National Cardiac
Audit Programme

NICOR

National Cardiac Audit Programme (NCAP)

2025 Annual Report for patients, carers and the public

(2023/24 and 2021/24 data)

Contents

National Cardiac Audit Programme
2025 Annual report for patients, carers and the public

About **this report**

This patient, carer and public report is designed as a companion to the 2025 National Cardiac Audit Programme (NCAP) annual report produced by the National Institute for Cardiovascular Outcomes Research (NICOR). NICOR is commissioned by NHS England and GIG Cymru/NHS Wales to complete national cardiac audits to inform healthcare providers and research organisations.

The 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.

The patient, carer and public report is co-produced by members of NICOR's Community Representative Group (CRG) and covers data from 1 April 2023 to 31 March 2024.

How to **use this report**

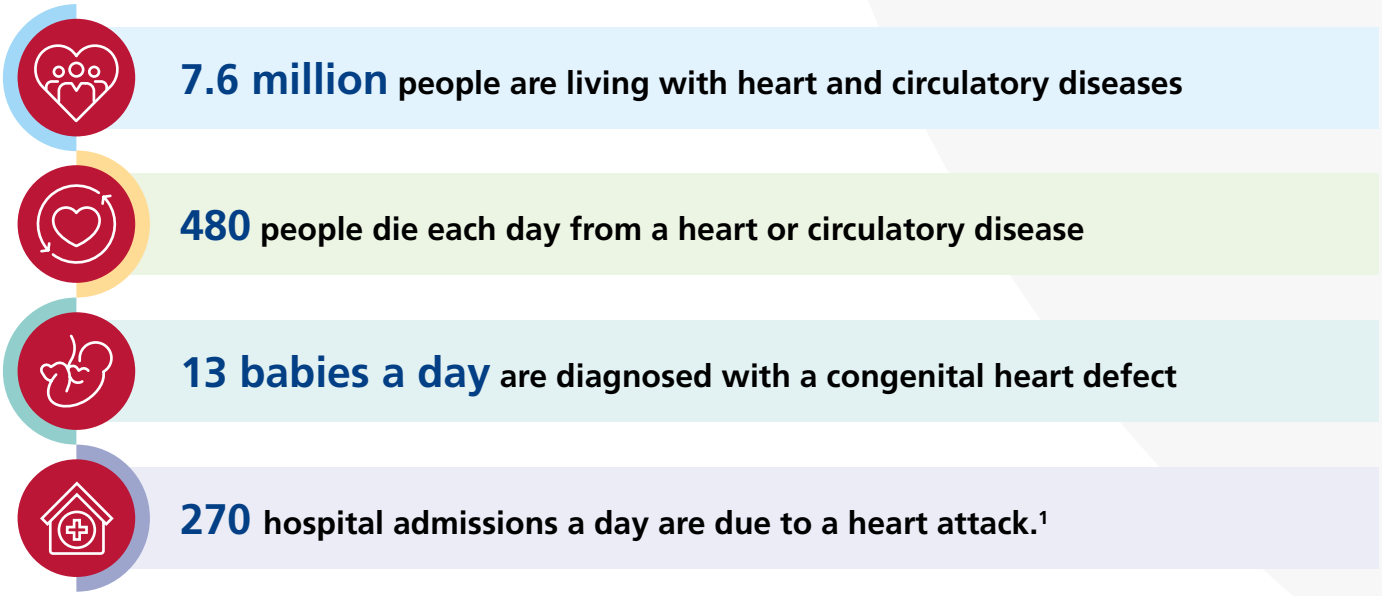
The report is divided into 10 areas of clinical expertise (called "domains") audited by NCAP.

We have summarised key findings from the full 2025 annual report, provided useful background information and highlighted what you can do to help improve cardiac health for you, your family, and carers.

We have also included links to additional information or support from key national organisations. If you would like to read specific parts of the annual report, there are links to all 10 clinical domain summaries.

Why do we audit hospital services?

In the UK:



Our aim is to support improvement in care. The audit work at NICOR helps the 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 to help hospitals and medical professionals improve their performance. The report also enables healthcare organisations and commissioners to understand the national picture.

The national audit data are also useful for public health research, the findings of which may then become 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 trends for medical researchers (for example, the link between deprivation and cardiovascular risk factors).

The British Heart Foundation published a report in January 2025 highlighting the range of modifiable risk factors and their influence on heart health. In England, approximately 70% of the cardiovascular disease burden is linked to risks that can be reduced or managed (such as smoking and physical inactivity), as well as clinical risk factors like high blood pressure and obesity.[2]

[1] British Heart Foundation: heart statistics

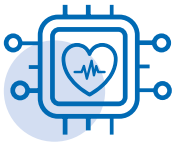
[2] British Heart Foundation: Cardiovascular inequalities in England: an analysis

What's new at NICOR?

Over the last 12 months we have supported clinicians, hospitals and healthcare improvement bodies by delivering:

New clinical audits and registries, growing from 7 to 10 sub-specialty areas

27 interactive reports completed for the National Cardiac Audit Programme (NCAP) over 3 reporting periods



Continuous improvements in the way we collect and interpret health data

Regular data updates throughout the year to help 'paint the current picture'

An improved system to monitor and improve the quality of care of cardiovascular services across the UK, helping to inform change and improve patient outcomes

Registries that are clinically-led (for example, 4 new Clinical Leads were appointed)

NICOR's new and improved website in March 2024 making the latest data accessible to everyone

Involvement and feedback from our Community Representative Group (CRG) and virtual panel, putting their voices at the heart of everything we do

All with the aim to support the delivery of better health outcomes for patients, both in terms of their chances of improved survival and better experiences.

Foreword from **Sarah Murray, Chair of NICOR Community Representative Group (CRG)**

The role of NICOR is to observe but not explain and with the new data reporting model being slicker, quicker and more user friendly we have more and more accessible data at our fingertips. This is both good and bad. Good, because we can see at almost in real time what is happening to the results of each registry: good, because information that matters to us we see more easily. Bad, because we can see the failings of the system and those areas where there are persistent problems and bad, because we have more and more questions and not the answers.

The NICOR Community Representation Group, which I lead, is made up of patients, carers and members of the public who are passionate about cardiac care in this country. Our role is to advise on what patients and families would like to see, highlight the areas of poor performance, challenge the data, the Integrated Care Board (ICB) and health care commissioners and question the way forward.

This year's aggregate report which I recommend you read, presents us with an excellent overview of the cardiac services in England, Wales and Northern Ireland. There are areas of improvement and excellent practice and those who are delivering this are to be congratulated. However, there are areas of real concern, and many are repeated year on year with little or no progress toward change.

With this in mind, the CRG will spend the coming year highlighting the issues to those who need to know by contacting them directly, meeting with them and we will be challenging them to do better. As the audits continue to improve the drive to uncover and challenge wide variations in practice and provision will increase and the CRG will be at the forefront.

I hope you find this document helpful and if you have any questions about it or the work of the CRG please contact me via email nicor.auditenquiries@nhs.net.

This report is dedicated to our long time friend and colleague, Richard Corder. As an invaluable member of the NCAP Operational and Methodology Group, Richard brought a wealth of lived experience as a cardiac patient, patient advocate and his significant business experience. He was a fierce supporter of the patient voice and his dedication, tenacity and eye for detail when reviewing the audits will be sorely missed. He was generous with his time and experience, and his good manners and kindness made him a pleasure to work with.

We will miss him.

Heart heath: the current picture

This report looks at the performance of cardiovascular services, shows the positives but illustrates where there are opportunities for improvements.

The aim is to raise awareness of the current picture of cardiovascular services across the country and to monitor performance across hospitals and healthcare improvement bodies. Where good practice standards are being met, hospital teams should be applauded but where standards are not met, hospitals should implement a quality improvement programme.

These efforts should drive sustainable improvements in patient wellbeing, safety and outcomes.

The data from 1 April 2023 to 31 March 2024 (or 2021/22 to 2023/24 where it is collected over a 3-year period) show changes in the care and treatment provided by cardiovascular services and the experiences and outcomes they deliver. Some trends reflect long-term alterations in clinical practice amongst some cardiovascular procedures.

Other changes result from the COVID-19 pandemic, which had a significant impact on local health services and hospitals. This included increased waiting times for elective treatment (non-urgent and planned) and delayed admissions for urgent cases. The positive news is some of these effects are being reversed, though the health and social care system continues to experience ongoing challenges to restore service capacity and improve delays to treatment. The reasons are complex but include staff retention and recruitment.

This adds further strain to an already overworked NHS, which is struggling to cope with growing demands from a larger and older population.

Of particular concern are the substantial inequalities and variances in care across the country. More work is needed to understand these and to determine which variations are unwarranted and how things can be done to ensure universal and equal access to treatment for everyone.

Despite the many challenges and in what remains a turbulent time for the NHS, progress is being made on the overall quality of care in many areas of cardiology care, with hospitals achieving excellent results for many specific national quality standards. This includes:

- very low mortality and complication rates for cardiac surgery in both adults and children with congenital heart disease
- more heart attack patients being managed on a cardiac ward and most being seen by a specialist team, receiving appropriate care and having referrals to cardiac rehabilitation on discharge
- an increase in the number of higher-risk (STEMI) heart attack patients being prescribed the newer P2Y12 antiplatelet drugs
- most hospitalised heart failure patients being seen by a specialist team and many receiving appropriate care

- increased use of intracoronary imaging to detect type of disease and results of treatment in percutaneous coronary intervention (PCI) cases for left main coronary lesions and for complex PCI cases
- the majority of Transcatheter Aortic Valve Implantation (TAVI) procedures being performed under conscious sedation using the percutaneous transfemoral approach (the catheter is inserted into the femoral artery), resulting in fewer complications and low in-hospital and 30-day mortality rates
- low re-intervention rates because of complications in the first year after a cardiac rhythm management device implant.

The Government has announced that it will publish a new 10 Year Plan in Spring 2025 to "transform the NHS" and you can help. Members of the public are being asked to help shape this plan and share their experiences and views on what change is needed. Take this opportunity to ensure heart health and cardiovascular services receive the attention they deserve. You can comment on the Change NHS portal and share your views at Change NHS.

Integrated Care Boards (ICBs) and Cardiac Networks (CNs) will have a crucial role to play in this, leading a localised approach to implementing improvements.

Your heart

It's not just any organ, your heart is amazing! It's the powerhouse of your circulatory system, working constantly to keep you alive.

The heart is a muscular organ, made of four chambers about the size of your fist that pumps blood and oxygen around your body constantly.

It works like a powerful pump, sending oxygen-rich blood to your organs and tissues, 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.

What is structural heart disease?

If the heart is not working properly health problems will occur.

Structural heart disease is the overarching term for several heart defects that affect the valves and chambers of the heart and aorta. Some defects are present at birth (congenital abnormalities) while others form later in life. If a defect is identified, treatments will be offered and will vary depending on the type and severity of the condition. To learn more about the conditions and treatments available, refer to information available on the NHS and British Heart Foundation website.

To explore the different areas of cardiac healthcare or 'specialities', including a brief look at how the heart works, and help to understand what treatment or procedures are available when managing a heart condition, you can read NICOR's introduction to your heart. Here you will find a useful diagram of the heart structure and anatomy.

What information does this report for patients, carers and the public cover on conditions and treatments?

This report looks at 10 areas of clinical expertise for heart health and how hospitals are performing, the opportunities and challenges. The clinical audit areas covered by the NCAP are:

- Myocardial Ischaemia National Audit Project (MINAP) (Heart attack)
- National Heart Failure Audit (NHFA)
- National Audit of Percutaneous Coronary Interventions (NAPCI) (Coronary angioplasty)
- National Audit of Cardiac Rhythm Management (NACRM) (Abnormal heartbeat)
- National Congenital Heart Disease Audit (NCHDA) (Congenital disease)
- National Adult Cardiac Surgery Audit (NACSA) (Open heart surgery in adults)
- UK Transcatheter Aortic Valve Implantation (TAVI procedures)

In 2023 and 2024, NICOR launched three new structural heart intervention registries to NCAP, bringing the total to 10 clinical audits:

- Transcatheter Mitral and Tricuspid Valve procedure (TMTV)
- Percutaneous Foramen Ovale Closure (PFOC)
- Left Atrial Appendage Occlusion (LAAO)

The rest of this report considers the results of each of these audits.

How does the NCAP annual report differ to this report?

The NCAP 2025 annual report is designed to support and drive quality improvement within hospitals. Though it is aimed at those with some level of clinical knowledge, it is available to everyone and you can download it alongside supporting documents containing additional detailed audit outputs on the NICOR website.

Heart attack audit

With data from the Myocardial Ischaemia National Audit project (MINAP) 2025 report (2023/24 data for England, Wales and Northern Ireland unless otherwise stated).

The number of recorded heart attacks continues to fall, but admission rates vary across the country

- **81,814** patients were admitted to hospitals across England, Wales and Northern Ireland with a confirmed heart attack in 2023/24.
- Numbers have continued to fall over the last 6 years, **down over 8% compared to 2017/18** and 2.2% fewer cases compared to 2022/23.
- Fewer heart attacks (especially in lower-risk NSTEMI cases) amongst people **aged 75 or older is the main contributor** to the overall reduction in cases over the last 6 years.
- For people aged under 65, rates appeared to rise for a period after the COVID-19 pandemic but are now similar to the numbers recorded in 2016/17 (before the pandemic).
- Just over **1 in 3** patients had suffered a higher-risk (STEMI) heart attack with the rest being lower-risk (NSTEMI) cases.

There is substantial variance between the number of people admitted to hospital with a heart attack. The Integrated Care Boards (ICBs) /Health Boards (HBs) with the most admissions per 100,000 population (Hywel Dda University Health Board and North East and North Cumbria ICB) have rates **3 times higher** than in those with the least (NHS Coventry and Warwickshire ICB and NHS Derby and Derbyshire ICB).

PCI treatment times for high-risk heart attacks have improved, but patients over 75 are less likely to receive it, especially older females

The time to treat higher-risk STEMI heart attacks is critical to patient recovery and survival. National guidelines suggest all patients confirmed with a STEMI heart attack should be considered for reperfusion therapy to restore blood flow through blocked arteries using primary percutaneous coronary intervention (PCI) within 12 hours from the start of their symptoms (thereby reducing the damage to the heart).

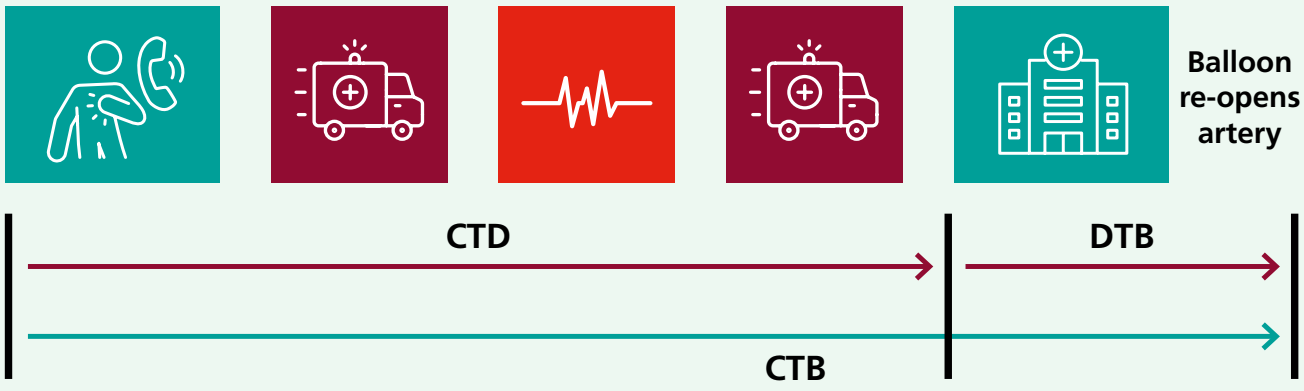
For the first time in 10-years, the average Call-To-Balloon (CTB) time has improved, with a **reduction of 3 minutes** for patients undergoing primary PCI compared to 2022/23. This is encouraging, but the CTB time is still 27 minutes longer compared to 2014/15, and so improvement needs to continue.

CTB time is a measure of performance of a system of care and not just of the hospital where the PCI takes place. It is the interval between the first call for professional help and the time that the PCI procedure is performed. See the graphic 'Emergency time periods for the treatment of high-risk STEMI heart attack patients' below.

A far higher proportion of older patients with STEMI do not receive reperfusion treatment, especially older females. There is no difference in the rates of PCI treatment for men and women aged 55-64 years, with almost 90% receiving reperfusion treatment. However, for women aged 75 and over, **32% did not receive treatment**, compared to **24% of men** in this age group. The reasons for the lower rates could include the frailty of the patient, difficulty in making a reliable diagnosis in older people and arriving at hospital later.

An improvement of **3 minutes** has been recorded for the average time for a patient to be brought to hospital by ambulance (the 'Call-To-Door' or CTD time), the first improvement seen in 10 years, although this remains 22 minutes longer compared to 10 years ago.

Emergency time periods for the treatment of higher-risk STEMI heart attack patients



CTD = Call-To-Door time
From patient 999 call to arrival at hospital
DTB = Door-To-Balloon time
From arrival at hospital to re-opening of artery using reperfusion primary PCI therapy
CTB = Call-To-Balloon time
From patient 999 call to re-opening of artery using reperfusion primary PCI therapy

A rising number of heart attack patients face longer delays for treatment because they are self-presenting at hospital rather than arriving by ambulance

1 in 10 people with higher-risk heart attacks 'self-presented' to hospital rather than travelling by ambulance (almost 12% of STEMI patients and 31% of NSTEMI). This compares with 5% and 25% of patients respectively up until 2020.

Patients should always call 999 because the ambulance service can provide immediate life-saving treatment and take the patient directly to the nearest hospital which is able to provide primary PCI (PPCI) treatment. Patients who take themselves (or 'self-present') to hospital first have to be assessed in the Accident & Emergency (A&E) department before being taken on to the cardiac team able to perform the PPCI. If a patient arrives at a local hospital that does not offer PPCI treatment, this will involve an additional journey (inter-hospital transfer or IHT) to a PCI centre in a hospital that can provide this, delaying access to treatment and potentially a worse outcome.

In 2023/24 there was an **additional delay of 84 minutes** in Symptom-To-Balloon (STB) times for patients who self-presented at hospital compared to those brought directly to hospital by ambulance. STB is the time interval beginning from the start of symptoms that led the patient to call for help or to attend hospital and ending at the time of the first balloon inflation to open narrow or blocked arteries. The delays are particularly long for patients who attended a hospital where primary PCI treatment was unavailable and had to be transferred to another hospital.

If you suspect a heart attack, call 999. Paramedics can begin treatment and take you to the best hospital for your needs.

Longer delays for urgent PCI treatment and inequalities seen

International guidelines state that patients with lower-risk NSTEMI heart attacks should undergo angiography prior to discharge and, ideally, within 72 hours of admission. In 2023/24, only **51%** of these patients underwent angiography within 72 hours of admission compared to **67% in 2017/18.**

A smaller proportion of older people and slightly fewer younger females receive angiography within 72 hours of admission. More frequent and earlier use of ECG testing and special blood tests may help clinical teams to optimise care for patients, regardless of sex or age.

Access to hospital specialist cardiac care improves, but discharge medication targets not met

Both heart attack and heart failure patients should receive specialist cardiology care either by being admitted to a cardiology ward or having a cardiology team input to their treatment. For lower-risk NSTEMI heart attack patients, the proportion of patients admitted to a cardiology ward increased to 84% in 2023/24 and nearly all were seen by a specialist cardiology team, including those admitted to a general or other ward.

Despite this, there has been a worrying fall over the last four years in the percentage of patients discharged home with the appropriate package of drugs. Only **81%** of eligible patients received all the prevention drugs they required, **down from 85% in 2019/20**. There was though an improvement in relation to offering some form of aldosterone antagonist drug, with **74%** of eligible patients being prescribed this medication on their discharge from hospital.

Referral to cardiac rehabilitation programmes at discharge remains high and is achieved for most patients. Many hospitals also report referring at least 85% of all heart attack patients to a cardiac rehabilitation programme in 2023/24, although 66 hospitals did not achieve this level.

Useful resources for heart attack patients:
Heart UK (cholesterol charity)
NHS conditions: Heart attack and recovery
British Heart Foundation: Heart attack

Percutaneous coronary intervention (PCI) audit

With data from the National Audit of Percutaneous Coronary Intervention (NAPCI) 2025 report (2023/24 data for England and Wales unless otherwise stated).

Slight increase in PCI procedures but remain lower compared to 2017/18

The number of PCI procedures to improve coronary artery blood flow increased slightly in 2023/24 to 91,092 compared to 89,660 the previous year but was 7% lower overall than in 2017/18.

Since 2017/18, there have been 25% fewer planned PCI treatments for stable angina, probably because of evidence of similar outcomes if patients are taking optimal medical therapy, although PCI is still a good treatment for angina.

There was a small 2.8% increase in primary PCI procedures for patients suffering higher-risk STEMI heart attacks and a 3.3% increase in PCI for lower-risk NSTEMI heart attacks, though fewer of both procedures were performed than in 2017/18.

Patients treated faster if taken directly to a PCI centre

Patients with a high-risk STEMI heart attack need emergency treatment at a hospital with a PCI centre. Patients who self-present at hospital instead of calling an ambulance, may end up at a hospital without a PCI centre and need to be transferred, causing delays. These delays can lead to more heart damage, with a higher risk of heart failure and death.

In 2023/24, **68%** of STEMI patients taken straight to a PCI centre were treated within 150 minutes of a call for help (a 3% improvement compared to 2022/23). However, patients needing transfer still faced longer delays (average Call-To-Balloon time of **163 minutes**) compared to those admitted directly to a hospital with a PCI centre (**119 minutes**).

Intracoronary imaging techniques for PCI procedures continue to rise

Using intracoronary imaging (ICI) techniques for more complex PCI procedures helps ensure the quality of these procedures and there has been a steady increase in this (**ICI was used in 30% of cases in 2023/24** compared to 26% in 2022/23).

There is a **wide variation** between hospitals in the use of ICI for these complex procedures, from 24% to 70% for hospitals undertaking more than 500 complex PCI procedures.

There is growing use of ICI in PCI for left main stem (LMS) lesions, up from 62% in 2018/19 to **78% in 2023/24**. Research shows ICI is associated with a 30% decrease in death one year following LMS PCI.

Improvement seen in the prescription of drug therapies but still below recommended guidelines

After patients have received a stent from a PCI procedure, they receive two drugs ('dual anti-platelet therapy') to prevent blood clots and reduce the risk of a future heart attack. Typically, this comprises aspirin and one of a class of drugs referred to as P2Y12 inhibitors such as prasugrel or ticagrelor, antiplatelet medicines which help blood flow through vessels more easily and can help prevent blood clots.

The number of patients being prescribed P2Y12 drugs following primary PCI for higher-risk STEMI heart attacks is up from 44% in 2019/20 to **59% in 2023/24**. The use of prasugrel grew faster than ticagrelor but is still below the recommended guidelines.

The use of a drug-eluting balloon (a balloon coated with medication that is released into the vessel wall, which inhibits scar tissue that might later re-narrow the vessel after treatment) during PCI procedures has **grown steadily** from less than 1% of cases in 2018/19 to 13% overall in 2023/24 and **35%** of PCI procedures to treat a restenosis lesion (recurring narrowing of the blood vessel).

Useful resources for PCI patients:

British Heart Foundation: Treatments for heart conditions, angioplasty – your quick guide

NHS: coronary angioplasty and stent insertion

British Cardiovascular Intervention Society

Adult cardiac surgery audit

With data from the National Audit for Adult Cardiac Surgery (NACSA) 2025 report (2021-2024 data for England, Wales and Northern Ireland unless otherwise stated)

The number of adult heart operations continued to fall and survival rates remained high

The total number of adult heart operations was 26,529, a **10% (3,044)** fall compared with 2019/20. The number of operations has continued to fall compared to 10 years ago and activity has not returned to pre-COVID-19 levels.

The overall hospital survival rate after cardiac surgery was **98.2%** over the last 3 years (2021/22 – 2023/24) which is 'as expected'.

There is a big variance in the number of operations carried out at NHS hospitals, ranging from just over 1,900 to under 400 (the average was 832). Six hospitals performed fewer than 500 procedures.

Surgeons are performing an average of **96** operations per year, lower than should be achieved and down from 140 in 2013/14. Consultants could expect to complete 168 cases per year, assuming full schedules with no cancellations. There are a number of reasons why the expected levels were not achieved, but one main reason is the lack of availability of staffed intensive care unit beds.

Waiting times for elective surgery remain high and are getting worse

The average waiting time for an elective coronary artery bypass graft (CABG) operation has risen to **130 days on average**. This has increased by an additional 11 days compared to last year (2022/23). The NHS target is a 12-week waiting time (under 84 days) for patients requiring non-urgent CABG. Waiting times had fallen to 96 days in 2017/18.

Waiting times for urgent CABG procedures are significantly longer than the NHS target of 7 days

The average waiting time in hospitals for urgent CABG procedures was **13 days** in England compared to 10 days in 2019/20. The number of patients who were treated within the 7-day target continues to fall in England (down to 23% from 35% in 2020/21).

Wales saw a slight improvement to **13 days** on average compared to 14 days last year (2022/23), but the 7-day target was only met in **16%** of patients in 2023/24.

Only 2% of patients in Northern Ireland were operated on within the 7-day target, where the average waiting time for urgent CABG was **27 days**.

Day-of-Surgery Admission (DOSA) rates for elective operations improved but only 2 hospitals met the target

The target is for hospitals to undertake 50% of procedures as Day-of-Surgery Admission (DOSA) cases. In England, just over 15% of elective operations were DOSA cases, compared to 12.7% in 2022/23. This compares with 21% of cases in 2019/20, suggesting hospitals should be able to return to much higher levels.

Only 2 out of 32 **NHS hospitals** met the 50% target, and 20 NHS hospitals delivered less than 5% DOSA cases. The number of NHS hospitals below 5% DOSA cases is rising, (17 in 2022/23).

Wales and Northern Ireland saw minimal improvement, but the number of overall DOSA cases was very small (2.4% in Wales, 3.9% in Northern Ireland).

Significant differences between hospitals in the type of aortic valve treatment received by patients aged under 60

Most patients aged under 60 requiring aortic valve replacement (AVR) would be expected to receive a mechanical valve according to current guidelines. There is a huge variation across UK hospitals in the number of patients in this age group who instead, against guidelines, receive a biological valve (from **7% to 82%** amongst NHS hospitals).

Some additional data on patients who underwent surgical mitral valve procedures is included in the chapter on the Transcatheter Mitral and Tricuspid Valve (TMTV) Registry.

Useful resources for adult cardiac surgery patients:
British Heart Foundation: coronary bypass surgery
British Heart Foundation Heart Matters Magazine: valve disease
British Heart Foundation: aortic aneurysm

Heart failure audit

With data from the National Heart Failure Audit (NHFA) 2025 report (2023/24 data for England and Wales unless otherwise stated).

Heart failure hospital admissions still below pre-COVID-19 levels and variances seen across the country

Confirmed index (or first) admissions to hospital where heart failure was the primary diagnosis are rising (**up 7% from 2022/23**) but remain below levels seen in 2019/20 (**down 5.5%**).

Heart failure admission rates varied widely, with NHS Dorset Integrated Care Board (ICB) seeing 3 times more cases per 100,000 people than the lowest rates in Cornwall, Cardiff, and other areas.

Heart failure patients admitted to hospital stay longer and have better outcomes if seen by a specialist

At least 60% of heart failure patients should be cared for on a cardiology ward based on current targets, but the actual number has been falling gradually and was **only 39%** in 2023/24. Of the patients admitted to hospital, **81%** of patients received care from a specialist heart failure team but this remains below the audit target of 90%. Only **52%** were seen by a specialist heart failure nurse.

Access to specialist heart failure care (cardiologists and specialist nurses) is associated with better evidence-based care, improved treatment of patients on discharge and a lower mortality rate.

The average length of stay for patients seen by a specialist heart failure team is 9 days. This is **4 days longer** compared to in-hospital patients with no specialist input. Although care on a cardiology ward is associated with better outcomes, only **20%** of these patients were recorded as being referred for cardiac rehabilitation.

Proportion of female heart failure patients varies by geographic area

44% of all heart failure admissions were female but there is considerable variation by ICB, Health Board (HB) and Cardiac Network, ranging from **32% to 49%**.

More patients receive the beneficial combination of drug therapies, but consistency of prescribing must improve

Four key disease-modifying drug classes are now recommended for optimal care in patients with heart failure with reduced ejection fraction (HFrEF). These are

(a) a Beta Blocker (BB)

(b) one of a group including an Angiotensin Converting Enzyme inhibitor (ACEi), an Angiotensin Receptor Blocker (ARB) or an Angiotensin Receptor / Neprilysin inhibitor (ARNI)

(c) a Mineralocorticoid (aldosterone) Receptor Antagonist (MRA)

(d) a Sodium-glucose co-transporter 2 inhibitor (SGLT2i) drug.

The quality improvement target for prescribing all of these drugs (solely or in combination) is 90% for all eligible patients with HFrEF. There has been some improvement (e.g. a **10% increase for SGLT2is**), but prescribing rates individually, except for Beta Blockers, fall below the target.

For the prescribing of MRAs, there has only been a **1%** change compared to last year (2022/23) which is a cause for concern.

Only **46%** of eligible patients with HFrEF were prescribed the combination of all 4 recommended drugs.

Drug therapy for heart failure

There are several groups of drugs which have been shown to improve survival for heart failure patients where there is impairment of the pump function of the heart. Information and videos can be viewed on the British Heart Foundation and Heart Failure Matters websites:

'How do ACE inhibitors work?'

'How do Beta Blockers Work?'

Heart Failure Matters

British Heart Foundation: Medicines for heart conditions

Other useful resources for heart failure patients:

The Pumping Marvellous Foundation

Cardiomyopathy UK (for diseases of the heart muscle)

Cardiac arrhythmia (cardiac rhythm management) audit

With data from the National Audit for Cardiac Rhythm Management (NACRM) 2025 report (2023/24 data for England, Wales and Northern Ireland unless otherwise stated).

Fewer pacemaker and defibrillator procedures, but increase in pacemaker battery replacements

There were almost 82,000 cardiac implantable electronic devices (CIED) procedures reported in 2023/24. First-time pacemaker implants have dropped **8.4%** since 2015/16 (from 47,403 to 43,415), below the European average. Meanwhile, pacemaker battery replacements have increased **28%** over the last eight years (from 11,728 in 2015/16 to 15,062).

The use of complex devices continues to decline. In 2023/24, implantable cardioverter-defibrillators (ICD) procedures fell to 6,748 (**down 21% since 2015/16**), and cardiac resynchronisation therapy devices with defibrillator function (CRT-D) procedures dropped to 5,120 (**down 30%**).

Atrial ablation procedures are growing, but at very different rates around the country

Unlike device implants, ablation procedures have gradually increased as evidence of their benefits grows. The number of procedures for atrial fibrillation (AF) has more than doubled (**53%**) since 2014/15 with 10,372 procedures carried out in 2023/24. AF is a condition that affects quality of life, raises stroke risk, and worsens long-term outcomes.

77% of hospitals met the British Heart Rhythm Society's (BHRS) recommended minimum by performing over 100 ablations.

However, the rate of atrial ablation cases in some areas is **5 times higher** than in others, suggesting wide variation in referral patterns, population demographics and service capacity within hospitals.

Rise in leadless cardiac pacemakers but big variances across the country

561 leadless cardiac pacemakers (LCPs) procedures were carried out, a rise of **25%** compared to last year (2022/23). Whilst the numbers are low, the techniques for implantation are evolving, and at present, they are only available in certain UK centres. It is hoped the areas without access to leadless pacing will change with time.

Significant variance across hospitals for re-intervention rates in the first year after implantation of pacemaker devices

There is significant variance in the rates of re-intervention after complex CIED implants across hospitals. The re-intervention rate within hospitals performing more than 100 procedures ranged from **0.8% to 17%**. The national average was 5.2%.

Similarly for simple CIED implants, the reintervention rate within hospitals performing more than 200 procedures ranged from **0.4% to 10.9%** (average 4.4%).

The overall re-intervention rate (regardless of hospital activity levels) one year after the implantation of complex CIED devices continues to fall. Rates for re-intervention for CIED devices fell to **5.5%** (a 20% reduction compared to 2018/19).

Useful resources for patients with heart arrhythmia:

Arrhythmia – NHS conditions

Arrhythmia Alliance

British Heart Foundation: Implantable cardioverter defibrillators

British Heart Foundation: Abnormal Heart Rhythms

British Heart Foundation: Sudden Cardiac Arrest

British Heart Foundation: Catheter ablation

Congenital heart disease

With data from the National Congenital Heart Disease Audit (NCHDA) 2025 report (2023/24 data for England, Wales and Northern Ireland unless otherwise stated).

The number of procedures on adults and children increased, but not to pre-pandemic levels

11,757 congenital heart disease procedures were completed on adults and children in 2023/24, a **3%** increase compared to 2022/23 but still 7% fewer than before the COVID-19 pandemic (2019/20).

The number of adult procedures has risen by **13%** in 2023/24, compared to 2019/20, whereas the number of procedures on children dropped **12%** during the same period. This could be for a number of factors including a falling birth rate in the UK, change in the number of patients requiring procedures, use of different treatment strategies and developments in interventional practice for children which replaces the need for surgery.

There is an overall fall in the number of surgical procedures compared to 2019/20 (**10% less**). However, the number of surgical procedures increased by **3%** in the last year and there has been a **4%** increase in interventional (catheter-based) procedures since 2019/20.

30-day survival rate for surgery in adults and children remains high

The overall 30-day survival rate surgical operations undertaken in children under 16 years of age was **1.09%**, the lowest level seen in the last 10 years and amongst the best reported anywhere in the world.

For patients aged 16 and over with congenital heart lesions, the overall 30-day mortality rate remained low at **0.6%**.

Over half of all procedures needed within first year of life have a prenatal diagnosis

Antenatal detection for cardiac conditions that require intervention within the first year of life was achieved in **52%** of cases. Over the last 7 years, the rate of antenatal diagnosis has plateaued at just over 50%.

There is a high level of variance across the UK, with the highest rate at **67%** in East London Health and Care Partnership, compared to **15%** in Cornwall and Isles of Scilly Health and Social Care Partnership. This could be for a number of reasons including falling birth rate in the UK and regional socio-demographic differences.

It should be noted that these are not the 'true' prenatal diagnostic rates for all congenital heart disease abnormalities because not all patients require or survive to undergo a procedure.

Antenatal detection

52% of children needing a procedure before 1 year of age had their condition diagnosed antenatally in 2023/24.

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

91% of children needing a procedure before 1 year of age were diagnosed antenatally, compared to 70% in 2022/23.

Hypoplastic Left Heart Syndrome (HLHS)

86% of children needing a procedure before 1 year of age were diagnosed antenatally, compared to 96% in 2022/23.

Complete Atrioventricular Septal Defect (AVSD)

63% of children needing a procedure before 1 year of age were diagnosed antenatally, compared to 67% in 2022/23.

Tetralogy of Fallot

74% of children needing a procedure before 1 year of age were diagnosed antenatally, compared to 76% in 2022/23.

Visit the NHS website for more information on the types of congenital heart disease.

Useful resources for congenital heart disease patients:

Tiny Tickers

Children's Heart Federation

Little Hearts Matter

The Somerville Heart Foundation (adults with congenital heart problems)

Antenatal Results and Choices

Transcatheter aortic valve implantation (TAVI) Registry

With data from the Transcatheter Aortic Valve Implantation (TAVI) Registry 2025 report (2023/24 data for England, Wales and Northern Ireland unless otherwise stated).

TAVI is a procedure to treat aortic stenosis. TAVI is provided by 32 NHS and eight private hospitals in England, Wales and Northern Ireland.

Rapid growth in TAVI procedures

A total of 8,766 TAVI procedures were performed, a **13%** increase compared with 2022/23. Urgent procedures accounted for **26%** of all cases (17% increase compared to the previous year) and non-urgent cases rose by **7%**.

In the last 10 years, the number of TAVI procedures for aortic valve disease has increased by more than **5 times**. The number of patients treated by either TAVI or surgical valve replacement has nearly doubled in the same time period.

Of those TAVI procedures, **94%** were performed with conscious sedation (local anaesthetic), and technical advances now mean that **95%** of patients were treated via percutaneous femoral arterial access (in the upper thigh, near to the groin), with fewer complications.

Age of TAVI patients fell slightly and fewer women receive treatment

The average age of TAVI patients is 81, down 1 year from 2022/23 and 2 years since 2019/20.

For all TAVI patients, **fewer than half are female**. The proportion of females treated has fallen slowly to **41%** from 46% in 2013/14. This suggests there may be an under-provision of TAVI treatment to this group (though further investigation is needed to confirm this). For urgent TAVI cases, there is no significant difference in the proportions between males and females.

Wide variation in number of TAVI procedures across the country suggesting unequal access to services

The rate of TAVI cases per million population (pmp) is more than **5 times higher in some areas compared to others**. The total number of procedures varied from 65 pmp in North West London Integrated Care Board (ICB) to 329 pmp in Powys Teaching Health Board (HB). The variance is evident in both elective and urgent cases.

These differences are not likely to be fully explained by demographic and clinical differences in each population and suggest that access to treatment and referral patterns in some regions are less well developed than in others.

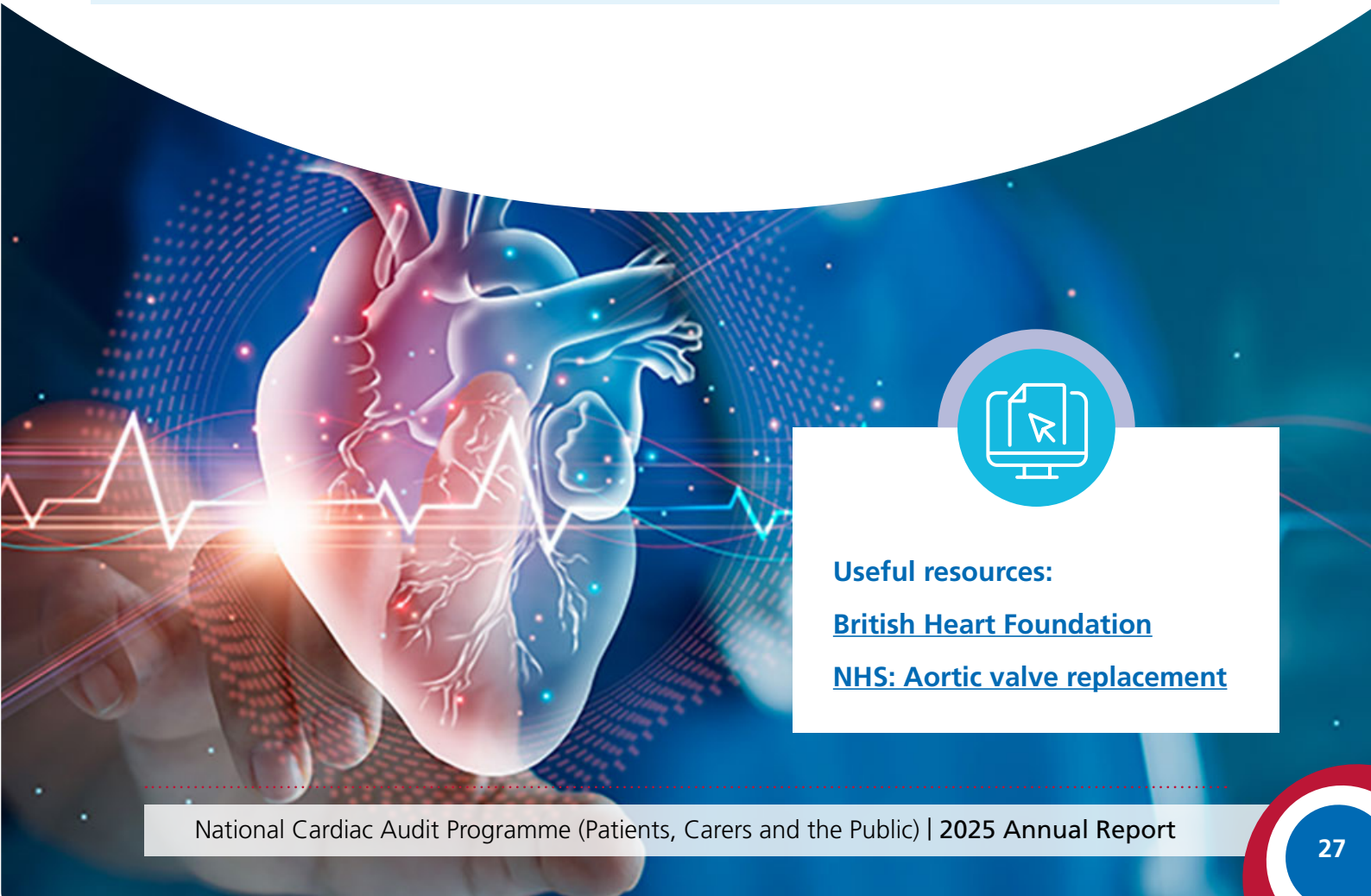
Length of stay following TAVI has reduced and low complication rates

The length of stay (LOS) for elective TAVI patients has continued to fall in recent years. The average LOS was **2 days** in 2023/24, with some patients having only 1 night in hospital.

For urgent TAVI patients, the average LOS fell by a day, from 15 days in 2022/23 to **14 days** in 2023/24. The time to discharge after their TAVI procedure remains consistent at **2 days**. Prior to the TAVI procedure there is a necessary preparation time in hospital which would not differ significantly for other treatment options.

Being less invasive than open heart surgery, TAVI procedures generally benefit from low (**1-2%**) rates of major complications.

Survival rates following TAVI procedures have continued to improve over time. In 2023/24, the 30-day mortality for elective cases was **1.3%** and **2.7%** for urgent procedures.



Useful resources:

British Heart Foundation

NHS: Aortic valve replacement

Transcatheter Mitral and Tricuspid Valve (TMTV) Registry

With data from the TMTV Registry 2025 report (2023/24 data for England) and the NACSA 2025 report.

The TMTV registry covers all transcatheter procedures in England relating to the mitral and tricuspid valve, including mitral transcatheter edge-to-edge repairs (TEER) to treat a leaking mitral valve.

TMTV procedures are provided by 21 NHS hospitals and 1 private hospital in England.

Mitral valve repairs procedures continue to fall

The number of total mitral valve surgical procedures fell by **24%** (693 fewer procedures) compared with 2019/20. This fall is not accounted for by the introduction of transcatheter techniques, which are commissioned for patients deemed too high risk for surgery.

Mitral TEER procedures (391) accounted for **74%** and tricuspid TEER procedures (46) accounted for **8.7%** of the 530 transcatheter procedures reported in 2023/24. The most common non-TEER procedure was mitral balloon valvuloplasty (26 in total). More than half of patients undergoing TMTV procedures were aged 76 years or more.

92% of procedures were elective, non-urgent procedures. All hospitals reported a small number of urgent procedures. The average length of stay (LOS) for mitral TEER procedures was **2 days**.

Variances seen across the country for access to treatment and sex

There is considerable variation between hospitals in the rate at which repairs are undertaken relative to replacements. The rate of mitral TEER cases per million population (pmp) in some areas is more than **26 times** higher than in other areas.

The total number of mitral TEER procedures carried out varied from 1 per million population (pmp) in NHS Norfolk and Waveney Integrated Care Board (ICB) to 25 pmp in NHS Buckinghamshire, Oxfordshire and Berkshire West ICB.

There is also a variance between the number of procedures completed for men and women. A higher number of male patients (**57%**) underwent a TMTV procedure than women (**43%**) in 2023/24. Because of the low number of cases reported to date, it is unknown if this variation will continue.

High survival rates and complications are rare

The overall in-hospital mortality rate following TMTV procedures is low at **1.9%** and 30-day mortality rate is **2.1%**.

Complications from TMTV procedures are rare. The most common complication after a mitral TEER procedure was pericardial effusion, occurring in **1%** of cases. Where reported, 98% of cases were free from a severe leak of the valve and nearly 75% had no or only a mild leak.

Useful resources:

NHS: Mitral valve problems

Left atrial appendage occlusion (LAAO) Registry

With data from the LAAO Registry 2025 report (2023/24 data for England).

The LAAO Registry launched in 2023 and the first phase of the programme was to ensure all hospitals are registered and submitting data on all patients who have an LAAO procedure. This registration process is ongoing and for this reason the LAAO Registry 2025 report (2023/24 data) contains limited data. As the number of cases reported increases, it will be possible to monitor the standard of care provided by the hospitals and to ensure the best possible outcomes for patients.

11 NHS hospitals are registered and 10 are now submitting data.

Complication rates are low for LAAO procedures

A low number of complications have been reported for LAAO procedures. In 2023/24, of the **126 cases** reported up to October 2024, complication rates are below **2%**.

It is a priority for all hospitals to submit their data for LAAO procedures to fully understand trends and determine where improvements can be made.

Mostly men treated for LAAO and average age is over 70 years

Up to October 2024, **80%** of patients treated with an LAAO procedure were aged 70 years or older and **75%** were male.

There are insufficient data at this stage to report if there is any inequality to access. As more data are reported, insights will be provided into these issues.

Useful resources for patients with heart arrhythmia:

Arrhythmia Alliance: Left atrial appendage occlusion

Patent Foramen Ovale Closure (PFOC) Registry

With data from the PFOC Registry 2025 report (2023/24 data for England) and the NCHDA.

The PFOC Registry launched in 2024 and 20 NHS hospitals are commissioned to perform PFOC procedures. The hospitals are being asked to register and submit data for all PFOC procedures. Whilst this process is ongoing, the PFOC Registry 2025 report has analysed data collected over the last few years through the National Congenital Heart Disease Audit (NCHDA). Trends over 3 years have been included where relevant.

19 hospitals (18 NHS and 1 private) submitted data for the audit.

Early reporting shows variances in access to treatment

Among hospitals reporting data on PFOC procedures, the rate per million population (pmp) varied significantly, with some areas delivering treatment rates over **32 times higher** than others. NHS Staffordshire and Stoke-on-Trent Integrated Care Board (ICB) reported the lowest rate at <2 ppm, while Somerset ICB had the highest at 55 ppm.

PFOC procedures were predominantly performed on patients aged 40 to 60, with **93%** of procedures carried out on individuals between 20 and 60 years old. Among those treated, women aged under 50 accounted for 55%, compared to 42% for women aged over 50. However, overall, more men (**57%**) underwent PFOC procedures than women (**42%**).

Complete capture of data on all procedures will be necessary to investigate these issues fully. Ensuring all hospitals submit data on PFOC procedures is essential to identifying potential inequities in access and determining areas for improvement.

Majority of cases are day cases and very low complications reported

The majority of PFOC procedures are performed as day cases, with some patients requiring a 1-night stay. Longer hospital stays may occur in cases with complications.

71% of procedures were completed as day cases (an improvement from 2022/23 when **63%** were day cases) and **25%** required a 1-night stay.

Complication rates following PFOC procedures were very low. The most commonly reported complication was embolisation of the catheter-introduced device, occurring in **1.4%** of cases.

Future audit data will be linked to hospital admission data to ensure complications are captured in detail and any areas for improvement are identified.

Useful resources:

NICOR: Patent Foramen Ovale Closure

Royal Brompton and Harefield hospitals – Your patent foramen ovale closure

Useful resources

NICOR A-Z Glossary

To view NICOR's A-Z Glossary, visit the website.

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 sup-port:

- NHS: Introduction to care and support
- Carers Trust

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:

- NHS talking therapies
- Samaritans
- Mind
- British Heart Foundation: Heart matters magazine – Mental Health, coping with anxiety and depression

Shared decision making

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 consider 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 wants. The decision-making process is a two-way dialogue, so it is 'shared'.

- NHS England: Shared decision making
- National Institute for Health and Care Excellence (NICE): Shared decision making

Learn CPR

St John Ambulance provides instruction on CPR on an adult and child.

Where is my nearest public defibrillator (AED)?

The Circuit is the national defibrillator network which maps defibrillators across the UK, providing NHS ambulance services with vital information so that in those crucial moments after a cardiac arrest, they can be accessed quickly to help save lives. The Circuit works in partnership with the British Heart Foundation (BHF), the Resuscitation Council UK and St John Ambulance. The Defib finder will show you defibrillators close by.

A defibrillator registered on The Circuit could make the difference between life and death. There are an estimated 100,000 defibrillators across the UK. However, tens of thousands of these are unknown to ambulance and emergency services. Once located and registered, emergency services can direct bystanders to their nearest defibrillator and increase a per-son's chance of survival.

Since the launch, The Circuit has helped map over 50,000 defibrillators in the UK. Find out more and how to register your defibrillator.

Another option is the HeartSafe website, which has a map of defibrillators in the UK.

What can I do to keep my heart healthy?

The British Health Foundation (BHF) Heart Matters magazine is a comprehensive and engaging resource for healthy lifestyle tips and personal stories about living with heart conditions. You can subscribe via the BHF website.

The NHS Live Well page offers advice about healthy living, including eating a balanced diet, healthy weight, exercise, quitting smoking and drinking less alcohol.

Guide to useful apps for managing your heart health

We live in an increasingly online world. Smartphone and other online apps can help us navigate the bewildering amount of online support and advice out there. This guide is not meant to be prescriptive; it is intended to give you ideas about how you can use free online tools to help keep your heart healthy or manage an existing condition. In addition to the free apps suggested, you may be eligible in your local area for a range of digital health monitoring pro-grammes involving home self-testing tools such as electronic blood pressure cuffs, or there are paid options for managing cardiac rehabilitation at home. Please consult your doctor be-fore starting a new exercise regime or changing your diet.

Thanks and acknowledgements

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National Institute of Cardiovascular Outcomes Research (NICOR)

NICOR is a partnership of clinicians, IT experts, statisticians, academics and managers who are responsible for the National Cardiac Audit Programme (NCAP) and several health technology registries, including the UK TAVI registry. Hosted by Arden & GEM CSU, NICOR collects, analyses and interprets vital cardiovascular data into relevant and meaningful information to promote sustainable improvements in patient well-being, safety and outcomes. NICOR is funded by NHS England and the GIG Cymru (NHS Wales).

Email: nicor.auditenquiries@nhs.net

NHS Arden and GEM

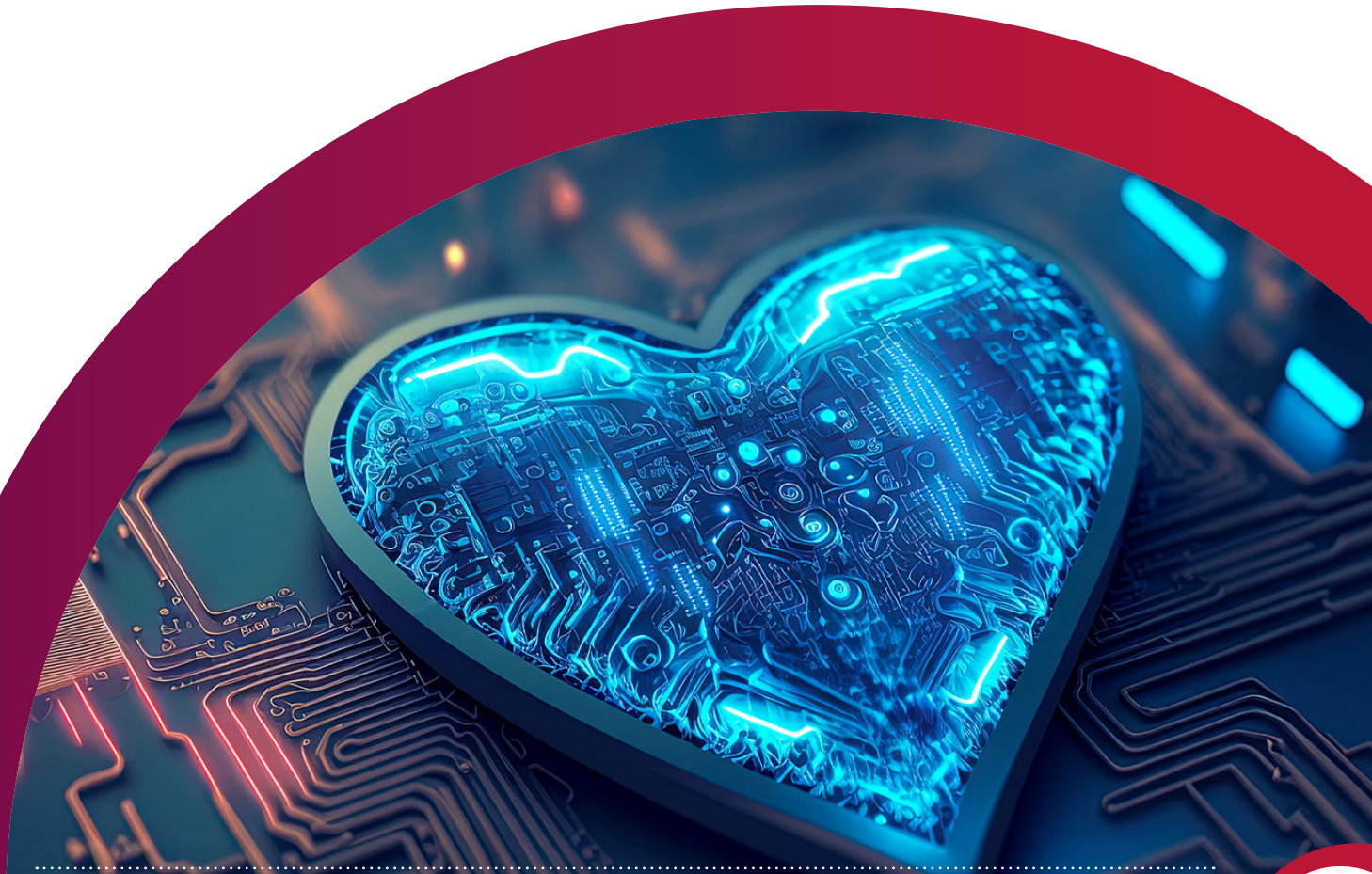
NHS Arden & GEM works across England's health and care sector to provide a range of services, including procurement and contracting, service transformation, business intelligence, business support and clinical support. Its ability to draw upon expertise from over 1000 staff working in multi-disciplinary teams enables the CSU to help healthcare commissioners and providers navigate and implement the change needed to improve patient care and outcomes. Arden & GEM's clients include more than 70 customers, including Integrated Care Boards, NHS England, Integrated Care Systems, Primary Care Networks, NHS provider trusts and local authorities.

NHS England

NHS England leads the NHS in England. NHS England provides national leadership for the NHS. NHS England is creating a new 10-Year Health Plan, to be published in spring 2025. Though the plan, we will promote high-quality health and care for all and support NHS organisations to work in partnership to deliver better outcomes for our patients and communities at the best possible value for taxpayers and to continuously improve the NHS. We are working to make the NHS an employer of excellence and to enable NHS patients to benefit from world-leading research, innovation and technology.

GIG Cymru (NHS Wales)

NHS Wales is the publicly funded National Health Service of Wales, providing healthcare to some 3 million people living there. The Welsh Government sets the Health Care strategy, and NHS in Wales delivers that strategy and services via the seven Local Health Boards, three NHS Trusts and two Special Health Authorities. The NHS has a key principle: good healthcare should be available to all.



National Cardiac
Audit Programme

NICOR

National Cardiac Audit Programme

2025 Annual Report for Patients, Carers and the Public