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Hello and welcome to the Health Hits podcast.

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Today's episode is all about blood pressure, specifically high blood pressure or hypertension.

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What do we mean by blood pressure?

Well the heart pumps blood around our bodies. In its relaxed state it is filling, with blood returning from the body and from the lungs; then when it contracts, or squeezes or beats it pumps blood out to the body and through the lungs.

The blood returning to the heart comes via veins and leaves the heart through arteries.

And it is in these arteries that we measure the pressure or blood pressure.

The blood needs to flow under a certain amount of pressure to get to places like the brain, because it's working against resistance and gravity. Just imagine holding a hosepipe upright - with the tap turned on only a little - the water just dribbles out the top of the pipe, but turn up the flow of water, and therefore increase the pressure, and you get a much more impressive column of water.

So it's important to have some pressure to keep blood flowing through tissues such as the brain, the lungs, the kidneys, the liver.

Too low a pressure and you may not be getting enough blood flow to the brain, resulting in lightheaded or faint feelings. In fact a faint is your body's way of correcting this problem as you most likely end up lying flat on the floor and blood can more easily get to the brain with gravity eliminated.

Blood pressure is measured by a device called a sphygmomanometer. Most people will be familiar with these cuffs that wrap around the upper arm. It is an incredibly cumbersome word to say so you'll often find that most medics refer to it as a "Sphyg" or simply a blood pressure cuff.

Blood pressure is recorded in units called millimetres of mercury which seems to have been the standard unit of pressure in 1881 when Samuel Siegfried Karl Ritter von Basch invented the sphyg. Basch had a fascinating life working in Europe before moving to Mexico to be the personal physician of the Mexican Emperor, fellow Austrian Archduke Ferdinand Maximilian. The Emperor met a predictable death at the hands of a military opposed to occupation, but our doctor escaped and went on to invent the blood pressure cuff.

There are two numbers recorded when measuring blood pressure, written like a fraction with the higher number on the top. A textbook normal blood pressure would be 120 over 80.

The higher number is the pressure, in millimeters of mercury, when the heart contracts or beats. The blood is forced down the arteries under high pressure.

If you feel the pulse at your wrist, a few centimetres from the base of your thumb, what you are feeling is that initial surge of blood as the heart contracts.

But it might be surprising that the lower number, the pressure when the heart is relaxed, is not zero.

This is because during the initial surge of blood from the heart, under high pressure, the elastic walls of the arteries stretch almost like a waterballoon, then spring back when the heart is relaxed, keeping the blood pressure from dropping to zero. The blood keeps flowing in the correct direction because a one way valve closes in the heart to stop backflow.

High blood pressure is considered to be 140/90 or higher. Current evidence suggests that either number can be at that threshold for it to be classified as hypertension or high blood pressure.

Things that can push blood pressure up include smoking, being overweight, lack of physical activity, too much alcohol, stress, eating excess salt, kidney disease, thyroid disease.

There are certainly genetic factors and all other factors being equal, blood pressure almost always goes up with age.

We talked about the elastic arteries stretching as the surge of blood travels down them, but just like the difference between a brand new rubber tube and an old one, the arteries get stiffer as we age and so the blood pressure goes up.

This can be a problem as the higher pressure can cause damage to the cells that line the inside of the arteries and this in turn can cause narrowing.

Narrowing of the arteries to the brain can cause stroke, to the heart can cause heart attacks, in fact there are very few parts of the body that would not be affected by reduced bloodflow.

This is not something that happens immediately and a one off high reading would likely not result in damage. If we are stressed, in pain or unwell our blood pressure can often go up for a short time. It is sustained, prolonged high pressure possibly over years that can lead to the damage I described.

What can we do if our blood pressure is high? Well clearly it's important to discuss it with your doctors but simple lifestyle change can often bring the blood pressure down.

Exercising more, drinking less alcohol, losing weight, not smoking, looking at reducing stress if possible. These can all help. There are links to excellent resources on the twitter feed or the site healthits.info

Getting good control of blood pressure is important for anyone, but if you have other risk factors for heart attack or stroke such as ever having smoked, diabetes, high cholesterol, then it is even more important. We will cover these other conditions in subsequent podcasts.

If the blood pressure is persistently raised then there are medication options which include drugs such as ace inhibitors, beta-blockers, calcium channel blockers, diuretics, alpha-blockers. These are the main classes of

drugs and each work in their own way by relaxing the arteries or removing more fluid from the bloodstream or changing the contraction speed or strength of the heart or some combination of these things.

People often ask about statins. Statins are drugs which reduce cholesterol. They have no specific role in reducing blood pressure, but as we have covered, high cholesterol can increase the risk of heart attack and stroke, so patients with high blood pressure are often offered statins as well.

Statins would take up a whole episode in themselves, so we'll leave them there for now.

So that's it for the blood pressure episode.

Please do check out the resources on the site, healthhits.info

Thank you for listening and please join me again for another episode of Health Hits.