Nearly 60 years of life saving breakthroughs

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Nearly 60 years of progress.

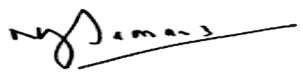
As a cardiologist and researcher I have seen first-hand the phenomenal improvements that have been made in the prevention, diagnosis and treatment of heart and circulatory diseases over the last 30 years.

Undoubtedly, one of the main drivers for these improvements has been the British Heart Foundation (BHF). Almost 60 years ago, we were established by a small group of leading doctors and cardiologists who had the ambitious vision of raising money to invest in research that would help beat the epidemic of heart disease.

This booklet recounts just a few of the hundreds of ways that BHF-funded research has led the way in beating heartbreak since its inception, finding cures and treatments that keep families together. The researchers featured in this booklet represent the tip of a very large iceberg of scientific achievement, from which every one of us is benefitting.

Our work is entirely funded by the generosity of the public and the efforts of many thousands of supporters and volunteers. These breakthroughs should evoke pride in those who have donated and should also give confidence to those who may donate in the future that their contribution will make a difference.

We have come a long way. But with seven million people living with the burden of heart and circulatory diseases in the UK, and hundreds of millions round the world, we still have a lot further to go.



Professor Sir Nilesh Samani, BHF Medical Director

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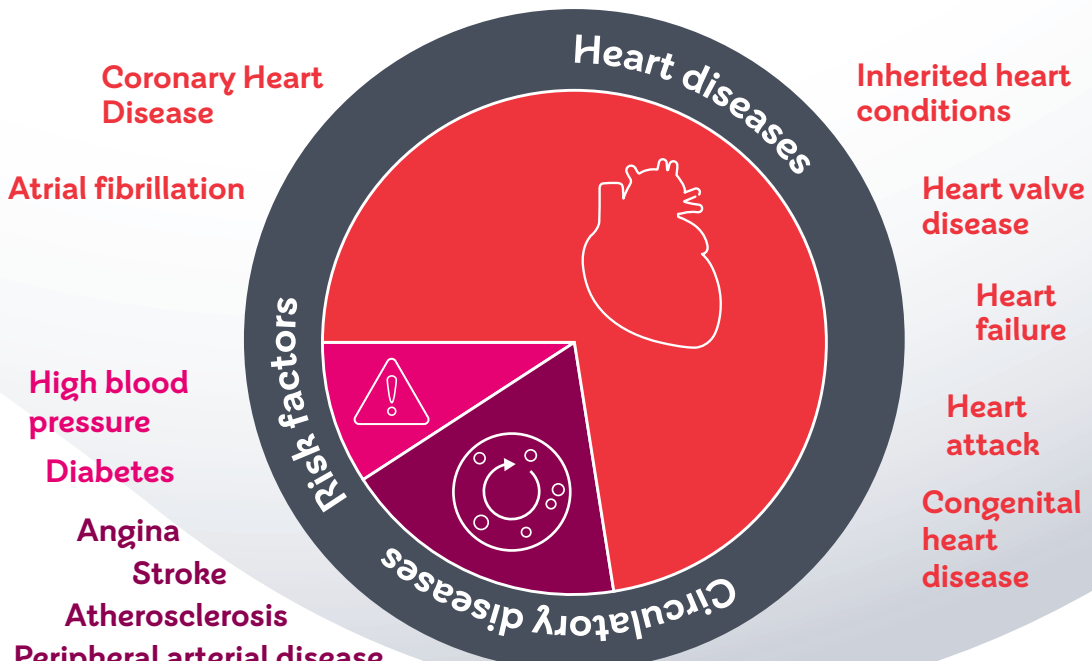
At the BHF, we will work tirelessly to continue to make important breakthroughs that save and benefit the lives of people with heart and circulatory diseases.

Professor Sir Nilesh Samani, BHF Medical Director

It's all connected.

We fund research into all heart and circulatory diseases and their risk factors.



A life saving revolution.

Before the 1970s, heart attacks were poorly understood. There were no medicines to treat them and most victims lost their lives.

All that began to change when meticulous research by BHF Professor Michael Davies proved that heart attacks are caused by a blood clot in a coronary artery. His work paved the way for clot-busting drugs, and we helped to show the world their life saving potential by supporting the pioneering Clinical Trial Service Unit (CTSU) in Oxford.

Scientists discovered that high cholesterol increases a person's risk of heart attack, but whether drugs could reduce this risk remained a mystery. In the late 1980s and mid-1990s, BHF Professors Stuart Cobbe and Rory Collins ran large-scale trials which proved the safety and benefits of statins, drugs which lowers cholesterol in the blood.

Statins are now the most commonly prescribed drugs given to those at risk of developing heart disease, and are estimated to save around 7,000 lives each year in England alone.

Thanks to understanding and modern treatments built on BHF-funded discovery, around seven out of ten people who suffer a heart attack now survive.

Transforming aftercare.

BHF-funded researchers have shaped how patients' hearts are cared for after a heart attack.

A heart attack can cause irreversible damage to your heart muscle. Sometimes this damage is so significant that it can stop your heart pumping blood around your body properly – a condition called heart failure. In its severest form, heart failure has a life expectancy worse than many cancers. But BHF research has shown that treatments given immediately after a heart attack can help limit this long-term damage.

In 1994, BHF Professor Stephen Ball and colleagues published a transformative clinical trial, known as the AIRE study. He showed that medicines called ACE inhibitors, given to patients with signs of heart failure in the days after a heart attack, prevented one death for every 18 patients treated.

The AIRE trial proved that ACE inhibitors give heart attack victims a better chance of recovery. Two decades later, they're still a vital part of heart attack care worldwide.

"Limiting the damage caused by a heart attack is crucial. Thanks to research, we've made truly incredible strides in aftercare.

Dr Richard Jabbour, Researcher

Unveiling a hidden disease.

Hypertrophic cardiomyopathy (HCM) is an inherited disease that causes the heart muscle to thicken. It can go unnoticed in families until it causes the sudden death of an otherwise healthy person.

We funded two researchers, Professors Hugh Watkins and Bill McKenna, to find the cause of HCM. They were among the first to find a number of faulty genes underlying the condition in the early 1990s and have since discovered more.

As a BHF Professor, Hugh Watkins set up the first genetic testing service for HCM in the UK. This meant that parents, siblings and children of someone known to have the condition could find out if they had it too, and get help.

Thanks to these pioneering efforts, genetic testing for HCM and other diseases of the heart muscle is now available UK wide.

“I passed on my heart condition to both my sons. I needed a heart transplant, but as a family we’re taking part in research. It gives you that boost that things are getting done, that things are looking promising.

Inderdeep Birk

Fighting organ rejection.

In the 1980s, BHF-funded Professor Sir Magdi Yacoub and Sir Terence English played a big part in making the heart transplant a surgical success story. Now, as many as 200 heart transplants are carried out on adults in the UK each year.

But those who receive a new heart are at risk of organ rejection. This happens when the body's immune system recognises the new heart as a foreign object and attacks it, just as it would attack an infection.

BHF Professor Federica Marelli-Berg at Queen Mary University of London is trying to 'hijack' the immune system and stop it attacking the transplanted heart. Her research focuses on T-cells, a type of immune cell involved in transplant rejection.

Thanks to tireless research, the team discovered the 'area code' for the heart, a vital piece of information which the T-cells need to be able to travel to the organ.

Understanding the T-cells movements could lead to new treatments, which dramatically reduce organ rejection and save lives.

"Imagine a world where heart transplant patients don't dread the possibility of organ rejection. That's what I'm striving for.

BHF Professor Federica Marelli-Berg, Researcher

Fixing little hearts.

Each day in the UK around 12 babies are diagnosed with a congenital heart condition.

In the 1970s, BHF Professor Sir Magdi Yacoub developed a surgical technique to correct a defect in which a baby's major blood vessels are attached to the wrong chambers of their heart. Surgeons still use the method today.

BHF Professor Robert Anderson helped to improve treatment by carefully mapping the anatomy of heart defects. This helped surgeons avoid putting a stitch where it could disrupt an electrical circuit controlling the heartbeat.

Until over decade ago, replacement of faulty heart valves in children required open heart surgery. We funded research at Great Ormond Street Hospital (GOSH) to develop a quicker and less stressful technique to replace heart valves via a tube inserted into a blood vessel in the groin.

Such BHF-funded advances have helped to significantly reduce the number of children dying from congenital heart disease and improved survivors' quality of life.

"Even before he was born we knew our baby would need open heart surgery to save his life. The operation Nino had was created by a BHF Professor. Looking at our son now, it's like a miracle.

Nino Doran and mum

Combating early heart attack.

Three decades of BHF-funded research have turned findings in the lab into life saving practice.

Familial hypercholesterolaemia (FH) affects an estimated one in 250 people and is passed down through families. It causes dangerously high cholesterol levels which, if untreated, can lead to heart attacks at an early age.

Through the 1980s and 1990s, BHF Professor Steve Humphries collected DNA samples from FH patients and discovered the faulty genes which cause the condition. His work led to the development of a blood test that can be used to detect the faulty genes in those affected and their families.

Professor Humphries' research into 'cascade testing', the selective testing of close relatives of those with a faulty gene, was incorporated into national guidelines in 2008.

Since 2010, the BHF has invested over £2 million towards a ground-breaking genetic testing programme for FH. This work has led to more than 2,000 people being diagnosed with FH and given potentially life saving treatment.

"Finding and protecting families who are at risk of heart attack is so important. I'm proud of what I've achieved in my research, but I'm far from finished.

Professor Steve Humphries, Researcher

Protecting the brain.

A stroke happens when blood supply to part of the brain is cut off. This leads to the damage of brain cells, often leaving the sufferer with devastating consequences.

A person who has had a stroke caused by a blood clot is sometimes treated with clot-busting drugs. But when this happens, small molecules called free radicals can travel to the blood-deprived part of the brain and damage brain cells.

Professor Giovanni Mann and his team at King's College London are investigating whether sulforaphane, a molecule found in broccoli, could reduce the damage caused by free radicals and improve outcomes.

People who have suffered a stroke are at greater risk of vascular dementia – a disease which affects brain function such as cognitive abilities and memory. There is currently no treatment, but researchers we fund are working to bring hope to people with this disease.

Professor Joanna Wardlaw at the University of Edinburgh is trying to find stroke survivors who may be at risk of vascular dementia. This vital work could help doctors better detect problems early on and tailor care to each individual patient.

"Russell had a heart attack in his twenties, and then 12 years later a stroke robbed him of his voice. We can't undo the damage for Russell, but we need research to help people like him whose lives are turned upside down.

Rachel Hanford, Russell's wife

Tackling a 'silent killer'.

High blood pressure – also known as hypertension – affects around 16 million people in the UK and millions more around the world.

When blood pressure is high, 'bad' molecules called free radicals can damage blood vessel walls.

In the damaged areas, clots can form, increasing a person's risk of a heart attack or stroke. The vast majority of people who have high blood pressure have no symptoms, which is why it is often called 'the silent killer'.

BHF Professor Rhian Touyz is a world-renowned scientist in the field of hypertension. She has found that an enzyme called Nox5 is partly responsible for the release of free radicals and subsequent damage caused to vessels.

This high-quality work is helping researchers develop new treatments that lower the number of damaging molecules in blood vessels, reducing people's risk of heart and circulatory diseases.

"It is absolutely essential that we understand the causes of high blood pressure, so that we can lower people's risk of heart and circulatory diseases.

BHF Professor Rhian Touyz, Researcher

Finding genetic risk factors.

Coronary heart disease, the leading cause of heart attacks, often runs in families. Our researchers have been instrumental in discovering why, paving the way for the next big breakthrough that will help end the heartbreak caused by heart and circulatory diseases.

In the 1990s, BHF Professors Stephen Ball and Professor Sir Nilesh Samani set up the Family Heart Study, which collected blood samples from 2,000 families with a history of heart attacks.

The DNA analysis of these volunteers created the foundation for a huge international research collaboration to untangle the complex inheritance of coronary heart disease, led by Professor Sir Nilesh Samani and BHF Professor Hugh Watkins.

Over 50 genes have been discovered which each raise the risk of heart disease and may hold the key to vital new prevention or treatment strategies.

Global genetic discoveries, underpinned by the BHF, are setting the stage to take a giant leap forward in protecting the hearts of future generations.

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Discovering new genes that cause heart diseases could be the first step in finding new treatments that could improve and save many more lives.

BHF Professor Hugh Watkins, Researcher

Reversing vessel damage.

Diabetes is a lifelong condition affecting nearly 3.7 million people in the UK alone. It leads to high levels of sugar in the blood, which damages the lining of blood vessels.

BHF Professor Mark Kearney and his team at the University of Leeds are determined to develop new treatments that repair blood vessels in people with diabetes.

The team are specifically looking at how the cells of people with type 2 diabetes become resistant to insulin – a hormone that controls blood sugar levels. They discovered that low levels of a protein called IGFBP-1 can cause insulin resistance. Professor Kearney is now trying to find ways of reversing this problem in mice with type 2 diabetes.

Professor Kearney has also joined forces with Professor Sven Plein to image the hearts of people with diabetes, and try to understand why they are more prone to developing heart failure.

This vital research will help inform doctors which treatments are best for people with diabetes and heart failure.

“Diabetes, stroke and heart disease run right through my family. I do have a fear about my child, because my father died at a very young age. So I do carry that fear with me.

Soma Biswas

bhf.org.uk

We are built on breakthroughs. Heart transplants. Clot busting drugs. Pacemakers. Breakthroughs born from visionary medical research. Research you fund with your donations.

Heart and circulatory diseases kill 1 in 4 people in the UK. They cause heartbreak on every street. But if we can invent machines to restart hearts, fix arteries in newborn babies, build tiny devices to correct heartbeats, and if we can give someone a heart they weren't born with - imagine what's next.

We research all heart and circulatory diseases and the things that cause them. Heart diseases, stroke, vascular dementia, diabetes and many more. All connected, all under our microscope. Our research is the promise of future cures and treatments.

The promise to protect the people we love. Our children. Our parents. Our brothers. Our sisters. Our grandparents. Our closest friends.

You and the British Heart Foundation. Together, we will beat heartbreak forever.

Beat heartbreak forever.

Beat heartbreak from heart diseases stroke vascular dementia diabetes