# Lack of information and understanding of the relationship between your menstrual cycle and exercise could be CVCIES compromising your running and your health. Kate Carter investigates

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**GB** runner Jessica Judd made headlines when she talked about the influence of her menstrual cycle on her performance

#### FEW YEARS AGO, GB

runner Jessica Judd made a startling admission: depending on the stage of her menstrual cycle, her 3,000m time could vary by as much as 15 seconds - the difference between first place and glory, and finishing last.

It made for headline news - no surprise, given the lingering omerta around the issue – but it's not just elite athletes who find their cycle affects their performance. Leading distance coach Tom Craggs tells the story of one of his runners who started taking iron when a doctor finally diagnosed anaemia, which is frequently caused by heavy periods. Three weeks later she took 15 minutes off her half-marathon PB.

This shouldn't come as a shock. either, considering the hormonal fluctuations of the menstrual cycle can cause stomach issues, cramps, insomnia, elevated heart rate and shortness of breath. There is even evidence that you are more prone to certain injuries – such as ACL (anterior cruciate ligament) tears - at certain times of the cycle. And that's before you factor in state of mind: confidence levels can be affected, too.

In one recent survey, 54 per cent of women said they stopped exercising as a result of their menstrual cycle - that figure rose to 73 per cent in 16-24-year-olds. And yet, for most women, there is absolutely no physical reason to stop being active.

Unfortunately, discussion of the menstrual cycle largely remains taboo: 'Auntie Flo is visiting', 'the painters are in', 'the curse' - the language is certainly creative but almost entirely euphemistic. Even the direct approach - 'I'm on my period' is strange - why would you be 'on' it rather than 'having' it?

What is clear, however, is that everyone's cycle is different and that the female body's reaction to it is complex and under-researched. For most girls, menstruation begins at around 12 and continues until the menopause at around 50-55. Yet cycles of anywhere between 21 and 35 days - and bleeding for anywhere from two to 10 days – are all within what is considered a 'normal' range.

## **'I'VE FOUND THAT** CAN RACE QUITE WELL ON DAY THREE'

For those who can't remember their GCSE biology, the menstrual cycle is defined as the time from the first day of a woman's period to the day before the next one, and is controlled by hormones. During the first half of each cycle, levels of oestrogen gradually rise, causing the ovary to develop and then release an egg. Then, in the second half, progesterone helps to prepare the womb for implantation of a developing embryo.

During a period, the egg travels down the fallopian tube, but if pregnancy does not occur, it is reabsorbed into the body. Levels of oestrogen and progesterone then fall, the womb lining comes away and leaves the body in the form of blood and tissue. It is an entirely normal physiological process, which a woman will go through around 480 times in her lifetime, yet it can also have profound effects on performance.

### The painful truth

**MOST WOMEN WILL** be keenly aware of the cramps menstruation can bring and elite athletes are not immune. Top GB marathoner Aly Dixon says her cramps are so bad they have often left her curled into a foetal position. 'I've been very lucky that, in the last few years, races have fallen at the right time in my cycle,'



she says. 'I've found that I can race quite well on day three, but the previous four days are not so good. I always try to make day one an easy or a rest day, as I often suffer with cramps so bad I can't move from a curled-up ball on the sofa. I also get an achy back and heavy quads in the two days leading up to my period, which makes running hard a bit tougher, but my sessions still tend to go well.'

Yet while cramps are certainly horrible, they don't need to ruin your race; exercise itself can actually help to alleviate them. Paula Radcliffe proved the point when she broke the world marathon record in Chicago in 2002 despite suffering period cramps during the latter stages of the race.

Some women might resist the idea that a natural process such as the menstrual cycle is something we should feel 'enslaved' by. Yet the effects that changing levels of hormones can have is demonstrable.

'I had amenorrhea [lack of periods] and had to have lots of hormone treatment when I wanted to get pregnant,' says top club runner Gill Bland, a 2:53 marathoner. 'The treatment had a massive impact. It made me a lot hotter, and my heart rate rise a lot quicker. I'll never forget a 10K race I trained for - the week before I was running fast reps and I had to stop because I just couldn't breathe properly. On race day itself I just felt so much hotter and couldn't get the same speed for the effort.'

In Bland's case, the hormonal changes were artificially induced, but the natural hormone changes in the second half of the cycle can result in similar symptoms. Runners who track their cycles soon start to see familiar patterns. 'Every 28-29 days, at approximately 2pm, my period arrives and to be honest, the world becomes a better place,' says Gemma Hockett, another top club runner. 'Approximately seven days out I tend to get ratty and short tempered and my appetite starts



to increase. I get restless during the night, and feel considerably warmer in bed. Two days out it's like an animal takes over, and I cannot stop eating. I become bloated. I also struggle with headaches.'

This, of course, is PMT, and the effect on Hockett's training is considerable: 'I feel particularly flat two days out until two days after it begins,' she admits. 'I can still achieve marathon pace, but it feels so much harder. My breathing is also heavier. I struggle to run speed sessions. However, by day three and four it's like a sudden transformation and I can run well.'

'My training is typically the best during phase one [just after her period] of my cycle,' Hockett continues. 'Racing a marathon during phase one and two is where I feel I can run well and do myself justice. Early phase three I would still consider it, but it would not be ideal. Phase four: sweet baby Jesus, forget it! Before I sign up to marathons I always check where it fits in with my cycle!'

Hockett's symptoms fit exactly with what we know about the cycle and performance: declining hormones in the premenstrual stage cause an inflammatory response, which can affect mood, sleep and energy levels, and compromise recovery. Then, when the period comes, hormone levels start to rise and energy returns.

Paula Radcliffe

marathon world record in Chicago

despite suffering

from cramps

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That inflammatory response also leads to a potentially higher risk of injury, another element scientists are only now starting to explore. For example, it's already known that women are more likely to suffer an ACL tear than men. A key reason for this is oestrogen and the role it plays in the tissue surrounding

and stabilising the knee. Perhaps unsurprisingly, as oestrogen fluctuates through the menstrual cycle, so does risk of this particular injury - study reviews published in Muscle, Ligaments and Tendons Journal and The Othapaedic Journal of Sports Medicine concluded that the greatest risk is in week two of a normal cycle - the days just leading

up to, and including, ovulation. But what if it's more than just cramps? Much attention recently has - rightly - surrounded the issue of endurance athletes not having periods for months or years on end. and the terrible impact this can have on their health. But at the other extreme, heavy menstrual bleeding (HMB) - or menorrhagia - affects around a quarter of women. Yet we know almost nothing about its frequency among regular exercisers as there's very little research on it. When the research scientist Your in the second an inflami. Georgie Bruinvels, Vourhormone herself a 2:37 marathon runner, surveyed

over 1,000 female runners at the London Marathon expo, she found that 36 per cent reported HMB. Around a third of runners also reported a history of anaemia. However, while half of them had supplemented with iron, only 22 per cent had sought medical advice. Anaemia symptoms can include fatiguing easily, loss of energy and a rapid heartbeat and shortness of breath with exercise. You can see how it would be easy to pass this off as lack of fitness, but as Craggs discovered with his runner's huge PB. adjusting iron to normal levels can have a massive positive impact

on performance.

But how do you know what constitutes 'heavy' and whether

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A GUIDE TO MATCHING YOUR NUTRITION TO YOUR CYCLE, FROM SCIENTIST **GEORGIE BRUINVELS** 

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#### PERIODISATION

you have HMB? Clinically, the definition is 80ml blood loss per cycle. But as Bruinvels says, 'How do you even measure that? Realistically, who wants to measure that? And even if you did, not all menstrual fluid is blood - perhaps only about half. It's just not very helpful.'

The National Institute for Clinical Excellence (NICE) have their own criteria: 'Excessive menstrual blood loss which interferes with a woman's physical, social, emotional and/ or material quality of life'. This is also vague and subjective, so when Bruinvels was researching the area for her PhD, she came up with her own four-part criteria: bleeding through clothing or bedding; passing large clots; needing double sanitary protection; needing to change sanitary products more frequently. 'Because people don't talk about it, they don't know if their situation is abnormal,' says Bruinvels 'Women often experience symptoms and just accept them and think. "I'm a woman, **>** 

foods such as vegetables, nuts, seeds and salmon. Foods rich in omega-3s can also help alleviate symptoms - flaxseeds and chia seeds, oily fish, walnuts. Your body is mainly using carbs for fuel, so up your carb intake before your longer runs.

## **'MANY RUNNERS JUST** DON'T PREPARE FOR THEIR MENSTRUAL CYCLE<sup>3</sup>

that's what happens."' But she stresses that you should see a doctor if you suspect anaemia.

Heavy bleeding and anaemia can be significant detrimental factors in athletic performance. But can a perfectly 'normal' cycle still affect performance? Yes, says Bruinvels, if you don't understand and adapt to it properly. 'Many runners just don't prepare for their menstrual cycle,' says Bruinvels. 'They prepare for everything else, but not for their period. When I was interviewing women at the London Marathon, so many of them said – just a few days before the race -"I'm going to be on the worst day of my

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off PMT <sub>SYMp</sub>

Phase 4

period on race day. What am I going to do?". It was all last-minute panic.'

But what can you do? Many women may have heard of, or taken, norethisterone, the 'period delay' drug. This synthetic form of the hormone progesterone stops the womb from shedding its lining by keeping up hormone levels. It's a pretty common way of

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However, during this phase, there is some evidence that your neuromuscular control may be lower, so include muscle-activation exercises (eg running drills) in your warm-up, particularly before intense sessions.

THE TRAINING

CYCLE

HERE'S HOW TO ADAPT YOUR TRAINING

TO YOUR HORMONAL CHANGES.

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ensuring bleeding arrives at a less inconvenient moment. whether that's your wedding day or marathon day.

The trouble is that side effects of hormonal treatments can end up affecting your performance, too. This was what caused Jess Judd to talk about her period back in 2013: as a British hopeful in the 800m at the World Championships she was worried about the timing of her big race. So she took the drug.

'I think it played with my hormones more,' she said afterwards. 'I had to risk that. I thought, whatever happens it's going to be better than being on my period. But it still affected me, I still felt heavy-legged. And I was very emotional, especially after the race. I wasn't myself that day.' Other elite athletes have also

spoken out. Paula Radcliffe said at the time she felt that it made things 'a hundred times worse' and was critical of British Athletics for not listening to female athletes' feedback. Bruinvels isn't a

fan either. 'Effectively,

phase 2 orts. With your energy levels ver at this time onth, it's als

Youroverall power is starting to dwindle at this point in the cycle, so consider reducing your repsin the gym, or choose lighter weights, and be sure to includ some flexibility and low-level conditioning work.

you're elongating your premenstrual state, but that's typically when you feel rubbish,' she says.

If you are going to take it, she adds, then it should be done in advance. Ideally - and, of course, this does rely on a predictable cycle – do it a few months before, when potential side effects matter less, but it still shifts your cycle for the big day.

While norethisterone is taken as an occasional one-off, two to three million women in the UK take one of the hormone-based contraceptive pills daily. Could this, too, affect your running performance?

Frustratingly, even though the pill has been in common use for more than 50 years, there's not a large amount of research either way. Certainly, a huge number of athletes have taken it for many years to no obvious detriment – a 2008 survey found that more than 80 per cent of elite female athletes were on the pill. But there are few studies large enough to draw any firm conclusions - some, such as a study published in The British Journal of Sports Medicine have found a slight decrease in VO<sub>2</sub> max among female athletes on the pill, while another, published in the same journal, found no difference in performance.

But while we wait for more studies. there are options. Many women are moving away from long-term use of hormonal pills owing to more general concerns, such as the impact on mental health. LARCs - long-acting reversible contraceptives such as the copper coil or IUD – are increasingly popular (39 per cent of women accessing contraceptives from NHS sexual health clinics in England now choose an LARC, up from 21 per cent in 2007).



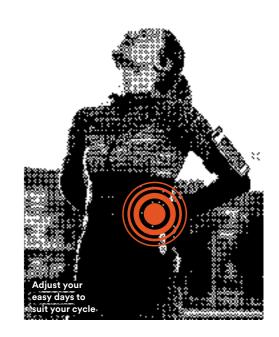
From a performance point of view. Bruinvels recommends them. because her research suggests that taking certain types of pill increases levels of underlying inflammation and oxidative stress. 'There is also a suggestion that it may blunt an adaptation to training,' she says, 'so just from a performance perspective, it may not be the best option.'

### **Positive steps**

KNOWING ALL THIS, should you adapt your training depending on your cycle? Definitely, says Bruinvels. 'We know that oestrogen for example, influences adaptation. So research demonstrates that resistance training in the first half of your menstrual cycle is more beneficial than in the second half.' Bruinvels, along with colleagues at Orreco, which focuses on applying data to improve sports science, has created FitrWoman, an app that tracks the cycle of female athletes and is full of tips as to when and why certain related symptoms might occur, how to mitigate them and what type of training might be best at different times of the month. And what if race day falls at a bad time? For Bruinvels, understanding is key: 'The first thing to do is to work out why that is the worst day for you, and what you can do to help naturally control your cycle and reduce the symptoms,' she says. 'I worked with someone last year who gets really bad sleep disruption at certain points. and it had really affected her races. So we put a sleep strategy in place, which meant we didn't have to do anything to (medically) deregulate her.' Focusing on diet can also help. 'Premenstrually, as oestrogen and progesterone levels decrease, there's an increase in hormonelike substances called prostoglandins, which drive an inflammatory response,' says Bruinvels. 'Diet at that time is very important because you might avoid having anything that's proinflammatory in your diet, like processed meats, or even dairy, which has been shown to exacerbate symptoms. Then you can include anti-inflammatory foods, antioxidants and fibre.'

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#### PERIODISATION



The key message here is that while all the potential issues might appear worrying, there's no reason to stop training. Adjusting your rest days or easy days according to your own cycle can work really well, and just being informed can help. 'Knowledge is power.' says Bruinvels. 'Loads of women tell us that just understanding makes them feel much better. There are so many simple things that can be done - optimising your diet, looking after your general health and wellbeing - that can reduce the severity of symptoms.'

It is also, though, a good idea to avoid making assumptions about how vou might feel. A day after talking to us about her terrible cramps, Dixon got back in touch with RW. 'After all I said, today I got my period three days early,' she explained. 'I had a 10-mile tempo planned, so I thought I'd warm up and see how I felt. I didn't feel bad, so I went for it - and it ended up being my best tempo since this time in 2017!

'I think, like a lot of things, you can get an idea in your head and it controls you. I know in the past I've had some real shockers, and if I really looked into it, it might be more to do with training fatigue. But now I just associate it with my period. Having said that, I also haven't had my normal restless night's sleep that I tend to get. The body is very complicated!'

Meanwhile. Bruinvels also has a message for female athletes who fear that their menstrual cycle could cost them a PB, or even an Olympic medal. 'I think if you don't do something about it, it could,' she says. 'But if you are savvy and understand your cycle, there is no reason why you can't perform at your best on any one day.' 🔤



Marathon runner Alv Dixon knows her body well, but sometimes it just breaks the rules