit and healthy throughout their life. Research shows that being active for 150 minutes per week at levels suitable to your age and fitness level is associated with reduced risk of suffering and dying from cardiovascular disease, cancer, respiratory diseases, neuro-degenerative diseases and metabolic conditions such as diabetes.⁴ In women, higher fitness levels are associated with lower risk of death,⁵ even among those with more body fat, meaning fitness is

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more important for health than fatness. If fitness were a pill, it would be a best-selling, market-leading sensation. Nothing else gets close to offering the lifelong health benefits of exercise.

It doesn't matter if you're dancing around the kitchen or running around the block, banging out the burpees at CrossFit or squeezing in some squats while burping the baby, moving is always a good idea. It's not about the label of 'athlete' or being a fitness fanatic; it's just about you knowing how to get enjoyment and satisfaction out of your active body. The knowledge we impart within these pages applies to every woman. The stories we've heard throughout our careers echo across all women.

The words we use

We want our work to support anyone who thinks they can benefit from learning about the female body, and how that connects to health, well-being and performance. Since talking about being female or being a woman can mean very different things to different people, we wanted to share what we mean when we use these terms in this book.

There is a difference between sex and gender. Someone's sex is biological – XX chromosomes make a female, and XY chromosomes make a male. Those genetics mean males and females are born with different anatomy and physiology. Gender is a combination of cultural, social, biological and psychological factors. It's how we look, act and feel. For many people, their biological sex aligns with their gender identity and this is often referred to as cisgender. In people whose biological sex and gender identity don't match, terminology varies, but it includes terms like transgender.

On the whole, our book relates to cisgender girls and women, and when we use the terms 'girls' and 'women' we are referring to people who were born with female genitals and who identify as women.

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One of our missions is to shine a light on the fact that the research on, and understanding of, the female body is seriously lacking. Much of what we know about exercise, health and fitness is based on research conducted on males. This doesn't allow women to fulfil their potential, and we are dedicated to righting that wrong and empowering all active women with the knowledge and understanding to be architects of their own health and fitness.

Rising to the level of your goals

'We do not rise to the level of our goals. We fall to the level of our systems.'⁶ You probably have goals for your fitness and health – perhaps it's to move more, drink less, or get better sleep. James Clear's book *Atomic Habits* suggests that goals are great for setting direction but designing a reliable system within your life is the best way to make successful progress.

A system is based on the habits you create in your life to help you live the way you want to. They can include not having caffeine after lunch, leaving your phone downstairs to make sure you sleep well, or putting your trainers and running kit by the side of the bed to ensure you get up for that early-morning jog. This book will help you create healthy habits that consider your whole body, where things like menstrual health, breast support, a female-centric approach to eating, pelvic health and life stages are all acknowledged and supported, so you can not only rise to, but exceed the level of your goals.

Mind the gaps

Before we design this new kick-ass system, we need to acknowledge that it's not quite as simple as just reading this book. There

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are a few fundamental gaps that mean even when we know what we need to know, we can't do what we need to do.

First there's the communication gap. We simply don't talk openly about many of the topics in this book. We don't tell our physiotherapist where we are in our menstrual cycle so they can see if our niggles are related to our hormones. We don't mention to our jogging group that we wet ourselves every week when everyone sprints back to the car park. We can often be found mumbling 'Why didn't anyone tell me?' as we bump into another inevitable yet unspoken aspect of womanhood. Increasingly, social media and campaigns like #metoo and #menopausematters drive an increased awareness of these issues, and a desire to discuss them. But undoubtedly, some stigma, embarrassment and discomfort remain, particularly between men and women, which is a dynamic that commonly exists across sport and physical activity. Whether it's a male Physical Education (PE) teacher, personal trainer or coach, only about 20% of women feel comfortable talking about female-specific issues with people in these roles;⁷ and for the men, a lack of confidence in their knowledge is the biggest barrier to opening up the conversation.⁸

Then there's the data gap based on a lack of research on women in health, fitness, sport and exercise. When we started looking into this, years ago, a survey showed that as little as 4% of sports science research was conducted exclusively on women.⁹ In 2020, when we felt like the world was wising up to the need for more research on women, we looked again. Over the intervening five years since the initial survey, we found that the dial had barely shifted, and that measly 4% had risen only to an embarrassing 6%.¹⁰ That's worth repeating: only 6% of all sports science research in 2020 was conducted exclusively on women. And that's a problem, because most of the topics we cover in this book – the menstrual cycle, breast support, high prevalence of stress incontinence, menopause – relate exclusively to the female body.

Outside of that tiny percentage of female-only research, 60%

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is done on mixed-participant groups of both males and females. This work fails to serve anyone well but is most challenging for women because the changing physiology and psychology across the menstrual cycle is usually ignored. It's so important for women to get curious about the research that underpins what we believe to be true, and which informs any actions we take based on 'the science'. Often, the findings from research simply don't apply to us, or only apply to us for a few days of our monthly cycle. To give you an idea of how important that can be: long after they were released for safe use in all patients, new research showed that the effectiveness and, in some cases, the safety of antihistamines, antipsychotics, antibiotics and heart medication was affected by the menstrual cycle.¹¹

The gender data gap can often be hidden in plain sight. When research is conducted exclusively on males, it's not made clear that this research applies only to men; instead, the implication is that the findings will be relevant for everyone. At a recent conference for PE teachers and coaches of school sport, Emma sat through a presentation on the importance of effectively recognizing and treating concussion in school sport – a hot topic. Yet all the data presented was from boys' sport. Worryingly, there is emerging evidence that girls report concussion more frequently, and with worse symptoms than boys. But in this case, the guidance for all sports teachers was based on findings derived entirely from male subjects, without acknowledging this. We must demand that research transparently states who it was performed on and to whom its findings best apply, and we must ensure that guidance in sport and exercise that applies to girls and women is based on research performed on girls and women.

Without wishing to sound ungrateful, it's also important to note that the 6% of research that is performed exclusively on girls and women is not all that good. In a comprehensive analysis of all research conducted on the menstrual cycle and performance in sport and exercise, when the studies were rated against rigorous

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criteria, only 8% of them were found to be of high enough quality for the outcomes to be trusted.¹² A survey of ten years' worth of research on strength training in women found that only three studies¹³ used research methods that met the highest industry standard.

But it's not all bad news. There are some brilliant people working on high-quality research in women's sport, health and fitness in the UK and around the world, and their work has been used to inform the pages of this book.

A key step to drive change should be to take research from the pages of hallowed academic journals and translate it quickly into what we do on the gym floor, what we put on our dinner plate, and organizations' HR policies. But it's the translation of this research into practice that often forms the bottleneck: it's thought that in healthcare, it takes about seventeen years.¹⁴ This is the final, often most impactful gap: the 'doing' gap.

It's one thing to know all the stuff in this book, and quite another to put it into practice, or to share the knowledge with the girls and women in your life. How many of us know that screen time before bed is the devil when it comes to sleeping well, but still find ourselves having a quick scroll of the socials before lights out? How many of us know that we should do our pelvic floor exercises every day, but don't because we're not actually sure what to do and why it's so vital. Even in the upper echelons of sport, athletes and trainers know there are some important female-specific things they should be considering but they aren't really sure what to do about them. In a study of the top five US colleges, only 3% of sports coaches who were working with women said they felt like they actually trained their athletes in a female-centric way that honoured the important differences from the male athletes they coached. They didn't know how to turn what they had learned into tangible actions in their everyday approach to sport and exercise.¹⁵ Our ambition for this book is that it makes you feel empowered and equipped to take action.

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Who are we to say?

If there isn't enough reliable research currently available, how can we write a credible, evidence-based book to help you learn what you need to know to be well? There are definitely times when the lack of evidence means we don't know enough to have developed a gold-standard approach. For example, there's some exciting research that shows the benefits of doing different exercises in sync with your menstrual cycle, but it's not a large enough body of evidence to become mainstream advice. There's also some interesting research into the links between injuries and our hormones, but some of it simply isn't of good enough quality to make use of yet.

That said, we have drawn from the best research available, established wisdom and our own practice-based evidence following decades of experience as a scientist, a doctor and a coach each working with thousands of women. This is not intended to be the big book of rules for being an active woman. For each of the topics we cover in this book, there isn't a one-size-fits-all approach that will be true for everyone. All women will experience their body in the context of their life, their age, their relationships, their health, their work, sport and leisure pursuits. We are each a unique combination of our nature and nurture. Don't ever be hoodwinked into believing that what works perfectly for one woman will work wonders for you too.

While this isn't the rulebook, it *is* the playbook. It's a book of all the elements that go into getting the most out of your body, and a selection of strategies that you can try to find out what works for you and your incredible body.

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Chapter 2

Health and Fitness Through a Female Filter

The ‘shrink it and pink it’ model seems to have been applied to women’s health and fitness; it’s assumed that what works for the male body will probably work just fine for the female body too. Women are offered pink versions of men’s kit, are served up the same type of training – albeit with lighter weights and lower targets – and are told to approach nutrition in the same way as men, but just eat less. Well, you know what they say about the word ‘assume’? It makes an ‘ass’ out of ‘u’ and ‘me’, and that’s certainly true here. Now that we know better, we have an opportunity to do better when it comes to our approach to being active women.

Instead of adapting what already exists in a system of sport and exercise that has been designed by men, for men, we’d like the entire approach to be reinvented with training programmes, kit, classes and facilities specifically designed to meet women’s needs. We’d like a female filter applied to the landscape of sport and exercise. This chapter introduces some of the important factors we think need to be considered in our new world order. These are the things we want to be better understood by women who are exercising, training or competing.

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The menstrual cycle

Without a doubt, this should be considered one of the most important areas for a girl or woman to understand because, for the vast majority of women in the world, the menstrual cycle is a defining rhythm of their life.

The ebb and flow of menstrual cycle hormones affects us physically and emotionally. These hormones are amazing for our short- and long-term health, and they have an impact on how we feel about moving our bodies too, yet we don't instinctively know how to have the best experience of our cycle, and what we're taught at school as young adults is not enough. We need more than biology, because a theoretical description is meaningless unless it connects with what women actually experience. If we're encouraged to notice how we're feeling, how there is a rhythm to our cycle that we can work with to minimize the effect of symptoms and to optimize the times when we feel terrific, that adds a whole new dimension to our life. It means that we're not pushing the cart uphill, by eating, exercising and resting in a way that tunes in to our physiology and how we experience it. It also means that if we do have to perform on days where our cycle symptoms show up, then we have strategies in place to overcome them, and still get the best out of ourselves.

The menstrual cycle is a superpower – but all too often it is not described as such, which is at best a shame and at worst a drastic oversight of the potential girls and women gain through understanding their cycle.

Hormonal contraception

Not all women will experience a natural menstrual cycle all the time, because about 50% of women will use hormonal contraception – most commonly the pill – at some stage.¹ As with all medications,

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it's sensible to make sure that you're making an informed decision about what's right for you, and what to do if you don't find the right fit the first time. Yet hormonal contraception is not something we're well educated about; instead, we tend to resort to friends' reports of what's worked for them or we simply use the first thing we're prescribed. What's more, hormonal contraceptives still come with a 'try it and see' approach, which can make finding the one that's right for you hard work.

Hormonal contraceptives are popular because they are effective and convenient. They are also a great solution for many women suffering with debilitating menstrual cycle issues or underlying conditions. However, we think that we should all be better informed about all forms of hormonal contraception, their side effects, what might best suit our body and how they might impact our lives.

Simply knowing the ins and outs of using the pill can make us better ambassadors for our health. For example, in sport, having a period as part of a natural menstrual cycle is a sign that a woman is getting enough energy through her diet to fuel her training. Hormonal contraceptive users don't get that monthly high five from their period, as the withdrawal bleeds on the pill – bleeding in response to days when the pill doesn't include hormones – are not the same as the bleeding experienced during a period. Yet we've met lots of active women who didn't know that using hormonal contraceptives can mask a sport-related cycle dysfunction, such as under-fuelling or over-training.

For active women, the side effects of using hormonal contraceptives might be challenging, from weight gain and low mood to reductions in performance. It's time we had more open conversations and education about hormonal contraception in the context of our active lives and our sporting goals.

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Breast support

The first patent for a sports bra was granted in 1979, but we've still got a long way to go in terms of this essential piece of kit. Breast support has been hugely overlooked – thrown into the underwear category, rather than considered to be a functional, performance-impacting bit of kit. Ask any active woman how essential a good bra is and she'll tell you in a heartbeat.

Thankfully the evidence backs this up and shows the significant performance gains that can be had purely by properly supporting a woman's breasts. Whether it's about alleviating pain and discomfort, making exercise feel easier or reducing the energy cost of your movement, the right breast support is proven to make a difference.²

The challenge at the moment is that although innovation and technology exists, and brands are making brilliant sports bras, these are not getting into the hands (or should we say on to the breasts) of all women. Whether that's because of their often extortionate price tag or the lack of understanding about which design and fit of bra would be suitable for your body and your sport, there are still lots of women without the right breast support.

Poor breast support is holding girls and women back. From the 46% of teens who have concerns about their breasts and exercise that stop them participating in sport³ to the fact that women with a D-cup or larger breast size do 37% less exercise because of their breasts⁴ there are multiple reasons we need to be teaching all girls and women how to choose a sports bra that fits properly, regardless of their breast size and budget. We would love to see all sports stores having trained sports bra fitters so that, just as you would hop on an in-store treadmill to see if a pair of trainers is right for you, you could get sound advice before buying the sports bra that's right for you.

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Pelvic floor

We all have a pelvic floor and for many of us it comes into sharp focus around childbirth, but the stats from sport and exercise will blow your mind. Most women who participate in high-impact sports, such as netball, gymnastics and running, leak during training or competition because their pelvic floors are not working as they should do. This might just be the last taboo in women's health, especially for those keen on exercise, because if you can train every day, perform at a high level or run fast, why can't your body do something really basic like stay continent?

Mums and midlife women have 'permission' to have pelvic floor issues, but young athletic women often feel they do not, which means that they rarely reach out to get help. The reason young women have pelvic floor dysfunction is usually different from post-natal or menopausal women, but a basic understanding of how to activate, relax and coordinate the pelvic floor muscles can help women of all ages maintain or restore good pelvic floor health.

It's key that pelvic floor dysfunction is not quietly accepted in the context of sport and exercise – it's not OK to laugh off sneezy wees, leaky bouncing, the number of trips to the toilet you've taken or the fact that you have to wear black to hide the leaks. We need to move towards a place where everyone can have open conversations about this topic, know how training can be adapted to help restore good pelvic floor function and know where to find the local women's health physiotherapist to get additional support.

Injury risk

Women are up to six times more likely to suffer a non-contact anterior cruciate ligament (ACL) injury in the knee than men⁵

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and twice as likely in other joints in our body.⁶ Despite the reasons for injury being complex and varied, what is clear is that we need to design training programmes so that girls and women don't get injured as often.

There is growing evidence to support a gendered approach to warming up: if girls and women do ten minutes of specific conditioning exercises three times a week, then injury risk is reduced by over 40%.⁷ Examples of these exercises can be found in the FIFA '11+' football warm-up, or the England Netball 'Jump High Land Strong' programme, both of which can be used by anyone of any age and not just footballers or netballers. There are also some great resources if you search 'ACL injury prevention for females' on YouTube (look for videos developed by sports scientists, physiotherapists and orthopaedic and sports medicine clinics). These programmes promote injury resilience by using conditioning exercises to address some of the key risk factors that have been found in women – muscle weakness, muscle imbalance, poor landing mechanics and lack of agility or instinctive awareness of where parts of our body are without looking at them, known as proprioception. All of these factors can be modified through proper training to stop them contributing to injury risk. We've met so many women whose participation in a sport they love has been cut short because of a significant injury. Let's change the course of future generations of women by helping them develop strong, resilient bodies that move well.

Strength training

Over the course of our lives as women, staying strong and resilient means we can stay active, healthy and happy. Strength training is a really important component of a balanced approach to fitness, especially for women as they enter midlife, when muscle strength

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and bone density can be compromised by declining hormones. If you've never done weights, you don't have to head to the gym; home-based workouts will work well. Whether you do exercises like squats, arm curls and shoulder presses, either with a two-litre milk carton or with dumbbells, barbells or kettlebells, the key is that it should be a challenge – it should feel like work; this way your body will adapt and get stronger. So many women feel intimidated by strength training that they never pursue it. We need the culture around strength training to shift, and for it to welcome and educate girls and women of all ages.

Nutrition

Most women get nutrition wrong – we know this sounds negative, but it's true. It's for a whole host of reasons, including the fact that most nutritional advice, even when it's 'evidence'-based, is taken from research done on men. A great example is intermittent fasting or fasted training, which works well for a male's physiology but is not effective in females, and actually has a potentially harmful impact on our physiology. Then there's the fact that improving gut health can be more impactful for women, based on emerging research showing that it's more tightly linked to immune function and hormone health in women than it is in men.

If the female filter were applied in our brave new world, we'd ensure that everyone knew that:

- without a balanced approach to nutrition, it doesn't matter how much you train, study or work, you won't be able to achieve your full potential
- eating the right food allows us to adapt to the stimulus of exercise; without getting enough energy from our diet, we compromise our performance and our health; we see so many cases of athletes who end up breaking, either

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physically or emotionally, simply because they haven't been getting their nutrition right

- educating girls about the importance of a balanced diet will help them become strong, resilient women who have a healthy relationship with food, exercise and their bodies
- nutrition helps us manage the symptoms our body throws at us; there are inherent qualities in certain foods that help women's health challenges; eating a diet rich in anti-inflammatory⁸ foods such as seeds, berries, turmeric, garlic and ginger, and having foods rich in micronutrients such as calcium, magnesium, zinc, B and D vitamins, have been shown to alleviate menstrual and perimenopausal symptoms⁹

To achieve this, we need reliable sources of information that don't prey on a woman's insecurities around her shape, weight or size and which delve deeper into her health and well-being on a level that is concerned about how she functions, rather than how she looks.

Mindset

Let's start with a disclaimer: there's no such thing as a male brain or a female brain. Our brains are all beautifully unique and are sculpted by our genetics and our biology – that's the nature bit – and by our education, our families, our cultures and our experiences – that's the nurture bit. But most women will say that they often think or behave in different ways to men, and most men will say the same. Research confirms this, and it gives us clues to how we can use our mindset to get the best out of ourselves and others in sport and exercise.

One interesting difference is how women derive confidence and motivation to pursue their goals. Women tend to draw on

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the quality of their relationships with the people that support them – their teacher, trainer or teammates. Men are usually driven more by the quality of the achievements of the people who support them, and how successful they've been helping others achieve their goals. If this resonates with you, it's more likely that in the pursuit of your goals, you'll benefit from being supported by someone who cares about you as a person rather than someone who is a technically brilliant master.

We also know that women are more motivated by personal development, by mastery and by each other, compared with men, who tend to have a more egocentric approach – they are motivated by winning and by beating others. Considering this might help us find an approach to health, fitness and performance that keeps us coming back and putting in the effort because it's pressing all the right buttons in the brain.

Training across the lifespan

It's impossible to design our new world of health and physical activity without considering the life stages a woman goes through, from the inevitable changes of puberty and menopause – which impact us physiologically, psychologically and socially – to those brought about through pregnancy and birth. Whether you have experienced all of them or just some, each reader will have had a very different lived experience of each one.

These life stages are often vulnerable moments in a woman's life in terms of her relationship with sport and exercise; they are times when her body changes hugely. The experience can be traumatic. They can also be times when women do not feel in control of what's happening to them, physically or emotionally. Current research shows that many girls and women stop exercising or fall out of love with sport at these points in their lives. Our female-centric Utopia would provide for women's physical and

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emotional health at each of these stages by better educating women of all ages about the long-term benefits of staying active throughout their lives and by creating systems that make being active an accessible and enjoyable way to live.

Changing the world

It doesn't matter how much we learn about our bodies and how to optimize our exercise routines, if the world doesn't change, we will all be limited by the male-centric system. A system that doesn't acknowledge and support female bodies, that continues to generate data and evidence based on men, that continues to stigmatize topics like periods and pelvic floors, that values being photogenic over health and happiness. And while changing the world may sound like a grand plan, if we all play a part, we can make it happen.

When it comes to sport and fitness at school, at work or in the gym, we need to create psychologically safe environments. These don't just benefit women, they benefit everyone. Psychological safety means being able to speak up about whatever is going on with you and what is getting in the way of you participating or performing that day, and not being afraid that you will be judged, dismissed, or that speaking up will have negative consequences. A psychologically safe environment is one where girls and women believe that those around them will be comfortable talking about all the topics we cover in this book. It's a compassionate environment where we listen, validate, empathize and commit to support. And before anyone pursuing ambitious goals assumes that this type of environment could become too comfortable, psychological safety can still exist with accountability, ambition and high performance. These are not mutually exclusive ideals.

It's an *Avengers Assemble* kind of situation, one where researchers, educational institutions, sports coaches, trainers, teachers,

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parents, brands, governing bodies, and of course girls and women, can all play a role in forging a future where girls and women feel that they truly belong; that any place they decide to spend their time has been designed with them in mind. That they have been provided with enough education about their bodies, throughout their lives, for their body, and how they experience it, not to be the thing that holds them back from fulfilling their potential in work, sport – and life.

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Chapter 3

Mastering Your Menstrual Cycle

The menstrual cycle is incredible. It's the defining biological rhythm of half our lives as women. Yet information about the cycle is often distilled into reproductive biology lessons, where we learn about fallopian tubes and maturing eggs, about ovulation and uterus linings, rather than its power and influence over us throughout our lives. Our personal relationship with our cycle is often focused on how awful it makes us feel at certain times of the month, or how annoying it is when your period arrives on the first day of your long-awaited beach holiday. Yet there is so much more to the cycle that we want everyone to know.

We believe that knowing more about the menstrual cycle:

- is fundamental to lifelong health and well-being in women
- gives us important, reassuring and empowering context to our lives
- gives us an opportunity to stop our bodies holding us back
- can help young women navigate puberty when the influence of newly cycling hormones can feel confusing and chaotic
- can better prepare women for starting a family and help improve awareness of how our bodies cope in the aftermath of birth

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- can prepare and empower women through their peri- and post-menopausal years
- can be an important part of our approach to fitness and getting the best out of our body throughout all stages of life
- can change your life

Yet the general level of understanding of our cycle is notoriously low. In 2019 the Royal College of Obstetricians and Gynaecologists reported that women are ‘woefully uneducated at every life stage’ about what’s happening in their bodies and how that relates to their physical and mental health and well-being.¹ In a study of 14,000 active women, 72% said they had never had any education about exercise and their menstrual cycle.²



Emma

After barely hearing the word ‘period’ for the whole decade I worked in Olympic and Paralympic sport, I am on a mission to take the menstrual cycle mainstream and one of my first jobs is to stop people using euphemisms. There are over 5,000 words used to mean ‘period’ across the globe. The volume alone is enough to tell us that we don’t like talking openly about menstruation. When it comes to our sexual anatomy and our reproductive functions, we have for centuries tried to find other words to describe them. We’re happy to talk about breathing and sweating, nipples and belly buttons, but when it comes to vulvas, vaginas and periods, there are so many euphemisms that it’s easy to lose track of whether someone is talking about their vulva or their pet pony, their period or the title of a horror film. Social anthropologists explain that euphemisms don’t typically exist for bodily functions without histories of stigma. They persist because there hasn’t been a good enough reason to correct them: why get rid of words

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which make us feel less uncomfortable about things that we believe are vulgar or embarrassing? When we describe breathing or sweating, the words don't create emotional tension, embarrassment or disgust. Professor Chris Bobel, a researcher in the field of sociology of menstruation, goes further, suggesting that as well as exposing our social views, euphemisms also reflect how distant we are from our bodies. When we teach children euphemisms, we start a lifetime of skirting around the realities of our body, and body literacy is hard to come by when you don't even have the right language to describe it.³

Yes, I'm hormonal. So try to keep up!

The term 'hormonal' has been exclusively reserved for women, particularly in the days before their period. The word has been entangled with our emotionality, which is often seen as a weakness. Being 'hormonal' is considered an apology. When you react emotionally to something, perhaps by snapping at someone, or if you feel low, you may say, 'Sorry, I'm a bit hormonal today.' Please stop apologizing for your hormones. Hormones are amazing, and none of us would be alive without them.

When we dismiss women's emotions in the days before their period (well, any time, actually) as hormonal, we are effectively deeming them invalid. Yes, hormones can affect our mood, and yes, they can make the highs higher and the lows lower, but (in the absence of mental health issues) these feelings are caused by something real and valid, and you shouldn't deny them.

In sport we're accustomed to tuning in to and taking advantage of the effects of hormones. Take the practice of 'priming' by male athletes.⁴ In the hour leading up to a football or rugby

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match, the coach makes a rousing speech to his players, they watch footage of them beating the team they're about to play, they beat their chests, or do some push-ups on the changing-room floor. These activities cause a natural spike in testosterone, so that these players can capitalize on the effects of this hormone – it helps make them aggressive, strong, self-confident and more inclined to take risks during the game. But, if these feelings spill over and we see a player commit a foul, a late tackle, or talk back to the referee in the first few minutes of the game, we don't hear the commentator say, 'Oooh, he's hormonal,' do we? Yet if we were to describe that player's response, in physiological terms, it would be a hormonal response. The fact is that all humans are hormonal, all the time. Hormones keep our bodies working properly, responding to what we're doing and what the world around us is doing.

When it comes to our menstrual cycle, our two main cycle hormones – oestrogen and progesterone – exert their influence throughout our body, from muscles to gut, bones to brain. These hormones not only control our cycle and our ability to reproduce, they have widespread effects on everything from our growth and development, to our metabolism, mood, immune function, body temperature, sleep and cognitive functions. When we think about how hormone levels rise and fall across a cycle, impacting on the body and the brain, it comes as no surprise that women often feel different when levels are high compared with when they are low.

Four steps to menstrual cycle domination

When it comes to the menstrual cycle, there are whole books written on the subject. In this chapter, we've distilled our approach to understanding the menstrual cycle into four steps:

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- knowing what the menstrual cycle is, what's considered healthy and normal, and how best to manage it
- understanding and tracking your own unique experience of the cycle
- managing your symptoms
- training around your cycle for improved fitness or performance

There is no right or wrong way for you to explore your cycle, and you might only want to take the first two or three steps. It's your cycle, and the fact that you are seeking to understand more means you are already improving your body literacy, and that's a personal revolution in itself.

Step 1: Know what's normal

As the L'Oréal ad says, here comes the science bit. The menstrual cycle is a predictable pattern of hormonal fluctuation across roughly twenty-eight days. While we know for certain what the cycle looks like as a hormonal pattern, there is actually a lot of variation between women in terms of the levels of hormones we each produce, our ability to metabolize these hormones and our sensitivity to them. Factors such as lifestyle, sleep, diet, type and amount of physical activity, as well as illness and injury, can also influence the release and effect of the cycle hormones in our bodies. This means that no two women's cycle experiences are likely to be the same. However, with that in mind, like all the topics we cover in this book, a great place to start is to know what's normal and what's not.

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The menstrual cycle 101

- Having a regular, manageable period is a vital sign of whole-body health in menstruating women.⁵
- Girls should start their periods by the age of sixteen. The average age for starting (in the UK) is twelve.
- The first day of your period is day one of your menstrual cycle.
- Periods usually last between five to seven days.
- During a healthy period we can lose anywhere between 30ml and 50ml of blood.
- A regular tampon can hold about 5ml of blood.
- You are considered to have heavy periods if you lose over 80ml of menstrual blood during your period.
- Some women have very regular cycles that are exactly the same length each month, but for some women their cycle length can vary by up to eight days per month, and that's normal too.
- Two important hormones are released by your ovaries during your cycle: oestrogen and progesterone. They peak and trough across your cycle and send signals across your body.
- The first half of your cycle is called the follicular phase and includes your period, with oestrogen rising from day one of your period until ovulation.
- The second half of your cycle is called the luteal phase, when progesterone and oestrogen are both elevated before rapidly declining just before your next period arrives.
- Ovulation, which is the release of an egg from the ovary, happens about midway through your cycle. Your hormones help your body to know when to release the egg.

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