

the magazine of Blood Pressure UK **ISSUE 41 > SUMMER 2017**

GETTING ACTIVE AT HOME

Keep your heart healthy without leaving the house

THE BATTLE' NOT OVER UNTIL IT'S WON A stroke survivor's story

NEW CHANCE TO BEAT HIGH **BLOOD PRESSURE**

New gene discovery paves the way for better treatment

5 is good 0 is better Why more is more when it comes to fruit and veg

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pressure is the magazine

of UK charity, Blood Pressure UK. We aim to significantly improve the prevention, diagnosis and treatment of high blood pressure in order to prevent death and disability from stroke and heart disease. We are an independent registered charity and rely on donations and grants to carry out our work. All views expressed within the magazine are those of the authors and do not necessarily reflect those of Blood Pressure UK. The information in this magazine is designed to support and supplement your relationship with your doctor, not to replace it.

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Welcome

From Katharine Jenner, Chief Executive Officer

This year marks a turning point in the way we approach high blood pressure. After the number with high blood pressure reached 1 billion people worldwide last December, health professionals sat up and took note, and the world is taking action.

Last month was the first ever May Measurement Month. In one of the biggest screening programmes in history, inspired by our Know Your Numbers! Week, health professionals around the world set out to measure 25 million people's blood pressures in just one month. The idea was to motivate governments to improve healthcare in their nations, to bring the numbers living with high blood pressure down and save countless lives. The campaign found many of those living with high blood pressure in the process, giving them the chance to get the support they need.

There are grass roots changes too: local pharmacies across the UK are joining forces to reach the people in their communities; Salt Awareness Week put pressure on the food industry to take responsibility for the effect they have on our health; meanwhile our campaign to stop stroke gets into gear, letting people know that stroke can often be prevented if you make the right changes.

One woman who's introduced changes into her life is Christine. She's recovering from a stroke and has learned how to adjust what she eats and be active to lead a healthy life. She shares what she's learned on page 16. While I take inspiration from her story, I hope there will be something in this issue to inspire you too – not only to make changes in your own life, but to know that the rest of the world is making changes right there with you.

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Out and about A few things we've been up to lately

GETTING SERIOUS ABOUT PREVENTION

We caught up with friends from fellow UK charities at the NHS Health Checks conference in February

to discuss how we can work together to prevent cardiovascular disease. Health Checks are free check-ups, aiming to pick up on the early signs of disease, providing the perfect opportunity to tackle heart disease and stroke.

Speaking up for better hospital food

Our CEO Katharine spoke at the Diet and Nutrition in Institutions of Care conference at the University of Warwick this April. As Chair of the Campaign for Better Hospital Food, Katharine argued that only legislation can make sure that patients get adequate nutrition from hospital food, and that salt levels must come down. A survey found that 15 out of 25 hospital meals contained more salt than a Big Mac.

LOCAL PHARMACIES JOIN FORCES

We went along to the official launch of a new set of plans to tackle high blood pressure created by Pharmacy Voice – an organisation representing community pharmacies across the UK. Local pharmacies are set to take on a bigger role in finding people with undiagnosed high blood pressure and making sure they get the support they need.



The Life Scientific

Our Chairman, Professor Graham MacGrego spoke on the popular BBC Radio 4 show, The Life Scientific, in April about his career researching the effect of salt on health and his life campaigning to do something about it. Listen to it online at https://www.youtube.com/ watch?v=XDI1FWQAsvM



Our website is getting a new look

We're busy working on a brand new website and updating our leaflets about blood pressure, making them as helpful, attractive and easy to use as possible. Let us know if you have any suggestions, we can't wait for the finished results.



Looking after your data

We take care to look after the information we have on all our members. This February we went to the interesting Fundraising and Regulatory Compliance Conference, run by ICO (Information Commissioners Office), in Manchester to make sure we're up to date with how to go about it. We keep your information secure, accurate and up to date, and only keep it as long as is reasonable and necessary. We won't share it with third parties or bombard you with requests for money. Please contact us if you would like to know more.



Taking action against salt

We were at the House of Commons in March for the annual Salt Awareness Week reception, the highlight of an annual campaign calling for the food industry to put less salt in our food. We measured people's blood pressures and gave advice on lifestyle changes to lower the risk of stroke.

Blood Pressure NEWS

1 BILLION PEOPLE HAVE HIGH BLOOD PRESSURE

While the high blood pressure epidemic continues to grow, the UK has some of the lowest rates in the world

A major new study published at the end | with the biggest increases seen in South of last year revealed that the number living with high blood pressure has doubled over the last 40 years, with the problem shifting from wealthy western countries to the developing world.

The rise is thought to be due to an ever growing and aging population,

Asia and parts of Africa. More than half of those with high blood pressure live in Asia, including 226 million people in China and 199 million in India.

While high blood pressure becomes more common worldwide, some countries have seen a fall in its

prevalence in recent years. The UK now has some of the lowest rates, along with Canada, Australia and parts of Europe.

The researchers called for better policies to help the countries who are worst off, focussing on reducing salt intake, making fruit and vegetables affordable and improving detection and treatment.

While the numbers are very concerning, there is good news – the figures show that with a good salt reduction programme, access to healthcare and a healthy diet, it's possible to lower a nation's numbers.



A WORLD FIRST IN TACKLING HIGH BLOOD PRESSURE

Campaigners around the world joined forces in one of the biggest screening programmes in history

Doctors, nurses and scientists set out to measure the blood pressures of 25 million people during the first ever May Measurement Month. Led by the International Society of Hypertension and the World Hypertension League, the team aimed to raise awareness of high blood pressure and the 10 million lives lost every year to due to the health problems it causes.

The British and Irish Hypertension Society (BIHS) led the campaign for the UK and Ireland, taking on the target of measuring a million people's blood pressures in just one month. Volunteers worldwide set up screening centres in imaginative locations, from city centre squares and shopping malls to railway stations. A team in India collected 20,000 pressures in just 22 days, and two British nurses ran a clinic in Cambridge in early May before heading to Uganda to do the same in a Kampala hospital. As well as providing governments with information and motivation to improve their nations' health, the event found many of the undiagnosed, giving them the chance to get the support they need.

This is a milestone event in raising awareness of the countless lives that could be saved if everyone knew their numbers. Take part in Know Your Numbers! Week in September, p17.



Blood pressure news

Progress in medicines

A NEW DRUG TO LOWER CHOLESTEROL

A new vaccine-style drug has been found to lower cholesterol in people living with heart disease who are already taking statins – a drug used to lower blood cholesterol. In a study of 27,564 people, the new drug, called Evolocumab, lowered cholesterol by 59% and lowered the risk of heart attacks and stroke. This trial was only two years long and the drug was only used in people with raised cholesterol that is resistant to statins, which means we don't know much about how well the drug works and the possible side effects in the long term or in other people. Nevertherless, the long-awaited results of this high-quality study bring hope that the drug, or ones like it, could be used to treat high cholesterol in the future, particularly in people with familial hypercholesterolaemia, an inherited condition which causes high cholesterol.

A MULTI-PILL FOR HIGH BLOOD PRESSURE

Australian researchers have combined four drugs used to treat high blood pressure into one pill, using a lower dose of each. After four weeks, they found the pill lowered blood pressure and didn't cause any side effects.

This study is very exciting as it shows it could be possible to use existing drugs to treat high blood pressure, without the side effects. This study was very small with only 18 people and lasted only a few weeks, so we need a much larger study that runs for much longer and compares the pill with the drugs we use at the moment to see how well it really works.

THE HEALTHIEST ARTERIES IN THE WORLD

The Tsimane people of the Bolivian Amazon have the healthiest arteries ever reported

Anthropologists in America studied a group of people living in Bolivia and found their arteries resemble those of people 30 years younger in the developed world.

The researchers wanted to understand why lifestyles before the industrial age are linked to low rates of coronary artery disease – the most common type of heart disease, characterised by stiffening of the arteries – so they studied the Tsimane people who lead a life of hunting, gathering, fishing and farming.

CT scans and blood tests showed that 85% of the 705 adults studied had clear arteries with no sign of stiffening. Even in adults aged over 75, two thirds had arteries in perfect health and only 8% had a moderate to high risk of coronary artery disease, five times lower than in industrialised countries. In fact, when a Tsimane person reaches 80, their arteries resemble that of a 50 year old in North America.



It's rare for a Tsimane person to have high blood pressure, high blood cholesterol, or to be obese. Their good health is thought to be due to a diet low in fat and refined sugar, not smoking, and their highly active lifestyles – they're sedentary for just 10% of the daylight hours compared to 54% of the day in other populations.

This isn't the first time we have seen the health effects of a pre-industrial way of life. In the 70s and 80s, studies of the Yanomamo Indians living in the Amazon Rainforest in Brazil and Venezuela showed similarities with the Tsimane people. Their diets were low in saturated fat and high in fruit, vegetables and roots, and they were highly active and in good health. Importantly, their salt intake was very low and their blood pressure didn't rise with age. But when they migrated to a Venezuelan or Brazilian town and adopted a western lifestyle, they became overweight, developed diabetes and premature disease of the blood vessels. Although our Western lifestyles wouldn't allow us to be as active

or eat the same diet as the Tsimane people, that doesn't mean we can't learn something from them. Avoiding salt, being active, sticking to a healthy weight, not smoking and looking after our blood pressures can help keep our hearts and blood vessels in good shape into old age.

Blood pressure news

A NEW ROLE FOR NITRIC OXIDE

Why nitric oxide could be the key to new high blood pressure treatments

Nitric oxide is a gas which is present in our blood and plays a role in regulating blood pressure. It's formed in both the walls of the blood vessels and the nerves. Now researchers have made a surprising discovery - the nitric oxide that's important for blood pressure control is formed in the nerves, not the blood vessels walls.

17 healthy adults were given a drug

which

stopped their nerves

from producing nitric oxide. This led to an increase in blood pressure and greater vascular resistance – the force that opposes the flow of blood - showing that this nitric oxide plays an important role in controlling blood pressure.



This interesting discovery builds on

our knowledge of how blood pressure is controlled in the body, possibly giving researchers more clues to help them develop high blood pressure medications in the future.



Higher activity in a part of the brain could explain if stress really can lead to heart disease and stroke

It's long been suggested that long-term stress is linked to health problems such as heart disease and stroke, but this was thought to be due to people under stress taking on unhealthy lifestyle habits to cope with stress, such as relying on alcohol, smoking and junk food. Now scientists in America have developed a new theory explaining the possible link.

In a recent study of 300 people in the United States, those with higher activity in a part of the brain called the amygdala, shown on the scans, were more likely to have had serious health problems four years later, including heart failure, stroke and heart attack. The amygdala has previously been linked to primal emotions such as stress, fear and the fight or flight response.

Interestingly, those with serious health problems also had more activity in their

bone marrow (where blood cells, part of the immune system, are made) and inflammation in the blood vessels. The researchers believe that stress causes activity in the amygdala, leading to an immune response which causes inflammation in the blood vessels, which leads to heart disease and stroke.

The links found in this study are $\overset{\mathrm{M}}{=}$ entirely theoretical and there is no evidence that stress directly causes heart disease or stroke. But if you are under such stress and it's affecting your life and your happiness, if you're always struggling to meet deadlines for example, it's important to think about the changes you can make in your life. NHS Choices has a huge range of information about coping with stress. Go to http://www.nhs.uk/ and search for stress.

Blood pressure news

PUTTING THE SPOTLIGHT ON SALT

ORDAN

Campaign group calls for less salt in our food

This March, Consensus Action on Salt & Health (CASH) urged the food industry to take responsibility for the part they play in the nation's health during their annual Salt Awareness Week.

CASH called for manufacturers to lower the amount of salt they put in their products and meet the 2017 salt reduction targets – voluntary targets set by the government. Most of the salt in our diets is hidden in the products we buy, making it hard for individuals to cut down.

With just six months left to meet the 2017 salt reduction targets, CASH revealed that out of 28 food categories, the category for bread rolls is the only one that's on track.

There is no need for foods to be so salty

CASH used the FoodSwitch UK app to compare similar food products and found massive differences in the amount of salt they contain, showing there is no need for salt levels to be so high. They used two shopping baskets containing similar everyday food items to demonstrate the difference – one contained a staggering 60g more than the other. The revelation was widely discussed in the media, featuring in everything from The Guardian to Good Morning Britain, and in news rooms as far afield as India and Kuwait.

The forgotten killer

Our recent survey found that only 12% of people in the UK know that eating too much salt is the leading cause of high blood pressure, making this year's theme of Salt: The Forgotten Killer incredibly apt. CASH raised awareness of the effects of salt throughout the week, providing posters and leaflets to more than 600 pharmacies, schools, libraries and GP surgeries.

Eat less salt to STOP Stroke

The highlight of the week was the annual House of Commons reception where more than 100 guests, including MPs, Public Health England and manufacturers, showed support for the campaign. Anthony Whitington, who helped his dad to change his lifestyle to save his life, a story told in the BBC documentary, Fixing Dad (page 19), gave a heartfelt speech about how our reliance on processed food is damaging our health. Professor Graham MacGregor, Chairman of CASH and Blood Pressure UK, took to the stand with a powerful plea for the government and the food industry to help us reach the target of 6g of salt per person per day, an achievable aim that would save tens of thousands of lives every year. "Each 1 gram reduction in salt saves £1.5 billion in health care saving costs... It saves around 7000 lives and 7000 people who would have been left disabled from a stroke or heart attack. So it's incredibly important that we keep going with this programme... Let's go on fighting for salt reduction."

THE FOODS YOU NEVER KNEW WERE SO SALTY

sausages.

Breakfast cereals Breakfast cereals still make up a major part of our salt intake despite their salt level

being halved in the last 10 years. Some contain almost a gram of salt per 100g, while others contain almost none at all. **Crumpets** Two Warburtons' crumpets contain over 1.5g of salt, more than a quarter of your daily allowance, and almost half of crumpets wouldn't meet the salt targets for

Hot chocolate

Even a Hot Chocolate can contain up to 0.8g of salt in one mug, more than a packet of crisps. Galaxy Ultimate Marshmallow Hot Chocolate has an astonishing five times more salt than the maximum target for drinks.

We launch our new campaign to prevent stroke

Many people in the UK don't know that stroke can be prevented, but in reality the outlook is much brighter

According to research published last year, nine out of 10 strokes are preventable. That's why this year we're focussing our efforts on telling the nation that we can take steps to reduce our risk of stroke.

Our recent survey found that while many people know there is a link between high blood pressure and stroke, most don't realise just how big a role it plays.

Lowering your salt intake is one of the simplest ways to lower your blood pressure and, in turn, your risk of stroke, so we officially launched our campaign during Salt Awareness Week in March, the annual campaign that puts salt under the spotlight.

At the Salt Awareness Week reception our nurse, Nirmala, checked attendees' blood pressures and our nutritionist, Shefalee, gave lifestyle advice on lowering it. Many didn't know their numbers and we highlighted how a blood pressure check takes just a few minutes and could save your life. We're working with employers around the UK to nudge their staff to eat more healthily and be more active, and with other charities to improve awareness of how stroke can be prevented. Our campaign will culminate in Know Your Numbers! Week in September, where we'll be offering free blood pressure checks nationwide to make sure people get the advice, treatments and support they need.

Order our new booklet

Our new booklet tells you everything you need to know to lower your risk of stroke, with expert lifestyle advice and ideas to help you lead a healthier life. To pre-order your copy email our Nutritionist, Shefalee Loth, at shefalee.loth@bloodpressureuk.org or call 020 7882 6255. 74%

KNOW THAT HIGH BLOOD PRESSURE IS A RISK FACTOR FOR STROKE

ONLY 12% know that a high salt intake is the biggest cause of high blood

pressure

LESS THAN A THIRD KNOW THAT HIGH BLOOD PRESSURE IS THE BIGGEST CAUSE OF STROKE

41% KNOW THAT STROKE CAN BE PREVENTED



FIND HEALTHIER FOODS WITH FOODSWITCH

FoodSwitch is a free app that helps you make smarter food and drink choices by comparing similar products instantly. Simply scan the barcode of the product you fancy with your smartphone to scan the barcode of the product you fancy with your smartphone to

see the nutrition information and what similar but healthier options are available. It's just been updated with a SaltSwitch filter too so you can find low salt alternatives.

The app is free and available from iTunes and Google Play.

New research suggests we should aim for 10 portions of fruit and veg a day to live a long and healthy life – we take a look at whether we really need to double the 5-a-day recommendation ➤

More is

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major new study has found that eating 10 portions of fruit and vegetables a day lowers the risk of serious health problems such as heart disease, stroke and some types of cancer. Researchers looked at around 95 studies from around the world, involving about 2 million people, and found that those with the most fruit and vegetables in their diet had the most benefit.

It's no surprise to read that eating more fruit and vegetables is good for you. Experts have long recognised the role they play in staving off numerous health problems and almost all dietary guidelines around the world include them as an essential part of a healthy diet. But why do the UK guidelines and the majority of guidelines around the world focus on 5-a-day and not more? Shefalee Loth, Nutritionist at Blood Pressure UK, explains why, and the answer is surprisingly simple.

"We need to balance the ideal diet with what's achievable. Most people in the UK struggle to eat 5-a-day, so when the government set the guidelines they didn't want to put people off with an impossible target. You don't need to eat 10-a-day to have health benefits, even a little is better than none.

"This new study found that the more fruit and vegetables people ate, the lower their risk of health problems, but every 2.5 portions made a noticeable difference. The World Health Organisation set the target at 5-a-day to lower the risk of heart disease, stroke, cancer and osteoporosis as research shows this amount has a protective effect. In other words, the more, the better."

Does the type of fruit and veg matter?

The researchers linked different types of fruit and vegetables to different health conditions. Cruciferous vegetables, such as cauliflower and broccoli, were linked with a lower risk of cancer, while apples, pears, citrus fruits, green leafy veg and carrots appeared to play a role in preventing heart disease and stroke.

Shefalee explains: "The study can't prove these foods are responsible, just that there was an association. The most important thing is to eat a variety of fruit and veg, beans and pulses, and nuts and seeds too, to get the full range of nutrients.

"Plant foods contain different vitamins and minerals which are essential just for your body to keep

"This new study found that the more fruit and vegetables people ate, the lower their risk of health problems, but every 2.5 portions made a noticeable difference"

ticking over and prevent numerous diseases, plus they are low in calories, high in fibre which helps with digestion and heart health, and of course, potassium, which helps to lower blood pressure and keep your heart healthy."

What counts as a portion?

A portion is 80g, which is a handful. For example, one apple, two satsumas, seven strawberries or half a grapefruit.

Almost all fruit and veg count. They can be fresh, dried, frozen or tinned, just go for options in water or natural juices rather than syrup or water with added salt. Beans and lentils count too, but only as one portion regardless of how much you eat.

A small glass of fruit juice, vegetable juice or smoothies also count, but again only as one portion a day, as the sugars could damage your teeth and they could give you unnecessary calories without filling you up.

Potatoes and other starchy vegetables like yams and cassava don't count because they're considered a starchy food as they often replace pasta, bread and rice.

Fruity facts from around the world



Eat vegetables every day; fill yourself up with life. Eat fresh fruits and your vitality will increase – advice from Cuba

> At just 2.4 portions per day, South America has some of the lowest intakes

Vegetables should always be close at hand, according to the Hungarian guidelines

Western Europe has some of the highest fruit and veg intakes in the world, averaging 5.6 portions per person per day

Oman recommends up to nine servings daily, including three to five of vegetables and two to four of fruit

The Greeks recommend nine servings per day – six of vegetables and three

of fruit, plus three or four servings of olives, pulses and nuts a week STOP STROKE

How to up your intake

Use these ideas to add fruit and veg to the foods you already eat, they're kind to your waist line, low in salt and saturated fat, and altogether blood pressure-friendly

BREAKFAST

- Add fruits to your usual breakfast cereal – try mixed berries or summer fruits which you can buy frozen.
- Muesli or dried fruits and nuts stirred into a tropical fruit salad and yogurt is filling and delicious.
- Mash some banana onto your weekday toast for a simple but satisfying start to the morning.
- Slice some avocado and tomato on toast – add a poached egg or chilli flakes if you're feeling adventurous.
- Go for a 'half' English have scrambled or poached eggs, grilled tomatoes, mushrooms, toast and fresh or lightly fried spinach – skip the bacon, black pudding and fried bread.
- Make a smoothie with a plain yoghurt and frozen berries – just blend everything together.

LUNCH

- Slip a little salad into your sandwiches and wraps. Try tuna with tomatoes and red onion, chicken with avocado and salad leaves, or red peppers with mozzarella cheese and rocket.
- Add different vegetables to your soups – mushrooms, beans, peas and leeks are all good options.
- Simplest of all, add a side salad to whatever you're having – remember to go easy on the dressing or just use olive oil and/ or balsamic vinegar.



DINNER

- Add some extra vegetables to your pasta sauce – broccoli, peppers, mushrooms, peas and carrots all work well thrown in a tomato sauce.
- Try a bean burrito instead of a meaty Mexican meal, or throw some extra kidney beans, peppers and courgettes into your stews and casseroles.
- Roast a selection of vegetables when you would normally stick with potatoes – carrots, onions, squash and sweet potato are a perfect combination for a Sunday roast.

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THE BLOOD PRESSURE-FRIEND EXERCISE PLAN

Build strength and lower your risk of stroke with this safe and simple exercise plan

he benefits of exercise are countless. It keeps your heart, blood vessels, lungs and muscles in good shape, it keeps your weight, blood pressure and blood sugar under control, and it strengthens the bones and improves balance. Keeping your muscles and joints moving can help keep you active and independent in later life too.

As well as the physical gains, there's a bonus effect on your well being too. It can lift your mood and even improve your cognitive function.

There are two main types of exercise our bodies need: aerobic and strength. Aerobic exercise gets the heart and lungs working and includes anything that gets you breathing harder, feeling warmer and your heart beating faster,

but you should still be able to talk. This can be something as simple as going for a brisk walk.

Ramblers and Walking for Health both organise free walks all over the country every week. Visit ramblers.org or walkingforhealth.org.uk to find your nearest walking group. Walking is sociable too, take a friend along or turn up by yourself.

Aim for 150 minutes of aerobic exercise each week. That's equal to half an hour five times a week, but you could split it up into shorter bursts if you want to. More than 150 minutes has added benefits, but even a little helps.

The second type of exercise is strength training. This could be lifting weights, using resistance bands,

exercises that use your body weight such as press ups and sit ups, and yoga. Aim for at least two sessions a week.

If you can't be up and about, just do what you can. If you have high blood pressure, avoid very vigorous or strenuous exercise such as lifting heavy weights, sprinting or spinning classes (classes on exercise bikes). Speak to your doctor before starting a new exercise programme to make sure it's safe and suitable for you.

Sarah Dilley is a personal trainer from Exeter who specialises in working with people recovering from illness and injury. She explained "The simplest way to look after your blood pressure is to move more, as well as making small changes to your diet, like eating less salt and sugar. Even a little activity helps, try and be active every day and break up long periods of sitting - pick one of these exercises to do when the adverts come on, or get up and walk around the living room or walk up and down the stairs. Just keep active and keep moving."

Six simple exercises

Work all the major muscle groups and get your heart and lungs working with these simple movements

Set aside about 10 minutes every day to help you get into a routine. Aim to do each exercise five to 10 times, with a break of about 30 seconds to a minute in between. Start off with one round (or set) of all six. Slowly, over a few weeks, build up to three or four rounds.

Sit to stand Starting from a seated position, simply stand up and sit back down again. Try to do this without using your hands to help you. Start with your feet just wider than hip width apart, with your feet slightly turned out. Keep your knees over your toes, trying not to let your knees point inwards towards each other, and your knees should be bent at about 90 degrees. A kitchen chair is perfect but you can also do this from a sofa, arm chair or bed. This will work your buttocks and thighs.

Step ups Start standing on the floor and step up onto the bottom step of a staircase and back down again. Once you've done five or 10 starting with one leg, switch to start with the other leg. This will work your buttocks and thighs.

Arm-raises Start with your palms facing your thighs, and slowly raise your arms up to shoulder height then lower them back down. You



can raise your arms in front or out to the sides, and you can do this sitting or standing. To make it harder, hold light weights, tins or bottles of water. This works your shoulders.

Wall

Press ups Place your palms on a wall with your hands just wider than a shoulder-width apart. Slowly bend your elbows allowing yourself to lean fowards, then push away. To make the exercise harder, walk your feet further away from the wall or place your hands on the edge of a table. This works your chest and shoulders. **Biceps curls** Start from sitting or standing with your arms down by your sides and your palms facing forwards. Curl your hands into fists and squeeze your biceps to bring your hands upwards. Hold light weights, tins or bottles of water to make it harder.

Single arm row Stand with one hand resting on the seat of a chair or on a table, bending forward from your hips. Let the other arm hang down, palm facing towards your body, and curl your hand into a fist. Think about squeezing your tricep, the muscle at the back of your upper arm, to help you lift your elbow up towards the ceiling. Hold onto a weight or bottle to make this harder, or a bag of potatoes or flour.

The future of blood pressure treatment

Scientists have found 107 new genes which are linked to blood pressure, paving the way for more personalised prevention of heart disease and stroke

S cientists at William Harvey Research institute at Queen Mary University of London, and Imperial College London, looked at the genes of over 140,000 people along with their blood pressures and found 107 new gene regions (stretches of DNA, which can contain a number of genes) which

could be linked to blood pressure. They developed a risk score based on these gene regions and showed that the higher a person's genetic risk score, the higher their blood pressure



and the higher their risk of heart disease and stroke – especially for people aged 50 or over. These breakthrough findings could lead to major changes in the way high blood pressure is prevented and treated.

Dr Helen Warren is a Lecturer in Statistical Genetics at Queen Mary and was part of the team who made the discovery, published in the journal, *Nature Genetics*. She talks to us about what the research means for treating high blood pressure.

Why are these findings important?

Discovering these new genes could lead to two key changes in how we treat and prevent high blood pressure. The first is that it could be possible to target drugs to these genes – either by developing new treatments for high blood pressure, or by selecting the best available treatment for each individual. The second is that we could develop a genetic test to identify those who have the highest genetic risk of developing high blood pressure. These are the long term goals – they're still a long way off.

Why would a genetic test be helpful?

It's easy to measure a person's blood pressure, but people don't tend to start checking and monitoring their blood pressure until problems develop, often in middle-age. If we knew earlier on in a person's life if they were genetically

So the good

news is that even

blood pressure can

offset this risk with

a healthy lifestyle

predisposed to higher blood pressure, GPs and nurses would be able to better target those individuals, making people with genes that sure they had the predispose them to high right lifestyle advice or medications. This means their blood pressure can be better controlled. lowering their risk of heart disease and stroke.

What can we learn from this study now?

We developed a risk score which uses a person's genetic data to look at the relationship between our genes and our blood pressure levels. When aged 50 years or over, the people with the highest genetic risk had systolic blood pressure readings 9 or 10mmHg higher than those with lower genetic risk.

We know from previous studies that 10mmHg is an achievable amount to lower your blood pressure by - for example, by eating less salt, losing weight, being more active and drinking less alcohol. So the good news is that even people with genes that predispose them to high blood pressure can offset this risk with a healthy lifestyle.

How did you find the new genes?

We looked at the genes of over 140,000 people in the UK Biobank alongside their blood pressure numbers. This allowed us to see which genetic variants (versions of a gene) were linked to blood pressure levels.

Many of these genes were expressed in the blood vessels, meaning they have a role there. This helps us to know we've found the right genes - as

we know blood vessels are involved in blood pressure regulation - but it also helps to build up a better picture, at a whole body-level, of how all the genes may play their part. It means we can understand the underlying biology of blood pressure better.

What are the next steps?

The main reason for studying how genes are related to health problems is to get a better understanding of the biology so in this case, how high blood pressure develops and which genes are involved.

What's

targets

The genes we identified are called candidate genes. This means there is some evidence that

they may have a role in regulating blood pressure, but we don't know if they actually cause it. The next step is to test them encouraging is that in the lab to find the more candidate out what their genes we have, the more exact roles are, and chance we have of then find the ones finding good drug which are most important. What's encouraging is that the more candidate genes we have, the more chance we have of finding good drug targets.

What is the UK Biobank? There are nearly half a million adults in the UK Biobank. They have all given a DNA sample, as well as permission to use their medical records, so that researches can study different illnesses and develop treatments. Before the UK Biobank existed we had to combine the results of lots of small studies all over the world, all measuring genes and patient health in different ways. The UK Biobank gives us much more data to work with and makes everything much cleaner, with a very large number of people all having their genetic data and blood pressure measured in exactly the same way.

What else can we learn from this study?

The findings show the merits of this type of research and that we are making good progress. With advancements in technology we have so much more data that we can use nowadays.

This study shows the importance of patient involvement in research, whether that's the people who have contributed to the UK Biobank or indeed to any clinical trial or research study. I can't emphasise enough how grateful we are to those who take part.

What will you be working on next?

Before we did this research, we knew of 122 genetic regions linked to blood pressure. We've almost doubled it by finding more than 100 new ones. So our knowledge of blood pressure genetics is arowing. The work we've just done was

on a subset of just over 140,000 people in the Biobank who we currently have interim genetic data for.

What's very exciting is that the genetic data for the rest of the Biobank, that's nearly half a million people, will be available soon. We've already doubled the number of genetic regions

we know about, and soon we will be able to find out even more - so there's more to come!

WHAT RESEARCH PROJECTS DO YOU THINK ARE A PRIORITY? A message from the British & Irish Hypertension Society. We're interested in your opinion on what the most important issues are that should be researched in the diagnosis and treatment of high blood pressure. What concerns you the most? Please let us know your suggestions by Monday 17 July 2017. Email us at bihs@le.ac.uk or write to us at British & Irish Hypertension Society, c/o Hypertension Research Team, Clinical Sciences Wing, Glenfield Hospital, Leicester, LE7 4YN



The battle's not over until it's won

After surviving a stroke five years ago, Christine was determined to recover. She talks to us about how she got through it and the changes she has made in order to live a healthier life worked for the London Fire Brigade for 24 years. I was very dedicated to my work, moving through catering to administration to training and development. I had high blood pressure for quite a while towards the end of my time there. I had a very busy schedule – working, studying, looking after my home and my two sons – there were times I forgot to take my blood pressure medications.

I began retraining as a teacher after I finally bid the Fire Authority farewell, meanwhile working for the London 2012 Olympics in administration. It was after the Olympics that I had a stroke.

I wasn't feeling 100 per cent even during The Games – I felt like I was dragging myself along to things I would normally excel at. I was with a friend one day when I started to feel a bit unwell. I excused myself and went back home, cooked a meal for my sons then sat down and fell asleep. When I woke up, I felt numbness down the left side of my body and I said to my son, 'I think I'm having a stroke'.

The ambulance arrived within eight minutes. My speech was going, I wasn't my normal self, and an MRI scan the next morning confirmed the stroke.

I was in hospital for 14 days. I couldn't walk. One evening my blood pressure shot to 200mgHg systolic. There were doctors everywhere and nurses supporting me. I was at the point of death, but inside of me I felt, this cannot be me, I have to get up, and I have to get through this.

An Occupational Therapist made adjustments to my house so that I could go home. They showed me how to walk and how to cross the road. I got myself washed and dressed. I crawled when I had to, I had physiotherapy, I went to the gym and I did the exercises I was given. I used a taxi service to get to work, and I studied for my diploma in teaching adult education on crutches.

I had challenges, but my mind was made up. I had my sons to think about and decided I would not throw a pity party by feeling sorry for myself.

If you saw me you wouldn't know I had a stroke. I teach cooking classes to adults one day a week in Newham, and I give training on food safety and allergen awareness. I still have mobility issues, I'm not 100 per cent, but I'm still fighting on. The battle's not over until you've won.

I'm from Ghana and African Caribbean people like to eat food that's salty, spicy, fried and full of flavour. Not everything we like is good for us, and I've had to make some adjustments in order to live a healthy life.

Salt is a challenge, but I've explored a wide variety of recipes, and my background in cooking helps. I use lots of herbs and spices for flavour, I bake instead of frying, I eat lots of vegetables instead of potatoes or rice, and I try not to have too much red meat. It's having an impact on my children because what I cook I serve to them as well.

My doctor advised me about exercise and I go to the park when the weather is nice. Walking in the park is free, you meet nice people and you don't get bored, stressed or depressed because you are up and about in the fresh air.

Life is a journey. You meet challenges, but don't let them get on top of you. Make the best of what life throws at you and learn from it, that's what makes life rich.

I'm 60 and I carry a bit of weight but I know I still have more to give to

Christine's tips for healthy eating

Juice vegetables for breakfast I use a juicer to blend fruits and vegetables. My favourite combination is a handful of kale, one or two lemons or limes, an orange (peeled), a piece of ginger, a carrot and an apple (peeled). Stay full with regular meals so you don't snack

I teach pastry and bread making, so I take my vegetable juice to work so I don't snack when I finish baking.

Roast a range of vegetables

I like roast dinners, but I replace the potatoes with

swede, carrots,

onions, tomatoes and courgettes. Cook them with a little drizzle of olive oil and dried or fresh herbs.

Watch the salt

Sometimes it's hidden in stock cubes. If you have to use some, just use a tiny bit. Use black

pepper, herbs and spices instead. **Don't eat too much red meat**

I just eat a little, and choose fish and chicken with the skin off instead. Vegetarian food can be very nice too.

Try not to fry, bake instead Most things can be baked – it's iust as nice.

Make different soups

Avoid tinned soup and make some to put in containers and warm up when you need it. Try using different beans and vegetables. **Watch your portion sizes**

> And swap some of the carbohydrates like rice and potatoes for vegetables. You can see two of Christine's Caribbean recipes on page

> > 21-22

I had my sons to think about and decided I would not throw a pity party by feeling sorry for myself

ity so I know I have to look after my health. Doctors can do what they're trained to do for you, but you can help yourself too. I would say to African Caribbean people, or anyone who's finding

it hard to

make changes, we only have one chance in life and once it's gone it's gone. So make adjustments now so you can live longer to enjoy your family and friends.

Faith has had a lot to do with my recovery. There were times I called on God to give me the strength to pull through. With the help of God, my sons and a friend called Sister Mercy, I know I've achieved a lot and I will win this battle. Life is not about giving up it's about going on, and learning that you can encourage yourself and make it if you want to.

Share YOUR STORY

Perhaps you've found effective ways to lower your numbers or found support where you never expected it. Real life stories let others know they're not alone. If you'd like to share the lessons you've learned, contact us at info@bloodpressureuk.org or 020 7882 6255.

Congratulations JP

Our Marathon runner had a blast as he stormed to the finish line, raising over £2,000 for our life-saving work *p*

he sun came out on Sunday 23 April as our Marathon runner, JP, took to the streets of London to run 26.2 miles for Blood Pressure UK. With support from his family – our CEO Katharine and their baby Sylvia – he finished in 3hr 29mins, raising over £2,000 to help us prevent heart disease and stroke.

JP tells us: "The atmosphere was amazing – everyone calling out your name and cheering you on, high-fiving as you run past.

"It was a tough race. It was busy and crowded at the start, and later on it was hotter so it became much harder. The last three miles were extremely hard work, even with all the training. My legs felt like they were made of lead.

"After the race I felt like a bit of a hero with people congratulating me wherever I went across London. I reckon I'll be hanging up my running shoes for a while, but I had a blast, I got round and I'm really happy with my time! "A massive thank you for all the support, encouragement and extremely generous donations. Without it, I would have found it impossible to get through those last few very difficult miles."

We are very grateful to JP and to everyone who supported him in all his fantastic efforts. The money raised will really help us in our search to find the missing millions living with high blood pressure and reduce their risk of stroke and heart attacks. Would you like to take part in the London 2018 marathon? Then get in touch! info@bloodpressureuk.org

Help others to know their numbers

Take part in Know Your Numbers! Week 2017 to find those at risk of stroke and heart disease

I know my

numbers

18-24 September is Know Your Numbers! Week and will be the high point of our 2017 campaign to STOP Stroke. By setting up a Pressure Station, where people in your community can get a free blood pressure check, or letting people know about the event,

you'll be helping us to find some of the 5 million people with undiagnosed high blood pressure and get them the support they need. Thousands of people had a free blood pressure check during last year's event, with Pressure Stations

popping up in local markets, gyms, colleges, and even the Royal Opera House. And it works – a third of those who had a test because they were just passing by were told they had raised blood pressure for the first time. "We enjoyed it immensely, and may I compliment you on the support during the lead up to the event, a well thought out programme." **Rimmington Pharmacy**, Bradford

"It was great to be involved – fantastic campaign!"

Parker Healthcare Limited

"I was surprised at the amount of people that wanted to be tested. We found employees with raised blood pressure."

Bradgate Bakery

"Many of the patients who had high blood pressure had no idea – and the majority were relatively young." Saffron Walden Community Hospital

> Contact kyn@bloodpressureuk.org or call 020 7882 6255 if you're interested in taking part or would like to know more. You will have all the support you need.



The story of how two brothers set out to save their Dad's life, becoming healthier and growing closer in the process

eoff's blood pressure was over 200mmHg systolic. He was overweight and over worked, and facing a foot amputation due to the damage caused by type 2 diabetes.

YDIV VDCO

That was in 2013, when his two sons Ian and Anthony stepped in to fix him. *"We had no medical background but we did have a clear choice: fix dad now or lose him for good"* explains Anthony. They made a pact with Geoff that, over the next year, Geoff would do whatever they asked him to in an attempt to save his life.

Fixing Dad, a documentary shown on BBC2 last August, shows Geoff's transformation from a *"disaster waiting to happen"* to an endurance cyclist, determined to inspire and improve the health of others.

In their year-long intervention, the brothers set goals for three main areas – diet, exercise and mind (or attitude). They cut out processed food and dug out Geoff's old bike, the perfect form of exercise as it limited the pressure on his damaged feet. An activity-filled holiday in the Pyrenees rebuilt their family bond and, after a year of training, Geoff completed the Prudential RideLondon -- Surrey 100, a 100 mile cycle through the challenging countryside of Surrey.

Their year wasn't without its struggles as they attempted to break a lifetime of bad habits and a lifestyle of work, television and food. But it was worth it. "It's not a story of fat man gets thin, it's about a family pulling together and coming back from the brink of amputation, and getting the old person back" explained Anthony.

Speaking at the House of Commons reception for Salt Awareness Week in March, he added: "It is a physical, emotional and mental before and after. It's a 'before man' sitting with me at the kitchen table making his Will, versus the 'after man' who is in utter disbelief at his own achievement as he crosses the finish line, and opens the letter from the consultant saying he's in remission and puts his pills in the bin because he doesn't need them anymore."

As well as taking responsibility for

ourselves and those closest to us, the responsibility of the food industry was a message that couldn't be ignored. "I was diagnosed pre-diabetic during the project as well. As a family we would look at those brands on the shelves and hear those 1980s theme tunes and those adverts and we had a life-long trust in them."

He urged manufacturers to take the opportunity to be part of a change in our diets, fostering health rather than damaging it. And he called for the health care system to work with families, friends and support networks, as that's where the greatest trust is, describing them as the key to unlocking the 'after man' or 'after woman'.

At the end of Fixing Dad, we saw Geoff take to the stand: "I would say to anybody, especially the diabetics out there, don't give up. Nobody was in worse condition than me. There's always a chance out there. All you've got to do is get out, build your self-confidence, and you can get through it."

The family's journey has inspired them to help others, and they're now working with four other people with type 2 diabetes. See their story in the Fixing Challenge on the BBC this August.

If you'd like more information about eating well, being active and looking after your health, visit our website at bloodpressureuk.org or call us on 020 7882 6255.

MEET THE TRUSTEES

Over the next few issues of *Positive Pressure*, we're going to introduce you to our Trustees. Meet our hypertension nurse Nirmala Markandu

QWhat is your role at Blood Pressure UK?

As a Trustee I'm here to advise the staff on anything they need help with for the charity to run smoothly, such as fundraising or policy changes. I'm also the hypertension nurse specialist on the helpline, answering questions and offering advice about medications, side effects, lifestyle changes and home monitoring for example.

QTell us about your career and what led you to Blood Pressure UK

I trained as a nurse many years back and after trying out different areas, I tried a research post in a metabolic unit and never looked back.

I went on to become a clinical nurse manager for the blood pressure unit at St George's Hospital while also working as a senior research fellow, running numerous research projects. For many years I ran annual conferences on hypertension and cardiovascular disease, with 200-300 health professionals attending each meeting.

I helped set up one of the first nurse-

led hypertension clinics at St George's, where we assessed all the new patients before they had their consultations with the doctor, cutting the waiting time down from over six months to less than four weeks, identifying patients who needed to be seen urgently in the process.

What's the most memorable study you've worked on?

My first ever study was looking at the link between salt and blood pressure. We gave people different amounts of salt and after a few weeks on a high salt diet, we saw that their urinary sodium and blood pressure went up, and with a low salt diet the opposite happened. This experience helped me to realise that with good lifestyle advice it's possible to lower salt intake, and, in turn, lower blood pressure – knowledge I have been putting into practice ever since.

I have enjoyed working on over 200 clinical and scientific studies on blood pressure during my career so far.

Why did you want to start Blood Pressure UK?

Working in clinics, we found patients always had many questions so we wanted to create somewhere people could access information. Professor Graham MacGregor, Professor Gareth Beevers and I set up the Blood Pressure Association in 2000, and with the help of charity staff, patients and other health professionals, we've written many award-winning leaflets over the years.

QWhat changes in clinical practice have you seen in your career?

The way clinics are run has improved dramatically, with leadership from nurses who can also train to prescribe certain medications.

The introduction of electronic blood pressure monitors was a big change. We ran a study highlighting the problems with mercury

sphygmomanometers (blood pressure monitors) in 2000 which started the trend in replacing them with electronic machines.



The introduction of home monitors was another important change. We did an audit when they first became available showing that people were generally confident using them and felt empowered and more in control. Home monitoring has changed the way GPs measure blood pressure too. It overcomes white coat effect and helps to diagnose high blood pressure. We've come a long way, and I am pleased that Blood Pressure UK has helped towards that.

What are your goals for the charity?

My vision is for everyone to know their numbers and be able to take control of their health. We have a lot of knowledge in the team to share. We're focussing on stroke prevention now, and in the future I'd like to focus on preventing other associated problems such as kidney disease and diabetes.

QI'd like to continue working with the team to make more people aware of high blood pressure and how to prevent and manage it. I enjoy spending time with all my family who are spread out all over the world. When I retire, perhaps I will go travelling again. I've been to many places and I loved them all.

We are so grateful to Nirmala for all her help over the years. She is caring and compassionate about our members and looks after our staff with her generosity and kindness as well as extraordinary expertise, and keeps us in good supply of tropical fruits and nuts!

Christine's story on

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Christine's Caribbean mackerel with lemon, herbs and peppers

Christine shares her favourite recipes

his is my take on Escabeche, a popular Caribbean dish where the fish is marinated and cooked in vinegar and lemon. The ingredients form their own juices to drizzle over the fish and the colours and aromas are beautiful. You can use mackerel or red snappers, or tuna steaks if you prefer, and serve with jacket potatoes, boiled potatoes or yam, or mixed roasted vegetables such as sweet potato, swede and carrot.

Ingredients (Serves 2)

- 2 tablespoon olive oil
- 2 garlic cloves, finely chopped
- 1 onion, sliced
- 2 carrots, sliced
- Half each of a sweet red, green and yellow pepper, cut into strips
- 2 fresh tomatoes, chopped
- 1 scotch bonnet pepper (optional), sliced
- 1 tablespoon white wine vinegar or malt vinegar
- Juice of one lemon
- Handful of fresh herbs such as sage, parsley and thyme and bay leaves, or a bouquet garni
- A tiny bit of LoSalt to taste
- Black pepper
- 2 fresh mackerel or red snappers, gutted and cleaned. Use fillets if you prefer, or tuna steaks
- 1 lemon, sliced

Method

- Preheat the oven to gas 6, 200°C, fan 180°C.
- In a large frying pan heat the olive oil and sauté the garlic over a low heat for a couple of minutes until golden brown.
- Add the sliced onion, carrots, peppers, tomatoes, and the scotch bonnet pepper if using. Cook for a few more minutes then add the vinegar, lemon juice and fresh herbs, season to taste with a pinch of LoSalt and black pepper.
- Remove from the pan from the heat and let it stand for a few minutes.
- Using a sharp knife, slash the skins of each side of the fish then lay them on a piece of kitchen foil on a baking tray.
- Pour the vegetables and juices over the fish, add the lemon slices and wrap everything up in the foil. Cook in the oven for 20 minutes. Occasionally, spoon the marinated veg and the juices over the fish. Leave to stand for a few minutes and serve.

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Christine's chicken and vegetable soup

This is my favourite chicken and vegetable soup recipe. I love to try soups with different vegetables mushrooms, beans, chickpeas and leafy green vegetables – and store it in containers to heat up when I need it. You can freeze some for another time too.

Ingredients (serves 4) For the stock

- 1 whole roasting chicken
- 2 large carrots, peeled
- 2 medium onions. peeled but whole
- 2 sticks of celery, whole
- 1 leek. sliced
- 2 pints of water
- Half a low salt chicken stock cube, optional
- A few bay leaves
- 1 bouquet garni or a handful of fresh mixed herbs

For the soup

 2 tablespoons olive oil

- 1 medium onion, peeled and diced
- 2 large carrots, chopped
- 2 sticks of celery, chopped
- 1 leek, sliced into rounds
- 50a plain flour
- A handful of fresh herbs, chopped
- White or black pepper
- A pinch of LoSalt, optional

Method

• Place the chicken in a stockpot with the carrots, onions, celery and leeks. Add the water, stock cube if using, bay leaves and bouquet Salt is a challenge, garni. but I've explored a

• Cover the pot with a lid and boil on a medium heat for about 45 minutes until the chicken is

- cooked. Turn off the heat and remove the chicken from the pot and leave it to cool. Strain the vegetables from the stock but keep the stock.
- Once the chicken has cooled. remove the skin and bones and dice the chicken into pieces.
- Heat the olive oil in a saucepan over a medium heat. Add the diced onion and cook

wide variety of recipes,

and my background in

of herbs and spices

for flavour

until soft. Add the chopped carrots, celery and leeks and cook for about 5 minutes. Add the flour cooking helps. I use lots and cook for about 10 minutes, stirring so that the flour doesn't burn.

> • Stir in the stock from the cooked chicken. Cook the soup on a medium heat to simmer for 15 minutes and add the diced chicken and the fresh herbs.

• Season with white pepper and a pinch of LoSalt to taste and simmer for a further 5 minutes. Serve with freshly made bread rolls and enjoy.

Helping others with High Blood Pressure

Have you thought of Blood Pressure UK in your Will?

Finding out that you have high blood pressure is traumatic, particularly if you are young. Most people don't know anything about the condition and worry about how it will affect themselves and those around them. But Blood Pressure UK is here to help, and with our



information packs, range of leaflets and our helpline, we provide reassurance and support to sufferers and their families. But all of this work is expensive and while membership subscriptions and general donations help enormously, leaving a gift in your Will can help us make a bigger difference.

It isn't as complicated as you might think, doesn't have to be a large amount, and will give you the reassurance that our work helping fellow sufferers will continue once you have gone.

Obviously, providing for your family and friends comes first, but once that is done please consider a gift to Blood Pressure UK in your Will. We have put together a simple leaflet to guide you through the process and you can get a copy by telephoning: (020) 7882 6255, visiting the website: www.bloodpressureuk.org, or by writing to: Blood Pressure UK, Wolfson Institute, Charterhouse Square, London, EC1M 6BQ.

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Information & publications

We have a range of booklets and fact sheets giving valuable information about living with high blood pressure to help you understand it, lower it and and manage it.



Introducing high blood pressure

This booklet explains what high blood pressure is, who gets it and why. It gives basic information on lifestyle changes to lower blood pressure, and about measuring your own blood pressure at home.

Healthy lifestyle and blood pressure

This booklet shows how getting more active and keeping to a healthy weight can help lower your blood pressure. It looks at how you can start to build more activity into your day, and what types of activity may be best for you. It also talks about sensible approaches to losing weight if you need to.



Measuring your blood pressure at home

This booklet can help you decide whether measuring your blood pressure at home is right for you, and how to choose the right type of monitor. It also gives you tips about how and when to measure your blood pressure to be sure you are getting reliable readings.



Getting the most from blood pressure medicines

Most people with high blood pressure will need to take medicines to control it. This booklet talks about the different medicines for high blood pressure and about how you can get the best results from them. It also looks at side effects of blood pressure medicines and what you can do to avoid these.







Healthy eating and blood pressure

This booklet looks at how what you eat can affect your blood pressure. It shows you how you can start to eat less salt, and how to get your five daily portions of fruit and vegetables. It also explains how alcohol, fats and sugar can all affect your heart and body.

Love your heart: a South Asian guide to controlling your blood pressure

High blood pressure is a major cause of heart disease and stroke. People of South Asian descent are much more likely to develop these health problems than other people. This booklet looks at how to lower your risk by keeping your blood pressure controlled.

Healthy eating: the African Caribbean way

People of African Caribbean origin are more likely to develop high blood pressure. This booklet looks at how you can help lower your blood pressure by eating healthily. Traditional African Caribbean cooking can be high in salt and fat, so this booklet looks at how to prepare healthier alternatives.

Our medicines information sheets provide information for patients about the different blood pressure medications that are used to treat high blood pressure. They are all available to download from our website and titles include:

- ACE inhibitors.
- Angiotensin receptor blockers (ARBs).
- Calcium channel blockers.
- Diuretics.
- Beta-blockers.
- Non-standard medicines for high blood pressure.

All these publications are free to Blood Pressure UK members. Call **020 7882 6255** for your copy or visit **www.bloodpressureuk.org**

