



NATIONAL CARDIAC AUDIT PROGRAMME

2022 Annual Report for Patients, Carers and the Public

NICOR

NHS
Barts Health
NHS Trust

 **HQIP**
Healthcare Quality
Improvement Partnership

Contents

How to use this report	4
COVID-19 and cardiac health and care	4
Foreword from the NICOR Patient Representative Group Chair, Sarah Murray	5
An introduction to your heart	6
Heart attack	8
Percutaneous Coronary Intervention (PCI)	10
Adult Cardiac Surgery	12
Heart Failure	14
Arrhythmia (Cardiac Rhythm Management)	18
Congenital Heart Disease	20
COVID-19 and its impact on cardiovascular care (infographic)	23
Useful resources	24
Thanks and acknowledgements	25

About this report

This patient report is designed as a companion to the 2022 National Cardiac Audit Programme (NCAP) report produced by the National Institute for Cardiovascular Outcomes Research (NICOR), which has been carrying out national cardiac audits on behalf of the Healthcare Quality Improvement Partnership (HQIP) since 2011.

The primary aim of the NCAP is to support and drive quality improvement within hospitals. For this reason our annual report is aimed at those with some level of clinical knowledge. This patient report is intended to be accessible to all patients, family members, carers and members of the public.

You can download the 2022 NCAP annual report and other key documents at <https://www.nicor.org.uk/national-cardiac-audit-programme/>, covering data from the 1st April 2020 to 31st March 2021. For some of the measures, three years' data are considered (i.e. 2018/19 – 2020/21).





How to use this report

The report is divided into the six areas of clinical expertise (called “domains”) audited by NCAP. We have summarised some of the key findings from the full 2022 annual report, provided useful background information and highlighted what you can do to help improve cardiac health for you and your friends and family. We’ve also included answers to some frequently asked questions and links to further information or support. If you would like to read specific parts of the annual report there are links to all six of the domain summaries.

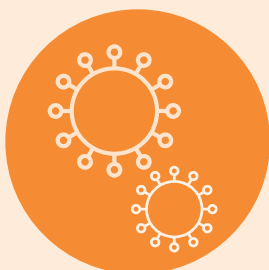


Why do we audit hospital services?

The information routinely collected from clinical audit is used for Quality Improvement and Quality Assurance purposes. The audit work we carry out at NICOR helps the National Health Service (NHS) to define the standards used for evidence-based cardiac healthcare and to monitor whether those standards are being met. Where standards are not met, we recommend actions which can help hospitals and medical professionals improve their performance. The report also enables large healthcare organisations and commissioners to look at the national picture.

The national audit data are also very useful for public health research, the findings of which may then become very important for the audit programme. Many discoveries which have improved millions of lives worldwide have been made by analysing patient data, or the patient data have highlighted important areas of clinical research for medical researchers. For instance the links between smoking and obesity and heart disease (among other important factors) were discovered in a study of 35,000 British doctors which ran for 50 years.

See our infographic in [last year's report](#).



COVID-19 and cardiac health and care

The focus of the report this year has been on care during the unprecedented situation caused by the COVID-19 pandemic. We published a [report](#) on the impact of COVID-19 on cardiovascular care in September 2020. The period covered by this 2022 annual report (1 April 2020 to end March 2021) encompasses much of the first and second waves of the pandemic. We have also spoken to some patients and carers to hear their accounts of care during the pandemic and these have been published on our [website](#).

Foreword from the NICOR Patient Representative Group Chair, Sarah Murray



This report should be read for so many reasons; it highlights triumph over adversity. Our cardiology and cardiac surgical teams kept working through a pandemic the likes of which we have not experienced in our lifetime; it highlights the truly excellent work so many dedicated hospital staff put in and it is a sobering record of those procedures where patients were isolated in hospital and separated from loved ones and carers. There was tangible fear in the community and this fear pervaded everything we did. Add in a

hospital admission, a serious operation, being on one's own, with stressed but professional staff, and it is truly a remarkable event.

We recognise all the amazing stories of excellent care received: the new and creative ways of working during the pandemic.

This report is equally important for what it does not directly tell us but is implicit in the results.

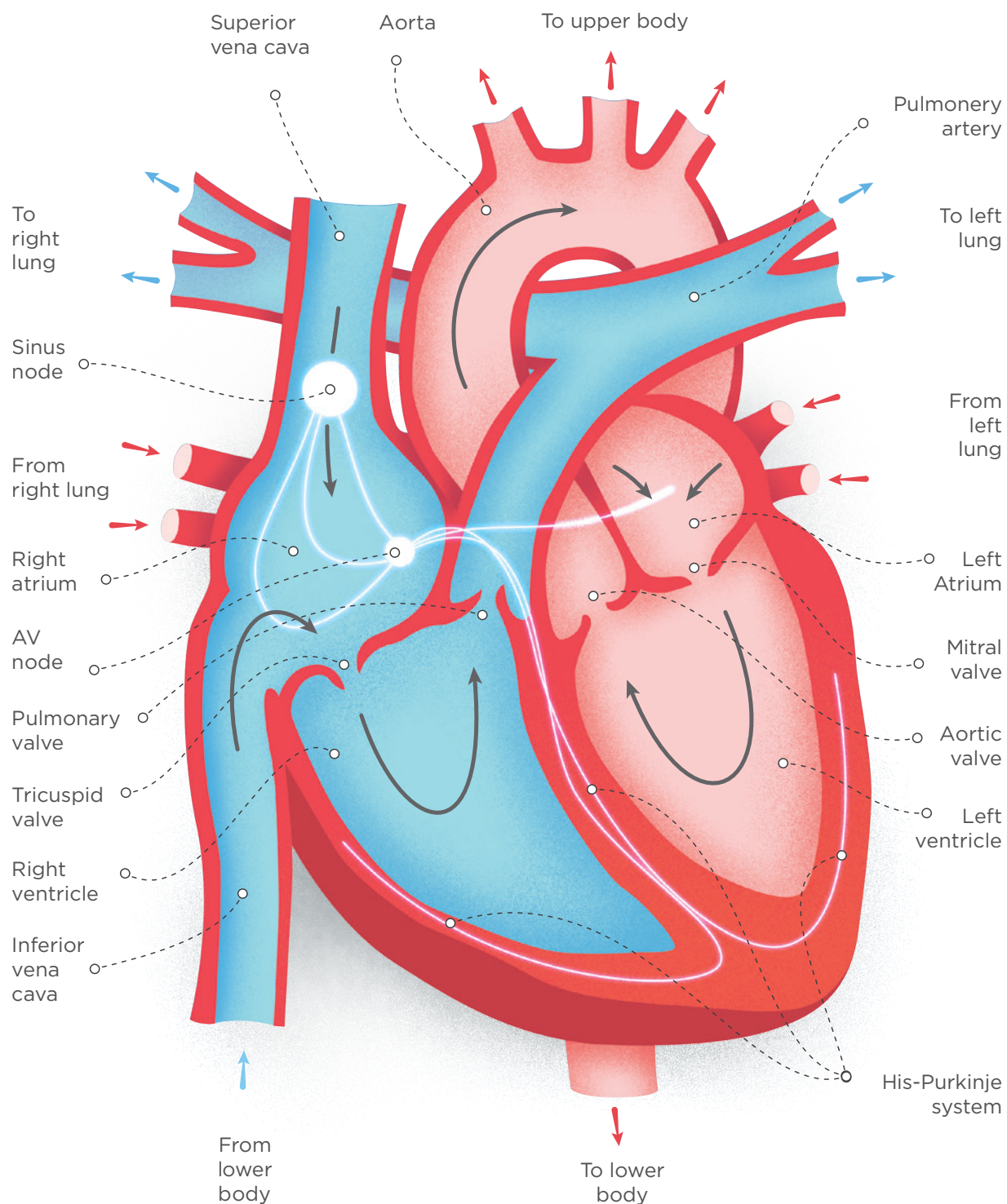
Many thousands of patients who would normally have had procedures did not. There is a silent majority of patients who desperately needed treatment or interventions who have had no care. This group has not been audited or recognised in this report. Carers continued to care for their loved ones in the community and many will have died untreated.

The challenge now is to embed and roll out nationally the efficient and innovative working practices developed in the pandemic; challenge poor performance in some hospitals and the wider system which has for so long been allowed to persist and put the patient at the centre of our cardiac service recovery plans now and for the future.

A handwritten signature in black ink that reads "Sarah Murray".



An introduction to your heart





Before we explore the different areas of cardiac healthcare or 'specialties' let's take a brief look at how the heart works, which will help us understand how things can sometimes go wrong.

Your heart is amazing. It is the central point of your circulatory system.

The heart is a muscle made of four chambers which pumps blood and oxygen constantly, supplying your whole body, responding to extra demand placed on it, such as vigorous exercise, when needed. The rhythm of your heartbeat is regulated by electrical signals from the heart's 'natural pacemaker', the **sinus node** in the **right atrium**, which make the heart muscle contract and relax at a steady pace to pump the blood.

If either of these systems fails to work properly health problems will occur. If the arteries which channel blood to your heart muscle become blocked either partially or fully you can experience a **heart attack***. The treatment for this includes drug therapy, **percutaneous coronary intervention (PCI)** (a procedure using a balloon and stent(s) to open up an artery) or **cardiac surgery**. Or, if the electrical system is not working properly the rhythm of the heart might be irregular, too fast, too slow or the heart can even suddenly stop beating altogether, which is a cardiac arrest (see fact box on page 19). Both of these cardiac events are a medical emergency and the person must receive treatment fast to maximise the chances of survival.

Heart failure is the term doctors use for when the heart is no longer able to pump the blood around the body as well as it should. The same expression is used whether there is only mild impairment or the pumping power is very poor - it does not say anything about the severity of the condition. The

impaired pumping ability can be for a variety of reasons, such as disease of the heart muscle (known as cardiomyopathy) or the long term damaging effects of high blood pressure, but commonly it occurs after a heart attack when the heart muscle can be permanently damaged.

Cardiac **arrhythmia** is where there is an abnormal heart rhythm. A relatively common form of arrhythmia is atrial fibrillation. This can lead to abnormal flow in the heart chambers, and sometimes results in a clot forming in a heart chamber. If this breaks off into the circulation it can cause a stroke. A number of implantable devices such as **pacemakers** and **defibrillators** and treatments such as **ablation**, a procedure that scars tissue in your heart to block abnormal electrical signals, can be used to regulate heart rhythm.

Finally, babies can be born with structural problems of the heart. These abnormalities are called **congenital heart disease**, and urgent surgery may be required on the baby's heart before the first birthday, and often within the first couple of weeks after birth. Many of these heart problems are discovered through routine antenatal screening offered to pregnant women at 20 weeks of pregnancy or earlier. Where this is possible, it enables doctors to plan treatment of these babies before their mothers give birth, helping to improve their survival rate. However some more minor congenital heart conditions are not detected before birth as they are not easily seen on the scan.

* Most heart attacks are due to blockages. However it is now recognised that a small number (up to 10 %) occur due to a temporary constriction of the coronary arteries, small blood vessels or a spontaneous tear in the inner lining of the blood vessels. See 4th Universal definition of an MI figure 4 in section 7.2 <https://academic.oup.com/eurheartj/article/40/3/237/5079081>



Heart attack (Myocardial Infarction)

With data from the [Myocardial Ischaemia National Audit Project \(MINAP\)](#)

IMPACT OF COVID PANDEMIC



Fewer heart attacks recorded

There was a **14.8%** reduction in the number of confirmed heart attacks recorded by the MINAP audit in 2020/21, from 86,727 to 73,867. This was more pronounced with lower risk heart attacks (called NSTEMI, see our electrocardiogram explanation below). There were **18%** fewer of these events recorded in the audit than the previous year, while the higher risk heart attacks (called STEMI, see below) dropped by **9%** in 2020/21. It is thought that this reflects that patients were less likely to seek urgent medical care during the COVID pandemic for a range of reasons.

The [MINAP audit data](#) shows that the greatest fall in patient admissions coincided with the first lockdown (announced 23 March 2020, our data start on 1 April) compared with the same period last year. Admissions for higher risk heart attacks gradually recovered during the rest of the year, however the number of patients admitted with low risk heart attacks stayed lower during the whole period, particularly older and male patients who were not admitted in the numbers they had been in the pre-pandemic year.



The average (median) age of heart attack patients went down

Patients who have the higher risk type of heart attack (STEMI) tend to be younger than those who have the lower risk type (NSTEMI). The median age for the former is 64 and the latter 70. What this means is that half of the patients with STEMI are 64 years old or younger, while half of those with NSTEMI are 70 years old or older. For the year 2020/21 the age is one year lower in both cases than the year 2019/20.



Time from first calling 999 to receiving emergency treatment increased

The average (median time by which half of the heart attack patients had been treated) time from a patient calling for help to receiving PCI treatment (see below) was **130** minutes in England, Wales and Northern Ireland combined. This had been steadily increasing in recent years and was up from 126 minutes in 2019/20. The time taken for a patient to be treated on arrival at hospital has only increased by two minutes, but the trend over several years tells us that patients are taking increasingly longer to get to the hospital by ambulance after they call for help.



Lower risk heart attack (NSTEMI) patients referred for angiography seen faster during the pandemic

National guidelines state that these patients should receive angiography (see the description below) within 72 hours of first admission. The percentage of patients treated within the guideline target was highest during the first lockdown, when more than 80% received angiography within 72 hours. This was almost certainly influenced by the increased capacity in catheter labs that resulted from the reduction in activity as fewer heart attack patients (and virtually no elective cases) were admitted. As the labs became busier after elective procedures recommenced the proportion of patients treated during the 72 hour target time fell once more but remained slightly higher than the levels seen before the pandemic.

Diagnosis of heart attack and other tests

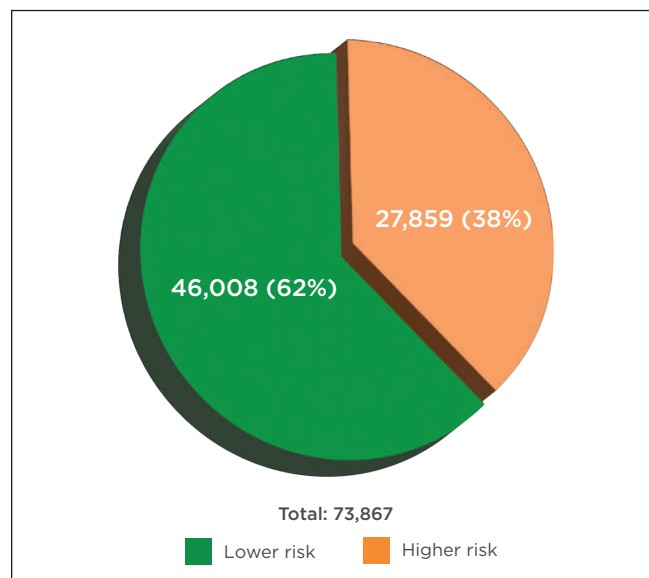
As explained in the introduction on page 7, most heart attacks happen when a coronary artery becomes blocked either partially or fully. This condition is known as acute coronary syndrome. If the blood flow is fully blocked, a particular change is

usually seen with a test called an **electrocardiogram (ECG)**, which is carried out as soon as possible, ideally by paramedics called to a patient's home, or immediately on admission to hospital. This type of heart attack carries the highest immediate risk (called a 'STEMI' (ST-Elevation Myocardial Infarction))

by doctors after the specific pattern it makes on the ECG) and is an emergency situation requiring urgent unblocking of the artery. The symptoms felt during a heart attack are because damage is being caused to the heart by the reduced blood supply. Delays accessing treatment can reduce the chances of surviving the attack, and increase the chances of further permanent damage to the heart or serious complications.

There is another more common type of heart attack which is less immediately life-threatening, but can lead to serious health problems later on. This is when a coronary artery has suddenly become partially blocked by a clot, narrowed to the point where blood cannot easily pass through. Often the heart will have developed its own protective action to minimise potential damage, but it is vulnerable. When an ECG is carried out, the pattern is different from the higher risk heart attack, and doctors call it an “NSTEMI” (non-ST-Elevation Myocardial Infarction).

Number of heart attacks in 2020/21 by lower/higher risk type



Other tests which can help to diagnose a lower risk heart attack include a **troponin** test, which measures levels of a heart muscle protein released into your blood when your heart muscle is damaged, or an **echocardiogram ('echo scan')**. An echocardiogram is an ultrasound scan which bounces sound waves off different parts of your heart, and uses the echoes to produce an accurate picture of your heart's structure and function on a screen.

Angiography is a procedure that uses X-rays to check the health of your blood vessels and to assess any blockages to blood flow. This is done most commonly by inserting a thin catheter into an artery and injecting a dye which highlights the blood. It helps the cardiologist decide which is likely to be the best treatment for you. If the best option is to use a balloon and stent (a procedure called percutaneous coronary intervention 'PCI') to re-open a blockage, then this may be done immediately following the angiogram.

For a higher risk heart attack (STEMI), the angiogram and PCI are carried out immediately on arrival in hospital, as part of emergency treatment. For a higher risk heart attack the delay between admission to hospital and having a PCI is measured in minutes. For a lower risk heart attack, national guidelines (from the National Institute for Health and Care Excellence (NICE)) recommend that an angiogram, and PCI if appropriate, is performed within 72 hours of admission.

Care of heart attack patients

Place of care and access to specialists is important for heart attack patients, as it is for heart failure patients (see page 15). With the lower risk type of heart attacks, 62.1% of patients in 2020/21 were admitted to a cardiology ward, and 96.5% seen by a cardiologist. 90.3% of all heart attack patients were discharged home with all drugs for which they were eligible. 84.6% of all heart attack patients who were discharged home were referred to a cardiac rehabilitation programme in 2020/21, continuing an upwards trend.

Useful resources for heart attack patients:

Heart UK (cholesterol charity)

<https://www.heartuk.org.uk/>

<https://www.nhs.uk/conditions/heart-attack/recovery/>

<https://www.bhf.org.uk/information-support/conditions/heart-attack>



Percutaneous Coronary Intervention (PCI)

With data from the [National Audit of Percutaneous Coronary Interventions \(NAPCI\)](#)

IMPACT OF COVID PANDEMIC



Fewer PCI procedures carried out

The number of PCI procedures over the year dropped from 100,112 in 2019/20 to 90,708 in 2020/21, a 9.8% fall. There was a 19.7% fall in Northern Ireland, a 10.3% fall in England and a 1.2% fall in Wales (Scotland was not part of the audit). Elective procedures were worst affected with a 70% drop during the first wave of the pandemic.

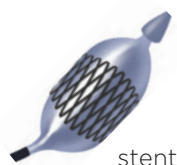


PCI for lower risk heart attacks was carried out more quickly during the pandemic lockdowns

During the first lockdown the percentage of patients with lower risk heart attacks receiving PCI within 72 hours of admission increased from around 55% to >80%, then began to fall again to about 60%, then rose again to >65% in the second pandemic wave but fell towards <60% again in March 2021. This was, as with the angiography mentioned on page 8, likely due to greater cath lab capacity when the amount of elective PCI procedures was reduced, or they were stopped in some centres.

If you experience a high risk heart attack, the preferred treatment in the UK is emergency or **primary PCI** (also known as **primary angioplasty**) to restore blood flow to the heart as soon as possible to stop further damage. On the previous page we saw how the heart attack diagnosis is made by performing an **ECG**.

The ambulance will normally take you to a hospital which is a heart attack centre where this procedure is performed regularly (which may not be your local hospital). This is because larger or specialised hospitals tend to have better facilities such as a 24 hour service, a dedicated treatment room (a 'cath lab') as well as a clinical team who are used to seeing heart attack patients and performing the PCI procedure as an emergency treatment day and night.



stent



stent in artery

There has been some debate in the media about whether you should try to take yourself to hospital in a taxi, or be driven there by a friend or family member when the ambulance service is experiencing extra pressure, such as during periods of the pandemic where there were more patients but also many staff were off sick.

The advice is that you should always dial 999 if you experience symptoms of a heart attack.

If you present yourself at the nearest A&E with symptoms of a heart attack you will often have to wait longer for treatment as the diagnosis will first need to be confirmed and, if there are no available facilities on site, you will need to be transferred by ambulance to the nearest hospital which can perform the PCI procedure, causing unnecessary delay to you getting the treatment you need.

Another important reason for calling an ambulance rather than taking yourself to your local hospital's Accident & Emergency (A&E) department is that if a heart attack is suspected the ECG test can often be carried out by paramedics at your home. This ensures not only that you are taken to the correct hospital (a heart attack centre – see above) but also that they will be warned you are on the way, saving precious time so that you can undergo the most appropriate treatment as quickly as possible.

Once you arrive at the hospital cath lab, a fine tube, known as a catheter, is passed to your heart arteries under local anaesthetic to find out where the blockage is. Then a balloon and wire mesh 'stent' will be used to open up the blockage and restore blood flow to your heart muscle. The catheter can be inserted from either a blood vessel in your groin (femoral artery) or your wrist (radial artery). The use of the wrist is associated with fewer complications including reduced bleeding and is now the most usual access point for the procedure with approximately 90% of PCIs being carried out this way.

Once a balloon has restored blood flow, a stent (a tiny scaffold which helps hold open the artery) is then put in place and will remain there. Other technological advances have been made, and most stents are now 'drug eluting', containing specific drugs which minimise the risk of the artery re-narrowing due to scar tissue growing around the stent as the artery heals.



A HEART ATTACK IS A MEDICAL EMERGENCY

Call 999 urgently for an ambulance which will take you to the best available treatment centre. Do not attempt to take yourself to hospital. Fast treatment could save your life.

HEART ATTACK SYMPTOMS

- Sudden pain, pressure or discomfort in your chest that doesn't go away.
- The pain may radiate to one or both arms or your neck, jaw, back or stomach. This can be severe for some people, and others simply experience discomfort.
- You may also start to sweat, feel sick, breathless, faint, dizzy, or a sense of panic.

It's possible to have a heart attack without experiencing sudden chest pain – this is more common in women and people with certain conditions which affect how pain is experienced.

You can read more about heart attack symptoms [here](#).



Day case PCI – where you don't need to stay in hospital overnight after a non-urgent procedure

PCI techniques have improved so the procedure is associated with a lower risk of complications than in the past and it's often possible and safe to have the procedure and go home the same day. It will depend on your condition and where you have the procedure as some hospitals still prefer to keep an eye on patients overnight.

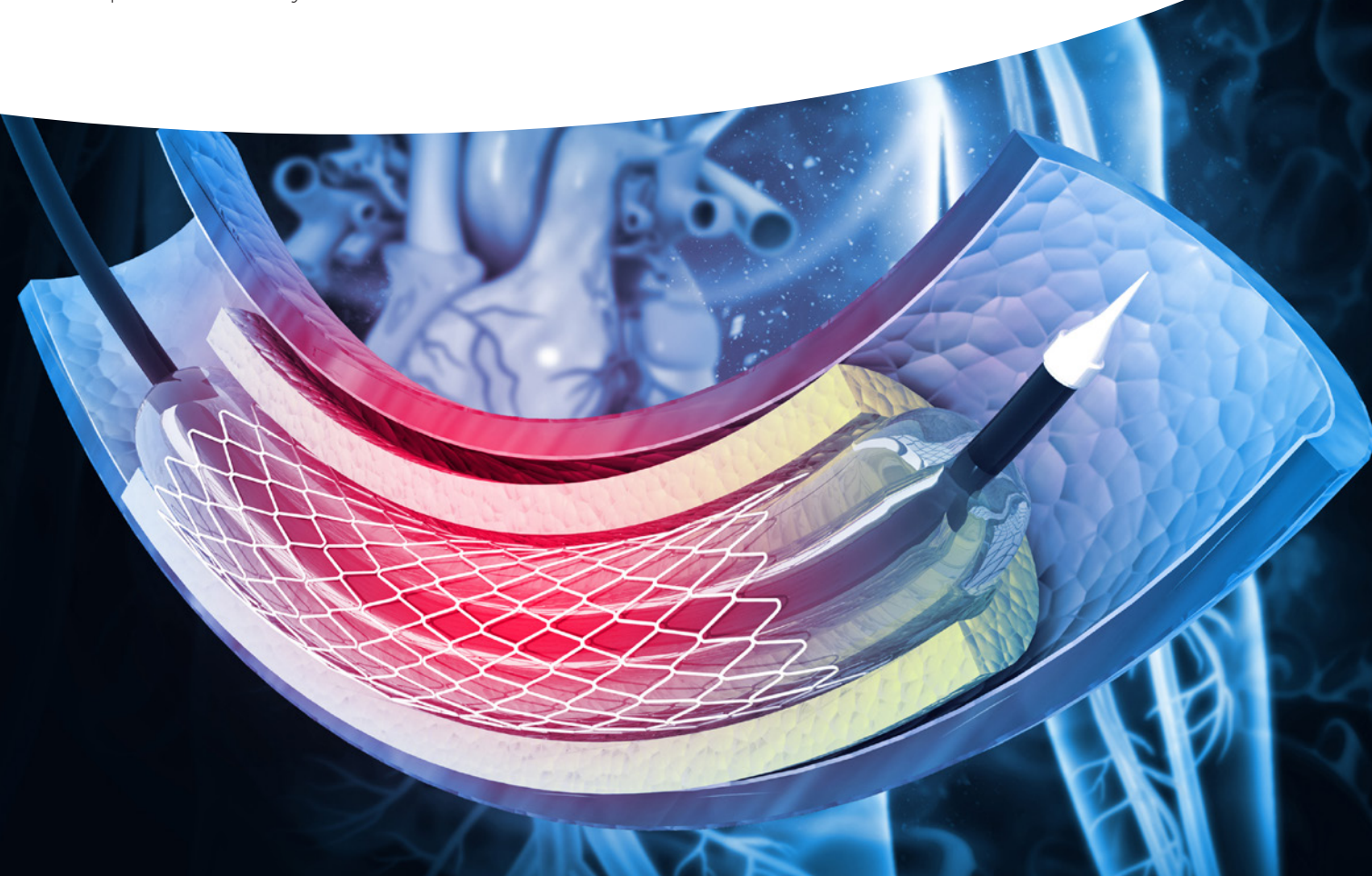
In 2020/21 **69.1%** of elective PCI procedures were performed as day cases.

Useful resources for PCI patients:

<https://www.bhf.org.uk/information-support/publications/treatments-for-heart-conditions/angioplasty---your-quick-guide>

<https://www.nhs.uk/conditions/coronary-angioplasty/>

<https://www.bcis.org.uk/public-information/>





Adult Cardiac Surgery

With data from the [National Audit for Adult Cardiac Surgery \(NACSA\)](#)

IMPACT OF COVID PANDEMIC



Over a third fewer heart operations performed in the UK (excluding Scotland) in 2020/21

In 2020/21 only 19,333 adult heart operations were performed (a **34%** drop from 2019/20). It's estimated that around 10,000 patients did not have heart surgery who should have done. Wales had the largest fall in heart operations (by **48%**). There was a **42%** drop in Northern Ireland and **33%** in England (Scotland was not included in the audit). There were changes nationally to cope with the challenging situation caused by the pandemic and the majority of elective surgery was cancelled or postponed, with only 438 cardiac operations in total carried out across the UK in April 2020 (around 2500 would normally be expected). In London, badly hit by the first wave of the pandemic, cardiac surgery activity was reduced to two hospital sites so that other

hospitals could focus on treating the surge of COVID-19 patients.



Average age of surgery patients fell by one year in the UK (excluding Scotland)

The average (mean) age of a patient having cardiac surgery was 65.1 years old in 2020/21, compared to 66.1 in 2019/20, a figure which had seen little change in the 5 years before.



Waiting times for elective surgery increased across the UK, but urgent surgery was quicker

The average waiting time for elective cardiac surgery increased by **22%** to 127 days from 104 days in 2019/20. Wales was worst affected, with a 122 day increase in waiting time for elective surgery patients. Overall urgent surgery patients had on average less time to wait for their operation than in 2019/20.

Adult Cardiac Surgery

Adult Cardiac Surgery includes all procedures performed on patients aged 18 or over that involve the heart or structures attached to the heart (see diagram on page 6). For the purposes of the audit these operations involve opening the chest wall (via the breastbone or ribs) and usually the pericardium (the sac around the heart). Heart operations include Coronary Artery Bypass Grafts (CABG); valve replacement or repair; aortic surgery (surgery on the body's main artery); or a combination of these. Procedures on the heart not requiring the chest to be opened surgically and surgical procedures on babies and children are reported elsewhere in this report.

The average age for a patient undergoing cardiac surgery in the UK in 2020/21 was 65.1 years old and 74.2% were men, with only a quarter of patients female.

A CABG operation treats patients who have angina (chest pain) as a result of a narrowing or blockage in their coronary arteries. This involves taking a healthy artery or vein from elsewhere in the body

and surgically joining (grafting) it to the affected coronary artery above and below the point of narrowing, allowing blood to flow around ('bypass') the blockage and reach the heart muscle without restriction.

A CABG is occasionally performed as an emergency operation straight after the patient has been diagnosed with a heart attack. However, following most heart attacks it is more usually performed as an urgent in-patient surgery scheduled several days after the initial angiogram (see Heart Attack on page 8). For patients with more stable symptoms of chest pain, then the operation is usually performed on an elective basis, where the patient is admitted from home for their operation in a planned fashion.

8,451 coronary artery bypass graft (CABG) operations were carried out in 2020/21. The operation can also be performed in combination with an aortic valve replacement. 2,790 aortic valve replacement (AVR) operations were carried out in 2020/21, with a further 1,388 carried out in combination with a coronary artery bypass graft



operation (AVR + CABG). These figures are around 40% less than in 2020/21.

Generally at the time of a heart attack you will be given anti-platelet drugs which thin your blood and reduce clotting to counter the effects of the narrowed or blocked artery. This often means that it could be more dangerous to operate during the first few days after stopping these drugs, due to the increased risks of bleeding with surgery. So there needs to be a waiting period before an operation (commonly 5 days, depending on which drugs have been used). Also, a cardiac surgery patient will need to be kept on an intensive care ward after the surgery which needs to be coordinated and planned with care.

Useful resources for adult cardiac surgery patients:

<https://www.bhf.org.uk/information-support/treatments/coronary-bypass-surgery>

<https://www.rcseng.ac.uk/patient-care/recovering-from-surgery/coronary-artery-bypass/>

<https://www.bhf.org.uk/information-support/heart-matters-magazine/medical/valve-disease>

<https://www.bhf.org.uk/information-support/conditions/aortic-aneurysm>



Heart Failure

With data from the [National Heart Failure Audit \(NHFA\)](#)

IMPACT OF COVID PANDEMIC



Fewer patients were admitted with heart failure

This audit year saw a drop of 12% in confirmed acute heart failure admissions to 61,784. Records were submitted on 72,523 admissions, a decrease of 11% from last year.



Patients seen by heart failure specialists and treated on cardiology wards were discharged sooner

During 2020/21 the average (median) length of stay in hospital for these two groups of patients decreased by one day from 2019/20, from 9 to 8 days. Before the pandemic, these patients normally stayed longer than patients

on general medicine wards (6 days) or patients without access to specialist heart failure care (5 days). The length of stay for these patients remained the same, possibly reflecting pressure to discharge patients receiving specialist care sooner to accommodate COVID-19 patients.



Slightly fewer patients survived 30 days after discharge from hospital

The number of patients admitted with heart failure who survived for 30 days after discharge decreased by 1% from 85% to 84%. The number of patients who survived to be discharged from hospital and overall patient survival after one year remained static at 91% and 61%.

Heart failure (see also the description in the introduction on page 7) occurs for a number of reasons. It is often a secondary effect of other heart problems such as a heart attack (when the heart muscle is damaged), damage caused by the increased strain on the heart from high blood pressure, or cardiomyopathy (a disease of the heart muscle), as well as other causes. It essentially means that the heart is failing to pump as well as it should and can cause symptoms such as weakness, breathlessness, fatigue and swelling around the legs. It cannot be cured but in many cases patients can manage their condition with drugs and other therapies.

Heart failure can be missed or confused for other conditions, even in hospital. Patients are sometimes treated on a general medical ward for the whole of their stay, even when their heart failure has been diagnosed. The place of care is very important for patients, as being seen on a cardiology ward is associated with the best survival (during admission and after discharge) and the best access to specialist care. See our infographic below.

Age and sex of Heart Failure patients

The average (mean) age of a Heart Failure patient was **77.8** years old in 2020/21. Men are typically younger than women when admitted to hospital with Heart Failure with an average age of **75.8** years compared to the female **80.2** years.

Survival of patients with Heart Failure 2020/21

The survival rate of UK heart failure patients in hospital is **90.8%**. This varies with age, with **94.2%** of under 75s and **89.1%** of over 75s surviving to be discharged.

After 30 days from discharge the survival rate of patients is **84%** and 1 year from discharge it is 61%, but this can depend on a number of factors. Many patients with mild or moderate heart failure can survive many years if they are given the right treatment.

Specialist Care and Place of Care

88% of Heart Failure patients received specialist care in hospital. Specialist care can either mean a Consultant Cardiologist, another Consultant with specialist Heart Failure interest (usually a Care of the Elderly Physician) or a Heart Failure specialist nurse (some patients are seen by more than one of these). Patients treated by specialists regardless of place of care are more likely to receive key tests like ECGs and echocardiograms (**89%** of those treated by specialists received an echocardiogram (compared to **85%** of patients overall) which help cardiologists see the heart's reduced function, and determine the best treatment. This might be surgery or an implantable device (see Arrhythmia/Cardiac Rhythm

Management on page 18). They have a higher survival rate in hospital (**92.1%**) than those receiving no specialist care (**85.1%**). They are also more likely to receive the appropriate triple drug therapy (see below), offered follow up out-patient appointments, and to be referred to a tailored cardiac rehabilitation programme (which has been shown to help cardiac patients recover and lead as full a life as possible with their condition). This is possibly because patients are selected for rehabilitation based on their individual ability to benefit from the programme. The rate of cardiac rehabilitation continues to be a key area for improvement with only **12%** of all Heart Failure patients referred in 2020/21, a drop from **15%** in 2019/20 after a slight rise in recent years.

The place of care in hospital is also key to the treatment of Heart Failure patients. **48%** of these

patients are admitted to a cardiology ward with great variation between hospitals. Patients admitted to a cardiology ward have a higher survival rate in hospital (**94%**) than those on general medical wards (**89.8%**). After one year, patients admitted to a cardiology ward are more likely to still be alive than patients treated on a general medical ward or other ward. Again, those on cardiology wards are more likely to receive appropriate therapies and referrals. Patients over 75 years old are less likely to be admitted to a cardiology ward at **42%** compared to **60%** for those under 75. Patients' sex is also a factor, as women are less likely to be placed on a cardiology ward (**42%**) than men (**52%**).





Hospitalisation for Heart Failure 2020/21

Access to cardiology wards and specialist HF care is associated with better survival and improved treatment at discharge*.



61,784
total admissions

All patients

Admitted to
cardiology
ward

Seen by a
specialist

	Patients diagnosed with echocardiography	85%	92%	89%
	Patients receiving specialist care	88%	99%	100%
	Patients discharged on all three disease-modifying drugs*	52%	58%	55%
	Patients who received a cardiology follow up	39%	52%	43%
	Patients who received a Heart Failure nurse follow up	47%	57%	52%
	Patients referred to cardiac rehabilitation	12%	18%	14%
	Patients surviving to be discharged from hospital	91%	94%	92%

* The references to treatment at discharge apply to the most common form of heart failure (called heart failure with reduced ejection fraction or 'HFrEF'). There is good evidence that these patients, who have moderately or severely reduced heart pumps, have better outcomes with special drugs, referred to here as 'disease-modifying drugs'.

Drug therapy for heart failure

There are three drugs recommended for heart failure. A patient not discharged on any of these drugs has a significantly lower chance of still being alive a year on from discharge from hospital for heart failure in 2020/21 (**56%** for the most common form of heart failure) than a patient discharged on all three drugs (**80%**). **52%** of patients in 2020/21 were discharged on all three drugs. This varied by whether the patient had access to specialist care as only **25%** of patients who had no heart failure specialist care were prescribed all three drugs, irrespective of which ward they were treated on.

The three drugs are:

ACE Inhibitors/ARBs (prescribed to 84% of patients with the most common form of HF in 2020/21)

Most ACE Inhibitors have names ending in 'pril' such as lisinopril, enalapril, ramipril. Most ARBs have names ending in 'artan' such as candesartan, valsartan, losartan.

These drugs (angiotensin-converting enzyme inhibitors/angiotensin receptor blockers) affect an enzyme (angiotensin-converting enzyme) in your blood which can narrow your blood vessels, increasing your blood pressure and making your heart work harder to pump blood around your body. Taking this drug can often ease this narrowing of the vessels and lower your blood pressure. **Watch this video from the British Heart Foundation** <https://www.youtube.com/watch?v=xllaQuRaZmk>

Beta blockers (prescribed to 91% of patients with the most common form of HF in 2020/21)

Most beta blockers have names ending in 'lol' such as carvedilol, propranolol, bisoprolol.

Beta blockers block the action of the stress hormones adrenaline and noradrenaline which cause your heart to beat faster. This slows your heart rhythm and reduces the demand on your heart.

Watch this video from the British Heart Foundation <https://www.youtube.com/watch?v=uiYJKvwVhEU>

MRAs (prescribed to 61% of patients with the most common form of HF in 2020/21)

Most MRAs have names ending in 'one' such as spironolactone and eplerenone.

These drugs (mineralocorticoid-receptor antagonists) have a diuretic effect, important in heart failure where fluid is frequently retained, and also reduce levels of the hormone aldosterone, which raises your blood pressure and can cause other heart and kidney problems. **See this description from Heart Failure Matters**, <https://www.heartfailurematters.org/what-your-doctor-can-do/aldosterone-receptor-antagonists-or-mineralocorticoid-receptor-antagonist-mras/>

Useful resources for heart failure patients:

The Pumping Marvellous Foundation
<https://pumpingmarvellous.org/>

Heart Failure Matters
https://www.heartfailurematters.org/en_GB/

Cardiomyopathy UK
(for diseases of the heart muscle)
<https://www.cardiomyopathy.org/>



Arrhythmia (Cardiac Rhythm Management)

With data from the [National Audit for Cardiac Rhythm Management \(NACRM\)](#)

IMPACT OF COVID PANDEMIC



Fall in implanting of pacemakers and other electronic cardiac devices

In 2020/21 implants of all cardiac devices fell by 20-30 per cent compared to previous years. There was a 22% drop in first pacemaker implant procedures from the 2019/20 figures, and implantable cardioverter defibrillator (ICD, see below for description) procedures dropped by 29%. Cardiac resynchronisation therapy device implants (CRT) fell by 27%. This was particularly marked at the start of the pandemic with numbers of all implants halving in April 2020, partly because patients did not seek hospital treatment, or did not reach specialist centres. Implant rates improved after the first wave, but there was another (smaller) drop in numbers in the second wave towards the end of our reporting period. In between the two waves, monthly implant rates recovered somewhat but never reached their usual level.

As pacemakers, ICDs and CRT devices are lifesaving treatments, it is likely that many lives have been lost as a secondary effect of the COVID-19 pandemic.



Catheter ablation fell by 35% in 2020/21

Catheter ablation (see description below) as a treatment for arrhythmias (especially atrial fibrillation) had been increasingly common in recent years. However elective ablations dropped dramatically by 90% in April 2020 due to the first COVID-19 wave, in comparison with 2019/20. As with other cardiac procedures, numbers increased after the first wave but ablation dropped again by 50% in the autumn. There were 12,904 ablations of all types carried out in 2020/21 compared to 19,770 in 2019/20, a 35% drop overall. As a result, waiting lists for patients suffering significant symptoms will have grown considerably, while for many patients the opportunity to have a definitive treatment has been missed altogether.

An arrhythmia is a disorder of the heart rhythm, and cardiac rhythm management is the treatment. As we saw in the introduction on page 7, the pumping of your blood around your body is controlled by the electrical conduction system in your heart. If there is an irregular rhythm (arrhythmia) this can cause serious problems, even leading to **sudden cardiac arrest (SCA)** (see fact box on page 19) where the heart stops completely, which without medical attention on the scene is often fatal. Many arrhythmias are manageable with medication or technological solutions such as pacemakers or implantable cardioverter defibrillators (ICDs) to regulate the rhythm of the heart, and modern techniques such as ablation, where the problem electrical pathways are destroyed so they cannot influence the heart's rhythm.

Implantable electronic cardiac devices

The most common type of device implant is the **pacemaker**, which is a small device, usually implanted just under the collar bone, with one or more leads

threaded down a vein to connect to the heart, which artificially takes over the function of your heart's natural pacemaker, the sinus node. It works by continually monitoring the rhythm of your heart and when necessary can trigger the heartbeat at the correct rate, to prevent it going too slowly or stopping altogether. Technological advances have led to the development of more complex devices, such as **implantable cardioverter defibrillators (ICDs)** which can shock the heart into a regular rhythm, if it develops a chaotic rhythm (ventricular fibrillation). Most ICDs can also function as pacemakers. There are also **cardiac resynchronisation therapy (CRT)** devices which are often used to treat heart failure, when the heart becomes enlarged and contraction happens at different times on each side.

In the UK, we have found that following a first pacemaker implant, **4.5%** of pacemaker patients (2019/20 implants) required another procedure within a year, usually because of a complication. For complex devices (ICD and CRT) implanted in 2019/20 this figure was **5.7%**.



Depending on the type of device and the patient, most device batteries last for 6-10 years. A few months prior to the battery running out, the entire device is replaced and connected to the existing lead(s) – this is known as a **‘box change’**. Despite the COVID-19 pandemic these necessary procedures continued at normal levels during most of 2020/21 and the higher than expected device replacement figures from March 2020 data suggest many were brought forward by hospitals in anticipation of pandemic pressures.

Catheter Ablation

Catheter ablation is done by passing a thin catheter into the heart via a vein or artery. It is used to treat some forms of abnormally fast heart rhythms, such as [atrial fibrillation](#). The problem area which is causing the arrhythmia is identified, and either thermal (heat) or freezing (cryo) treatment is delivered via the catheter, destroying small areas of tissue and causing scar tissue to form. This can either deactivate the area entirely from the electrical pathways of your heart so the electricity takes a different route, or stop a damaged area of heart muscle from causing abnormal electrical impulses which make your heart rhythm potentially dangerous.

Useful resources for patients with arrhythmia:

Arrhythmia Alliance

<https://www.heartrhythmalliance.org/aa/uk>

<https://www.bhf.org.uk/informationsupport/conditions/arrhythmias>

Sudden Cardiac Arrest

<https://www.suddencardiocarrestuk.org>

SUDDEN CARDIAC ARREST

As we saw in the introduction on page 6, electrical signals sent by the system which powers your heart keep it beating and blood pumping around your body. If this system completely stops working for any reason, such as a chaotic abnormal heart rhythm developing, blood will stop being pumped and your brain is starved of oxygen, and you will become unconscious. You will often stop breathing.

Cardiac arrest is described by the British Heart Foundation as “the ultimate medical emergency”. This is especially so if it happens outside hospital. A few minutes of giving the right treatment can literally be the difference between life and death. Some arrhythmias can be fatal – ventricular tachycardia (VT) or ventricular fibrillation (VF). When this happens the heart rhythm becomes chaotic and rapid. Only a shock (defibrillation) can restore the normal rhythm. With the increased use of cardiopulmonary resuscitation (CPR) and automated external defibrillators (AEDs) held in ambulances and public places, more cardiac arrests are successfully treated. Unfortunately, the majority of patients suffering cardiac arrest still do not survive, either because there is nobody around to call paramedics and start CPR, or because help arrives too late. Implantable cardioverter defibrillators (ICDs, implanted under the skin with a small operation requiring only local anaesthetic) can automatically detect a cardiac arrest, and restore the normal heart rhythm with a shock or with pacing, within seconds. For this reason they are offered to patients who have been lucky enough to survive a prior cardiac arrest, and those whose heart tests have shown are at significant risk of a cardiac arrest.



Congenital Heart Disease

With data from the [National Congenital Heart Disease Audit \(NCHDA\)](#)

IMPACT OF COVID PANDEMIC



Fall in procedures carried out on children and adults in the UK (excluding Scotland) and Republic of Ireland

There was a significant fall in procedures, especially elective procedures on children and adults, which were mostly postponed or cancelled in the first wave of the pandemic, and to a lesser extent the second wave. Procedures on newborn babies and infants mostly continued, reflecting the generally urgent nature of these. This reflects the exemplary response of all congenital centres working together with excellent collaboration and providing an outstanding CHD service during the pandemic. Two major heart centres specialising in congenital heart disease were converted to support centres for severely affected COVID-19

patients and cardiac procedures which would have taken place there were relocated to other hospitals. Compared with 2019/20, all age groups saw a reduction in procedures by around **17%**, with surgery reduced by **18%**. Adult congenital heart surgery was particularly affected, and fell by **44%**.



More conditions which needed an operation within the first year of life were diagnosed antenatally than in 2019/20

During 2020/21 the routine scan offered to all pregnant women at 20 weeks continued and a slightly larger number of congenital heart conditions (**52.3%**) were picked up by this scan than in the previous year (**49.8%**).

Many heart problems develop during a person's lifetime and are influenced by lifestyle as well as genetics but some, called **congenital heart disease**, are present from birth and develop in the womb.

As a new or expectant parent this will obviously be a frightening thing to hear, but techniques, care and understanding have advanced significantly over the past few decades so that the vast majority of babies survive well into adulthood with a good quality of life. Some congenital heart disease problems self-correct over time (such as a small ventricular septal defect (a type of hole in the heart)), and others do not need surgery and can be monitored and managed with medications if necessary.

Research has shown that congenital heart disease is managed better when it can be diagnosed before birth, at the routine scan offered to all pregnant women at 20 weeks. The heart's structure has developed as early as 10 weeks of pregnancy and most major problems with the structure of the heart can often be detected with the ultrasound scan at the 20 week scan or even earlier.

For children who go on to need a procedure in the first year of life, 52.3% of their congenital heart problems are currently picked up by the scan.*

As a baby grows in its mother's womb a number of congenital heart conditions can develop. A few of these are:

Hole in the heart – this is where there is an opening in the wall that separates either the filling chambers (atria) or pumping chambers (ventricles) of the heart (or both). The most common types are an atrial septal defect (ASD) where there is a hole between the right and left atria, or a ventricular septal defect (VSD) between the right and left ventricles. These holes affect the flow of blood through the heart so that extra blood goes into the lungs and, if large, may lead to breathlessness and failure of the baby to grow. Not all holes will need treatment and some small ones will close on their own in time (up to 20 years). However if surgery is needed it is generally in infancy or early childhood, whilst some holes can be closed using a transcatheter device ('keyhole' procedure), usually by mid to late childhood. There is a need for subsequent monitoring through life,

*It is important to bear in mind that the Congenital Audit only publishes the success rate of detection before birth of congenital heart conditions found during ultrasound scans by sonographers linked to obstetric units at local hospitals, and only in those children who have survived pregnancy and have then required a procedure in infancy. The results underestimate national and local success in detecting cardiac conditions in the womb, as they do not include other possible outcomes following antenatal diagnosis, such as termination of pregnancy, or the child not undergoing a heart procedure in infancy.



although further procedures are unlikely to be required later in life if no other congenital heart condition is present.

Hypoplastic left heart syndrome (HLHS) – a relatively rare condition where the left side of the heart does not fully develop, and is much smaller. Multiple surgical procedures may be required in infancy and early childhood. It is often able to be detected in pregnancy, and **90.6%** of the babies with this condition who had to have a procedure before one year of age had their condition detected before birth in 2020/21 in the UK (excluding Scotland) and Republic of Ireland. This has risen over the last decade from **77.9%** in 2011/12.

Transposition of the great arteries with intact ventricular septum (TGA-IVS) – in a healthy heart the pulmonary (lung) artery is connected to the right pumping chamber (right ventricle) which pumps the blood to the lungs, whilst the left pumping chamber (left ventricle) pumps the blood around the body through the aorta (the body's main artery). However, in this condition they are switched, and both great arteries are connected to the wrong pumping chambers. This means that the blood being circulated around the body is low in oxygen and the baby is 'blue' at birth. It's likely that the baby will need an operation in the first couple of weeks of life. Again, this condition is often visible on an ultrasound scan at 20 weeks of pregnancy. In 2020/21 **85.7%** of babies

with this condition, who had to have a procedure before one year of age, had it detected before birth in the UK (excluding Scotland) and Republic of Ireland. This has risen over the last decade from **36.6%** in 2011/12.

Complete Atrioventricular Septal Defect (AVSD) – this is where there is a hole between the right and left side of the heart in the centre, between the atria (the upper chambers where blood enters the heart) and also between the ventricles (pumping chambers). This means that the pumping of oxygenated blood to supply the rest of the body is impeded. It is a condition often seen in babies with trisomy 21 (Down's Syndrome). In 2020/21, **47.9%** of babies with this condition, who had to have a 'corrective' procedure before one year of age, had it detected before birth in the UK (excluding Scotland) and Republic of Ireland. This has risen over the last decade from **35.5%** in 2011/12.

There can also be combinations of structural problems in different areas of the heart.

Tetralogy of Fallot (TOF) – is a combination of four structural heart abnormalities. It involves a narrow pulmonary (lung) valve/artery, impeding the supply of blood to the lungs, an enlarged right ventricle (see the diagram of a heart on page 6), along with a large hole (ventricular septal defect - VSD) between the right and left ventricles, which are the two main

pumping chambers. The entrance to the aorta, which supplies blood to the rest of the body (see page 6), is found next to the hole with this condition, meaning that blood low in oxygen flows through it mixing with the oxygenated blood and causing the level of oxygen in the blood to be lower than normal. This condition normally means the baby will need to have an operation before the age of one year, and how early in life this is depends on how severe the narrowing of the pulmonary valve/artery is. In 2020/21 **68.8%** of babies in the UK (excluding Scotland) and Republic of Ireland who had to have a 'corrective' procedure within one year of birth were diagnosed with the condition in the womb. This has risen over the last decade from **25.9%** in 2011/12.

The overall survival rate for the 3,113 surgical operations undertaken in children under 16 years of age in 2020/21 is **98.4%**, and remains among the best reported anywhere in the world. However, assessing the likely survival rate for a specific congenital heart problem at a particular centre with its clinical team is more complex. To estimate the likelihood for each hospital the congenital heart disease audit programme uses a risk-based calculation to take into account the type of congenital heart disease as

well as non-cardiac patient factors, such as genetic abnormalities and how sick the child is just before the operation, as these all influence the outcomes after a given procedure. You can read more about this and view the risk adjusted survival rates for all UK congenital heart disease centres [here](#).

Useful resources for congenital heart disease patients:

Tiny Tickers

<https://www.tinytickers.org/>

Children's Heart Federation

<http://www.chfed.org.uk/>

Little Hearts Matter

<https://www.lhm.org.uk/>

The Somerville Foundation (adults with congenital heart problems)

<https://thesf.org.uk/>

Antenatal Results and Choices

<https://www.arc-uk.org/>

ANTENATAL DETECTION

52.3% of children needing a procedure before one year of age had their condition diagnosed antenatally

Transposition of the great arteries with intact ventricular septum (TGA-IVS)

85.7% of children needing a procedure before one year of age were diagnosed antenatally

Hypoplastic Left Heart Syndrome (HLHS)

90.6% of children needing a procedure before one year of age were diagnosed antenatally

Complete Atrioventricular Septal Defect (AVSD)

47.9% of children needing a procedure before one year of age were diagnosed antenatally

Tetralogy of Fallot

68.8% of children needing a procedure before one year of age were diagnosed antenatally



COVID-19 and its impact on cardiovascular care

The experience of cardiac patients, family members and carers during the COVID-19 pandemic in 2020 and 2021. We spoke to four people about [their experiences](#) and also include excerpts from [British Heart Foundation](#) and [Patients' Association](#) reports.

"It also seemed that others missed their families and were sad that they could not have visitors; I think that we all worried about how our loved ones felt."

"There was also a little uncertainty about whether my operation could go ahead as planned, because of the possibility of COVID infection among staff."
Over a third fewer heart operations were performed in the UK (excluding Scotland) in 2020/21

"My husband was on the ground floor next to a window, and as I couldn't see him due to COVID regulations, I used to phone him and stand outside the window so he could see me while we spoke"

"A recent online survey conducted by YouGov on behalf of the BHF showed that 66% of UK adults who have a heart condition have avoided accessing care during the pandemic despite their condition worsening."
Source, BHF Report "The Untold Heartbreak"

"I had to do all my own post-op monitoring, I haven't seen any doctor since the surgery apart from a scan a year after, and I knew I was at risk if I were to go into a doctor's surgery, so I stayed at home."

"In England, IPPR analysis found that 470,000 fewer new prescriptions of preventative cardiovascular drugs (including anti-hypertensives, statins, anti-coagulants, and oral antidiabetics) were issued between March and October 2020 compared to the previous year"
Source, BHF Report "The Untold Heartbreak"

"Because of COVID the follow up appointment three months later was a telephone appointment. They advised me not to come into hospital and to manage my condition at home with diazepam and extra beta blockers if I had another episode. He told me that as soon as things improved I would be contacted for a proper follow up and checks. However this didn't happen and there was no further follow up."

"A recent study by the IPPR estimates this has led to 23,000 missed diagnoses of heart failure in England during the pandemic." Source, BHF Report "The Untold Heartbreak"

"My partner, who luckily had their heart surgery the day before lockdown, has had very little follow-up care and no rehabilitation. It has affected their mood and no doubt the delay will affect their recovery"
Source, Patients' Association report "Pandemic Patient Experience, Sept 2020"

"75% drop in referrals for consultant-led outpatient appointments in England in April 2020 compared with 2019" Source, BHF report "The Untold Heartbreak"

"It was as if he'd disappeared into a black hole for weeks. It was extremely difficult to get any information on his condition and wellbeing, we couldn't visit him in hospital due to the restrictions, and when staff did call they called the wrong person and had incorrect details."

"Many people told us that diagnostic services, GP appointments and dental services in particular were hard to access, as well as support for mental ill health. Some people said they wanted to know when and how services might restart, and that they felt they had been left in the dark."
Source, Patients' Association report "Pandemic Patient Experience, Sept 2020"



Useful resources

Support for carers

Carers have a fundamental role in the lives of patients living with a heart condition and their contribution is invaluable to patients' wellbeing. Here are some sources of advice and support.

<https://www.nhs.uk/conditions/social-care-and-support-guide/introduction-to-care-and-support/>

<https://carers.org/our-work-locally>

Mental health

Mental health issues go hand in hand with life changing health events. Post-traumatic stress disorder (PTSD), anxiety and depression can seem overwhelming but there is support available.

<https://www.nhs.uk/conditions/stress-anxiety-depression/free-therapy-or-counselling/>

<https://www.samaritans.org/>

<https://www.mind.org.uk/>

<https://www.bhf.org.uk/information-support/heart-matters-magazine/wellbeing/mental-health/coping-with-anxiety-and-depression>

Shared decision making

Until fairly recently most medical decisions were made solely by the consultant, GP or nurse. But nowadays patients are encouraged to discuss the pros and cons of the treatment that a doctor has recommended. The advantage of this is that it can take into account the patient's concerns and their overall situation, rather than just focusing on the medical issues. Sometimes what a doctor or nurse thinks is best for the patient can differ from what the patient actually wants. The decision-making process is a two-way dialogue, so it is 'shared'.

<https://www.england.nhs.uk/shared-decision-making/>

<https://www.sarawickham.com/questions-and-answers/what-is-the-bran-analysis/>

Learn CPR

St John's Ambulance provides instruction on CPR.

<https://www.sja.org.uk/get-advice/first-aid-advice/unresponsive-casualty/how-to-do-cpr-on-an-adult/>

Where is my nearest public defibrillator (AED)?

Try the Heartsafe website, which has a map of defibrillators in the UK.

<https://www.heartsafe.org.uk/aed-locations>

Try the GoodSAM app which will show you defibrillators close by on your mobile phone. You can also upload a picture of an unlisted defibrillator you spot when you are out and about. Many defibrillators haven't been registered with the local ambulance service, so this is a good way of flagging them up.

<https://www.goodsamapp.org/aed>

What can I do to keep my heart healthy?

The BHF Heart Matters magazine is a comprehensive and engaging resource for healthy lifestyle tips and personal stories about living with heart conditions.

<https://www.bhf.org.uk/information-support/heart-matters-magazine>

<https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/>

<https://www.nhs.uk/live-well/exercise/>

Guide to useful apps for managing your heart health

In our 2020 report we published a useful guide to the many apps available to help you live with a heart condition or improve your health. This can be found [here](#).

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This report was written by Sarah Brown and Richard Corder as patient co-writers, and Kelly O'Brien, with support from the NCAP team and the NICOR Patient Representative Group chaired by Sarah Murray, with graphic design by [Helen Joubert](#).

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National Institute for Cardiovascular Outcomes Research (NICOR)

NICOR is a partnership of clinicians, IT experts, statisticians, academics and managers who, together, are responsible for six cardiovascular clinical audits (the National Cardiac Audit Programme – NCAP) and a number of new health technology registries, including the UK TAVI registry. Hosted by Barts Health NHS Trust, NICOR collects, analyses and interprets vital cardiovascular data into relevant and meaningful information to promote sustainable improvements in patient well-being, safety and outcomes. It is commissioned by the Healthcare Quality Improvement Partnership (HQIP) with funding from NHS England and GIG Cymru/NHS Wales.

Email: nicor.auditenquiries@nhs.net



Barts Health NHS Trust

With a workforce of around 17,000 people, Barts Health is a leading healthcare provider in Britain and one of the largest NHS Trusts in the country. The Trust's five hospitals – St Bartholomew's Hospital in the City, including the Barts Heart Centre, The Royal London Hospital in Whitechapel, Newham Hospital in Plaistow, Whipps Cross Hospital in Leytonstone and Mile End Hospital – deliver high quality compassionate care to the 2.5 million people of east London and beyond.



The Healthcare Quality Improvement Partnership (HQIP)

HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies.

www.hqip.org.uk/

