Academy of PHYSICAL MEDICINE

Transcript

Treating the Cyclist
With Warren Hutson

APM: And good evening once again, ladies and gentlemen. Welcome to another 90 minutes of CPD from the Academy of Physical Medicine. That's 90 minutes of learning with others if you're a UK osteopath or chiropractor and 90 minutes of damn good CPD if you're anyone else. We've actually got two guests this evening. Our main guest is actually a man who has raced road bikes for England. He did that between 1966 and 1968, I think. He was the first osteopath to assist with the British Olympic Association's cycling team. He's lectured across the country to osteopaths, chiropractors, physiotherapists, sports massage trainees and he's even got a creditable track record in converting sports therapists to osteopathy. So let me welcome Warren, Warren Hutson, very nice to see you, Warren. Thank you for making the trip all the way down here from the midlands.

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WH: My pleasure.

APM: Especially with the weather up there at the moment. That was —

WH: We had two inches of snow this morning.

APM: And you're associate apparently lost her car in the ice and you kindly bailed out on treating her patients to come and talk to us.

WH: Yes.

APM: Kindly bailed out and come to help us rather than take on her patients.

WH: Yes.

APM: Thank you very much.

WH: That's OK.

APM: Warren, we're going to talk about a whole load of things and I know that you, yourself, have got this amazing record in competitive cycling and with assisting with Olympic cycling but can you reassure us first of all that this relates to ordinary people riding their bike to and from work or just for recreational activities as well?

WH: I class anybody who rides a bike as a cyclist, no matter it's recreational, going to work, racing or otherwise. A cyclist is a cyclist and the bike and the person needs to be set up correctly to get the best possible performance out of both machines.

APM: I remember listening to you lecturing on an MSc course that I was attending and you were very, very adamant about this whole business about making sure that the bike and…the man and the machine or the woman and the machine are set up together and perhaps you're going to run us through that, I know, this evening. And we're also going to talk about cycling-specific injuries and where we perhaps as osteopaths who don't treat athletic cyclists can identify where an injury might relate to what's going on with the setup of their own bike if they use one, recreation or otherwise. Where should we start? You want to talk about the range of conditions and things that you've treated in the past or we can start with setting up the bike itself?

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WH: I think better to start with the bike and also the body. I mean the title of my talk that I normally do is "Fit the Body to the Bike". There are two main components on the machine, one, the bicycle and two, the human body. The former is and can be adjustable, as we know but not adaptable while the latter is adaptable but can only compensate within certain limits. The human body makes contact with the machine at three points, the handlebars, the seat and the pedals and if these three points are not settled correctly then that can lead to injuries of overuse or even specific and they may occur and some will occur and if these limits are exceeded. So we need to actually need to keep the bike and the body within both limits and that's the best way to do it. And if we can go to slide two —

APM: While we're doing that, I mean do you ever get your patients before they buy a bike? They must know you're, you know, an expert in cycling, so they don't end up buying which can't be fitted to their bodies.

WH: Occasionally, yes, mainly on recommendation from the local bike shops, etcetera. They will tend to come out but a lot of good cycle shops these days will actually set up a bike as near as they possibly can to the rider and a few years ago, they used to sell bikes that were too big for people because to a certain extent, bike frame tubing comes in certain sizes and they have to cut the tubing down to the size that they want, so less labor…the bigger the frame, the less labor and less it cost but that's now altering now because cycling's becoming more and more popular.

APM: Now we got your first slide showing. So what are we going to learn from this one?

WH: Well, if you actually look at the slide, you can see that the three main points are…the hands on the handlebars is actually on the brake hoods. So that tends to mean he's either in a relaxed mode in riding uphill which I think he is…it's from the Tour de France in about '86 I think this is. And also the seat, you can see the nose of the seat, just poking from the front of his shorts and actually, the feet on the pedals at the bottom. Now, these feet are fastened on with cleats or shoe plates as I used to call them but now, the modern name is cleats and these three points are the most important parts of it. If we go to slide three, the main thing that we got to get sort out is posture, correct positions, adjusting the bike, looking at posture height, posture length and saddle position. If you go on to slide four, this gives a general explanation of what we're looking for and if we think of reach, the reach is from the front of the saddle to the handlebars, maybe down in the drops if it's a racing bike or actually on to the top. And also, the saddle height is, once again, the most important part of the bike because if you get those three points, the seat, the handlebars and the pedals right then you tend to find it to be a lot better.

APM: I've got a question for you here though because with a modern road bike, with my limited experience, you've actually got four potential positions, don't you? You got the tribars. You got resting on the brake hoods, as you mentioned. You've got your hands on the drop part of the handlebars or you can be on the crosspieces So how do you set a bike up to cope with all that? Use the one that's most common.

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WH: If it's a racing bike, you tend to set it up into the racing position which, in theory, for most of the time is actually on the bottoms of the handlebars. If you're riding in professional races of, say, 180 to 200 kilometers, you tend to find a lot of the racing is done in the last two hours. So they tend to ride up on the tops or on the hoods, as we call it and that tends to be a lot more relaxed but it doesn't alter the posture too much. All it will do is just bring the posture slightly forward —

APM: But for the recreational use, what would you go for if you were setting the bike up?

WH: I would just go for the posture setting up onto the top of the bars and, you know, certainly…a lot of people now ride mountain bikes as, you know, a pastime, really, more than road bikes. So they tend to have straight bars. So that doesn't…so to knock that equation out but they still weren't setting up correctly.

APM: Well, if we can, let's turn to the bike that we've got in the studio here at the moment. Now, this is a brand new…I think it's been used once, this road bike. So it's an ideal bike for setting up when we get our extra guest in but can you run through the things that you were talking about earlier on, the reach and the saddle heights and so on.

WH: If you look at the reach, the reach goes from the front of the saddle to the handlebars, OK? This part of your handlebars or this part, if it's a road bike and then the saddle height goes from here down to the pedal—

APM: When it's at the bottom of its —

WH: --when it's at the bottom of the circle, all right? And that's the best three ways to do it.

APM: And the adjustment that we've go available on this is…?

WH: The adjustment available is the height of the seat, height of the bars, the length of the extension, OK? And the pedal, the crank length.

APM: And you can also move the saddle forwards and backwards, don't you?

WH: You can move the saddle forward and backwards, yes if —

APM: That always can be critical.

WH: If you're riding on a lot of flat terrain, the saddle tends to be slightly further forward because you don't use the pedals, pressure on the pedals from the top. If you move it slightly back, it tends to put your weight over the back wheelers a bit more so you can get pressure earlier on to the pedal and that tends to be with people climbing hills and in a hilly terrain, really. And a lot of the professional cyclists will adjust this by 2 or 3 millimeters.

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APM: And that will make enough difference?

WH: That will make enough difference, yeah.

APM: Well, we're going to go through this in real time now because, you know, we're going to bring in the Academy of Physical Medicine's secret weapon. A lot of our guests, a lot of our viewers, our members will know Holly from having spoken to her on the phone on numerous occasions. Many of them won't know that Holly is actually…just completed her first season as an elite mountain biker in this country and we have very high hopes that she's going to be in the Olympics. Well, I do and she's going to get the sack if she doesn't make the Olympics in 2020. So Holly, let's get you in here. She's as nervous as anything about being on set. So I'll leave her in your tender car, Warren and you can show us how we set this bike up.

WH: Go on, Holly, on to your bike. Clip your pedal for me. Wonderful, OK. When you start to look at the reach, Holly sat in the, more or less…if you just stop pedaling, Holly. If you look at the reach, the reach comes from the back here and along the

arm to there. That's the measurement. So it's from this part of your arm down to there. That's your arm length. The reach is that plus your body length, OK? So your body length goes from here to the same point there and you have those together and that gives you basically the reach and it comes out at some silly formula that one of the best ways to do it…if you take that and that and add it together and then take…minus 0.75 centimeters off, that tends to give you the correct reach. Also —

APM: I just want to interrupt you there, Warren, for a second because in the photographs you showed, those cyclists have got very, very bent backs. So when you were measuring that hip to shoulder distance, that's with a straight back —

WH: Yeah. Holly's got, really, a perfectly good posture on it. You got to be careful that the pelvis doesn't sit forward or backwards on it. There is a figure later on that I'll show you once we've gone through this. If you look at this degree here, it's about 90 degrees. If you can keep that at 90 degrees, even when Holly goes down on to the drops…go on to the drops, Holly, for me, it still tends…although the posture is altered, it still tends to be 90 degrees and that's usually a good sign. That usually shows that the reach is more or less perfect. OK, if we go…put your left leg down to the bottom, Holly, for me. You can go back onto the tops, if you're more comfy. OK. Most cycling shoes these days, certainly racing shoes, are shaped. Before, years and years ago, they just used to have a flat sole. Now, they've actually got a slight curvature, basically to promote most power. If you look at this angle here, this is your leg length, here and here to your ankle, to your talus, OK. So you've got this to here, OK. If you measure that and then put the foot size in, that gives you your saddle height, OK. You've got to be careful to…please put the foot length in because if we don't put the foot length in then it all goes wrong. So you've got to add the two together. So you measure from there to there and then from here to here. In the barefoot, please. Not in your shoe, OK. Now the crank length just operate to a certain formula, is the inside leg measurement tends to give your crank length. The shorter the leg, the shorter the crank, OK? Basically, because of leverage and you tend to find that works. Somebody with a probably…what? I think I've got the measurement somewhere. Let me just go through them. If you've got an inside leg measurement of 75 centimeters, you need a crank length of 165 millimeters and Holly's got 165-millimeter cranks on that. So her leg length is within 75 centimeters, plus a foot length of 23 centimeters. So if you add those two together and then you could take up to minus 0.8 centimeters off the saddle height to give you this nice degree here. If Holly now presses the pedals so it's actually at the top of the stroke, to there, OK, that should basically be 90 degrees.

APM: That was a bit greater than 90 degrees —

WH: It is but it's just slightly but it's more or less but if she actually puts to foot level as it should be, OK…if you actually drop level, and I've got mine here, from the center of the pedal to there, that should just more or less go through the center of

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the joint line there. OK, so —

APM: Center of the knee joint through the center —

WH: Center of the knee joint. So we know, actually, more or less, that's the right position for her. OK, so that's what we do. You can't go wrong with having the level when you try and set the bike up because it actually can lead to a number of things but you have to make sure that the surface that the bike is on is on the level process to start with.

APM: Of course, this one is on a turbo trainer but it's actually got the front wheel propped up —

WH: It is, yes. It is a level surface that we're on. OK, right. If you want to jump off, Holly, you can leave your shoes, please. I'll show them how to set your cleat up. Going back to posture length, if you have the upper body and an arm length of 122 centimeters, this is just a figure, the reach from here to here should be about 78 centimeters with the handlebar level of about 5 ½ centimeters below the front of the seat.

APM: And the seat should be perfectly horizontal.

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WH: The seat should be perfectly horizontal and if we look at this one, it isn't. So what will happen while Holly is riding or any other person riding, if the seat is slightly forward, you will start to slide forward on it and therefore, you will actually lose power onto the pedals and this setup is the same as anybody else, really, even if it's…you'd be surprised how many people we get in with a seat pointing like this or like this.

APM: Now, you mentioned earlier the figures and things but…because what we'll do is we'll make sure that those figures are available to people on the website after so they don't have to try and write this down or remember it.

WH: Not a problem.

APM: And anything else that you can recommend as a source for this, we'll put it up on the website later. OK, now you were talking earlier on…before we went on air, you were talking about Holly's cleats as well, weren't you? About how they are set up in the shoes themselves. How critical is that for the average user as opposed to the supreme athlete?

WH: Well, if you're not using your bikes to race or train on then you're a lot better just having normal pedals but the more important thing is to get the ball of the foot over the spindle of the pedal and not actually the pedal into the instep because then you're losing power because you should pedal with your ankle as well as your leg. So you turn it to get more…but the idea of the cleat is not just to keep

you attached to the bike. It also enables you to actually pull backwards with the other leg because people who haven't got that are only cycling with 50% of the power. They're just cycling with one leg. If you're a cyclist, club cyclist or a racing cyclist, you need to…you want to be working at least 80% to 90% of your power ratio. This is one reason why we have cleats.

APM: So let's have a look at these cleats.

WH: These are road cleats and therefore Time pedals and there is different ones that you can…but they're all basically onto ski bindings. So if you look at Holly's…if I turn them the right way around, excuse me, OK. These are more or less right but the left one, OK, is slightly further forward by two millimeters to the right one. So this means, actually, when she's pedaling, her right knee…sorry, her left knee is actually going in towards the top tube and that shows that that's her longer leg and that the thing to do…unless it's within half a centimeter leg length difference, best thing to do is just leave it alone. It won't cause a problem.

APM: But you say that's her longer leg. That surely could just be that someone set the shoes up badly.

WH: It could be as well but when we look at it when she was just turning the pedals, then it just go in slightly and that…but these are not too bad. They are worn. They need changing, OK, but one of the best ways to check it is to just get your shoes…and normally, shoes have heel marks on. If you put them together like so…and you could actually put them together like that and then just move them forward and you'll find that the left shoe is just slightly two millimeters further forward, OK. But also, most shoes have got markings underneath and if we look at Holly's shoes, we look at the V in the back of the shoe plate. This is why they have these sections.

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APM: So we're looking down in here now.

WH: We're looking into here now, OK. There's a line here on the shoe. These lines aren't just for show. They are to actually set your cleats up and that one is slightly just off center on that one while on this one, it's actually further over this way. So it means that they're actually…because it's her longer leg, her toe is slightly turned in that way which will actually bend her knee towards the top tube as well. So that just needs tweaking slightly to make it straight. Unless you've actually got an old fracture or a badly sprained injury, an old, overuse injury like a sprained ankle where the ankle or the knee is not sitting correctly then you tend to find some people do ride with a shoe in this position or in that position. That's just anatomically the way that they are and they have to compensate for that.

APM: And if they didn't do it, what would happen?

WH: They would get overuse injuries on either the ankle, knee and even the hip and

then, also, correspondently into the low back.

APM: And they get that while they were cycling? Would that be something that comes on as a compensation injury afterwards?

WH: They could get the knee and the ankle pain while they're cycling. If they're cycling for a good way, a good distance, say, anything up to 3 to 4 hours at one time then you would certainly get some low back pain with it as well. The more pressure you put through, certainly, if you're racing, would actually cause more…the acute pain to be acute and it would last for quite a while afterwards.

APM: And that's quite interesting from an osteopathic therapist perspective because if someone comes in and say, "I'm getting pain when I'm riding," we might start to think about these things rather than just the usual —

WH: You just got a lot…if a cyclist comes in to see me, I always tell them to bring the shoes in so I can have a look at the shoes and if you just know what you're looking for, just…all you have to do is compare one shoe to the other and look at…say the problem is on the left-hand side, you know it's the left-hand shoe that's causing the problem and not the right one. The right one is settled correctly unless it's anatomically from an injury or something like that, OK, but cleats do wear out and they do need changing quite regularly, unless if you're walking on them as well.

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APM: They're pretty uncomfortable —

WH: Yes but you don't walk very far on them, I'm afraid. When you start looking at Holly's mountain bike's use, these actually have got the smaller pedal. These are called SPDs and the idea is that the height clearance on the pedal is a lot higher because of the rough terrain that you go over and also, most mountain bike's use are also used for walking because you have to walk over terrain. So the shoe plate or the cleat in the center is a lot smaller and there, you just click in and this is set up exactly the same on these shoes as is on that shoe. So whoever set the shoes up had set them correctly for Holly.

APM: Deliberately.

WH: And that's something you just got to take into consideration.

APM: So we've looked at this nice brand new road bike and the setup on the brand new road bike is presumably somewhat different to that of a mountain bike. So if we have a quick look at that, we're now going to introduce a very dirty mountain bike. I should speak to Holly about this later on, bringing a dirty mountain bike into the studio. We're going to get our secret weapon back in again so that you can show what we're going to do with this one. Holly, come on, back into the picture here. Let's look at the mountain bike.

WH: If we look at the mountain bike here, OK, the two biggest things on the mountain bike is the bigger tires, bigger frame, straight handlebars, OK? A lot of mountain bikers tend not to have to get into a low or tucked position because they need the strength from the low back muscles to push the pedals round, etcetera. The seat should be slightly further back. Holly's still got hers in a road position. That's the way she is. It needs to come back at about half a centimeter, really and the idea, really, if the seat is further back, you get more pressure through the pedal. If you look here, the way Holly sat there, if I turn the pedal, she's probably pushing the pedal from about there, OK, which is about 10 past whereas she should be pushing it from about 5 past.

APM: And that half centimeter will make all the difference.

WH: That half centimeter will make probably anything up to 20 or 30 watts of energy per pedal push on both sides. Not just on one side, it's on both sides.

APM: Have you noticed anything like that when you've been cycling, Holly? Have you adjusted the saddle position to get a feel for what gives you better power?

HOLLY: No, I adjust it base on comfort, more than anything. When I set a bike up, the idea is for me, at the minute, not power but comfort.

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WH: But if you're racing, you need power and comfort. So if you set the bike up correctly, you tend to find you get both, OK? Right. Once again, Holly's seat is slightly downhill on this one again. You tend to find that more on female cyclists more than male cyclists because the pelvis is slightly wider. A lot of people buy wider seats for female cyclists because the pelvis is slightly wider. The iliums are further apart and it's not really necessary. As long as the seat is comfy, it's fine. My seat on my road bike is a carbon fiber one. It's as thin as a piece of paper and it's absolutely solid. There's no padding on this. The more padding you have, the more problems you'll get from saddle soreness, etcetera. So that's the thing to do. If you actually just turn the handlebars, Holly, so it doesn't fall off. All right. If you look at this, this is slightly higher which is what you want on a mountain bike because you need control. You need to be set up so you can actually look further into the distance, OK, and the handlebars should be the width of your shoulders, the center from outside to outside of your shoulders. If they're not then they're too wide for you.

APM: Is that because of the extra leverage you need to control?

WH: Yes. If you get more leverage in them…the disadvantage of having too wide a bars, if you're pulling and you pull incorrectly, just on one side, you'll tend to find you'll twist your wheel and you lose a little bit of power, a little bit of forward momentum. The easiest thing to do is to just cut them down and what I do on my mountain bike…I've actually got bar ends as well. So it gives me an alternative

position as well which I find is actually more comfortable, certainly on the longer ones and you could still get to your brakes and gears with them as well. People call them cow horns but they're actually bar ends and you can actually put the rubber grips on them so it makes them comfortable and this is just the typical mountain bike setup, really. The same crank length, although you tend to push bigger gears, OK…lower gears, rather, sorry, because you've only got a micro chain set on the front. You should actually have two. Two chain sets are better than one. OK and other than that, it's not in a bad position, really. Just need to seat…just tilt it upwards and that's, really, the only difference between a mountain bike and the road bike. If you look at the road bike, the handlebars are actually a lot narrower than this one. I mean those bars should be roughly…if you took the measurement to the road bars, they'd actually be here. So you've literally got, what, 10 centimeters extra bars on either side. So that's 20 centimeters.

APM: And is the advantage there aerodynamics rather than —

WH: Yes, it's aerodynamic on the road bike but you need a little bit of stability on the mountain bike but you need to bring it in. If they're too far then you start getting shoulder aches and wrist ache and wrist injuries and that's what can cause the problem.

APM: Well, Holly's always complaining about injuries, aren't you, Holly? Usually because you've done a nosedive into a thistle bush at about 40 miles an hour.

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HOLLY: It's normally my own fault as opposed to a bike setup.

APM: How much did that bike cost that you wrote off last year, about £7,000 with the bike?

HOLLY: Yeah, it wasn't far of that.

WH: Well, I can remember riding in a mountain bike in College Pines near Worksop in Nottinghamshire and I went round the corner and missed the corner and I went into a pine tree and I was stuck in there for half an hour. I actually couldn't get out. It's only because somebody had actually seen me go in or I'd probably still be there. There'd just be a skeleton on the bike now. So you got to be a little bit careful but I think Holly's handlebars on the mountain bike need to come in at probably about three inches on either side.

APM: To be…?

WH: To be safe.

APM: Holly, you're getting a new bike, a new mountain bike this weekend, aren't you?

HOLLY: I am.

APM: Is that the one you're getting set up for you on Monday?

HOLLY: I should be getting both the road bike and the mountain bike —

APM: Both set up, OK. It'd be interesting to hear what the guy who sets them up says after you've heard what Warren's had to say. You made me think there actually, Warren, because, you know, you ended up impaled in a pine tree for however long it was. I'm going to sell the first aid courses that we run in the academy now because on one of Holly's races last year, the rider in front of her came off his bike and was unconscious on the track in front of her. So she sacrificed her position in the race…noble woman, sacrificed her position so that she could give first aid to this guy on the ground. So first aid, essential for cyclists —

WH: It is. It's essential for everybody but more essential when you're actually doing a sport.

APM: Got a question here. What would you do if Holly had one leg significantly shorter than the other one or any cyclist? I mean we're talking, what, half a centimeter of being a significant difference.

WH: If it's half a centimeter or more, what I would tend to do, I would probably get the cleat off the shoe and actually put 50% or a third of the leg length difference between the shoe and the cleat. A lot of people put it in the shoe and it's not the shoe that it's actually on. What you're going to do in the shoe is actually push the foot upwards. If it's in the cleat then it actually gives that extra length in it and that tends to help.

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APM: And there is a good rule of thumb, isn't it? That you don't correct more than 50% of the leg length difference.

WH: Correct, yeah.

APM: Leading on from that, if you have somebody…now, I quite like the business of gait analysis myself a lot of gait problems come from the rear foot but equally, there are a lot of undiagnosed problems coming from the forefoot, particularly forefoot varus. If you've got an athlete with a forefoot varus and they're cycling with their forefoot rigidly fixed to the cleat and it's not corrected, presumably, you're going to start getting knee pain, are you?

WH: You're going to start getting knee pain and possibly hip pain and certainly, some gluteal pain as well.

APM: Gluteal pain as well, OK. When you straighten the leg, the twist is going to go through the whole leg as well —

WH: Yes and also the…so the hip flexor muscle is more important because if you're not in the correct plane, at the foot or the bottom of the pedal stroke and also, at the top of the pedal stroke…because if you've got fixed cleats, as you move upwards, it's your hip flexor that pulls the bike…the foot back up and that can actually cause lumbar pain as well.

APM: So how are you going to correct that? That's the time for, presumably, some sort of correction in the shoe or would you put a shim in the cleats there as well?

WH: I would put a shim actually just in the cleat here but make sure that this is set up correctly before you actually put a lift in there. Also, what you've got to do…cycling shoes tend to be quite narrow or quite compact and they tend to strap and all sorts of silly things, really, to keep the foot immobile, really. If somebody's got a forefoot varus and they're trying to move it which a lot of them do, is that you tend to find that it probably rocks it slightly. So what you've got to do, you've got to try…a lot of people tend to get cleats with a slightly little bit of movement in, OK, which sometimes helps that but if you haven't got that problem then stick to the fixed cleats because the fixed cleats don't…sorry, the variable movement cleats tend to cause more knee pains if you've not got a problem to start with.

APM: So who's more likely to have variable movement, variable cleats? Is that going to be the amateur or the —

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WH: Yeah, it's more the amateur because they tend to sometimes not get the bike set up correctly and also, they tend to not take any notice of aches and pains to start with until it becomes more serious. In fact, I had a young man stop me in the street yesterday when I was walking around to work and he said… "Warren," he says. I said, "Yes, hello, David." He said, "I can remember when I came in with my bike about five years ago." He says, "And you set my position up and you set my shoe plates up." Well, David actually has a club foot on his right foot. So we had to sort of really start to work out how to do his cleat and his feet problem to start with and then we started to work his way up and after probably six months, he actually went and won his first race.

APM: Fantastic.

WH: It took a little while for us to do that but we did padding. We got some more orthotics made for him that went in but we also altered the way that his foot sat on the pedal as well.

APM: And if you get a patient who comes to your clinic who has back pain, at what stage do you start thinking, "This could be the bike that's the problem," and not just the —

WH: Well, just taking history which we all do, hopefully, and listen to what the

person's saying and if possible, if I know it's a cycling…if I know he's a cyclist or a runner then they complain of a back pain, if they say they get it while they're actually competing or they're getting it soon after they've competed then I want to look at the equipment, the bike or the shoes or both and then we could start to solve it out and see what's happening with that.

APM: And do you think that's something that's within the scope of the average osteopath, chiropractor, sports therapist or do they really need to come and see someone with years of experience like yourself?

WH: I think most osteopaths know how to look at a person via mechanically. The only difference is that when you're looking at someone, a cyclist is that you've got to take into consideration that there's a part of that biomechanics and that's what the bike is and the easiest way is to just actually get them in the bike and just let them sit on it and just turn the pedals backwards. If you haven't got a rack like this to actually put them on. Just get them to turn the pedals backwards and you just have to see it in reverse and just repeat it backwards and you tend to find that works just as well.

APM: Now, when I…as a very young chap, my parents were buying me bikes. They would say, "Your knees got to be slightly bent at the bottom of the crank," and I guess they didn't care much what it was like at the top but you're saying it's 90 degrees at the top of the —

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WH: More or less, yes.

APM: When the pedal's vertical and then it's going to be few degrees —

WH: Yes, it's about 35 to 40 degrees sort of back movement at the back —

APM: And that's with the ball of the foot carefully —

WH: Yeah, yeah..

APM: So that's reasonably straightforward.

WH: Another thing, another good guide for your saddle height is that if you stand on your bike…if you sit on your bike holding your handlebars, the shoe, when you're standing, a lot of people think you should be able to put your foot flat on the floor like that. You don't. You just have to perch it on your toe and that's —

APM: When you're sat on the saddle.

WH: When you're sat on the saddle. Both feet, OK, and that tends to be a good way to actually judge somebody's —

APM: Well, I don't want to draw attention to this yet again but Holly definitely has two very short legs and there's no way, on that mountain bike, she can sit on that saddle with her toes on the floor. I think she needs a box to get on to it.

WH: I bet she can.

APM: Holly, your back on. Come on. Let's have a look at this because this is a challenge.

WH: But you have to take it off the stand.

APM: We can manage that. That's it. OK, so while she's —

WH: I mean that —

APM: While she's putting her shoes on, we're talking about back pain. If you're going to look at someone on their bike, you're going to need to check the reach is set up. The average osteopath isn't going to be able to say, "Well, you need to extend the handlebars or move the saddle," because they're not going to know what's correct form, are they?

WH: No.

APM: So is that the point to say, "Here's the best cycling shop I know nearby and I know that they know how to set people up"?

Transcript

WH: Yes.

APM: Do all bike shops know how to do that?

WH: The good ones are where you get the really good bikes. Probably the best ones to go to are the individual bike shops, not the conglomerate ones unless they've actually got a very good cyclist in them which a lot of them, funnily enough, sometimes, these days, tend to. You got to find out which is the best way.

APM: I'm always a little bit skeptical about this as there are running shops and they'll claim to do gait analysis but actually, what they'll do is watch you walk up and down on the carpet and tell you need the custom insoles. And I suspect that if you went to the average cycle shop, they would claim to be able to set you up on your bike. Is there a way of knowing who's good at it and who's not?

WH: Ask around. That's the best thing to do. If you're not sure…if you live in a fairly biggish town, somebody somewhere will know a good cycle shop and that's the best way to —

APM: It's word of mouth, as always —

WH: It's word of mouth.

APM: It's the Holly challenge. I'm going to get out of the shot so that you can tell me whether Holly's got this bike —

WH: Look at it, she needs a box to get on it. She really does. We'll take it off the stand, Holly then we won't…

HOLLY: I know I'm not going to be able to.

WH: I've got you. You're not going anywhere. See, that seat is actually slightly too high. Simple as that. I bet —

APM: Is that the height that you would normally race at, Holly?

HOLLY: Yeah.

APM: And you feel comfortable on that height and the cranks are the right length for you. So actually, the only problem is —

WH: But once again, you see, you actually have to take…this is right for this but also, don't forget that she's got two and a half inches of tire there compared to the road bike and that's the big difference. If you look at Holly's ilium here, it's literally the size of the tire from off the seat and that's what the difference is.

Transcript

APM: But you've also got very large wheels on that bike. Is that meant for that frame or —

HOLLY: They're the same but there's three different sizes for mountain bikes. So it varies.

WH: This is not too far up. The only trouble is that she has further to fall if she falls.

APM: Well, she does with regularity, I can assure you.

WH: I'll let you put that up on the —

APM: Put it over there, Holly. Other way. We can always get back —

WH: Yeah.

APM: So some of these questions have been coming in from the audience. We may need Holly again for this but if you get a…not even a casual distance cyclist, a recreational cyclist, you just get someone who uses a bike to get from A to B, would you go to the lengths of telling them how to set their bike up properly? Presuming they're only coming to you because they're a patient anyway, so

therefore, they have something wrong.

WH: Unless it's specifically…the problem is specific to when they're actually cycling, say, to and from work or going to the shops or whatever they're using the bike for then I'll probably not but I would ask them, you know, "When do you get the problem? Do you get the problem after you've been on the bike?" If you know that they cycle…I mean some people don't tell you that they cycle to the shops, actually. So no, I probably wouldn't but you still…if they want you to then just have a quick look at it. It's quite easy to do, really.

APM: Does the fact that they get pain or injuries when they're cycling… so in reverse to what it is that might be causing the problem in the first place, if that makes any sense.

WH: Yeah.

APM: It does. Give us some example then.

WH: You tend to find…if people get a knee problem, OK, you tend to find it's either a bent pedal or a cleat that's wrong or the saddle height is incorrect. It's as simple as that. So you look at all those three. You might find…the first place I would actually look is probably the cleat. If he's a recreational cyclist who hasn't got…who's just got pedals on then I would say what to do and they're actually riding in normal shoes and they're pushing the pedal right up to the heel of the shoe. So they're actually not using the pedal correctly and that's something that you got to look at.

Transcript

APM: What would you do with those? I mean would you say to get…I mean what we used to use was toe clips, wasn't it? Rather than cleats —

WH: You can get little plastic toe clips but you don't put straps in and your feet just slip in them. So you're not actually strapped in to the bike. You're not fixed to the bike but you can just take your feet out of them. They actually keep you in the correct position.

APM: A lot of people would find cleats quite I would say dangerous to use as well because I don't know anybody who hasn't tried cleats for the first time and not fallen off when they stop at the traffic lights and forget they can't get the foot out quickly but again…so presumably, if you get a patient that you think is doing that then you're going to say, "Well, try this but you got to exercise a bit of caution as well"?

WH: Don't forget that the pedal, the pressure on the…keeps the cleat locked to the pedal is actually adjustable. You tend to find that most cyclists tend to…certainly, racing cyclists, tend to actually have them quite tight so that when they pull in backwards, the foot doesn't come out but also, what you tend to find, when they

come off, the idea of them coming off is that they land and the bike goes away from them. That's the idea. Just like a ski binding, really. You know, the tighter you have the binding, the less chance you've got of that but also, you've got to also think back and recall that if the foot is actually static, if there is a movement and there is a problem then it's got to transfer to somewhere else and the first place I would look is the knee or the hip or the low back.

APM: So that leads us into sort of types of injuries that you get and I know that, you know…you can say knee and back but there are specific injuries on the knee that might arise through different setup on the bike, presumably?

WH: Yeah.

APM: Such as?

WH: Well, if your reach is incorrect, what tends to happen…when the pedal is horizontal, horizontal plate, if your knee is too far forward or too far back, you'll get patellofemoral knee pain because of the position of the knee. So what you've got to do is actually just get that slightly back, just put the seat backward or forward and just see which is most comfortable. A lot of people say, "Well, you should put the seat up a couple of centimeters," but that…I've never actually ever done that because it just alters the posture on the bike too much. The best thing to do is just move the seat forward or backwards, about half a centimeter or a centimeter. You tend to find that that works quite well but also, just go on to lower gears just for a short while and just treat it as, basically, a normal knee pain and you tend to find that more…plenty of stretching, plenty of ice and…

Transcript

APM: Other knee injuries?

WH: Other than traumatic ones like a torn meniscus and things like that, no, not really. You tend to find the TFL down the outside of the tibia band sometimes can cause a problem but that's more the way the cleats is set up which twisted the foot inward or outwards and that tends to cause the problem as well.

APM: And again, I'm coming back to the fact that you deal with some people who do cycling seriously. It surprises me that you would see people. You'd think it would be obvious to them if their cleats aren't set up properly but clearly, these are still mysteries to the cyclist.

WH: Yes, they are. Sometimes they're a mystery to me as well. You know, you can get some people come in and the cleats have been set up by somebody else and they're incorrect. One of the best things I do when I get a pair of shoes…if you actually get hold of the shoe and just get a level and put them on the back of the cleat and stand the shoes actually on something that's level, sometimes you can actually judge which way is out. I mean obviously, this is probably, what, a little bit out because the bubbles aren't right. If I actually move, you see that cleat is

back in center and that one is off. So that shows that the cleat is out and it's just a simple thing just to put a ruler or something like that on the back of the shoe and that tells you if one cleat is further forward than the other without really doing too much scientific looking into it. Then you just got to look at the shape of how they are but also, look at the way that they walk, look at the normal shoes as well. If there's wear on one shoe then you tend to find that shoe is the one that's got the problem as well. So once again, it could be a biomechanical thing which is just getting transferred into the shoes.

APM: Which is a pet issue of mine that runners will come what…with what seems to be a biomechanical problem causing, let's say, knee pain and you can fix that issue with orthotics, perhaps but they won't wear them in their walking shoes. Now, to me, it would seem you're only fixing half the problem if you're letting your cyclist go away without correcting their problem when they're off the bike, yeah, which you'll —

WH: Yes, that is true. Yeah, what I intend to do…I've got a very good podiatrist that I work with and we tend to make some simple orthotics for them. So it puts them in the right plate to start with and also, insoles in cycling shoes, if you do have to wear orthotics, well, you take those outs and put the…make an orthotic that's shaped as a cycling shoe just like —

Transcript

APM: They've very narrow, aren't they?

WH: The cycling shoe isn't flat. It's like that. So you have to get an orthotic that's shaped for for a high-heel, really.9.

APM: We weren't here to talk about orthotics but are you using rigid, semi-rigid or —

WH: I tend to use soft or semi-rigid because when you're riding a bike for 5 or 6 hours, you don't need…your shoes are rigid enough and you need a certain amount of cushioning because if you don't, you start to get Achilles tendon problems as well.

APM: So that surprises me because I can see the need for cushioning when you've got heel strike and therefore, you've got impact coming through the leg. I'm very fond of saying to people, "Cycling is not an impact sports, so therefore, why the cushioning in the shoe." And the heel, of course, is not connected or anything.

WH: You still need to be comfortable. Like I say, the three points that you are sat on the bike are your hands, your backside and your feet and if your feet are uncomfortable in your cycling shoes, you tend to be tight and very restricted. They're different to sort of normal running shoes. Running shoes tend to give a little bit. The foot spreads. In cycling, it can't because it's there to connect to the power. So that energy's got to go somewhere and normally, it goes downwards or upwards as the pedal strike comes in. So if you can get that just to cushion and

make it comfortable then you tend to find that's a lot better.

APM: Do you see more injury as one sort on road bikes than you do on mountain bikes? I mean ignoring the traumatic stuff because you're going to fall off the mountain bikes more often.

WH: Yes because I think there's more people who actually use road bikes compared to mountain bikes.

APM: It's quite trendy though, isn't it? You know, it's a bit like Chelsea tractors in London, you know. It's very trendy for people to have mountain bikes—

WH: It is.

APM: --even if they never go off the garden path.

WH: Yes, exactly, yeah but a lot of people…you get a lot of sort of…how can I put this? People who —

APM: As bluntly as you like.

Transcript

WH: People who cycle long trail lines or trails, things like that, tend to ride in normal shoes or trainers on normal pedals. So they've got that cushioning but when you look at the trainer, the shoe is flat so they tend not to get that problem but what they can do, they can get a lot of Achilles tendon problems from that because when they push down, the back of the shoe goes down because the sole is flexible and that's what causes that.

APM: Which I meant to ask this earlier on, what is the correct action at the ankle when you're cycling because obviously, you can have it completely dorsiflexed as it comes to the top of its stroke.

WH: You shouldn't be. What should happen is that when you push down, because the foot is in that position, it goes down and it should go into that position and then as it gets to halfway, it should actually come —

APM: So it gets plantar flexed to 90 degrees, really.

WH: But some people will actually do dorsiflexion as well. That's just the biomechanics but the best way to do it is actually, at the top, it should be level. So when you get back to about 5 past, you're pushing in that direction and not in that direction which is —

APM: And if they are dorsiflexing, is that…presumably, that's going to cause more calf or Achilles injury, is it?

WH: Yes, exactly.

APM: So it's worth looking at that part of their cycling technique as well. We have a question from the Isle of Man, a practitioner who says they have a number of patients who regularly ride road bikes and they seem to get a lot of, he's putting it in inverted commas, hip pain but I don't know if it is a he because we don't know who the question is from but this resides more in the psoas region. Any ideas what we should be looking for there?

WH: So once again, as the hip flexes, so you've got to look at the saddle position and also, when I say the foot…when you've got the pedals horizontally, just look at where the knee is compared and when they actually come back on the back stroke where the pedal is, if the foot is too far back then they actually can't use the hip flexor properly to actually pull up. So that's —

APM: So they're overstraining it.

WH: So they're overstraining it. They're actually altering the way that the pelvis is tilting on the bike. So if the pelvis is tilted too far forward then the hip flexor doesn't work correctly. If it's back as it should be then you find that that should be fine.

Transcript

APM: When you say —

WH: In fact, we could probably put a slide up for that. If we could go to slide number eight, please.

APM: So when you say the pelvis is tilted normally, you mean that it's in its normal anatomical orientation to the lumbar spine.

WH: Yes. If you look at the slide now, it shows that the pelvis is actually slightly postural. It gives it a round back from the lumbar. So you've lost the curvature of the lumbar spine that's gone kyphotic and also, the thoracic spine has gone kyphotic So therefore, the cervical spine goes lordotic and what tends to happen if you're in that position, the pelvis goes up, backwards like this and it moves forward on to the seat. So you've everything out. So your leg length here tends to alter it, tends to go into a forward position instead of a backward position and that's what tends to happen. OK, now if we actually go into slide number seven, this is the correct posture, the anterior. If you look at the red line that follows a straight line from the glenohumeral joint, it goes all the way through the sacrum and actually finishes, more or less, at the back of the sacrum and that tends to be a straight line and that gives you…tend to give the proper posture. Also, if you look at the degree that the back leg is on the back pedal here with the knee bent, the degree there is approximately about 85 degrees and that's what you got to start looking for and if it isn't then the psoas muscle isn't working correctly. Pulls on to the lumbar spine, as we all know, and then the pelvis starts to rotate because it's

getting tired. You tend to find it's usually just on one side more than the other because people tend to…if the racing cyclist tend to lead off with a leading leg. So that's what we tend to do as well.

APM: So there's a bit of a balancing act there, isn't there? I remember struggling with this when I listened to you talk all those years ago at…on the MSc course. We need a 90-degree bend at the top of the stroke and 85 degrees at the rearmost position.

WH: Rearmost.

APM: Horizontal and that can be altered by the height of the saddle, the length of the crank —

WH: And the placing of the shoe cleat.

APM: And the placing of the shoe cleat. So getting all those —

WH: You got to fiddle around with it a little bit but if you tend to go with the general range of it, you tend to find that that actually fits in quite well. Like I say, this is adaptable, all right. The body tends to work to it and you can alter these quite quickly and not the body. The body tends to be quite a static thing and that's what sometimes happens but the psoas muscle quite easy sometimes, just to rectify.

Transcript

APM: I've got a question from one of our other viewers who…and again, we're probably going to go over stuff that you have covered to your own satisfaction so we less informed practitioners be reinforced. This is about a patient who suffers with chronic back pain and the practitioner has suggested lowering the saddle. Is that the correct approach to this or should we be looking at something a bit more —

WH: I would look more to the…a lot of that, once again, depends on how quickly the back pain is coming on, depends on the time and what sort of training they are doing or racing, OK, because a lot of cyclists do get back pain when they've been sat for a long time. There is certain stretching exercises you can actually do on the bike to relieve that. I'll send you some of those down too. You can have those, OK.

APM: Thank you.

WH: But a lot of it is basically reach. If the reach is incorrect then you'll probably get low back pain, if it's a fatigued sort of back pain.

APM: So we're talking now about moving the saddle, as long as it doesn't alter the angle of the knee—

WH: Correct.

APM: --or increasing the —

WH: The reach, the angle —

APM: The bit on the front of the…what do you call that bit on the front of the…extender, is it?

WH: The extension, yes.

APM: The extension, the thing that moves the handlebars —

WH: Yeah.

APM: Talk about overuse injuries in cyclists then and I know this has nothing, really, to do with cyclists. It has to do with sports generally. I mean I imagine that any cyclist is very reluctant to lay off their sport. How do you identify that it's an overuse injury, not a mechanical maladjustment and what do you do with your patients about that?

Transcript

WH: I always tend to look at overuse injuries, basically, as a mechanical injury, anyway because it's overuse of something incorrect that's actually caused the problem. So what we tend to do is…I tend to treat them as a normal…let's say if it's a knee problem, overuse knee problem. Find out where the discomfort is, OK, and just let them step back a little bit, treat them as you would do normally a normal knee injury. I always say there's no difference between a nice old lady walking down the street who hurts her knee to an athlete that hurts his knee. It's just that we put sports in the front of it.

APM: It's an injury —

WH: It's an injury. It's the same injury. It's just that sportsman tend to think it's more traumatic and they want to get back quicker. So what you got to do, you got to taking ladders and making sure that they're actually physically fit to actually carry on. So what I would do is look at moving the training back a little bit, going into lower gears and try and keep them riding as much as possible. If the rider say for two and a half hours a day is to cut it down, say, an hour to start with and then just step it up by 10% over a certain length of time until they feel fit enough to do it and that's one of the best ways to deal with —

APM: I suppose with cycling, it only just occurred to me, you have…there's a slight advantage in recommending that, isn't it? Because when you say to a rugby player, "Just train at 80%," they never can or a soccer player because they're always going to lunge for that ball or dodge that attack whereas with a cyclist, if they're not actually racing, they can back off. They can measure their speed or

their power on the bike's computers —

WH: I tend to find that people with injuries, if they step back properly and look at what's caused the injury and get it treated correctly and get a step ladder fitness program back in place, they tend not to lose that much fitness if it's over a short period of time. What I mean a short of period of time is in between 3 to 4 weeks. I always try and get most of my sports people back to competing the sport, if I can, within 3 to 4 weeks. That's my aim and they tend to do that but you always get somebody who doesn't listen to you. So you've just got to be a little bit careful. Going back to a rugby player, I had one in a few weeks ago who had hurt his back and I gave him some back exercises to do and I said, "I just want you to do five of these twice a day," and he came back four days later and he said, "My back's worse." And I said, "Why?" He said, "Well, I've been doing your exercises." I said, "Well, they shouldn't have caused it to be worse." He says, "Well, I didn't think five twice a day was any good. So I've been doing 150." I'm not decrying rugby players but that's the sort of —

APM: Well, I think you should. Was he a forward, by any chance?

WH: Yes.

APM: I could speak. I used to be a forward —

Transcript

WH: So you've just to be careful on how you set it out. Be specific and that's one of the better ways to actually get is a laddered fitness program and they're quite easy to do. There's quite a few…if you go on the Internet, there's a quite a few for different sports and you just put them in and they'll just download and you can set them out to whatever you want. That's the easiest way.

APM: Saying that, I mean cycling has…as far as I know, has taken off enormously in popularity with Britain's success in the Tour de France and the Olympics and so on. So therefore, there is potentially a lot of useful joint activity to be had with local cycling clubs or cycling coaches and so on. Is that an avenue you would recommend to practitioners…I won't be so callous to say looking for business but if you don't know a lot about cycling already, is it a useful avenue to get on? Does it take years of dedicated practice to become good at it?

WH: No, it doesn't, actually. If you go on the national coaching scheme, they have a list of coaches for all the different sports in your area. If there wasn't one, they'll probably find you one or if you know anybody, say, in the local athletics club or running club or boxing club, whatever you want to specialize in, they will tell where to go, OK, or they'll be able to advise you. And also, people like British Cycling, the Amateur Athletics Association, they all tend to have their own little programs already set for things like that and they tend to be one of the better ways. When I've been cycling since I was probably about 18 months old…my mother and father were cyclists so it's within the blood. So it's always been that

way but there are times when I get a problem. I don't know what I'm doing. So I actually usually referred people to the British Cycling Federation doctor in Manchester and they tend to…no matter where you are in the country, they'll find somebody, a specialist that will actually be able to cope with that and do it that way and that's sometimes the better way. You get into this chain and this link of different therapists helping people out and that's one of the best ways to do it.

APM: And in terms of other sports, I know we're talking…I know the risk of offending our cycling viewers. You're also quite heavily involved with golf, aren't you? You lecture to PGA…I'm out of my depth here but various PGA associations around the country?

WH: Yes, I do. Yes.

APM: And how do you find the difference in any approach to the sport and the types of injuries that you get?

WH: I tend to find a lot of amateur golfers don't warm-up. They tend not to…they just get the clubs out of the car, put the shoes on and walk up to the first tee and expect to it a 230 or 250-yard ball and then they wonder why they've got a back or they've got bad shoulders or something like that. Cyclists, when they're racing, tend to warm-up correctly. If you look at the Tour de France and the bigger races, most of them are on turbo trainers like Hollie's road bike is and they tend to warm-up. I mean when I was racing, if I was racing, say, at 25-mile time trial, I'll probably ride around the course to know the course, know where we're going but also, probably the last 5 or 6 miles will be done at 80%. The first lot would be done at about 60% then 80% and that's how you get warmed up and then do your stretching. A lot of people call it stretching. I don't agree with that. I think they should warm-up properly then do your stretching.

Transcript

APM: Well, we're going to challenge you now. We're going to challenge our own thinking now because I know you know Eyal Lederman and we actually…only a couple days ago, we're running a course on stretching with Eyal Lederman who, for those who don't know him, has a PhD in physiotherapy and is also an osteopath and has a terrier-like approach to digging out all the research he possibly can on every subject to do with physical therapy and I've always trusted his research and his advice that actually stretching, whether dynamic or static…cold or, well cold is definitely bad, but stretching doesn't make any difference at all in terms of performance and I was staggered on Sunday when he said, "Actually, warming up makes no difference at all either," and he gave a wonderful example of how lions don't stretch in the morning before they chase after their gazelles and…where's your research on stretching and warming up?

WH: That's lions. We're not lions. We're human beings.

APM: Well, indeed but the tissues and the physiology is not vastly different.

WH: Yes, I know. I've always agreed on stretching. I mean I can remember going over to East Germany when East Germany was the big cycling nation and there was a sprinter, a track sprinter and he was a mountain. He was 6 foot 4 and weighed about 15 or 16 stone of solid muscle and he could actually stand and put his head, top of his head onto the floor between his knees and he had that flexibility and that's why he was world champion about 10 times at sprinting and that didn't affect his power but it gave him that ability to actually be injury-free and perform to the best of his ability on the bike.

APM: It is an interesting approach though, isn't it? I mean because Eyal is quite adamant about this. In his defense. He doesn't need defending but he did say that the research does not show any advantage from stretching or from warming up except, very definitely, a psychological benefit because if that's what you think you need to do then if you don't do it, you won't perform as well.

WH: I always used to…I mean I stretch or used to stretch when I was competing but I'm not the most stretchable person. Cyclists tend to have very short hamstrings because of the way that you're at. A lot of cyclists, up until the early '80s, never used to stretch. It was only when British Cycling is now…brought people like myself and a few others in, a couple of physiotherapists that we started doing stretching exercises and from the…when you start looking at the people that when…what we did, we did a placebo sort of effect with people who didn't stretch, somebody who did dynamic stretching and somebody who just did passive stretching where they just move the part, OK, and we tend to find that the people who did the passive stretching, when they were actually on turbo trainers, actually their performance rate went up and the fatigue actually went down. So that was a lot better and that's what we found. We did that at Salford University.

Transcript

APM: That's fascinating stuff and this argument will probably go on. This debate will go on for a long time because Eyal would argue he's got the research behind him but let's face it, Britain's doing bloody well in cycling. So what you've been teaching and what you've been encouraging to do is clearly part of the successful regime that they're following. You mentioned a moment ago…and we'll come back to golf as well but you mentioned a moment ago turbo trainers or static bikes. How much of what you've said applies to those? Because I should imagine that most non-cyclists, going to the gym to do spinning or using the bikes in the gym will just take the thing as it is, adjust the saddle height slightly and that's all they've got to play with. Do you see injuries? Do you imagine their injuries coming about because of that?

WH: Yeah. If you're not a cyclist and you're going into a gym on a spinning class, what you tend…one of the best ways to actually judge how to set your seat height up, the length to…the reach tends not to be a problem on spinning because you're on for a short while, OK, but the saddle length is the more important. If you actually sit on the bike and put your heel on the pedal when the pedal is at the

bottom of its stroke, your leg should just be straight. Not strange straight but it should be comfortably straight and that's actually the best way to do your saddle height and tends to reduce injuries but once again, you tend to find in a lot of gyms, they will do a spinning class but they will also do stretching afterwards, if you wish to and that's what I agree with because it does help get rid of the lactic acid, etcetera, etcetera that collects in muscles.

APM: And what about those patients…I'm sorry, I should say these are coming from viewers, these questions. They are not my invention. What about those patients who go from road cycling in the summer months to the gyms in the winter? Is there a crossover between those two types of training? Is there a value in it or are they setting themselves up for injury by training in one way and then changing their activity?

WH: Now, as long as…I mean I used to go into the gym in the winter, basically, to build my upper body up because cyclists tend not to have a stronger —

APM: They don't need one, do they?

WH: They do, actually. You'd be surprised how much pressure you put through your handlebars when you're climbing up the hill. It also depends on how much pressure you put on the brake when you're going down the hill as well but the advantage of going in, it also gives you something to do and keep your general fitness up when you can't get out on the bike in the winter but what you've got to remember is that when you start training again on the road and you start racing again, any fitness or strength that you've gained from doing gym work actually disappears within the first 3 to 4 weeks of that thing, if you don't keep yourself. I used to go once a week in…all the way through the racing season in the summer just to do gym work and that actually helped me quite considerably and I found that was a lot better to do. It also gives you a break from riding the bike.

Transcript

APM: Well, I have often thought though, when I'm out on my own bike, particularly cycling into the wind which is so common around here and I'm sure, at where you are, actually, the ideal physique for a cyclist is a pencil-thin upper body and massive thighs and calves, isn't it? Because then you've got no wind resistance but lots of power.

WH: And no hair.

APM: And no hair, yeah. Well, I'm OK there.

WH: Yeah —

APM: So building up your lats, you know, build up some wings to catch the wind —

WH: But you don't really need to do…it's not a power training that you do in the

winter. It's just as simple as to keep that fitness, to keep your heart rate going, you know. There's only track men like Chris Hoy and people like that, the sprinters who need to build that big a power up because there's no wind on the track, you know. The only wind you get is from the —

APM: Is your own.

WH: So they tend to be big, heavy lads.

APM: We did have a question a long time ago, actually, from somebody in Italy who pointed out that they've got rather more hills there than we're used to and they want to know is the setup different for riding on hills, getting back to setting up the bike, as opposed to riding on the flat? And I think you talked about saddle angles early on.

WH: Yes, you tend to find that…if you look at the track bike, look at a pursuit bike or a sprinter's bike on the track, the seat tends to be slightly forward because they're sending the power further round because there tends to be a fixed wheel. So the pedal comes around, anyway. All right, on a gear bike, it tends not to. It tends to be a free one. So what you've got to do, you got to start working out differently. The more it comes to a position you are on the hill is to actually…is to bring your seat back slightly so you're sat more over the back where it makes you more stable when you're climbing. Also, it makes it more stable when you're actually going down the hill as well because it alters the center of gravity of the bike.

Transcript

APM: But we're talking small distances here —

WH: You're talking about half a centimeter or a centimeter. It's not a big amount.

APM: And when you say adjusting by half a centimeter and you're starting with the saddle in the middle, when it's fixed up as —

WH: You tend to find that on most cycle frames here now, they tend to have measurements. That's what I see but they tend to have one…those usually start up with 0 and then it's marked about 1 ½ centimeters that way and 1 ½ centimeters that way. So what you do, you start off with it in the center and then you move it forward or backwards, whichever way you wish it but if you go up into the mountains, if you go up into the Alps or the Dolomites in Italy, you tend to find that most people actually have the seat backwards or certainly more to the rear of the bike and that tends to be a lot better.

APM: So we're getting lost in all these questions that have come in a moment ago, we talked about, again, the more recreational user. It was about the use of panniers on a bike. If you're going to carry luggage on a bike, you're touring, do you recommend panniers on one side, both sides, rucksacks, baskets over the front? What's the ideal situation?

WH: I always recommend panniers and you need two, one on either side to balance and actually front of…the best place to put them if you're not carrying too much stuff is actually on the front wheel because you've got more control of the bike with the weight on the front than the back, OK, but if you're going to for a long one, you need four but never ride with one pannier because it just alters the balance and you tend to find that you lean one way than the other but you'll always have two and try and even the weight into that as well.

APM: And rucksacks? Bad idea?

WH: Yes.

APM: I thought you were going to say that. I thought I better check.

WH: When you're riding a bike, if you're in that forward position…you're not so bad if you're a recreational cyclist because you're more upright. They're not too bad, as long as you're not doing it for too long a distance. I mean if you're just going down to a local shop and riding back again or, let's say, anything up to about 5 to 6 miles, it shouldn't cause a problem but if you're in that more racing position or a mountain bike position, you don't want a heavy rucksack on your back. You've got to start supporting it with your arms and that causes problems.

Transcript

APM: Going back to the hills again, and I'm fleeting around as the questions come in, I've often wondered about this in terms of not just comfort but also efficiency, the business of standing on the pedals when you're going up a slope. Is that something to be avoided if you want to maintain efficiency or do you need to do it to get a break from a sitting position or —

WH: If you don't actually know how to ride a bike…when people get out the seat to actually stand up on the pedals, if they don't push down at the correct moment, the bike actually moves back about half a meter. So in theory, you're actually losing momentum.

APM: So you mean it's not going as far forward as it should, rather going backwards.

WH: Well, it's going backwards most of the time so you lose momentum. So you've got to build that momentum back up again. That's the idea of gears is to actually try and keep an optimum revs per minute and the optimum rev per minute is around about 18 revs per minute. That's why you have the gears to try and keep that rev exactly the same no matter what terrain you're actually riding.

APM: I shall have to get a rev counter on my bike's computer then, just to keep me going —

WH: Well, sometimes they do have them.

APM: Not on the one I've got, I'm afraid.

WH: But everybody has a different rev or pedal rate, you know. I've never been somebody who's got a fast pedal rate because my thighs are too big. So I've not got the fast twitch because it tends to be a mixed one —

APM: So you should stay in the seat if you can and keep the —

WH: Stay in the seat if you can because you keep the drive more and think…but sometimes, you need to get out and just stretch your back sometimes because actually going uphill is actually hard work. It is for me anyway. So sometimes, yes…if you get to a point where the gears can't make it then you sometimes have to need that extra force —

APM: It always puzzles me as well. Now, Holly's solved this problem on one of her bikes because I can never work out what the correct sequence of gears is. I've got three chain sets at the front and seven or so at the back. What sequence should they go in to be a proper progression? Well, she's got one tiny one on the front and about 13 at the back which makes it nice and easy. Is there a simple solution to this? Can you go from —

Transcript

WH: Smaller at the front and the bigger at the back is the lower gears.

APM: But can you go straight from small at the front and big at the back to the next one up and down to the small…is that a progression, a sequential progression?

WH: It is and it isn't. A lot of it depends on what terrain you're on. A lot of it depends on what gear you're actually using and a lot of it depends on how much bend you've actually got in the chain.

APM: Well, that puzzled me when I saw the range that Holly's got on her bike. I was amazed that a chain could, A, bend that far without coming off the chain set and also, still maintain its efficiency without —

WH: Well, if you look at the new bikes, newer bikes like this and the mountain bike, tend to have what they call micro gears on where…the bikes that I tend to have tend to have the three 30-second chain count but the micro ones tend to have a little bit more flexibility but they still have that rigidity. So you tend to find that but yes, you can use it. You see a lot of people going around town shopping and they've got gears and they tend to be on the biggest outside ring and the smallest cog because —

APM: And they've got flat tires as well.

WH: And you've got flat tires and they tend to cycle very, very slowly and you think

that's actually doing them more good but it isn't. It's harder. So if they actually just dropped 2, 3 cogs at the back and 1 into the center, you might find it actually makes it easy —

APM: Well, there is a theory in this, isn't there? That actually buying an umpteen thousand pound road bike like Hollie's here is less good for your fitness than using the same old rusty one you've had all year because you get more work out of it quicker if you've got an old rusty bike.

WH: No, you don't.

APM: All right. You don't sell bikes as well for a living, do you?

WH: Psychologically as well, a new bike is —

APM: It does make a difference than the…yeah.

WH: I've actually got a new one on order. I'm picking it up next Thursday.

APM: You're going back to competing, are you?

WH: No. This is a nice pre-1987 bike and it's actually made for the Eroica Britannia which is held at Bakewell every year in June, three-day event and the bike and the equipment has got to be pre-1987. So there's no hidden cables and things like that and the gear change has to be down here, etcetera and I've just spent a fortune on it.

Transcript

APM: I won't ask why.

APM: So we've got a bit of time left. There's some questions coming here. This person said that they have patients with neck pain connected to cycling. Do you think that's somebody that can be corrected?

WH: Yes. That tends to be, once again, the pelvic tilt here because it's —

APM: So not saddle height but pelvic tilt.

WH: It's the pelvic tilt and it's the reach because if the flatter you are, the more you have to put your head up to look and also, once again, it's also the width of the bars.

APM: Really?

WH: Yeah because if your arms are further out, you tend to be in that position. You

tend to be in a swan diving position than actually a cycling position and that tends to be the biggest problem with that.

APM: And a question, really, out of interest rather than suggesting we shouldn't do this but do you think helmets aggravate neck pain?

WH: No. I'd rather have an aggravated neck than a fractured skull.

APM: And I think the person asking the question made that point but do you think they aggravate the pain? I mean —

WH: No. They're too light I think to…I mean my helmet probably weighs more than the cap that I wear for playing golf. The cap that I play golf in actually probably weighs more than my helmet.

APM: That's what you meant.

WH: That's what I meant, sorry but, you know, if I'm out on the bike, if this saves my life then that's all that matters, you know. Neck pain is caused usually by position and it tends to be that the neck has got into a bigger lordosis curvature than what it should be and that's usually because either they're stretching too far or the handlebars are too wide. If your handlebars are too wide then you automatically lose that stretch. You have to stretch further. The handlebars should be measured from here to here, across your chest and that's how your handlebars should be. Your brake hoods on there should actually be the same width as your bars.

Transcript

APM: This is an interesting question, actually, about the difference between men's bikes and women's bikes. Now, in the old days, it was easy. One had a crossbar and one didn't well I'm buggered if I know why Holly's mountain bike is a ladies' bike as opposed to a man's bike. Does it make a difference? Should women only ride women-specific bikes?

WH: No.

APM: So it doesn't make a difference.

WH: No.

APM: But you told me that the angles, I think, were different or Holly said the angles different on her bike.

WH: Well, they are on the mountain bike compared to the road bike because you need a longer wheel base on a mountain bike to absorb the shock. All right, the only difference with Holly's bike, mountain bike is it's got a curved tube. Normally, on a man's bike, it's like this and it comes down to here. So the diamond is a slightly different shape. Most bikes are still the diamond shape. That's the best way they'll

ever be.

APM: So why would they make it different on women's bike? Especially since the tube is so far from —

WH: The idea really is because ladies and women years and years ago used to cycle in skirts.

APM: But we don't now, do we?

WH: No —

APM: And we're on a mountain bike these days. So a man's bike is fine for a woman as long as it's the right size —

WH: As long as it's the right size, yes. It's more rigid as well. It's the rigidity of the bike that actually transfers your pedal into the gears and onto the road.

APM: I'm not sure I have any clue about this one. Are isometric exercises better than isotonic for cyclists? That's a tricky one —

WH: That's a tricky one. That's one I'll answer when I've got…no. I'll try and answer that one now. It depends on what you're trying to achieve. If you've got muscle loss through an injury then I always advise people to do isometrics to get the tone back. A lot of people try to put strength into muscle before the muscle is ready. I always say to people, "Let's put the tone back into the muscle first and then build the strength up," and that's the best way to do it and I find that isometric exercises is a lot better to do that, in my opinion, that is. I don't know what the scientific side of that is.

Transcript

APM: It occurs to me that if you're training for cycling, the best exercise is to be cycling but reduce the output or the distance or the times that you're minimizing the strain on the muscles because…again, I keep mentioning Eyal Lederman but he says the only exercise you should do to train for a sport is the sport itself.

WH: Correct.

APM: Because nothing else translates to it. In fact, he even says, and I know your opinion on this, that mountain biking…if you train on a mountain bike, your skill there doesn't translate to a skill on a road bike.

WH: The skill that you attain on a mountain bike is actually being able to actually ride the bike and be able to get out of movements quicker. Your reactions are quicker but also, what you've got to think about is that when you're riding the bike, a mountain bike, you tend to be looking or you should be looking 10 to 50 yards…sorry, 50 yards to 100 yards in front of you so you know where you're

going. On the road, it doesn't really matter. You only have to look at about 20, 30 yards in front of you and if you're in a group, you're looking at probably two wheels in front of you. If you're in a bunch of 150 riders, all your bothered about is this little cocoon of riders around you. So that's what you tend to but riding the mountain bike does help the reaction if something goes wrong a lot quicker. So the skills on a mountain bike can relate back to the road bike and vice versa.

APM: This question came in a long time ago, actually, and it was about Holly's shoes and the fact that she's got a different of set of shoes for mountain bike as opposed to a road bike and I know you mentioned something about the depth of the cleats on them. In fact, actually, there were threads as deep as the cleats so she could walk on those but is there any difference in the setup of those cleats or shoes for the bike as opposed to —

WH: No, they're exactly the same. They're exactly the same. The only difference is that on the mountain bike shoe, because the pedal is narrower, you've got less platform to actually put the cleat in and that's why the cleat is smaller.

APM: Are they always narrower on mountain —

WH: Most of the time, yes. Originally, they weren't. They used to just put normal road pedals on years and years ago. You use to wear toe clips and straps on a mountain bike. So the pedal was literally a road pedal and this is one reason…I think it was Shimano that first brought those SPDs in the mountain bikes and they're a small pedal and the idea is to give you that clearance but also be able to…and also, a lot of them are double sided. So if you do have to clip your foot out, you can put it back in on the other side and that won't cause a problem.

Transcript

APM: Whichever way it comes, yeah.

WH: Whichever way it comes where on the road bike, they're not they to be one sided.

APM: Why?

WH: Because you don't need to take your foot out that often. It's as simple that. You're not putting your foot down to go around the corner on a road bike but you do sometimes. It just depends where you are.

APM: I'm just thinking of myself. I take my foot out when I get to traffic lights and corners and things like that but competitively, you don't do that too often. This question's going back to the handlebar height. Would you ever alter the height of the handlebars for a patient for…a person who comes to the clinic for any reason other than that they were not the correct setup for the bike? So is there a position which might alleviate certain pains or for certain types of —

WH: Yes, I would but if you go…I mean if you look at Holly's seat here to the…it's

more or less level and that's sort of the modern thinking now. A lot of handlebar extensions or stems tend, sometimes, to go upwards as well but that's the modern way of thinking it. It tends to put you in a slightly straighter position but if they do that, it shortens the reach. So it swings around about but if somebody's suffering with neck pain or shoulder pain then I would probably put it probably by just a centimeter at a time until it helps but once again, I would also look at the width of the handlebars as well because some people ride with too narrow bars and some people ride with…the idea is basically…like I say, is to get the shoulder width and that tends to help as well.

APM: I distracted you with a bit of golf earlier on. I'd like to go back to that because while we've got you here and since you are a bit of an expert, your MSc is in sports injuries and therapy, isn't it?

WH: It is, yes.

APM: So tell us a bit about what you see from golf. We've got just a few minutes left before we close.

WH: Well, everybody thinks golf is a one-sided sport —

APM: I did. I'm wrong, am I?

Transcript

WH: You're wrong. Well, if you look at the natural swing, your swing starts…if you're right-handed, starts to your right side and comes through and hits the ball and then carries on and goes up to the left-hand side. So —

APM: But most of the power is in one direction, isn't it?

WH: Most of the power is in one direction but the posture isn't. The posture comes through. Now, if you look at people like Ernie Els…Ernie Els plays in the old style of stance, etcetera and keeps his spine fairly straight all the way through. Look at McIlroy, he's got the C spine so it helps him get the ball further but you get more injuries with it because when he gets through to this part, he's going to start straightening his spine and sometimes the reaction isn't that quick. Now, if you think of a normal golfer, when they stand and they have…when they start the backswing, they move this pelvis, they move the left hip out the way. A normal golfer takes about 1.96 seconds to move that. McIlroy's movement is in 0.6 of a second. So that's why he hits it further and that's why he's got a bigger follow through and that's one reason why, when people play golf, that if they start getting back problems, it's because they're going into this C shape or they go in hunchback over the ball and the spine to a certain extent, once again, like on the setup on the bike, has to be fairly straight when you stood over the ball.

APM: A golfer's easier to treat than a cyclist?

WH: No, they're both the same.

APM: Golfer's got more money though, don't they?

WH: Not necessarily.

APM: Now, we've got a couple of minutes left and we've actually…somebody's actually said, "Can you demonstrate the setup of the bike again?" And I don't think it's going to eat too much into our time. So if we get Holly back into her road shoes again, would you quickly run through that setup for us?

WH: Yes. No problem.

APM: So this is you setting up a cyclist, from scratch, on their bike presumably for competition, at least in Holly's case.

WH: One of the first things you've got to be careful of is to make sure that this is level, OK, which it isn't but we haven't got anything to adjust it with and Holly's just got this bike so it's not been set up for her correctly but it's not too far off. OK. So if we actually look at the saddle height, it's the leg length plus the shoe length, OK, give or minus 0.75 centimeters.

Transcript

APM: And that's from the bottom of the strokes to the top of the stem.

WH: Yeah, to the…it's from here to there, OK, not the front of the pedal and that's got to be vertical. OK, right. Another way you can actually measure the reach, the old method is that if you put your elbow…it's probably too big for me. Put your elbow on the front of the seat, like that, in that position and you should be about 7 to 8 centimeters back off the handlebars.

APM: Seven and two-eighths.

WH: Seven to eight —

APM: Seven to eight. You could be very precise there.

WH: So to a certain extent, this is too short for me, OK. So my handlebars would be probably around about there.

APM: Holly, stick your elbow on there. Let's see if it's…if that rule works for you.

WH: Just put it a bit more…that's it. Yeah, it's about right though. Yeah, it's about perfect.

APM: So you haven't wasted your money on this bike —

WH: You're not wasting money, OK. Jump off, Holly. If you just pedal a few revs for me, OK. Look at the setup again. If you go down on to your drops for me, OK. There's 3 or 4 positions on the drops, one, where Holly is now, one further up in the bars, so if you just move up to there and then you can actually move even further, so to there as well. So you've got three sort of aerodynamic positions on the drops but if you notice, this alters, you notice how her back has actually gotten more round but she only can do that for a short period of time. So you tend to find, after awhile, she'll probably come back to the neutral position which is at the end. So if you do that for me then that goes back more or less to 90 degrees.

APM: I'm going to leap in here. A moment ago, Holly had very flexed wrists and she's changed that now. Is that something you watch out for in a cyclist?

WH: Yeah.

APM: Because presumably, you can get some nasty strings that way.

WH: It is, yeah.

APM: You want them straight?

WH: Straight but comfortable. You shouldn't grip too hard. If you go on to the top of the bars, Holly, OK. The thing to do is this when you're on the tops. I've actually got flat bars on mine because I've got a little bit of carpal tunnel problem here. If I grip with my hands in that way, I get pins and needles in my fingers. So mine are flat. So what I tend to do, I tend to be in that position because I can actually rest the heels of my hands on the tops.

Transcript

APM: It doesn't look like that would alter the angle of the body —

WH: No. Like I said, the body is adjustable, adaptable to what we want but sometimes it tends to be, you know…if you go on to your hoods now, OK. So once again, it basically stops at 90 degrees because this part here, this pelvis tends to actually…if we actually drop a straight line through there, you'll see what I mean, about level. See, that's more or less —

APM: So that's the line going through the—

WH: That's the line through, yeah.

APM: --glenohumeral joint, through the hip joint.

WH: And that's about, more or less, the perfect posture on the bike. OK, so that pelvis is actually in the right position. OK. If you just took your pelvis forward, Holly, you see how that…now, if you look at that —

APM: Now, that's what you get if the angle of the saddle —

WH: That's what goes wrong, see you. Can you see the difference straight away?

APM: So the angle of the saddle —

WH: So that will actually alter the way the soleus muscle works, alters the way that the quadriceps work and alters the way that the hamstrings work as well. It also causes problems here and into the neck. If Holly does that again for me, initially, with actually riding the bike, this head would actually start to come forward like that and it causes the lordosis.

APM: But that's going to be caused by changing the angle here or a change in the reach that could affect both those things, yeah. OK, we'll put this one up on the website but I think we have actually run out of time. So we'll let Holly off the hook or off her bike. You can stay there just for a second, Holly. Warren, that's been fantastic. It was great when I saw you the first time, I knew you'd be good on the set this evening. So thanks very much for coming down all this way and imparting all that information. We will, as you know, put as much as we can up on the website in terms of how you can advise your cyclist, where you can go for other advice and the common problems that, the things that Warren's been talking about, may cause. That's it from us this evening. Thanks very much for your attention. Hope you've enjoyed it and we'll see you again in a fortnight's time.

Transcript