Academy of PHYSICAL MEDICINE

Transcript

369R- Relative Energy Deficiency In Sport with Emma Ross

Steven Bruce

Good afternoon and welcome back to the Academy for another lunchtime learning session. Today's topic is an interesting one. I hadn't actually heard of it until earlier this year, but it turns out to be quite an important issue for women, particularly in sport. I'm talking about relative energy deficiency, and I'm turning to Dr. NMR, Ros, Ph. D to fill us in on that. Emma describes herself as an educator, a researcher and a scientist, her Bachelor's degrees in sport science, her master's in Sport and Exercise Physiology, and her PhD is in exercise neurophysiology. So she's a bit of a brain on legs. And she spent a lot of her career working with the very highest level of athletes, particularly women athletes. Emma, Hi, welcome to the academy.

Emma Ross

Hi, thanks for having me.

Steven Bruce

forever to do that. Did you justice in that introduction? Can you fill us in a little bit on what sort of athletes do you generally work with which sports which disciplines?

Emma Ross

Yeah, so I've been really lucky because my career has allowed me to work with athletes across all Olympic and Paralympic sports. So I joined the English Institute of Sport, which is now the UK Sports Institute, in 2012, just after the London Games, brilliant time to move into elite sport, because there was lots of excitement, lots of money. And we'd been set a really ambitious target to win more medals in Rio than we did in London and be the first country to do that. So great time to be in elite sport. And as their head of sports science in that system, I was working, you know, with a range of athletes from the cyclists in Manchester, you know, the athletes in Loughborough, the hockey

players and vishram down to the sailors at Weymouth. And I think that is really challenging, but also gives you a really broad understanding of lots of the important determinants of sport and athlete health.

Steven Bruce

Yeah, you've said athletes genuinely there, but your your main emphasis is on female athletes, isn't it?

Emma Ross

Yeah, so after the Rio Games, we were doing our usual debrief, you know, what went well, in the last Olympiad? What didn't? What can we do to stay at the top of the metal table to stay world leading? And I was actually asking some very, what I thought quite fundamental questions at the time, which was do we support our female athletes well enough. And we were in a system where we had a lot of success with our female athletes. So a lot of the first layer of response was, yeah, we're really good at training athletes to be Olympic medalists and look at all these amazing female medalists that we've had. But I've been in the system then for just over four years, and no one had had mentioned the menstrual cycle, no one had mentioned, pelvic floor breast health, any things that were sort of exclusively happening in the female's body and were important for peak performance and athlete health so that's the agenda I started to push and I really, I really over the next Olympiad towards Tokyo was involved in educating coaches, innovation projects, research projects, to understand what bits of the female body were important for us to consider in sports science and sports medicine and and how that might impact ultimately performance on the on the field of play. Yeah,

Steven Bruce

last year, you wrote this book as well, in conjunction with two others the female body Bible, which which I've read, and, and it's intended for athletes for women generally, isn't it not not just for practitioners, but there's a lot of really, really good stuff in here. And one of them is that is you've just alluded to is that business of communication. And you point out that, well, I imagine that most elite female athletes are going to be early, late teens or early 20s are going to be quite young, aren't they? And you point out in here that a lot of the words that you've said, I've never talked about, you know, they just people are shy about using those words, they don't like to ask they think they should know about these things, especially when it comes to the reproductive cycle, the menstrual cycle. And yeah, so there's lots of really good stuff in there. But one of the things that you do cover in here, amongst many others is this relative energy deficiency problem. So tell us about that, if you would.

Emma Ross

Yeah, so relative energy deficiency in sport, or Red's, as people might have heard it abbreviated to, is a real issue, I think for young women, young female athletes, and we're not talking about elite level athletes. I mean, we are, but we're talking about a condition that can affect any active or any active person, but most prevalent inactive women. And, essentially, it's an under fueling issue. So, you know, we all know that when we do exercise, we expend energy we eat to give ourselves that

energy. And in people who are suffering from reds, they've got an imbalance, they've got low energy availability, they're not putting enough energy in their system through their diet, to match what they're expending doing sport, but also just, you know, being a human being and existing and living their life. And that imbalance has really significant consequences if left unattended. And for some people who were studying sports science or sports medicine, in the 90s, they might have heard of the female athlete triad. And that was the first time that a scientist called Barbara Drinkwater did some really important work, to look at female athlete health and say, actually, that there's some real issues here if we've got menstrual dysfunction in girls, because we're seeing that that's linked to impact on bone density and bone health and injury. But the female athlete triad, only focused on a triad of things. And actually, we know now that redds is much more widespread. So female athlete triad was eating disordered eating, which led to menstrual irregular irregularities, which lead to poor bone health, we now know that if you have someone who has who is not meeting their energy demands, then it's not just bone health that suffers. And there's some brilliant work by the IOC, who have developed consensus statements around red s, the most recent one was published last year in 2023, which showed that there is such a widespread impact of suppressing, particularly suppressing menstrual function in reaction to under fueling because essentially, in the female body, it's a really smart move to turn off the reproductive cycle, when we haven't got enough energy, if you're consistently under fueling your body, and your body is thinking, geez, you know, like I've got, I need to save energy, one of the systems that we can switch off as females that that won't, you know, kill us off within minutes or days is our reproductive cycle. Actually, you can just walk around and appear completely normal. If your reproductive cycle isn't happening, and you save energy to have to produce hormones, you don't have to have periods, you certainly don't have to risk getting pregnant, which is very energy consuming. So it's a sensible approach from the body. But essentially, it's not just the reproductive cycle and the reproductive ability that we quash, because we crush those hormones that are responsible for the reproductive cycle and I take you back a wider impact.

Steven Bruce

Why on earth would somebody be under fueling their body if they're in sports or athletics? I mean, if you go to your average rugby club or Rowing Club, some somebody will be saying, How many 1000 calories Have you had for breakfast this morning in order to keep up this level of weight training, energy consumption? Why? Why is it and I'm guessing it's a particular problem for women from from what you said, although it could be other people.

Emma Ross

Yeah, I mean, I think there are many reasons why people under fuel, it can be unintentional. So we see lots of young athletes who are just getting it wrong. Particularly in the hotspots of transitioning, let's say from living at home to moving away to university or being signed to a club, which is, you know, away from home. They have to suddenly learn to budget to cook to know what to cook, know when to eat it and they're not being supported by that sort of family support network. So unintentionally, they just get it wrong. Not everyone has the knowledge of sports nutrition that they need and you'd be surprised even in Olympic level sports, we have athletes coming in from all socio economic and educational backgrounds. So some just arrive and they haven't got those that The basic level of knowledge that's required to be a professional athlete. So unintentional energy imbalance is one is one thing. Another thing that's really, really prevalent in young girls is this idea of restricted or controlled eating. So it's not a clinically diagnoseable eating disorder. But if we think

about the pressure that's put on girls, particularly, to be a certain shape, a certain size, and then you compound that with the narrative that that goes along with a lot of sports, particularly endurance sports, that lighter is faster. So you're basically telling these girls lighter is faster, lighter is better, then society is telling them, you know, being lean is beautiful. And this photo, you know, of this person with it, who's tiny is the ideal beauty standard, that puts a lot of pressure and embeds these relationships with food and bodies in girls that can lead to them restricting or controlling what they eat. It's in. And I always say to them, anything to do with food has to be a non judgmental area, because particularly athletic girls, no one is trying to do themselves harm. If they are doing themselves harm, it's either unintentional or it's it's beyond their control. And their brain, you know, they we have to unpick what's going on in their brain. So yeah, there are, there are three reasons why we under feel unintentionally, because we're controlling our diet. And then obviously, for the most obvious reason that we have a clinical eating disorder, and all of those things can lead to not enough energy being taken in compared to what's being expended. Hannah's

Steven Bruce

asked a question about reds. Seeing the Reds is obviously a description of a particular condition. Her question is, do you have to be underweight to have reds? Or do you have to have some form of dysmenorrhea stopped having your periods for that to be described? And I suppose the obvious corollary as well, it's all very well saying you can put a name to it, what happens if someone says you've got red?

Emma Ross

Yeah, it's a really good question. Because it's actually still really tricky to diagnose reds, it's much easier now than it was in the work done by the IOC expert committee, has allowed us to know what to measure what markers to measure. But actually, what's what's tricky about reds is it's about energy availability. So it's not about body weight. And it's not about BMI. And so an athlete can actually present as you know, quite a healthy body weight, or body shape, or body size. It's not just the very lean like girls that we should be worried about. You know, we've got rowers or powerful cyclists who are who have got, who have had reds, and they present with a fairly healthy BMI or body weight, but it's actually day on day, are they consuming the right amount of energy at the right time. So we now know that it's not just the overall amount of calories that someone's eating, it's the timing. And so for example, if you have athletes who obviously have an overnight fast and then don't eat before they train, that's a real kind of stimulus for all of the signals that would set about, you know, sort of suppressing menstrual function, but as a consequence of energy imbalance. So, timing of fueling, as well as the amount of fueling is important. So we can't just look at an athlete's body weight, we can't look at their BMI, we do know that it's often linked to body fat. So if an athlete has very low body fat, they might might be more at risk of reds. But what we have now is screening tools and kind of measurement indices and metrics that will allow us to explore whether someone has read, there's no one definitive test, you can't do a blood test and say, Well, this is showing up so it's reds. What's slightly more complex about the situation is that the the expert committee have kind of categorise different metrics as being more or less important when we're trying to diagnose diagnose reds. So the most important is, well, if someone has not started their periods when they're 16, or 17, or they've started their periods, and then they've stopped for a year, that's a really significant sign that someone's suffering from reds. That sort of lower tier sign isn't someone hasn't had periods for three months. But it might also be that they have low levels of free testosterone, it might be that

they have high waking cortisol, it might be that they have mood issues, gut issues, urinary stress incontinence. So there's a myriad of things that we can measure and assess and build a picture of whether someone is likely to be suffering from reds.

Steven Bruce

You talked about relative energy deficiency, leading to menstrual disorders. Obviously, I knew you say that's a prime indicator in your assessment there. The consequences of reds if left untreated, as it were, obviously, if you're messing around with female hormones, and you're definitely going to mess around with bone health, are there other adverse consequences that might ensue?

Emma Ross

Yeah, so as you mentioned, bone health is a big one, you know, we develop, we all we sorta deposit 90% of our bone strength before we're 20. So girls who aren't having periods and having no oestrogen in their teens, that's going to be significant. And we've seen athletes who have developed osteopenia or osteoporosis by the time they're 2022, because they've been in reds for so long. So we know that bone health can really suffer and, and actually presentation with bone stress injuries and frequency of brain social stress injuries is another metric we use to understand whether an athlete might be suffering from reds, but other consequences are written now we know they're really widespread, so immune function is compromised. There's a ceiling on cardiovascular or aerobic fitness. There's a ceiling on adaptation to training. So it's really a frustrating situation to be in when you're an athlete showing up and putting your all into training. But actually, your body isn't able to adapt and respond to that training. We know that there are gut issues, we know that as I say, you can have urinary stress incontinence. And that's to do with the female hormones and its relationship with the urinary tract, and mental health, we know that you're 70% more likely to suffer from depression, if you are suffering from read. So often, the combination of physical signs and psychological or emotional signs are things that we see as the picture of reds.

Steven Bruce

So I guess, if you're an elite athlete, and we've got a team of people, including yourself with all your expertise around around you, something like this will probably be picked up because people will notice a drop off in performance or all these other factors. Given that not everybody's an elite athlete, but presumably this can be a problem in just, I wouldn't necessarily say a park runner, but somebody who's maybe training for the London Marathon and doesn't see themselves as an athlete in any way. Other than that they just want to do that marathon. What is it that we as osteopath, chiropractors physiotherapist, what should we be looking out for in our patients? And what should we do with them? It's not enough surely for us to say, maybe you've got this eat more protein or whatever?

Emma Ross

Yeah, I think one of the things that our I think we don't do enough of across sports medicine and out with reds, but also outside of reds is asked about menstrual status and menstrual health in patients

is such a brilliant indicator for women. So if you've got a patient, and she knows, you know, she's having a regular menstrual cycle. And actually, it's, it's fairly mild and manageable in terms of symptoms, then that's a really good sign. First of all, it's a sign she's probably not suffering from reds. But also it's just a really good window into her overall health and actually in in the States. In a lot of medical pathways, it's considered like a fifth vital sign, you know, regularity and menstrual health. So that's, for me really important that we ask our patients about their menstrual cycle and just say, you know, do you have a menstrual cycle? Do you have a period every month and then I think it's knowing where to signpost people if you I mean, because often it will be as a physio or chiropractor, it will be someone coming to you with an injury or recurrent injury broke bone stress, injury or even muscular skeletal injury, low energy, ask, you know, sort of being curious about other factors that might might give you a signal and then knowing where to signpost and actually that is quite hard, because depending on the underlying cause, will depend on the the treatment pathway. So, reds will have to be diagnosed by a sports medicine consultant, sports doctor, ultimately, and then treatment will depend on why energy availability is happening is low. So why is it happening? Is it an eating disorder? Is it education? Is it overtraining, so are we going to have to balance training and recovery better, and that will be a multidisciplinary approach, but knowing where to signpost, either to sports medics for a diagnosis or to nutritionist to who will be able to review kind of energy and an energy out and look at energy balance. That's, that's, you know, probably the most important thing that we can do is give people the information to go and find support and

Steven Bruce

what happens to women who are postmenopausal, then presumably they can still suffer from this if they've decided that once they've kicked all the children out of the house and they're not in business of breeding any more babies they can still get heavily into exercise Can't they presumably raise could be a problem. But now we've no longer got a menstrual cycle as an indicator.

Emma Ross

Yeah, I mean, the menopause is kind of like a permanent red situation really, which is why why it's so important to for people to consider hormone replacement as an option during that time because ultimately there's there's the consequences of reds are the suppression of important hormones, whether that's oestrogen progesterone testosterone. And so actually, what we see in menopausal women is a lot of the symptoms that we see in red which is over See interesting as a model to study it, but yes, absolutely just because you don't have a menstrual cycle doesn't mean to say you can't also get energy balance wrong and still have the other the other consequences are compounded by the menopause compounded by ageing and and so you know we I think the midlife menopausal exerciser is one of the most underserved overlooked people in our sector because I don't think we support them enough with good information. I also don't think, you know, we we know enough ourselves about midlife women and their bodies.

Steven Bruce

Then a couple of comments come in while we've been talking, HB I don't know who he is. But he says this isn't just an issue in elite athletes, it's women, particularly young women, and she's talking about this whole pressure to be a certain size, shape, or lean, thin, small. He teaches nutrition in

college to 16 to 19 year olds, and so many of them have anaemia and menstrual dysfunction. That's that's quite, that's quite worrying, really, isn't it? That that pressure is put on youngsters? And when I say Yeah,

Emma Ross

is it and actually you mentioned, you mentioned iron status. And that that is another another sign to look out for. And just to give you a stat that is quite shocking, when when studies have looked at sports, and they're not necessarily elite sports, but just sports that where aesthetics are quite important. So the girls are wearing, you know, small bits of kit or something like cheerleading in, in America. 100% of the athletes in this study, were at risk of red, so we're showing more than three markers of red. So the prevalence in sports like that is super, super high.

Steven Bruce

Yeah, I've always had I've always struggled with the idea of cheerleading, it seems a really weird thing to do that, you know, the boys go and play some physical sport and all the girls do is to get kicked their heels high in skimpy dresses. And seriously odd, Hannah says, Hannah says her daughter is a serious rower. She says she's a university does 12 sessions a week. And just eating enough is surprisingly hard when you're doing that much exercise. And you must have seen a lot of that with elite athletes in their training and training and training.

Emma Ross

Yeah, sometimes it's almost physically impossible to meet the demands of your training something like rowing something like triathlon, the training load and volume is so high. And, and those guys have to work really hard to get it right. And and that's, that's, you know, one of the challenges of being being an elite athlete is getting that right, otherwise you will break and, and when I was at the Institute of Sport, some of the most biggest budgets, the most amount of resource was ploughed into reducing the number of days lost to illness and injury. And to do that, you have to get your fuelling right, whether it's reds, or whether it's something else. We know that if you can do the training that you're prescribed to do so you're not losing days to illness and injury, you're seven times more likely to achieve your goal, whatever, you know, pbsp power, whatever you've set yourself. So, you know, showing off and being able to give 100% in training is absolutely vital. And something like fuelling or reds is going to compromise that. Right.

Steven Bruce

Whoever it is calls himself empty has asked about with reds, how do aspects such as overtraining syndrome factor in at the other end of energy imbalance? Could you define rates beyond energy in energy out balance? Is there an aspect where calories in and energy out has been addressed? So it's it's quite a long comment. But homeostasis has been disrupted previously, mitochondrial dysfunction, systemic functions, etc. How to bring this back into balance specific nutrition recovery strategies. You want me to repeat that?

Emma Ross

I think I get the gist. And I think it's again, a really interesting because we distil reds down to energy balance, and that is essentially what it is. But I think what the question is, is, there are other things that could be compounding it like unexplained underperformance or overtraining. And absolutely, we know that you know, systemic inflammation can really compound some of these things. And like anything, the human being is a complex picture. So we know that energy and energy out is going to be the thing that defines whether someone falls into energy deficit. And we also know that timing of fueling is important for that. But absolutely got if you've got an elite athlete who is under recovered or overtrained, they're in a chronic state of stress and infant biological inflammation, then all of those things are kind of going to compound. So we seen we see athletes who take was gonna say we see athletes who take 18 months or two years to really restore, you know, back to good health, when they dig themselves into into that kind of hole. Right.

Steven Bruce

So you mentioned timing of meals several times. Is there a simple guide we can give people in our clinics about when they need to fuel up before they go to a training session?

Emma Ross

Yeah, so the thing with women, there's, there's a, I'm gonna call it a fad and maybe that's slightly condescending, but there is an approach to health well being now that involves fasting. So intermittent fasting, the five to whatever approach, it means not eating. And actually for women, that can be quite damaging. Because because it's it's a big stimulus for the body panicking and starting to sort of send those signals to switch off reproductive function. So fasting isn't a great idea. And nor is training without having fueling your system. So, you know, simple advice is eat regularly, always show up to do physical activity, having had something to eat, and always recover with some fuel, it doesn't have to be full blown meals, it can be a glass of milk and a banana, which is amazing. But it's the idea that you're giving your body the signal, that it's okay, it's safe, it's getting enough food. And so you don't have to increase the volume of food you eat, you just have to time it so that you're giving it energy before you train. And then you're replenishing the energy after you train. And so that regularity, and kind of making sure people aren't going long periods of time, particularly after an overnight fast without eating.

Steven Bruce

Right. Okay. Quite a few case questions coming in now, Mike, as asked the question, I think he's referring to the business of menstrual cycle. And we almost certainly, as he says, as part of a regular case history, taking as regular case history taking, we would ask about menstrual cycle on our first appointments for a new patient. And he's saying, presumably, is, is useful if we intermittently or every time continuing not every time with a patient appointed close together? But intermittently, we continue to inquire about that.

Emma Ross

Yeah, absolutely. That's I mean, that that would be great practice. And some of the medical records keeping and performance data systems in the elite level is being set up now to do just that, not but not just check in about whether you have a regular cycle, ask when your last period is. So you can also get an idea about the time of the cycle that that that person is presenting to you. Because we know that the menstrual cycle and the hormones of the menstrual cycle can influence pain, muscular skeletal pain, joint injury. And so understanding the individual in front of you and knowing actually this, you know, back niggle crops up actually pretty sick quickly can be really helpful because then you know, know the root cause. Rather than searching around for something

Steven Bruce

I was really struck by that in your book. Because in there you say it's useful for you say the physio I think in the book, but the physical therapist to ask where the patient is in their menstrual cycle, it would never have occurred to me to ask that question, might feel I was being intrusive. And as you can imagine, particularly as I'm a bloke, I don't want to ask questions, which will either embarrass me or embarrass my patient. And I thought there's a really important part in there. Is it particularly for younger women is to start learning that it's okay to talk about things like that, isn't it?

Emma Ross

Yeah, yeah. It's funny, isn't it? That it's been it's been such a taboo and such a sort of stigmatised topic that even saying, Do you have a regular cycle? And what day of the cycle are you on feels intrusive? You're asking, you know, What colour was your urine this morning? Because we want to know whether you're well hydrated, doesn't feel weird at all. So yeah, I think we do need to normalise the conversation a lot more. And we do need to, you know, get women to understand that their cycle can be an important factor in things they're experiencing. It's not going to be the only thing. But it can be an important factor. I was on a panel yesterday with Jasmine Soyez, who's an Olympic long jumper. Unfortunately, she ironically, is injured for this Olympics. But she had a lot of issues with her menstrual cycle. And one of the things was that she used to have back pain for two or three days at a particular point of a cycle just before her period arrives. And because she wasn't tracking her cycle, because no one was asking for her every month, she would just panic that she was about to get injured. And for an athlete, that's kind of headspace and anxiety that you don't need and then a couple of days later, it will just die down. So that information for her was really helpful to give her context and be allow her physio to work with her differently across her cycle.

Steven Bruce

Yeah, indeed. Interesting. You mentioned a long jumper there Paul has asked whether read is less of an issue in power athletes like shotput or finesse sports like archery as opposed to the endurance sports is that is that the case?

Emma Ross

Yeah, I think we would say the prevalence is highest in aesthetics, sports gym, trampolining, things like that. Weight making sports like boxing and combat sports and endurance sports where you

know the the coat the excuse me, the deeply entrenched belief of coaches is that everyone should be as light as possible, which is not an infinite game because you're eventually so likely you break but the prevalence is highest in them. And lower as you as you go through power sports and then as you can imagine, like golf or something is is less than that. But we still see we still see athletes, you know rowers, sprinters who suffer from read so a particularly as you've mentioned already those younger girls younger athletes who are really struggling just to figure out, you know how to be an elite athlete or how to do a high volume of training, and much much they're fueling and beyond to the pressures that social media and society put them under.

Steven Bruce

Kim has said that this sort of stuff should be taught in schools. And she's very, it's a really very valid point that, isn't it? Because if you want to get over the taboos and get people familiar with discussing things we say might otherwise regarded as private, you've got to start at a young age. Is the EU making any inroads into getting young people aware of these sorts of things?

Emma Ross

Yeah, so we do a lot of work in schools, at the moment, mainly independent schools, because they're better resource we're just put put an application in Sport England for some funding for state schools. But it is absolutely that is that education programme is education for the girls about what's normal and what's not. But also education for the staff, because it's no good as going in and talking to the girls. And then there's a culture and a layer of staff who don't want to talk about it or are uninformed. So we've also produced courses for teachers to be able to understand the girls that they're supporting. But absolutely right. I think if we create a generation now of girls who really understand their body, they're not just going to understand, you know, their journey through puberty, their menstrual cycle, their fertility, their pregnancy, their postnatal journey, but they're menopause. And they're going to understand their body throughout their whole life, which is a situation we don't have at the moment.

Steven Bruce

But also, as Kim points out here, you know, we are at the moon, we're creating a problem. And we because we are now much, much more actively encouraging girls to take part in rugby and soccer and other sports like that. But if we don't balance that up with some education about how, how things are different for female athletes or females, females, sportsmen, that's it, you

know what I mean? Then we are creating a problem. We've got some more questions that Lucy says, When will we move on from women and girls wearing such a ridiculous kit? Now, there's some interesting stuff in your book about the inappropriateness of equipment and so on for female athletes, isn't it? Lucy says her girls refused to take part in sports because of the outfits which makes them feel so uncomfortable physically and psychologically.

Emma Ross

Yeah, I mean, we've got really shocking data about the amount of girls that drop out of sport because of something to do with the kit. And, and there's a brilliant movement by the hockey player, Taz Howard. And she's developed the inclusive KIPP charter, and it really is aimed to give everyone in sport choice, because that's what people need if your body is changing during puberty, and we have to accept that during puberty, boys basically get taller and stronger and more powerful and faster. And bluntly, put girls get fatter. Now they get fatter, because they have to lay down a higher percentage of fat to be a really healthy female adult. But as a young girl, when you're developing hips and a bottom and breast tissue, that can suddenly feel like a huge change for someone who's who's been athletic and worn their kit and been a certain shape. So we have to, we have to take a good look at kit. And make sure it's inclusive for everyone if you keep an eye out in Paris, because Tess Howard is a hockey player, she's actually introduced this inclusive kit and choice into the GB hockey squad. And they will be the first squad where some players have chosen to play in shorts, some in skirts. And that's just a choice comfort. And it'll be the first time that a team will run out and they won't be absolutely uniform. And no one's going to die because of it. So it's going to be credible because we're going to realise that we've been so tied to tradition in sports and particularly sports kit. We don't need to be

Steven Bruce

you can't help feeling that there's a lot of male dominance involved in this, isn't it? I mean, I don't know what the rules are now at Wimbledon, but women have to wear short skirts and frilly knickers.

I mean, for heaven's sake, that's that is. If they want to wear shorts, they should be allowed to wear shorts, it probably makes a lot of sense. Absolutely. I Lucy's asked about what you said about fasting. Apparently, she's really given a reference here of Mindy pelts his book fast like a girl and apparently he says fasting at certain points in the cycle is okay, is that true?

Emma Ross

I've just read I'm always really sceptical about claims made about the menstrual cycle and nutrition because at the moment, we just don't have any evidence. So people will be making jumps from, you know, perhaps a hypothesis to prescription. We don't have any scientific evidence about whether eating differently across the cycle is good or bad. We know that inflammation for example, changes across the cycle, and we know that diet can help with inflammation. So we've got those kinds of steps in place to try and understand it but at the moment To me as an evidence based practitioner, we probably don't have enough to be able to with confidence know that to be true. Okay,

Steven Bruce

so the jury's out on that one, then Lucy. Steve says the whole subject of hormones and injury was the subject of his PhD thesis back in 2006. Certainly injuries are going to happen at certain times in the cycle. And also, if you choose when you treat them, your results can be better too. Is that your experience?

Emma Ross

Yeah, so he was ahead of the curve. As as everyone will know, when there's a lot of talk about particularly ACL injury of female athletes and a lot more investment being put into understanding it. And this is another one injury is really hard to study, you guys will all know that. Because we often have to wait for it to happen to then investigate, you know, what, why and what and what next, and then layering up the cycle and being like, Oh, I wonder what the hormones were doing at the time this person had an ACL injury makes it even more difficult. But we certainly have a few papers now emerging where there are hotspots in the cycle, where the hormones might be influencing injury risk. We also know across women's sport, that there are so many other things contributing to injury risk, I mean, the fact that there's only one pair of boots currently designed specifically for the biomechanics of the female body, mean that we are, you know, lightyears behind, optimising everything in the system to make sure females are resilient. We know that, for example, the culture around strength and conditioning means that girls don't get that that level of strength and conditioning along their pathway. They don't get taught to move well. So they get to elite level sport, and some of them can't even hip hinge and squat and lunge properly. So it's any wonder that they get on the on the pitch and they get injured. So the female body and injury is a really, really interesting area that I think we should yeah, keep our eyes peeled for.

Steven Bruce

Yeah, we've probably for obvious reasons. We're spending a lot of time on the menstrual cycle. In this particular discussion. Ryan says, Do you have a view on athletes using some types of contraception? For example, for example, the Mirena coil that blocks a menstrual cycle. He agrees that the cycle is a great key tool in knowing female health. Without knowing the stage of the cycle. How can athlete athletes use it to gauge themselves or when to push hard or back off from a training programme? But back to the question of contraception.

Emma Ross

Yeah, and it's an interesting one, because we tend to think of men and women, if we're, if we're going to be diligent, you know, we will understand men, and we'll understand women, but actually, you know, women fall into different categories, because they're a different life stages hormonally. Or they could be having a natural cycle, or they could be taking hormonal contraception, which suppresses the menstrual cycle. So they are two different physiological groups. And then in that hormonal contraception group, you've got people who, for example, are taking the pill, which completely suppresses the menstrual cycle and replaces it with synthetic hormones. Or you might have people using, as we've mentioned, the Mirena coil, which actually, after a short amount of time, allows some production of natural hormones and prevents pregnancy by another means. So that's a whole load of people with different physiology going on. And I think the first step is, is helping women understand what's going on in their own body when they're using the pill or hormonal contraception. Lots of women say to me, Oh, it's okay, I have a regular period, so I'll probably all right, and then we get to the crux of the issue is that they're having a regular blue because they're using the pill. So it's very regular 28 days cycle. So we need to educate those women that they're not having a natural cycle. It can't be used as that vital marker for health. And we need to be extra diligent in them for other signs and symptoms of dysfunction. I think we have to be careful about labelling the pill or hormonal contraception is good or bad. It was an amazing tool for

women to take ownership of their reproductive health. In the generations now where they have sort of started to question the pill, there is also an increase in unplanned pregnancies. So you have to balance all of these things, and make and that means that education is key. Okay.

Steven Bruce

Education is a big factor in your book, isn't it the female body Bible and as I think it was, Kim said earlier on, we should be getting this sort of information out to younger and younger women, particularly when I was asked a question following on from the long jumper with the back pain. She's asked if there's any evidence that high training volume is related to painful periods as an indication red threshold might be imminent.

Emma Ross

Yeah, so what will happen before periods stop altogether, is that ovulation will stop, but periods might still happen. And when ovulation stops, it means that we don't produce one of the important hormones of the cycle progesterone, so oestrogen is just doing the cycle on its own. And that can lead to more painful or heavier periods. So again, menstrual health isn't just the absence or presence of of periods, it's how are you experiencing your menstrual cycle? Has anything changed? Have your periods got heavier? Do you have pain where you didn't know? But before and kind of if you're trying to get to the bottom of something with it with a patient or an athlete, getting a bit curious about the menstrual cycle as a whole, not just Is it there or or isn't it?

Steven Bruce

Empty has asked if you suspect red is in a patient, what resources are there? And one question, of course is, what would a patient's GP do? Would the GP even recognise the the term red zone relative energy deficiency?

Emma Ross

I have to say, I don't think they weren't. So what the one of the cofounders of the Well, Dr. Vela has actually just done some training for GPS on reds. And she said, Yeah, this is not, this is not something that's on their radar. And, you know, understandably, it doesn't get put in any medical training currently. And actually, it's only been in the last decade that sports science has really, more fully understood it. So GPS will tend to do, you know, blood markers, and then they'll say, Well, you've got oestrogen in your system. So it's fine. Unfortunately, because we know hormones fluctuate across a cycle. That's not necessarily useful. So signposts, there's a great website called the Reds project, red s project, and that actually has sections for athletes, for parents and for practitioners, that specifically about reds. And then I would also signpost, people to the IOC, clinical assessment tool number two, because it's a second version released last year, it has really, really useful information, and it has a link to an Excel spreadsheet where you could start to put data from your patients in and it will classify their risk automatically, it kind of does some of the job for you. So yeah, that's a great paper or tool to go and have a look at.

Steven Bruce

What about I mean, do you provide resources for people as well, either in training or another documentation?

Emma Ross

Yeah, so one of the things we would love to do is to upskill everyone working across sport, Physical Activity and Health, with information like this about the female body. And so we've created some training courses for professionals working in the sector, which really helps understand, I say, all the things that happened either exclusively in a female body like menstrual cycle periods, breasts and sports bras and the importance of sports for us through two things that happened differently. So pelvic floor, floor dysfunction, injury, risk, reds, things like that. And our training courses are life stage specific. So if you're working with teenagers, women, or menopausal women or postnatal women, there's a specific course to deal with that life stage as well. And you can find those on our website.

Steven Bruce

Super. We also said we were going to talk about ACL problems in women. And we've got about three or four minutes left and probably not enough time to cover. Yeah,

Emma Ross

no, I mean, it's, it's an issue. And I think as we watch the Olympics this summer, it'll be another, you know, headline grabber. I think one of the things we have to remember is that as women's sport gets more media exposure, and we have more interest in the athletes, we're going to notice when they get injured. So I don't think ACL injuries are increasing in women's sport, but we know that women are at a higher risk. And we know that there are things we can do to help them develop injury, resilience. And that's the thing we haven't socialised well enough. So if you go into any football club on a Sunday morning, where the coach is really, you know, loving coaching these girls, I can guarantee they're not, you know, spending 10 minutes each time developing movement, mastery and resilience against injury. So for me, one of the best things we could do is try and socialise, good, you know, conditioning movements and coaching down the pathway to make sure these girls get the development they need.

Steven Bruce

But also Yeah, I think we've we've discussed on one of the programmes before that the girls playing football will be wearing men's style football boots, which maybe they'll have a different impact on a body which is less strong. You in your book, talk about the fact that if you go to any fitness class, the saddles on the exercise bikes are designed basically for one size fits all. And mainly that means one size fits all men. And that's a particular problem for high performance. Female cyclists, isn't it because when you're in a bracing position, you can do yourself some damage. I think I think you've mentioned that there are now some saddles designed for women to relieve the problems that that causes.

Emma Ross

So we just have to make sure that women don't suffer in silence. I think that's another thing that we've gotten used to so if something hurts or if something doesn't feel right, it's about seeking help with with the people who are watching. And part

Steven Bruce

of that starts with communication with their coaches, but also with physical therapists, like the people who are watching you today and we've got 345 people watching you who hopefully will take this message away. Because if we're shy about asking questions, like they don't maybe don't realise the importance of questions like that, then we're reinforcing the problem, aren't we? And, you know, I mentioned Emma his book at the beginning the female body Bible, if ever, I don't make it mention a book for a second time in a show, it means I'm not really convinced. I've looked through this book, and I reckon this is something that should be on the school curriculum because it's very readable. It's written in Greek language, very understandable. It's written for the Layperson. And and there are so many things in this book, which, you know, lots of female athletes could to take on board really simply and help them address their health. So I like that. And I particularly like at the end of it, the fact that you say you used to call yourself passionate about your profession. Now you describe yourself as a disrupter. And I don't like the word passionate, because everybody use it, but disruptive. I like I think that's really good. That's a great approach to healthcare and everything else. Emma, thank you so much. That's been fantastic. Run through 45 minutes of rims and two minutes of ACL injuries. Thank you again.

Emma Ross

Thank you so much, and some great questions.

Steven Bruce

Well, I really hope today's show is going to help you to enable your female patients to get the best out of their bodies, whether they're high level athletes or park runners, whether they're young or whether they're postmenopausal.