Professor Mike Tipton: Cold water swimming; The Benefits & Dangers

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SPEAKERS

Mike Tipton, Joyce Harper

Joyce Harper 00:01

Welcome to my podcast. Why didn't anyone tell me this? With my guests, we are discussing various health issues, questions you may have about your health, and debunking some of the many myths around our health. And today it's a great pleasure and long overdue to be talking to Professor Mike Tipton on cold water swimming benefits and dangers. So Mike is Professor of Human and Applied Physiology in the extreme environments laboratory. I love the second at the School of sports, Health and Exercise Science at the University of Portsmouth. And he has a ridiculously amazing bio. I'm not going to read it all out, but just to just to say some snippets, he has worked at the University of Surrey and University of Portsmouth, and in addition, he was based at the Institute of naval medicine from 1983 to 2004. Now, he has published over 800, scientific papers, reports, chapters, abstracts and books, in his research areas of drowning thermo regulation, environmental and occupational physiology, and survival in the sea. Now I've done about 250, and I've done quite a bit. So 800 is crazy. Now Mike does very many things besides his academic work. I've just got to read out a few he's honorary life member of the Surf Lifesaving GB and was a trustee director for 10 years. He's a member of the Council of the RnL Al as well as consultant to the Medical Director of the orange ally. And he has been involved with many groups all Air Force, UK Sport, etc, etc. But I think one of the cherries on the cake he was awarded an MBE for services to physiological research in extreme environments, and the Island Medal for saving lives from drowning worldwide. And the H and I swift water rescue Lifetime Achievement Award from the USA. Good afternoon, Mike.

Mike Tipton 02:03

Hello, Joyce, thanks for the invitation to come and talk to you. It's,

Joyce Harper 02:08

as I said, long overdue you You are my legend for cold water swimming. But before I started cold water swimming, I very soon came across your podcast and papers. And before I really took it up seriously, I read everything I could of yours and of of Heather's who has been on my podcast last year. And you'll probably hate me saying this. But I really look on you as a legend in Bala legend, but absolutely legend in cold water swimming. And you are I tell everyone go and check out Mike Lipton's work, so to total pleasure. And even

better than our wonderful friend Jill shore as network does all together. And Mike and I have been working on cold water swimming and pregnancy and reproductive health, which we'll talk a little bit about later. Now my first question to all my guests is to tell me about their careers, including an insight into what attracted you to work in adverse environments.

Mike Tipton 03:03
Well, thanks for the introduction. I feel like I should employ you as an agent if you're telling people to go and read all our stuff and listen to podcasts and things. So my mother and her four sisters, it wasn't the Spice Girls, it was that that group that invited invented gold power. And she was really into swimming, and taught swimming for I think it was about 70 years. She taught swimming 60 or 70 years. And so I was always going to be a swimmer. As a youngster, despite the fact that I'm completely wrong shape really. I'm more spherical and pencil like so. But there we are. So I was competitive. I was competitive swimming from eight onwards, I think I probably stopped when in my mid 20s and lies by then playing a lot of rugby. So I had a swimming background. So I had a common theme that runs through my life is water, really. I was in it from a very early age. And then I did a master's in human Applied Physiology at King's College, the second year of that course in 1982 83. And we visited the Institute of naval medicine, where a guy called Dr. Frank golden was doing a study on swimming in cold water. And by then I become very interested in temperature regulation and fuel. I think everyone's interested in human physiology. Everybody is interested in how the body how your body works and how it goes wrong and how you can make it better etc. And I was no different. And of course this the study that Frank was doing on swim failure in cold water just meant my worlds collided in I had an interest in swimming and I was interested in temperature regulation, how the body control is temperatures and the dangers associated with going Going into code, which the Navy have had a long interest in, obviously. And so that was it really, I got chatting to Frank, it was the year of the Falklands, people will remember. So I was unable to do my project, my MSc project with the Navy because they were busy down in the Falklands. So I went back and did a PhD there, the Institute of naval medicine through King's College in London, on human adaptation to cold in particular to cold water and repeated Immersions in cold water. And that started a 35 year collaboration with Frank, golden, you'll see him he and I together on many papers, looking at the responses to cold water. And the dangers initially the dangerous because obviously, that's where the Navy were coming from. And we we kind of reinvented some of the dangers associated with cold water in route when we started, it was primarily hypothermia that people were talking about. But I think people now understand that it's the initial responses, the first couple of minutes that are the most dangerous. So that's a potted history. But it was just a combination of a background of swimming and an interest in temperature regulation. And like many things in my life just being in the right place at the right time.

Joyce Harper 06:20
So we were you doing? I was doing my PhD at King's College in London from 84 to 87. So were we there at the same time.

Mike Tipton 06:31
Yeah, I was there from what I did my masters 8283. And then I was my PhD finished in 86. I was doing that 83 to 8086. But my I was based down in Gospel near across the border from Portsmouth at the Institute of naval medicine. And so I was rarely in Kings, although in that also in those days. It was on the strand. Were you on strand? Yeah,

Joyce Harper 06:58
I was on the strand I used to get driving. So

Mike Tipton 07:04
yeah, I'll pass almost definitely crossed. Although, as I say, I wasn't there on there on a daily basis. Even the MSC I did was really pretty much remote in all the teaching hospitals and then in the military research establishment, so I didn't actually go to London very, very often.

Joyce Harper 07:22
I'm sure I passed, of course, because I was there all the time. Even sometimes overnight. Chances are you were there. And I

Mike Tipton 07:33
That sounds like a PhD doesn't go

Joyce Harper 07:35
yeah, sometimes crying actually. Anyway, that's another story. Today, we are going to talk about a passion for both of us cold water swimming or wild swimming or all the different things that you can call it. Now, I personally don't have an addictive personality at all. I'm not addicted, hardly anything, maybe chocolate, but cold water Swimming has become really my addiction. And it it almost happened on my first swim. I, I have this huge sense of euphoria. And it does continue for hours and hours and people that go through and with me know. I'm very vocal, and I've always laughing and I know if you're feeling euphoric, this was to get out. But I'm in for it. Before I even get in. Lots of laughing. Lots of smiles. But obviously, I know there are benefits and dangers. So we're going to talk about both of those. But I also love love it because it's exercising in nature with friends. So for me, it just ticks all my boxes. But let's start at the beginning. Mike tell us what happens when we go into cold water.

Mike Tipton 08:43
So the obviously the first tissues to be called are the skin is the skin. And it is worth just remembering that about 50% of the tissues of the body are within 2.5 centimeters to an inch of the surface, we tend to concentrate and have historically on the core and talking about hypothermia, things like this, but actually at least half of your tissues are within an inch of the surface or 2.54 centimeters. And about point one eight millimeters below the surface of the skin. You've got cold receptors, these are about four times more cold receptors than warm in the skin. We're a tropical animal, so we don't like cold very much and we're we're geared up to sense it and particularly changes in temperature. All our sensory systems are more sensitive to change than to a constant environment. So you know if you come out of the cinema you're blinded by the light, but within a minute or two, your eyes adjust your cells and your retina adjust and you can see perfectly well certainly the same with the with the skin cold receptors. When you go into cold water. The skin cools rapidly because the water is very good at removing heat. And that change in temperature drives the dynamic response of those cold receptors, which is an enormous afferent output into the central nervous system. And that afferent output, drives gasping hyperventilation, and increase in the cardiac output, increasing the work of the heart, heart rate. So, and the release of an awful lot of stress hormones. So that's your first response. And it was known about for quite a long while it was, you know, but it was mostly of academic interest. And in about 1977, the home office published a report that I think was quite a watershed in that we looked at it and it said that about two thirds of those people who died going into cold water do so within two

or three meters of a say safe refuge. And about two thirds of them were regarded as good swimmers. And up to that point, people were talking about hypothermia. And this is the big danger. And you still hear that bandied about, you know, you're you people die from hypothermia in four minutes, when they don't, it's a physical impossibility for an adult to call enough to die from hypothermia in four minutes. So it's quite clear that something more rapid was happening. And so we started doing research into sudden changes in skin temperature and immersing people in cold water. And we saw these responses I've described. And we decided that we would call them cold shock. Because not because of the medicals is not a medical definition of shock is quite different, as you know. But it's just a shocking experience. And it was a nice catch catchy phrase that people would remember. And we think that we then we thought that cold shock was probably what was killing these people that were dying within minutes of going into water. And then something like the UK national immersion incident surveys suggested that around about 60% of those that die, die in the first minutes of immersion, about 20%, from longer term, immersions, about 20% Around the time of rescue, which is a fascinating subject in itself. And so that was it. I mean, we didn't hear that, that was that was 10 or 15 years of research summarized in a minute. But, but that first sudden change in skin temperature that drives the cold shock response is the first response that people get. And after that, I talked about it in terms of a cold front moving into the body. So the next tissues to call are slightly deeper than the skin, but they're the superficial nerves and muscles. And we know from work that we and others have done that once muscle temperature gets to about 27, it stops functioning properly, you become physically incapacitated, the nerve stop firing as frequently and as well. And so you become physically incapacitated. And that can happen as soon as 10 minutes in very cold water. And that's and then the third tissue to be impacted, or the third set of tissues, other deep tissues. And that's hypothermia. But as I say that's not going to happen in an adult human in less than about 30 minutes of immersion as a minimum. So most of the people who do open water, swimming and cold water swimming are more much more likely to experience skin and superficial cooling that 50% of the tissues of the body that are within inches of the surface than they are deep body cooling.

Joyce Harper 13:26
So that thermal sounds quite drastic. So is it really good for us? What's the benefits of doing cold water swimming,

Mike Tipton 13:35
I should ask you really frequently the wrong way around. So it's cold is a double edged sword. But then I think most of the environmental stressors are you know, you can have too little or too much oxygen. So that cold shock response is, I would argue is probably the thing that underpins the beneficial aspects of going into cold water. And that's quite an important conclusion to reach. And I would say upfront that the evidence in support of the winner, the detrimental side of cold is much stronger than in terms of the beneficial side. And I mean that in terms of mechanistic aspects. There's lots and lots of papers out there, as you know, where people who are doing open water swimming, anecdotally claim perceptually is of great benefit to them. And I've given talks to groups like the blue tits, where at the end of the talk, people have been in tears to talking to me about how it's changed their life and you know, the kinds of things that you said in the introduction, Joyce. So, and I'm not, I'm not disagreeing with that at all. But in terms of what's actually happening and the underpinning The mechanisms were far less clear on that than we are on the other side of the equation on the grasping and the drowning and the fact that you need about just one large inhalation of water to cross the lethal dose for drowning. Anyway, so what's the beneficial side? Well, we know that there's been there's been in the background for centuries, going right back to Hippocrates. A belief that taking to the waters is healthy. The Romans had in amongst their hot bars, they had a frigidarium, which was

a cold bath. So you know, it's been around a long while, and places like Penzance near me here in Cornwall and Brighton exist because of people taking to the waters. It really as you know, as a pastime, exploded during lockdown with COVID, where people just found their way to the sea because they couldn't go to indoor swimming pools anymore. And numbers exploded. Now, if you ask me, and it's purely speculation, I mean, I can tell you that people say that, you know, there's three major themes you get, firstly, you get the one that says, I'm alerted of where you can I get this euphoric feeling of euphoria that lasts some time, which you said in your introduction, my immune system is better, I haven't had a cold since I took up open water swimming, or cold water swimming. And other people say, well, there's conditions associated with inflammatory responses that are improved by cold water because it's got an anti inflammatory component. Now, they're all claims that are made, I think we can explain the cold, you know, the awakening and the feeling good for a bit because that's cold shock. That's all those stress hormones that are released, and then the hormones that are released with exercise. So the various catecholamines, cortisol, adrenaline, noradrenaline, and then things like endorphins. So I think that's probably we have a mechanism for that the immune system is a bit more questionable in terms of the benefits. I mean, there are some studies that suggest that short term immersions are good for our prime, the immune system, depends what markers you're measuring, there's a whole range, as you know, have markers you can measure for the immune system. And then there's actually the number of coughs and colds, you get a bit longer term immersions, particularly where body temperature falls, deep body temperature falls, may well be detrimental in terms of the function of the immune system. And then the anti inflammatory thing is, is probably correct. And that could have an impact on a whole range of conditions from diabetes through to depression, because they all have inflammatory components. So, again, that's pretty hypothetical. But there's a lot of anecdotal evidence to say something's happening. And, and, I mean, for me, I, that's enough, to some extent, because anecdotal evidence is still evidence. And I'm not going to argue with somebody that they can't tell me why it's happening. But of course, as a scientist, which I would come to this first and foremost as I want to know what the mechanism is, because we might be able to evoke it in other ways that people who can't go swimming can then benefit from so you could maybe maybe to take a ludicrous example, a cold pressor test where you put your hand into an ice bath, or your two feet into ice piles, could have a similar effect. The other side of the coin, of course, is because it's so multifactorial, you've already mentioned yourself, that when you go to the seaside for a swim, or to a lake, or whatever it is, that you meet people, you've got a community, you're in a beautiful place, you're doing exercise, you've gone into a weightless environment, the studies that isolate the active ingredient in that experience, have not been done. So they need to be done and be be controlled for. And the other point I would make is, from a safety perspective, because I think it's probably that cold shot response that if you deal with it safely, may well have some beneficial impact. It doesn't follow that the longer you spend in the water, the better is for you. But there's there's a natural inclination in everyone to think well, if five minutes is good for me, 10 minutes must be twice as good for me. And that just doesn't follow with cold water because as you go in there longer, you start to move towards that incapacitation. And we're seeing it we're seeing an increase in the number of swimmers who have to be rescued because they've overstayed their welcome in in cold water. Yeah, I'm going back

Joyce Harper 19:49
to evidence based medicine without evidence. I'm a scientist. It's my one of my things is that we should look at evidence based medicine and so on I was at a talk, I gave a talk in Oslo in January, and then was mentioned to the audience that I was going to go out and go to it was minus 24 degrees. And I was gonna go in the water, which was actually eight degrees, it was quite warm. And then there was someone in the audience who said, you've just given a talk about evidence based medicine. And now you're going to go and

do this. What evidence Have you got that cold water swimming is of any benefit whatsoever? And the audience absolutely cheered me because I said, Well, we have set up a research group looking at COVID, swimming and women's health. And we have a paper coming out next week. Now, again, our papers quite anecdotal. And it's a survey. But it was very good to actually say what we are thinking, yeah. And yeah, and I agree with you, we've got lots of anecdotal evidence for sure. And going back to the benefit, so one thing that I've really noticed, and we've talked about this before, is the adaptation of our body as we swim, year in year out, so I've exercised my whole life, I've not got any better at any of it, you know, I've just done body balance is studied Body Pump, etc, etc. And if anything, as I get older, I've got a bit worse, I can still do the splits. But anyway, with cold water swimming, you get better each year, I, well, I now only wear a swimming costume. I didn't when I started. I take my gloves and socks off quite soon now in probably next month, I'll be swimming without them. So I think for women who's aging, for me personally, the fact that I feel I've got better at something like swimming has, that's that's been a big benefit as well. So tell us about how we adapt as we swim more regularly.

Mike Tipton 21:51
Firstly, you're just a spring chicken, you're just you're still very young. So don't talk about query by age. I could also do the splits, but I suspect I can only do them once. And that would be that. So anyway. Yeah, so we're, we are good at habituating to things. And cold is one of them, particularly the cold shock response. So if we just quickly run through it, the cold shock response, the gasping hyperventilation, the inability to breath hold, as few as six, two or three minute Immersions in cold water will have that response. This was a study we did many years ago. And then 14 months later, we found that without even without cold exposure, that response was still reduced by around about 25%. And that suggests that it's a central phenomenon. And there's also probably a psychological component to it. We confirmed that it was more central than the cold receptor adaptation because we did a bizarre study where we repeatedly immerse one side of the body to evoke this habituation, this decrease in cold shock. And once we've done that, we turn the body over the person over and then we must decide that never been in the cold water had been kept warm with half a wetsuit. And we found that there was still the same reduction so that habituation is occurring central more centrally than the cold receptors. We've also done studies where we've looked at psychological skills training, and you can significantly increase the length of time somebody can breath home, going into cold water by simply going through the standard psychological skills training package of self talk mental imagery, so they don't even have to go in cold water, and it will be significantly extended. So when you do actually do the cold water immersion, I think you're probably getting a combination of physiological habituation, and psychological alteration. So you become less fearful of the water, we always, whenever we do a study is really noticeable that it's, you'll say to a participant, you're going to go into water at 12 degrees Celsius, the average water temperature around the British Isles, we know that the cold shock response peaks somewhere between 10 and 15 degrees Celsius. So if you want the maximum physiological response, there's not much point in going in much colder than that. So we tell them all about it. But there you can't explain cold water to people is like trying to explain to things and what happens is they go into cold water and they get this shock because they've suddenly they've equated it with their 10 or 12 degrees, which doesn't feel too bad. And so we always see the biggest heart rate prior to the Second immersion, because now they know what they're letting themselves in for. And then after that, you see it just plummet and you see the breath hold would improve and risk blood respiratory responses. So you can get a very significant cultural response. In fact, when we immerse people, like Lewis Pugh, who is the open water swimmer goes around all the coldest oceans in the world, raising the profile of plastics in the ocean and climate change. When you put him into cold water, you can't even see on the traces where he went in. He's completely

habituated, that cultural response is worth noting. So that that's clearly a beneficial adaptation because it decreases your chance of aspirating, the small volume of water needed to drown when you first go into cold water. But you still probably get the release of sufficient stress hormones, although that will be diminished as well. But you're still probably getting enough to give you that that positive feeling. But it's worth mentioning a couple of downsides of this habituation. And the first one is that, that neuromuscular incapacitation doesn't habituate. That doesn't get better, no matter how many times you go into cold water, you'll feel much better going in, you'll feel more comfortable going in. But your time to physical incapacitation won't change. You just don't adapt to that. Because of that is a direct temperature effect rather than a neurological adaptation, adaptable effects. And, and the third one is that actually the adaptation over the longer term is also habituation is habituation of the defensive reactions to cold. So shivering diminishes, and you feel more comfortable, and you develop what's called a hypothermic adaptation where you call more quickly. And if people want to follow up on this, although Hopefully, they're not going to stay in the water long enough for this to be a problem. But there was I published a paper on the story of Jason's Garner. So it was a very famous in the 50s, open water swimmer. And in those days, they didn't really know about hypothermia. And he, he did a swim in the Bosphorus and got very cold, and they thought he'd been poisoned. So they didn't really take any precautions. He then tried to swim from Ireland to Scotland, on the Northern Channel, he got within a mile or so of the Scottish coast and basically went unconscious, and they recovered him to the support boat, and the doctor there, opened his chest with a knife, pen knife and did, his heart was fib relating, and he did direct cardiac massage, and Jason's are gonna sadly died. And at no time had he felt cold. So one of the dangers of the habituation to cold that you get with repeated cold exposure is you do feel good. But you've, you've disassociated your perception from actually the state of your body. And of course, we talk a lot about shivering and shutting down blood flow to the skin, but actually the most powerful thermo regulatory response you have is your behavior. And that's driven by temperature and particularly change in temperature. Because you can achieve much more by changing what you're wearing, where you are, what you're doing, then you can buy shivering or by shutting down blood flow to the skin. And if you get habituated to cold to the point where you lose that drive to behavior, it can become dangerous. And that's when you start overstaying your welcome in the cold because you feel okay. So the, you know, if you're going to stay in longer than the recommended five to 10 minutes, whatever you do, don't rely on how you feel in the water, base it on a time, and be very strict with yourself because people have this tendency to want to say, Oh, well, I've been in 20 minutes. Well, I've been in 25 minutes where I've been in 30 minutes. And they'll be able to do it and they'll feel comfortable, but all of a sudden, they'll get into trouble without without any warning.

Joyce Harper 28:50
That's really important advice because that is something that we we do we think oh, God, you know, stayed in a bit longer at 10 degrees or whatever. And going back to that adaptation, one of my things I've noticed I've asked other swimmers I hardly ever wear tights. I hate wearing tight. So I know I've been a very hot person anyway. But this year, I've hardly worn a coat, which is a bit of a shame. But I've got some very nice coats. But I feel I'm just hot. Nothing during menopause. I'm very post menopause. But yeah, I think I think that I think it stays with you out of the water. So you've mentioned some of the dangers. Let's talk more. I know there are other dangers. So what dangers do we need to be aware of?

Mike Tipton 29:30
Well, I mean, there's a whole range of them. And I mean, I'm not going to get into polluted water, which is a real hot topic at the moment. But that's that's unacceptable what's going on in some areas where people

swim. So that's one thing there's there's the pollution. And then there's the physiological stuff we've talked about, which I think is critical, the most dangerous response associated with going into Cold War To is the initial response is the cold shock response. And that's where you have to be careful. But by the same token, I don't think you need to stay in much longer than a couple of minutes when that because I think it's that response that's evoking all the benefits. And as you stay in longer, then you move towards physical incapacitation. And, you know, the problems of so there's, he's just really smart. I mean, I know I, as I say, I now know lots of open water swimmers that I've spoken to worked with, that will only go in for a couple of minutes, they only need a couple of minutes to get that, that that buzz that that positive, that positivity. Now, the other conditions that people, I mean, people will have heard of frostbite, which, in theory can occur in water because sea water freezes at minus 1.9 degrees Celsius and human tissue at minus point five, three degrees Celsius, we're not going to get that around the British hours. But they do have a problem with in some of the southern North Sea areas of water temperature getting below the threshold for freezing cold injury, but I think we can largely ignore it, we're much more likely to have a problem with non freezing cold injury. And most of the people who are listening to your podcasts will never have heard of non freezing cold injury, despite the fact that it's been an enormous problem historically, for the military, going right back in time. In fact, we, we came within a matter of days of having a problem with the Falklands campaign through non freezing cold injury. And it's caused by prolonged cooling or repeated cooling of tissues, not to the point where they freeze, but to the point where they get shut down. I suspect we'll see an increase in it with the vote to buy yourself an ice bath and go and sit in an ice bath, which I don't think is necessary, for the reasons I said, but so non freezing cold injury, the symptoms that people may know are they get very cold very quickly, they've become cold sensitive, the the area that's damaged may well be a bit sweaty, and you can get pain from it. And so most most people will, I think are on a continuum. I mean, I played a lot of rugby, I played rugby for years and years, and got cold repeatedly. And I've undoubtedly got what I would call moderate, non freezing cold injury. So I get cold hands, cold feet, in particular, hard to warm them up. They're sometimes painful, if I get in the cold and they stay cold. And then mildly sweaty in makes you more likely to call. So there's that. So there's non freezing cold injury. And there's not much you can been called paddy foot, trench foot all kinds of other names for it. And I suspect that our open water swimming community, and particularly those that are going down the ice root are are experiencing or damaging their peripheral small nerves and vessels, which is the fundamental basis of this this injury. Of course, the other thing that we're seeing with increased numbers of people taking to the water is we're seeing increasing numbers of swimming induced pulmonary edema. And we're seeing increasing amounts and numbers of transient global amnesia. In fact, I've had two or three of those recently. The other the other thing, the other dangers are, of course, that I don't think it's not peculiar to cold water immersion, but going into cold water does suddenly increase the blood pressure, the pressure put on the cardiovascular system. And we've had a number of people now who have had things like aneurysms, burst blood pressure, cardiovascular related issues. And, I mean, that's not I mean, that could happen during press ups, to be honest. So we got to be slightly careful. I mean, there are things that you there are things that you wouldn't go and do cold water swimming, because you have and we've we've written about those in in a British Journal sports medicine paper recently. But then there's another group of conditions that you won't even know you've got, that are potentially aggravated by cold water immersion, but they would be aggravated by running or as I say, doing weights or something like that. So there's there's a whole range but I mean, this is almost like I'm beginning to sound like the Fun Police you know, you must do this and you mustn't do that. And, and that's not the that's not you know me better than that. That's not my position at all. My position is I want to encourage people to engage in physical activity. We have a real sedentary problem in particularly high income countries. And you know, Sometimes I talk a lot with a friend in New Zealand about what's the most extreme

environment, and probably the most extreme environment is the is the line of restaurants in a high street. Because it doesn't, it doesn't kill us immediately. But it's doing an enormous amount of damage to us later in life. And it's putting in, you know, some of the obesity related conditions is destroying our National Health Service. I mean, type two diabetes is costing a fortune in terms of its treatment. And so I don't want you know, I encourage people to engage in physical activity. And all we do, and you do the same, is we want to make sure that they do it in a way that maximizes the likelihood of a benefit and minimizes the chance of a problem. And so that's what it's about. And there are there are really clear, easy things to do. Yeah, to ensure that that happens.

Joyce Harper 35:59
Absolutely. Can I while we talk about dangers, can I ask you? I think you do know how many deaths there are? Or roughly how many deaths are in the UK? And I'd read that most of them are teenage boys in the summer who had drunk or stoned and jump in the water or dive in the water. Is that Is that right? Yep.

Mike Tipton 36:19
So in the UK, it's, it varies a bit. But that's about 400, around about 400 deaths, but three, three to 400. It varies depending on the type of year we've had, there's been a whole cohort, sadly, of suicides associated with immersion in water, where people jump into water. They're not included in the drowning statistics that we're talking about. Around about 60% of those, as I say die in the first minutes of immersion, because they've done something like Tomb stoning, they've jumped into cold water, the around about 25% of those deaths worldwide. And worldwide. Incidentally, it's at least 1000 people a day. So it's around about 365,000. It's an enormous pandemic that's been going on years, a lot of them in low income countries, and that that number is probably underestimated, because quite a few of the deaths don't get recorded. And for every death, there's probably five to 10 people who have life changing injuries. So the outcome from from a drowning incident can be obviously death, it can be lifelong morbidity, or, you know, no subsequent problems. So for every death, and we tend to focus on the deaths. But for every one of those is between five and 10 people who may well, you know, have particularly impaired neurological function because it's essentially a suffocation or drowning. And, and the organ that gets most affected is the brain. Yeah, so about 25% of the deaths are children under the age of five, about 46% are under the age of about 15. So yes, the majority of those that die are young children. And I did a calculate rough calculation for that if you if you look over a 10 year period, we're losing about 100 million years of life, because of people dying at 234 below the age of 20, rather than living to the life expectancy of the planet at the moment, which is about 70. So it's an enormous it's an enormous pandemic that's claiming, you know, lots of life.

Joyce Harper 38:49
Yeah, I didn't realize there were so many in the UK. So on that very depressing note, let's get a bit happier. So let's hope that some people do still want to go go water swimming, what would your advice be? For anyone who's starting out? Well,

Mike Tipton 39:04
I would make sure that you are fit and healthy enough to do it. As I say, we're a tropical animal, we want to be naked in air at 28 degrees Celsius, which is what everybody's currently doing, booking their holidays. Thermo neutral water temperature is 35 degrees Celsius, which you can only see around a narrow band around the equator. So our average water temperature is 12 degrees Celsius. So that's a pretty stressful environment. So you wouldn't go and buy a pair of running shoes and go and enter a marathon.

straightaway. You would, you know, do it incrementally and progressively. So do the same with open water swimming recognize it for the stress it is have a medical you'll get checked up for the things you should get checked out for if anybody's really interested in this we've written we've written a paper called Water therapist minimizing risks, which is published in the British British Medical Journal, a British Journal of Sports Medicine in 2022. So just a year or two ago, and it gives advice on the kind of medical that you should be given looking for, you know, general respiratory, cardiovascular nervous system issues. And then if you're once you get that the okay on that, then you know, join a club, if you can go with other people go in safe places. Don't stay in for more than 10 minutes swim parallel to the shore, there's people who have swam out to see and then found they couldn't swim back. Don't, don't be fazed by wearing a wetsuit, I know there's, there's a thing about not wearing one I'm swimming in skins. But actually, the cold shock response is sufficient in a wetsuit to give you the benefits you need. Avoid prolonged breath holds. So we know that if you go into cold water, and you get your face in the water, and you do a long breath, hold, it's a really good way of evoking cardiac problems. So you know, keep your head above the water if you can, if you're going to put your head in the water, breathe every stroke, don't hold your breath. Don't rely on how you feel if you get into difficulties float on your back, because we know that that cold shock response that peaks in the first minute is gone away in a couple of minutes. Hence the work that underpins the Analyze float to live campaign where you swim float, where luminous clothing that people will see you as they go with other people have an incremental approach develop that cold habituation that you've discussed and makes you feel so much better. Make sure you've got a safe swimming location, preferably between flags lifeguarded if not, you know something that people know about. When you come out of the water, you'll hear quite a lot of rubbish spoken about what you shouldn't do. And you'll hear the term after drop bandied about Well, if you've only been in the water five or 10 minutes, don't worry, just get yourself warm if you want to sit under a shower or sit in a bath or then that's fine. It's one of my one of my bugbears is that I mean quite a lot of this what we know about cold water immersion, we've actually done the the original experimentation and particularly Frank golden in something like the after drop, and then you see it contorted and misinterpreted and you know, and you can only spend so long trying to correct it. So when you come out do just make sure you get warm don't worry about after drops if you've only been in there for a few minutes. But try and get yourself make sure particularly your manual dexterity and your you know is back to normal before you start doing things like driving a car. So then we that that paper I just mentioned also gives advice for people who are running courses for people there's been as you know, a beat up surge in the number of people who are putting on cold water experiences. And some of them are excellent and really want to understand the basic physiology and do it correctly. Others are in it for making money. So you know, I would I would be I would incline or who do you I mean go Who do you swim with Joyce you swim in the serpentine? Or do you swim with the

Joyce Harper 43:22
no I live I live near Cambridge. So I swim a lot in the cam use I'm lakes we're doing lots of lakes at the moment. I I can get to the sea and just over an hour. And tomorrow I'm going to Belfast. And I'm really looking forward to swimming with Belfast people on Sunday. So whenever I travel, I try and find a local group. But yeah, I mean, everything you said is what I've always followed. Mike, I wanted to take up there's quite a lot of myths. And you've touched on a few already. So I'm going to reel off a few and then and then go for it. So and we just you know we just heard I hear opposites all the time. So we've always been told to have a hot drink after cake to get your sugar up. Someone said the other day Oh, you shouldn't hold a hot water bottle on your stomach. I don't use a hot water bottle actually. But someone else did this. Oh, that's not good. And then you mentioned about the getting warm after the you know in Scandinavia, they do the

sauna to cold water and they've done it for centuries. But then people said to me, oh no, you shouldn't you shouldn't get a sauna. After you come out with cold water or any of them true and even myths. What's the situation that

Mike Tipton 44:32
we're that's like ours we've worked it's the trouble is it's not it's it's not myth. And it's not true. It's all circumstantial. So if you start from the position that people follow the advice of not staying in the water too long. So they are in the water for a you know a few minutes they then just run through them again. And I'll give you a yes or no drink was the first one, wasn't it a hot drink of no use whatsoever in terms of your deep body temperature, but is quite psychologically comforting. Because you, you know, you're actually going to warm up the mouth, you're going to warm up some receptors in the mouth, it's going to make you feel warm, it's going to make you psychologically great. If you imagine that your average cup, let's, let's be generous, and say it's 400 mils, and you're pouring that into a body of 75 liters, 75 kilos of fluid, it's not going to make much difference. So it doesn't make much difference to your deep body temperature, but it might, it might make you feel good about the world. And as well a bit of cake. If you've been in the water just a short period of time, then you will not have become hypoglycemic. Five or 10 minutes of exercise doesn't justify a piece of cake, I'm afraid. However, again, there are quite a lot of what people talk about in terms of cold water immersion is actually the perception of well being. And if that's part of the perception, then I am nowhere near brave enough to tell the blue tips that they shouldn't have. I might my life expectancy will be measured in minutes. So but you don't need to do it for me, you just haven't. Now, if you're if you're just done an hour's swim training, and you come out then there's probably a bigger argument for having for having a you know, re resupplying your muscle glycogen which you've been using, but not for a short term emotion. What was the next one?

Joyce Harper 46:55
Well, I'll just say I, okay, we've done a good job. I don't drink tea on coffee. I never have never in my life. So for me actually, drinking hot drink is really a bit weird. And but recently, I've not even in winter, I've noticed I, I just sort of stopped, I have stopped doing it. So I'm kind of stuck to the hot water bottle, which I'd never heard before. Lots of women I see hold a hot water bottle to their stomach. And someone said recently you shouldn't do that.

Mike Tipton 47:24
Right. So one of the things that cold can do, provided you've been in it long enough. Again, it's a it's a circumstantial thing. Is it a nice attires is the cold receptors. So you go from feeling very cold to just feeling nothing. Yeah, so you're numb. And what that means is you're not very good at perceiving whether something's burning you or not. So you know, if you've got somebody who's profoundly cold and hypothermic, you don't get them to warm up by a fire because you go, the next thing you know is they burnt themselves. So there's, there's an element of truth in that, because of the the anesthetic and analgesic effect of cold on the peripheral cold receptors. And you you won't know whether you're too hot or not. However, it comes back to the to the fact the very fact that you want to put it on the body is just to increase your comfort. And if you've been in five or 10 minutes, then we have people in the lab that we put into cold water for an hour in 10 degrees and when we come out, we just put them into a hot bath to rewarm them. Because rewarming collapse has to be somebody who is has been in the water long while is has lost a lot of circulating blood volume is hypovolemic is borderline unconscious with hypothermia. If you take those people and you put them into a hot environment, there's a chance that their blood vessels will open up and

because they've lost a lot of their circulating blood volume through cold induced diuresis they'll feel faint and collapse and this happened in the Second World War when casualties were taken from the water and put into the engine room to rewarm and they suffered rewarming collapse it's not going to happen after a five or 10 minutes swim in cold water. So you know you can stand on the beach shivering like man in a in a robe trying to warm up with a piece with a piece of cake and a cup of coffee that will do nothing in terms of thermal responses. But you'd be much better off just getting under a shower or and that's why people are putting putting stuff out is trying to get comfortable as quickly as they can. is potentially hazardous if the water bottles too hot and you've lost sensation because of the cooling. Yeah,

Joyce Harper 49:32
I lost you there for a minute Did did. I just lost my wife over a bit that did you answer about the sauna? So you know the Scandinavians that seems a good knowing what you're saying volumes

Mike Tipton 49:44
or produces urine. If all that's happened and you're semi conscious and your baroreceptor reflexes which are the reflexes that maintain your blood pressure are dulled by cooling, then it's not a great idea to go into the heat and I said earlier, but that's exactly what happened to people who were taken from the cold water in the Second World War and put into the engine room to rewarm. It was too warm for people who were doing open water swimming are not going to be in that state. If they are, if they're in that state, they're not going to be going into a sauna. They're beginning you're going to you're going to be going into accident and emergency. And so how so if you've been in just a couple of minutes, there's absolutely no problem with jumping into a sauna for a few minutes to warm up. With all of this, as I say we put people into a hot bath after they've come out of the cold water. The only thing we are always careful about is you don't overstay your welcome, justice. You don't overstay your welcome in the cold, you don't overstay your welcome in the heat. And as soon as you get to the point where you feel comfortable, which will be very quickly because you're only going to warm up the skin. Then you can come out what you don't do is stay in there until you're flushed and sweating. Because when you come out then you will feel lightheaded in the same way as you'd feel lightheaded if you just climbed into a bath without doing cold water immersion before.

Joyce Harper 51:00
Yeah, brilliant. Last question about swimming. That's so there's, there's lots of women that swim. I mean, maybe it's just the Bluetooth thing. I don't know. But we, but there are obviously lots of minutes for him to but as I mentioned earlier, Jill shore up our wonderful friend has got us together to to look at cold water swimming in pregnancy and menopause and reproductive health. What do you think we need to do around helping helping women D Do you think oh, water swimming is helping women during some of their reproductive health issues? Or during pregnancy and menopause?

Mike Tipton 51:39
I think it is. I know it is because we've just published a paper on it. And I and I. And you know, and that I mean, just for people who are listening that paper which was Megan LB and Associates, which is actually that group that we pulled together when we're Joe got in touch some time ago, the title of the paper, the pirate paper is how the women fill cold water swimming affects their menstrual impairment menopausal symptoms, and quite a few of them i 114, you have to correct me if I get it wrong, Joyce was 114 women, I think. And they talked about it reduce their menstrual symptoms, notably, the psychological symptoms, the perceptual system of symptoms of anxiety, mood swings, irritability, and the peri menopausal women,

reductions in anxiety, mood swings, low mood and hot flashes. So, again, you know, it's an anecdotal study. And really importantly for me, and I think this is important, the conclusion to that paper was women felt that cold water swimming had a positive overall effect on menstrual and Peri menopausal symptoms. And then then studies on other forms of exercise to relieve menstrual and perimenopause symptoms may show similar findings. And that's, that's a really important thing, because that's a call for studies that have control, control branches and control arms. But so it seems to be beneficial that we're, we're kind of at the start of that journey, aren't we, I mean, we've, the first thing you do is you establish that there's something going on. And then the next thing is to establish how it's going on. And when it goes on, and when it doesn't go on, and it's the next step. And so absolutely fantastic that people are feeling that doing this is good for them. There's obviously a risk associated with it, we're trying to maximize the benefits and minimizes minimize the risks. But what we've really got to do now is isolate the active ingredient in that experience, so that we can say exactly what's going on not not just at a physiological level, but perhaps at a biochemical level, molecular biological level, and that we can activate maybe those pathways by alternative means. Now the problem we have with that is if I write a grant application, I say I want to study sudden cardiac death on immersion, or drowning or hypothermia is much more likely to get supported than if I write a grant saying, I want to look at the, you know, the underpinning mechanisms of the perception of well being from from cold water swimming. Yeah. And until people appreciate that, this, this, these non pharmacological approaches are a better way to go. So people are not dependent on drugs and are not able just to sit at home and do nothing and need to go out and actually engage in that in physicality. We, the sooner we and we appreciate that I think the more likely we'll get those studies funded, the we've become what I call thermostatic We, we sit about all day in temperature control rooms we recreate next to the skin, exactly the same temperature profile that we would have got if we were naked in East Africa where we evolved. And we've done it through a technological center and other animals have got blubber and fur and different things humans have done it left their tropical origins by their intellect and their bio technology. The problem with that is one we're consuming earth's resources to create that environment next to the skin that is the same as if we were naked in Africa. And the other problem is we never challenged we don't perturb our systems that keep us fit and well. And it doesn't matter whether it's the muscular skeletal system, it doesn't matter whether it's the metabolic system, it doesn't matter whether it's the thermo regulatory system, unless you perturb those systems unless you challenge them, then you don't maintain the systems necessary to be healthy and control those and regulate those systems. And that they're in underlines that. Therein lies a really strong argument for making sure that we're out there doing stuff so that we actually keep challenging the physiological systems of the body and maintain their functionality.

Joyce Harper 56:24
Yeah, well, it's well said I, I really am on a campaign to help motivate postmenopausal women to get out there, exercise in nature, be with friends, don't don't go to a coffee shop, go for a walk with your friends. And I just think the cold water is sort of the cherry on the cake for me. But you've been training for Ironman. How how's it going? And have you done it before?

Mike Tipton 56:53
So, I mean, I've always been sports orientated from swimming to rugby to triathlon, it was that in that order, because I couldn't, I couldn't manage contact sports anymore because it was taking me too long to recover. And I started doing triathlon in about when I was about 14, I suppose. And as you normally do you progress through up to Ironman. And then I decided I would do an Ironman every five years, which I've done since 45. I always you know, Tony always tongue in cheek so I do it because it's cheaper than Bupa because if I

survive the last one, then I'm think I'm probably okay for about five years. I hope that doesn't come back to bite me. So I'm currently try. So I've done one every five years. I used to do nice. I'm, for various reasons. I'm not doing nice anymore. I've switched Austria. So I'm doing the I'm training for the Austrian Ironman in June. So my, my plan is to be the only in my age group, the only person left doing it. So I can claim to be world champion, not because I'm any good, but because I'm and is it going well, on on a scale of one to 10, where 10 is going really well. And one is it's not doing as well as I'd like I'm closer to one. But it's, it's it's an interesting, it's an interesting thing, though, how much less spare capacity you have when you get older. Into I mean, when I was younger and doing them, I didn't really need much training because you're so you've got so much spare capacity, but now I'm in my mid 60s. And I find that I have to work harder, and things go away much more quickly. So you know, even between training sessions, I find I'm not I'm just not retaining that. So that's harder. And it also there's, there's lots of other pressures on you to do other things. And also there's psychologically, it's very easy. And I think a lot of people fit into this category. And one of the reasons why people not doing exercise because it's so much easier not to do it. Now, if you say oh, I'll do it tomorrow, twice as much tomorrow or, and my mantra, and somebody needs to write a book on training, as you get older, and the psychophysiology of training as you get older, because my mantra is learn to listen to your body and know when it's lying, because my body will tell me almost on a daily basis that I shouldn't do anything I should ever sit down and have some cake or coffee, chocolate and maybe do some more tomorrow. And it's but it's lying. And so my recommendation is whenever you get the urge to do something every day, and if after 10 or 15 minutes of doing it. You're not enjoying it, then stop doing it. But don't stop doing it before you start doing it.

Joyce Harper 59:50
Yeah, and I mean, I've had a good week. It's Friday. Today I've done two cold water swims and I've done five fitness classes a bit of everything. So we're live sort of yogurt a bit a bit of weight. So yeah, we mustn't don't sit in everyone. Just Just get out there do something, your body will be thankful. Hopefully, depending what you do, if you don't if you don't

Mike Tipton 1:00:12
guess to give you a just underline just Joyce just to underline how it's going. I big step forward for the triathlon this week is I found my bike, I think got a puncture. So that's good. No, no, no, I did. I had to go and get the bike. You know, have some maintenance done. I probably start cycling next week. So I've still got four months

Joyce Harper 1:00:34
or four months. Okay. Okay. Right. So, middle of middle of the middle of June. Okay, we'll be behind you, Mike. Well, not literally, but we'll have a little.

Mike Tipton 1:00:45
No doubt there'd be many people behind me to be honest.

Joyce Harper 1:00:48
I my final questions, which I asked all my guests. Have you heard people say, Why didn't anyone tell me this? And if so, what what what were they asking?

Mike Tipton 1:01:01

Like, well, I guess there's a couple of things. Really, I mean, I get that question a lot from students, particularly towards the end of their PhDs, you know. And it's an it's to do with finishing things. There are people find people find it quite difficult to finish things. And people should be warned about that. So there's that there's one thing is that, you know, you can start on these projects, but there are people I call finishes. And people are called non finishes. And there's a lot more non finishes and there are finishes. So people need to be warned about every aspect of a project, I guess, the business we've just talked about, about exercising as you get older, I think is quite is worth knowing, because it is a different mentality to go in, and exercise as you get older. But you know, I, you know, I want to, I want to spend as much time as I can with my grandkids. So that's, that's a pretty strong argument. And on the kids from I youngsters, younger people, particularly ones I work with, you know, are highly motivated. They often don't spend as much time with their family as they should do. And I mean, as I learned that through bitter experiencing, you know, I lost about a year of holiday by not taking it when my kids were young and growing up. And that's time you never get back. So if I was to tell a youngster anything at the moment, you know, family is precious young kids, and you know, time with family is precious. And there's nothing I would give up. Now. That would be more important than that. So yeah, as you can tell, probably Joyce hadn't given that much thought I didn't know about.

Joyce Harper 1:02:49
That is that was one of my questions. What advice would you give your younger self, but you summed that up? Perfectly? So? So there's two. Yeah,

Mike Tipton 1:02:58
work isn't everything is the work life balance, as it is, has always been poor. But it's gotten a lot worse, I think for I think, the generation that are coming through now. I think my generation, I won't say our generation, because you're younger, but my generation, I think, absolutely stuffed the place up with climate change, with financial systems with you know, and the sooner those guys come and take over the better, because they have a completely different mindset. Yeah.

Joyce Harper 1:03:29
I keep telling you, Mike, I'm not that much. I'm 61. So I'm not that much.

Mike Tipton 1:03:35
Oh, yeah. But 61 Crikey, I was leaping tall buildings when I was 61.

Joyce Harper 1:03:42
Thank you, I'm not leaving. So last couple of questions. You've done so much in your life. What motivates you,

Mike Tipton 1:03:49
those drowning statistics? Hmm. That was that was the thing. You know, it's, it's great working. And we we work about half of what we do is fundamental research. And then of the other half about a third is with elite sport, a third with the military, a third with industry. And that's all great is I mean, it's lovely working with some of the elite sports people and just seeing how they perform. But if I was honest about it, working to reduce those deaths caused by drowning, unnecessary deaths bite bite through drowning is an enormous motivation. And I remember hearing those statistics for the first time back in the late 70s, early 80s. And

they've just, you know, they burn on my memory really. So I'm particularly when you start seeing just how many of those deaths are young people and how much potential is therefore lost, and the contribution that they could make and the experiences they could have had. So that's, that's the motivation. Now, you know, there are other things you do and apply your expertise in other areas, but the foundation You know, that drive comes from those statistics?

Joyce Harper 1:05:04
And the last question, what makes you happy and where is your happy place?

Mike Tipton 1:05:07
I'm sitting in it. So my, it's in my, obviously, from what I said, being with the family, which is now down to grandchildren, which is great. We are in Cornwall, which is a beautiful place to be all year round. I mean, it's a different kind of beauty in the winter to the summer. But, but it's we, you know, but also, I also enjoy being back at the university with colleagues and you know, the chat and the banter. And, you know, and the kind of meetings we have Joyce when we get together with the other, the other team looking at the, you know, the menopause and the peri menopausal work. So, you know, it's, there's lots of Happy Places. I'm lucky in that I don't have many unhappy places.

Joyce Harper 1:05:57
Fantastic. And this year, I'm gonna say it on on this podcast this year. I want to Oh, I said it last year. I didn't do I'm gonna come down and we're gonna go swimming.

Mike Tipton 1:06:09
Yeah, yeah, that's fun. I mean, there's no shortage of places to swim. The the Perranporth group went from 25 members to nearly 1000 over a lockdown. Wow, the parent pool, blue tints are there and Sarah Walsh will be very welcoming. And, you know, you're, you're more than welcome.

Joyce Harper 1:06:32
I will be I'll be overseeing Mike, thank you so much. That was brimming with information. And I hope to see you very soon. Thank you.

Mike Tipton 1:06:42
Yep, safe day. Stay safe. Thanks, Joyce. Bye