



# THE RISK FACTOR

Patients used to only be informed they had diabetes, hypertension or osteoporosis after diagnosis. Now doctors can diagnose these and other ailments before they fully develop. So, if you are at risk of developing diabetes, you are 'pre-diabetic' and if your blood pressure is above normal, you could have 'pre-hypertension'. But can this early diagnosis improve our health?

"Pre-disease is determined by a reading that isn't quite normal but which hasn't reached the defined diagnostic standard for a disease," explains Dr Christina Hennessey, GP for online doctor service Dr Thom.

Pre-disease is a concept that has come to the fore as our lifestyles have become more sedentary. "Like Type 2 diabetes, pre-diabetes is strongly linked to being overweight

or obese," says Deepa Khatri from Diabetes UK. In the UK, between five and seven out of ten adults fall into these categories. Christina adds, "If someone's blood sugar is slightly raised above normal, they have a one in ten chance of developing full-blown diabetes within a year."

Meanwhile, the rise of osteopenia – the condition preceding 'brittle

bones disease' or osteoporosis – is linked to an ageing population. According to the National Osteoporosis Society, the percentage of the UK's population aged 65 and over is set to increase from 16 per cent in 2009 to reach 23 per cent by 2034. "As we get older, bones become more fragile and are more likely to break," explains Mr Michael

Dooley, Consultant Gynaecologist and osteoporosis expert at The Poundbury Clinic. "By the age of 75 about half of the population will have osteoporosis."

As we get older, we are also more likely to develop cancer long before any symptoms appear. This is why the NHS offers free breast screening (usually to women aged 50 to 70), cervical screening (women between the ages of 25 and 64) and bowel cancer screening (everyone aged 60 and over). "Two years ago, my first bowel cancer test results came back negative," says Mary Cox, 62, from Surrey. But only three months later, she noticed blood on her toilet tissue. This led to further investigations and discovery of precancerous polyps in her colon, which were removed.

Advanced genetic testing, which usually involves having a sample of your blood or tissue taken, also accounts for the rise of pre-disease cases. The genetic blueprint to the human body – DNA – was discovered in 1953 and scientists soon learnt they could compare unique parts of DNA to establish a link between genetic disorders and family members with a near 100 per cent certainty.

Since the 1980s DNA testing has been used by the medical profession to identify missing or faulty genes that could cause disease. For example, according to Breakthrough Breast Cancer, about one in four women with a family history of breast cancer has an inherited fault in a BRCA gene. "Changes or mutations in the BRCA1 and BRCA2 genes can increase the risk of

developing breast cancer," says Dr Rachel Greig, Senior Policy Officer at Breakthrough Breast Cancer.

According to the National Institute for Health and Clinical Excellence (NICE), more than 1,000 genetic tests are now available through the NHS, most commonly used to screen for Down's syndrome, muscular dystrophy, cystic fibrosis and breast cancer. Depending on your region, it costs the NHS between £125 and £220 to screen family members for known mutations of the BRCA1 or

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BRCA2 genes, according to the UK Genetic Testing Network.

But even if you can't get a referral on the NHS, private screening is becoming more affordable. The Genetic Predisposition DNA Health Test offered by some companies for around £300 allows you to discover if you are likely to develop cardiovascular conditions, some types of cancers, disorders of the immune system, diabetes and medical conditions related to ageing.

Other private, non-genetic tests cost even less. "Four years ago, after a friend was diagnosed with osteopenia, I had a DEXA scan, a

special type of X-ray that measures bone density, in my local private hospital," says Ann Blake, 51, from Wirral. "It cost £100 and I did it out of curiosity. Unlike my friend, I had no family history of osteoporosis."

Like Ann, some people get tested out of curiosity. Others want their fears confirmed or dispelled. But should you be tested if you have no worrying symptoms? "Consider your risk factors," advises Deepa Khatri. "With pre-diabetes, they're exactly the same as with Type 2 diabetes – being overweight, having a waistline greater than 80cm or 31½in for women and 94cm or 37in men, and having high blood pressure. Also, have you got any close family members with diabetes?" Genetics is a risk factor for developing osteopenia and osteoporosis, too, together with smoking, excess alcohol and lack of exercise. "So is decreased oestrogen in women after menopause and being too thin, with body mass index (BMI) of less than 20," says Mr Dooley.

But the risk factors are only guidelines – ultimately, it boils down to your individual risk assessment and predisposition. "I had no risk factors other than being a petite 5ft 3in and weighing a lot less than 9 stone," says Ann. "I'd given up dairy because of food intolerances, but I was nowhere near menopause, yet the DEXA scan showed I had osteopenia." Used both by the NHS and by private healthcare companies, DEXA scans can measure even very small changes in bone density, making it possible to

diagnose osteopenia before it develops into osteoporosis. Your GP or consultant will then use the results to decide on any treatment.

If you have been tested positive, there are obvious advantages to early diagnosis. While you cannot change your age and your genes, you can prevent some diseases by changing your lifestyle. "People with pre-diabetes are up to 15 times more likely to develop diabetes than people with normal glucose levels, but they can delay or even prevent it by losing weight, following a healthy diet and increasing their physical activities," says Deepa. In fact, research from the American Diabetes Prevention Program shows that losing just seven per cent of your body weight combined with 20-25 minutes of daily exercise can reduce the risk of developing Type 2 diabetes by 58 per cent.

Lifestyle changes and early intervention can also arrest progress of pre-conditions. "I now exercise at home, walk three miles four to five times a week, and I upped my intake of calcium via food and supplements," says Ann Blake. "My last two bone scans showed an increase in my bone density."

Early diagnosis and more invasive, pre-emptive therapy can remove the risk of disease in certain cases, too, although not always permanently. "There's a risk that more polyps will grow so I'll have another bowel scan in three to five years," adds Mary Cox.

However, not everyone agrees that early diagnosis and intervention improves our health. This year researchers from Bond University in

Australia have pointed to mounting evidence that medicine is harming healthy people through over-diagnosis and over-treatment. They have suggested that one in three breast tumours detected through screening may be harmless and expressed concerns over routine tests for lung, prostate and thyroid cancer, where identified abnormalities are often so tiny they will remain benign. "We've come to regard being 'at risk' of future disease as being a disease in its own right," said Ray Moynihan, Senior Research Fellow at

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Bond University. The research also shows that people with mild problems are now labelled as 'sick' and receive treatments that have no benefit and may even harm them.

Some experts blame the global alliance of doctors, pharmaceutical companies and sponsored advocacy groups. A US study last year showed that almost half of doctors involved in setting clinical guidelines in the US and Canada for diabetes and cholesterol had conflicts of interest.

Treatment of osteopenia has caused controversy, too. Studies show that drug marketing has encouraged treatment of women

at low risk of fracture, overstating the benefits and underplaying the harms of prescription medication. "In osteopenia, medication such as bisphosphonates can help build stronger bone, but can also cause serious inflammation of the oesophagus," says Mr Dooley.

High blood pressure or hypertension is another problem for half of Brits aged over 65 and for one in four middle-aged. Today many more are labelled with 'high normal blood pressure' or 'pre-hypertension', too, and some doctors may prescribe hypertension medication to manage the pre-condition. This seems to be a logical approach. But does it work? "About one in ten people with high normal blood pressure develop hypertension over five years," says Dr Christina Hennessey. "But using medication to treat pre-hypertension is more likely to harm than help. Lifestyle changes – like stopping smoking, losing weight, reducing salt – would all avoid blood pressure increasing."

According to the research from Bond University, another downside of unnecessary diagnosis and treatment of pre-disease is the cost of wasted resources. It is estimated that more than \$200bn (£128bn) is spent on unnecessary treatment every year in the US. Although there are no reliable figures for the UK, Christina says, "Supplying medication to those with a pre-disease could be an additional financial burden to the NHS."

For us as individuals, there may be additional health insurance costs, too. If you're told by your doctor that you need to do X to stop

a pre-condition before it becomes a full-blown disease and you don't act on their advice, could you be seen as a potential health liability? Dr Peter Mace, Assistant Medical Director at Bupa Health and Wellbeing UK, explains, "Whether or not you act has no impact on health insurance policies, existing or new. However, if you want to take out a policy and you already have symptoms of an illness, this may affect how you are insured, whether or not you've sought medical advice."

There are also less tangible – but serious – risks of telling people they

may be ill in future. "Knowing that you have a serious illness can cause emotions akin to the five stages of grieving – denial, anger, bargaining, depression and acceptance," says psychologist Dr Julie Scheiner. Other possibilities include sticking your head in the sand and ignoring symptoms or going to the other extreme and rushing to your GP whenever you experience anything untoward. There is also the risk of a psychosomatic response, Julie says, "We talk ourselves into being sick."

So, would you want to know if you are at risk? "The only person who can

answer this question is you. Will you draw comfort from knowing and be able to plan your life accordingly? Or will knowing cause you more anxiety?" asks Julie. Those who are naturally inclined to take care of themselves are perhaps more likely to want to know but, since diseases do not discriminate, money or social standing do not come into consideration. "After all, the healthcare system was set up for everyone to access," says Julie.

Step outside our healthcare system and you could be truly vulnerable. For example, unlike the NHS, not

### "Knowing my risk helped me make the right decisions"



Both my great-grandmother and my grandmother died of ovarian cancer when they were 52, the same age I am now. My mum died of the same disease aged 58. Even though

I lived under this big, black cloud all my life. I was devastated when, in my late 30s, I was given a 60 per cent risk of developing ovarian cancer and an 85 per cent risk of developing breast cancer. But I never felt it would've been better not to know. Only when you know what the worst-case scenario is, can you deal with it.

My choice was this – radical preventative surgery to have healthy parts of my body removed or face an almost certain untimely death. I got my test results in April and by August I'd had a full hysterectomy. The

### Tracey Barraclough, 52, from Leeds, tested positive for mutation in the BRCA1 gene in 1998

decision to have a double mastectomy was a different ball game and took almost a year to make. It was the loneliest journey of my life. I knew the relationship with my partner at the time wasn't right and that it would eventually end. I had counselling and a lot of love and support from friends and my dad, but no one could make that choice for me. I worried about meeting someone in the future. Would they still find me attractive? But I wanted to see my son Josh grow up more than anything else. This and my consultant, Professor Andrew Baildam, helped me go ahead with the operation.

I went through depression and a grieving process afterwards, but eventually realised there was more to being a woman than a pair of boobs! And the constant threat of the potential killer was gone – my risk is now the same as that of any other healthy woman.

To find out more about Tracey, visit [traceybarraclough.org.uk](http://traceybarraclough.org.uk). For information on Breakthrough Breast Cancer's work, visit [breakthrough.org.uk](http://breakthrough.org.uk)

all private companies that offer genetic tests offer counselling, so you need to ask if it is included in the test price. If it is not, find an alternative service provider. "You should be offered genetic counselling before any testing occurs," says Dr Rachel Greig. Say you have a strong family history of cancer – a genetic counsellor will assess your risk and will help determine which genetic tests may be appropriate. They will

also then explain the results of the tests and help you decide how to progress, whether to have further tests for example. Genetics, however, is a controversial area, sparking concerns over the moral and ethical boundaries that could be crossed.

Just because we can do something, does this mean we should? Should we be detecting and treating pre-disease, enabling more people to live longer, when the planet is already seriously overcrowded, or

returning to Darwin's 'survival of the fittest'? Perhaps instead, we have reached the age of the 'survival of the smartest' – because ethical and financial questions aside, on an individual level, diagnosis of pre-disease has huge positives.

Dr Christina Hennessey sums up, "It's an early warning sign to encourage us to lead a healthier lifestyle – eating a healthy diet, doing some exercise, not becoming overweight and not smoking." \*

## DO YOU HAVE A PRE-DISEASE CONDITION?

These are the simple tests to establish if you are at risk of developing five of the most common pre-conditions

### METHOD OF DETECTION

### HOW TO TELL IF YOU HAVE IT

#### PRE-DIABETES

△ Online risk assessment at [diabetes.org.uk/riskscore](http://diabetes.org.uk/riskscore). If the risk is high, your GP will give you a blood test

△ Ask to be told if you are in the category for pre-diabetes as this means you are 15 times more likely to develop Type 2 diabetes

#### PRE-OSTEOPOROSIS (OSTEOPENIA)

△ DEXA scan measures bone density

△ Osteopenia is defined as 1.0 standard deviation (SD) below that of a 30-year-old woman. Osteoporosis begins at -2.5 SD

#### PRE-HYPERTENSION

△ Blood pressure test. The risk of heart attack or stroke rises with even moderately elevated blood pressure

△ Systolic BP levels between 120 and 139 mm Hg or diastolic BP levels of 80 to 89 mm Hg

#### PRE-OBESITY

△ The body mass index (BMI). Being overweight is categorised as pre-obesity

△ BMI of 25 to 29.9. To calculate your BMI, divide your weight (in kilograms) by the square of your height (in metres)

#### HYPERLIPIDAEMIA (HIGH CHOLESTEROL)

△ Blood test. High cholesterol levels increase your risk of cardiovascular disease and stroke

△ Cholesterol level of 5 mmol/L or higher