NHS England

SCHEDULE 2 – THE SERVICES

A. Service Specifications

Service Specification No.	A10/S/a
Service	Cardiac Surgery - Adults
Commissioner Lead	
Provider Lead	
Period	*12 Months*
Date of Review	

1. Population Needs

1.1 National/local context and evidence base

Cardiac surgery is conveniently divided into that dealing with acquired heart disease and that with congenital disease. The group of adults with congenital disease is most conveniently dealt with alongside paediatric cardiac surgery.

Acquired heart disease that may be dealt with surgically falls into different categories. The largest single group relates to ischaemic heart disease and may lead to revascularisation of the heart following problems with its blood supply associated with narrowings and/or blockages in the coronary arteries. The next most common is related to malfunction of one of the valves in the heart. These ensure that there is a one-way flow of blood through the cardiac pumping chambers. There has been growth in this area of adult heart surgery.

There is a smaller group of acquired conditions related to problems with the aorta as it leaves the heart and traverses the chest. These problems generally relate to enlargement of this vessel with the potential for rupture (or dissection) as the vessel enlarges. Finally there is an associated group of conditions such as surgery of cardiac arrhythmias and obstruction of the flow of blood through the heart due to cardiac muscle enlargement.

Overall over the last few years there has been a stabilisation in the numbers of patients being operated upon so that in 2011 the number of heart operations performed were 34760. It is likely that numbers will stabilise at this level, as there is growth in the elderly, a group that is steadily increasing. In addition there is a steady increase in the numbers of patients being operated on semi-urgently. Most units are experiencing pressures on their waiting

lists so there may be growth in the forthcoming years.

Specialist heart surgery needs to fit in better with the patient pathway so that there is better information transfer between primary, secondary and tertiary care, with, of course, direct involvement of the patient at all points.

Ischaemic Heart Disease

There is a variety of diseases that lead to abnormalities of the coronary arteries; the blood vessels that supply oxygen to heart muscles (coronary artery disease or CAD).
Revascularisation in patients with CAD can be performed surgically (Coronary Artery Bypass Grafting: 'CABG') or by percutaneous techniques (PCI).

There has been a reduction in CABG operations due to improvements in primary and secondary prevention and the emergence of PCI (17070 in 2011 and 18034 in 2010). In addition there has been a significant move from elective to urgent treatments.

Valve Heart Disease

The pattern in terms of isolated valve disease is somewhat different with a steady increase that appears to have reached a plateau. There has been a slow but steady growth in the number of patients requiring intervention for valve disease because of the changes in population demographics and because of the increasing numbers of patients with mitral regurgitation being diagnosed.

There has been a long history of surgery for abnormal heart valves.
Initially surgery started for congenital disease with surgery for rheumatic valve disease taking off simultaneously. Initially this compromised of closed mitral valvotomy which was a highly successful operation. As the post-war epidemic of rheumatic valve disease abated the incidence of degenerative aortic valve disease rose. This was seen particularly in the elderly who are particularly susceptible to this degenerative problem. As our population ages the requirements for this operation rises. This rise has been accompanied by improved prosthetic valves with increased survival of these prosthetic valves.

This has also been accompanied by improved diagnostic techniques, particularly echocardiography which is now widely available. These various factors have led to this unprecedented rise in this operation which is replacing surgery for ischaemic heart disease.

In addition there has been a slower rise in the diagnosis of patients with mitral regurgitation accompanied by improved expertise in the techniques in mitral valve repair procedures. Again improved access to echocardiography has added to this.
In the former group of patients with aortic valve disease, some of these elderly patients have important co-morbidities which contributes to their operative mortality. All patients for valve disease need careful assessment and usually need to be presented to an MDT to assess that surgery is the most appropriate treatment.

There has been the recent introduction of percutaneous transaortic valve implantation (TAVI). This is being extensively evaluated in trials involving patients turned down for

conventional aortic valve replacement. All such patient need presented to a dedicated MDT so that the most optimal therapy (including no intervention) are considered.

In 2010, 760 patients had their aortic valve disease treated by a trans-catheter approach (Transcatheter aortic valve implantation or TAVI). Many of these patients are patients who would not have been treated by open-heart surgery because of their obvious very high risk.

It is likely that mitral valve repair procedures will move into an area covered by super-specialist surgeons who dedicate a lot of their time with these patients.
There is an important subgroup of patients with valve disease who have endocarditis. They need careful management with dedicated teams including non-invasive cardiologists, microbiologists and surgeons to ensure optimum treatment. Regions should develop such teams and these teams should be available to advise others who find such patients.

Aortic Vascular Disease

There are a variety of diseases affecting the aorta. Cardiac surgeons deal with surgery of the ascending aorta, the arch of the aorta and the descending aorta in the thorax. The thoracic aorta is managed in a multidisciplinary way with involvement of stenting and vascular surgeons.

The criteria for operating on the aorta, in the elective setting, depends on size and symptoms. In the emergency setting, surgery is carried out at high risk.

The vascular surgical group will develop guidance for use in both elective and emergency settings.

This will likely involve a strong multidisciplinary meeting and might involve emergency rotas.

Surgery for Arrhythmia

There is a growing body of evidence that surgical ablation of arrthymias leads to improved outcomes for patients.

While the original operations were performed as adjuncts to valvular surgery, there is evidence that surgical treatment of some arrhythmias might hold better outcomes for patients. The Clinical Reference Group (CRG) will look into this.

The evidence base for adult cardiac surgery is well documented in recent European Guidelines for both coronary and valvular heart disease and commissioning within the UK should be based around these guidelines. The sets of guidelines are:

> European Society of Cardiology (ESC)/European Association of Cardio-thoracic Surgery (EACTS) Guidelines on myocardial revascularization
> http://eurheartj.oxfordjournals.org/content/early/2010/08/28/eurheartj.ehq277.full.pdf+html

Guidelines on the management of valvular heart disease (version 2012)

http://eurheartj.oxfordjournals.org/content/33/19/2451.full

Nice guidelines Stable angina, 2011,
http://www.nice.org.uk/nicemedia/live/13549/55657/55657.pdf

The first two documents are available from: http://eurheartj.oxfordjournals.org

Guidelines on Myocardial revascularization. *European Heart Journal*, 2010;**31**:2501-2555.

Guidelines on the management of valvular heart disease (version 2012). *European Journal of cardio-Thoracic Surgery*, 2012;**42**:S1-S44.

Further evidence can be derived from the National Institute for Cardiovascular Outcomes Research (NICOR) report on adult cardiac surgery:

http://scts.org/patients/default.aspx

http://bluebook.scts.org/

Despite a steady increase in the risk profile of the patients treated (as reflected by an increase in the mean logistic Euroscore) there has been a steady reduction in hospital mortality
The numbers per million population should be expected to be in the region of:

i) All cardiac surgery; circa 580/million

ii) Isolated CABG; circa 300/million

iii) Isolated valve surgery; 240/million

The British Heart Foundation, the British Cardiovascular Society and the Cardio and Vascular Coalition commissioned work in 2009 in relation to cardiac services in the UK which remains relevant.

www.bancc.org/.../212_C1D_Access_to_Cardiac_Care_in_the_UK_-_UK_by_Country_&_English_SHA_-_FINAL2.pdf

Guidance for Rehabilitation:

http://www.nice.org.uk/usingguidance/commissioningguides/cardiacrehabilitation/cardiacrehabilitation.jsp
http://www.cardiacrehabilitation.org.uk

2. Outcomes

2.1 NHS Outcomes Framework Domains & Indicators

Domain 1	**Preventing people from dying prematurely**	√
Domain 2	**Enhancing quality of life for people with long-term conditions**	√
Domain 3	**Helping people to recover from episodes of ill-health or following injury**	√
Domain 4	**Ensuring people have a positive experience of care**	√
Domain 5	**Treating and caring for people in safe environment and protecting them from avoidable harm**	√

All patients undergoing heart surgery will have their results entered into the National Adult Cardiac Surgery audit run through the National Institute for Cardiovascular Outcomes Research (NICOR). There is a data set which must be completed which includes demographics, clinical details and outcomes. This allows a risk prediction model to be used (modifications of Euroscore). All information being entered must be associated with an individual consultant and the information is entered against their GMC number. NICOR produce a report every year detaining the results for the procedures performed and giving unit and individual results.

Until recently it was optional whether the names surgeons results could be specified. From April 2014, under the Transparency Agenda, it will be mandatory for all results to be available on a named surgeon basis.

It is expected that the data will be used in a live way in each unit and will form the basis of real time surveillance in each unit.

All these results are openly displayed. (http://bluebook.scts.org/ or http://scts.org/patients/default.aspx) With the continued display and review of these results it is arguable that the results obtained in the United Kingdom are the best obtained in the World.

Domain 1

Many of the cardiac surgical procedures are done to prevent patients from dying prematurely. The majority of patients presenting for surgery are brought forward to reduce their symptoms or to prolong life. The evidence base for these extends back many years and is sound.

For elective patients requiring revascularisation, the evidence base was created in the 80's and has not changed over the years.

Revascularisation:

One of the hallmark studies in cardiac surgery was the coronary artery surgery study **(**CASS) study published in the late 80's. This showed that certain groups of patient had

improved survival over medical therapy. The groups that had the most to benefit were those who presented, for surgery, at the highest risk. This specification concentrates on such patients. They are those shown to have a narrowing of the left main coronary artery and/or important narrowings of the three main coronary arteries, associated with some impairment of left ventricular function. For less than three-vessel disease the next most important narrowing is in the proximal portion of the left anterior descending coronary artery. This is frequently dealt with by percutaneous techniques although an arterial graft to this artery has been shown to neutralise on-going risk and confers important prognostic benefits in terms of survival (please see multi-disciplinary team (MDT) discussion).

Such patients would normally present with angina, breathlessness with or without a previous heart attack. There would be a small number who present through screening.

Semi urgent and urgent patients: Patients with an acute coronary syndrome (ACS) are those who present with less than an overt heart attack. The presence of an ACS would normally be thought of as patients at risk of an early acute heart attack. They are normally kept in hospital and investigated. Their situation is normally discussed at a MDT to decide on the best revascularisation strategy. The indications are similar to those who present electively although many of these patients will have important comorbidity and may have a more limited revascularisation performed percutaneous.

Surgery in all of these settings prevents people from dying prematurely.

The adult cardiac surgery audit will include all such patients.

The ACS group may also be included in the myocardial ischaemia national audit project (MINAP) audit and they may also be picked up using hospital episode statistics (HES) data.

There is a CQUIN target relating to the timely transfer for the ACS group for surgery following acceptance for surgery.

Valve Heart Surgery:

In relation to valvular heart disease the prognostic indication for surgery in the setting of aortic stenosis has changed and is sound. In the setting of symptoms, the indication is based upon the degree of obstruction produced by the valve and by the amount the left ventricle has enlarged. When the valves leak the indication is based upon the symptomatic state of the patient taken together with the degree of enlargement of the relevant pumping chamber.

Whilst not all valvular heart surgery is done for prognosis, the majority is. Generally this is because if a valve is malfunctioning and is left unchecked, the heart eventually fails and this leads to early death.

Results recorded in the Adult Cardiac Surgery Audit.

Aortic vascular disease:

When the aorta enlarges it can lead to untimely death from rupture or dissection. It can also cause important compression with adverse effects. Surgery neutralises this risk of death. The evidence base for this is strong, with slightly different size criteria for surgery, depending on which portion of the aorta has enlarged.

Results recorded in the Adult Cardiac Surgery Audit.

Domain 3

As is clear, there is a cross over between Domains 1 and 3. This is most clearly seen in patients presenting with ACS. These are patients presenting with a “minor” heart attack who are at risk of an important heart attack. For all the reasons given earlier, surgery in the context of an ACS would be regarded as helping people recover from an episode of ill health.

This will be covered by the Adult Cardiac Surgery Audit.

A large number of patients present with decompensated valve heart disease. Such patients may have had a valve problem for some time and suddenly decompensate. Others might present acutely. In addition patients present with endocarditis who need surgery to help them recover from this acute illness. All would be considered as having surgery to help them recover from an episode of ill health.

Covered by the Adult Cardiac Surgery Audit.

Domain 4

Many units are working on patient reported outcome measures (PROMS) and patient reported experience measures (PREMS). There are several examples of these but nothing uniform. The CRG is developing both of these for trial. It is hoped that this will be available in 2015/16.

Domain 5

All heart surgery takes place in environments where safety is monitored by the parent Trust. There are safety initiatives such as the Safety Thermometer and the Care bundles in the Intensive Care Areas, which are equally applicable to cardiac patients as any others.

Similarly the drive to combat infection is at the forefront with our surgery.

The service is based on an accepted international and national evidence base.

The service will be sustainable, value for money and give equity of access to the service across the country.

The service will demonstrate continued high standards documented in previous reports.

The detailed specific service outcomes will be defined through and collected by the national data collection and analysis hosted by NICOR who will produce a National Report. These will include:

1. 30 day and/or in-hospital mortality,
2. Length of stay (LOS),
3. Post-operative infection rates,
4. Take back to theatre,
5. Stroke rate

6. Mortality at 1 year.

The CRG are working on a variety of additional measures distributed through the four main themes (revascularization, valve surgery, aortic vascular disease and arrhythmia), some of which may be generic and several specific. In addition with the introduction of a more comprehensive set of MDTs it is expected to have outcomes (probably process measures) related to these meetings. The CRG has been considering safety measures, which might be specific to cardiac surgery. In addition the CRG has been discussing PROMs and PREMS for future introduction.

In the future there are additional measures that the CRG would be interested in, such as mortality over one year, repeat or additional procedures within one year and a variety of measures that the Intensive `care CRG might introduce such as length of time spent in Tiers 3,2 and1, post operatively, time to extubation and reintubation rates.

3. Scope

3.1 Aims and objectives of service

Aims

The aim of the service is to ensure the whole population has equitable access to adult cardiac surgical services.

Objectives

The service will continue to deliver the high quality cardiac surgical service provided in the UK.

It is expected that this service is delivered in an equitable manner to all those living in England. It encompasses an elective service and a semi urgent/urgent service.
In relation to the former it is expected all cardiothoracic units to have well defined patient pathways which allow all patients presenting with cardiac disease, amenable to surgery, to have their condition investigated locally, have any invasive tests performed in a safe environment and to have a timely referral made to the relevant surgical unit. All such patients should be "processed" in an equitable manner so that there is no difference in the time it takes for a patient to have their procedure depending on where they start their journey. We would expect that all units have arrangements for elective patients to be discussed at a multidisciplinary meeting (MDT). There should be network wide agreement as to which patients are discussed (including patients who are going straight for angioplasty) and audits performed to assess if such agreements are working or if they need refashioning. It is expected that units will work with other colleagues in primary and secondary care so that there are consistent standards for diagnosing heart valve disease across the country.

In the surgical units there should be processes so that there is no imbalance in the waiting depending on the surgeon involved or the procedure to be performed.

All patients should be seen by a consultant or surgeon with CCT and their procedure discussed and consent taken. The guidelines that exist for the taking of consent should be followed so that, irrespective of which clinician the patient meets, all interventional options and conservative ones are discussed and the patients and their families helped make the right decision suitable for them.

Patients presenting urgently are investigated locally depending on their presenting condition and transferred to their local cardiothoracic surgical centre without delay. This will vary depending on the particular condition:

- Acute ischaemia with decompensation will normally be dealt with by the tertiary cardiology team who may place an intra-aortic balloon pump (IABP) and perform percutaneous revascularisation. Occasionally such a patient may require urgent surgery (such as those with a rupture of the intraventricular septum as a consequence of a myocardial infarction).
- For patients with acute aortic dissection the diagnosis is frequently made by CT scan where ever the patient presents and the patient transferred, directly, urgently, for surgery.
- With acute cardiac decompensation due to valve disease, patients are generally seen by a cardiologist, locally, and may be transferred to the tertiary cardiology team or directly for surgery.

Local arrangements will usually exist for such patients. The principal will always be that such patients should experience no delay in their transfer depending on bed, ITU, surgeon or anaesthetic availability. All units providing cardiac surgery would have a surgeon available to perform surgery or offer telephone advice 24 hours a day. We would expect that all units providing NHS cardiac surgery would have written, working, audited arrangements to ensure that this is the case.

There is a larger group of patients who need semi urgent surgery. Such patients commonly present with a non-ST elevation myocardial infarction (NSTEMI) but can present with valve decompensation, valve endocarditis or a critical anatomical narrowing of a coronary artery. There should be systems in place in all units so that there is cover available at all times. There needs to be pathways of care to allow the safe and quick processing of such patients, again, so that irrespective of where a patients presents, they will be transferred in, and have surgery within an agreed time frame. Commonly such patients will be discussed in a MDT so that the best modality of treatment is arrived at. Such MDTs such be organised so that the movement of the patient to definitive treatment is not delayed and so that there is an opportunity for the patient and their relative to have a say in the choice of therapy.

Semi-urgent patients, when accepted for surgery, should be seen by a surgeon with a CCT in cardiac surgery, and be consented for such surgery. There should be agreed network wide protocols for the safe management of their ongoing ischaemia so that antiplatelet drugs and other evidenced based therapies are continued to reduce risk to as low as possible while preparing for surgery. Variance in such protocols should be avoided and audit performed to ensure that this is the case. Such patients should be scheduled on the next list and not have to wait for any particular surgeons' availability depending on any geographical peculiarities related to elective referral patterns.

There is a CQUIN related specifying the time from acceptance onto a surgical list, to surgery. This has not really given improvement and we would proposed that a better CQUIN would be the time from diagnostic angiography (in the case of ischaemia) to surgery. In the case of patients with semi-urgent valve disease this would be the time from a cardiologist informing a surgeon of the need for surgery to surgery.

In the next year it is not anticipated that there will be major changes but looking forward would see many benefits in sub-dividing this specification into 4 divisions (revascularisation, valve disease, aortic vascular disease and surgery for arrhythmias). This will replicate what is already happening in cardiothoracic units with the development of more specialist surgeons.

It is the intention that there will always be a core set of procedures that all surgeons in the adult arena will perform. These would be those that a surgeon “on-call” would expect to encounter and deal with. These would encompass urgent coronary artery bypass grafting and surgery for acute valvular decompensation. It becomes more difficult when one included acute aortic dissection. The majority of such cases are dealt with by the “on-call” surgeon. It will be part of the remit of the Aortic Vascular Group to advise on how this area of acute surgery should be taken forward.

It is anticipated that there should be networks of surgeons crossing traditional geographical boundaries so that patients presenting with difficult or unusual problems could be discussed and, if need be, moved to a unit or surgeon with a particular expertise. There should also be systems of joint working so that surgeons might travel to work with others in their base hospital to ensure that expertise disseminates out and all learn from one surgeons particular experience.

3.2 Service description/care pathway

All adult cardiac surgical units are appropriately configured to continue providing this service. The aforementioned National Institute for Care Excellence (NICE) and European guidelines for both coronary and valvular heart disease provide the basis for the care pathways that should be delivered by every cardiac centre. These standards will apply also to any patients subcontracted to the independent sector and the governance will remain with the referring Trust.

There are many advantages in discussing many patients presenting for heart surgery at multidisciplinary meetings. It is anticipated that the four divisions specified above would have their individual meetings. This is particularly important in the decision making when dealing with patients presenting with ischaemic heart disease. In this way the three strategies, medical therapy, angioplasty and surgery, can be discussed. When setting up these meetings it is the anticipation that the lessons learned from adopting the same approach for cancer are adopted. There should be all the members of the team as are necessary, there should be minutes, junior doctors and nurses should be active participants, the meetings should be audited and there should be systems so that patients and families understand the process and outcomes are conveyed to them in a timely manner.

There should be regular meeting whereby all cases that have not gone well, including those who have died, are discussed and reflected upon. These morbidity and mortality

meetings should be formal with registers and minutes, and most importantly, action plans for improvement.

All patients should be offered cardiac rehabilitation. Phase 1 rehabilitation will be carried out during the inpatient stay. This will be undertaken by the High Dependency Unit (HDU) ward nurse/cardiac rehab nurse.

Upon discharge patients will be referred to the local district general hospital or general practitioner, as appropriate, for medical review **and** to the local cardiac rehabilitation service for cardiac rehabilitation unless this is to take place in the base hospital when a similar referral will be made.

All patients will have a clear follow-up plan at the time of discharge along with a discharge summary and plan to be given to the patient and the GP.

All patients to be discharged on the full battery of evidenced based medicines.

3.3 Population covered.

The service outlined in the specification is for patients ordinarily resident in England*; or otherwise the commissioning responsibility of the NHS in England (as defined in *Who Pays?: Establishing the responsible commissioner* and other Department of Health guidance relating to patients entitled to NHS care or exempt from charges).

*Note for the purposes of commissioning health services, this EXCLUDES patients who, whilst resident in England, are registered with a GP practice in Wales or Scotland, but INCLUDES patients resident in Wales or Scotland who are registered with a GP practice in England.

It is expected that the entire population of England would access cardiac surgical services in similar ways irrespective of geography, gender and race. Some units have developed common waiting lists, particularly for CABG operations. Many units run such a system for semi urgent patients. To run such systems surgeons need to have agreed criteria to allow this to run smoothly.

3.4 Any acceptance and exclusion criteria and thresholds

This specification covers ALL adult cardiac surgery BUT does not include surgery for the following groups of patients who might require cardiac surgery:

i) Transplantation with or without Ventricular Assisted Device implantation
ii) Surgery for congenital cardiac problems
iii) Non vascular thoracic surgery

3.5 Interdependencies with other services/providers

All heart surgery is undertaken in fully equipped and staffed operating theatres by specialist cardiac anaesthetists with immediate availability of transoesophageal echocardiography. Patients who have undergone such surgery are returned to an area capable of managing such patients including those who do not follow a straightforward path and might necessitate prolonged ventilation and inotropic support, an intra aortic balloon pump, haemofiltration and

access to many additional specialists who will be available to attend at short notice. This should be available without a transfer of hospital.

Such a service will be delivered in a dedicated area with core staff dedicated to the delivery of postoperative care of patients recovering from open-heart surgery. Such staff would be fully trained in the post operative care of surgical patients, including their resuscitation. Similarly there should be dedicated intensivists who have experience and training in the management of the ill postoperative patient following open-heart surgery.

All cardiac surgical units must have detailed and robust working relationships with all other major branches of acute medicine and surgery, in particular; complex interventional cardiology, vascular services, renal, gastroenterological, general and plastic surgical, neurology and intensive care programmes. In addition, there must be close links with physiotherapy and rehabilitation services.

4. Applicable Service Standards

4.1 Applicable national standards e.g. NICE

All units must submit data pertaining to heart surgery to the NICOR national audit into postoperative death. The date must be of satisfactory quality (i.e. 100% completion of age, gender, responsible consultant, operation type, discharge status and >97% completion of other risk fields, and >95% completion of non-mortality outcomes). The submission must contain all patients operated on. It is expected that such audits will be "live" audits in departments so that the data is used real time to improve outcomes for patients.

There needs to be a dedicated perfusion service, which is fully compliant with Department of Health guidance "A guide to good practice in clinical perfusion"[1]. Monitoring during surgery needs to be compliant with the Surgical/Anaesthetic recommendations "Recommendations of standards for monitoring during cardiopulmonary bypass"[2], and that there be near patient testing available to both the theatres and recovery area.

To perform in accordance with the European Society of Cardiology/European Association of Cardio-Thoracic Surgery (ESC/EACTS) guidelines on both coronary and valvular heart disease.

4.2 Applicable standards set out in Guidance and/or issued by a competent body (e.g. Royal Colleges)

Royal College of Anaesthetists: Guidelines for the provision of anaesthetic services 2014

http://www.rcoa.ac.uk/GPAS2014

http://www.rcoa.ac.uk/document-store/guidance-the-provision-of-cardiac-and-thoracic-

[1] http://www.acta.org.uk/store/docs/guidelines/DH-Guide-to-good-practice-199-30-07-2009.pdf
[2] http://www.acta.org.uk/store/docs/publications/CPBRecommendations2007-298972-31-08-2011.pdf

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Intensive Care Society/Faculty of Intensive Care Medicine: Core Standards for Intensive Care Units (2013)
http://www.ficm.ac.uk/sites/default/files/Core%20Standards%20for%20ICUs%20Ed.1%20%282013%29.pdf

5. Applicable quality requirements and CQUIN goals

5.1 Applicable quality requirements (See Schedule 4 Parts A-D)

5.2 Applicable CQUIN goals (See Schedule 4 Part E)

6. Location of Provider Premises
The Provider's Premises are located at:

All current active adult cardiac surgical centres

The Provider's Premises are located at:

Appendix One

Quality standards specific to the service using the following template:

Quality Requirement	Threshold	Method of Measurement	Consequence of breach
Domain 1: Preventing people dying prematurely			
Optimal quality of life and survival for patients post surgery 1. In base hospital mortality for CABG (first time) and Cardiac Surgery (All) as specified by the Society of Cardiothoracic Surgeons NICOR audit 2. Post operative deep sternal infection rates, 3. Take back to theatre for bleeding/tamponade, 4. In first time CABG operations the rate of use of the internal mammary artery. 5. Mortality at 1 year.	Risk adjusted threshold: 1. First time CABG and Cardiac Surgery (All), mortality to be within 99% confidence limit as predicted by Logistic Euroscore. 2. Less than 2.5% 3. Less than 5% 4. Greater than 90% 5. 1st time CABG, survival greater than 85%; First time AVR, greater than 85%	Figures from the annual NICOR audit together with ONS data for 5.	As per Standard NHS Contract General Conditions Clause 9 (GC9) Remedial Action Plan
Domain 2: Enhancing the quality of life of people with long-term conditions			
All patients with prostheses (valves and rings) have these	95% completion of relevant fields	Completion of the data fields relating to	As per Standard NHS Contract General

Quality Requirement	Threshold	Method of Measurement	Consequence of breach
recorded in NICOR data set to enable the late surveillance of such implants		prosthetic implants in NICOR. Annual audit.	Conditions Clause 9 (GC9) Remedial Action Plan
Domain 3: Helping people to recover from episodes of ill-health or following injury			
Patients needing semi urgent Cardiac Surgery* to have the procedure within 7 days of acceptance to treat by cardiac surgeon.	20% reduction in patients waiting from baseline	Quarterly reports to commissioner	As per Standard NHS Contract General Conditions Clause 9 (GC9) Remedial Action Plan
Domain 4: Ensuring that people have a positive experience of care			
Each provider will undertake a patient satisfaction questionnaire and report results to commissioners.	75%	Patient satisfaction questionnaire.	As per Standard NHS Contract General Conditions Clause 9 (GC9) Remedial Action Plan
Domain 5: Treating and caring for people in a safe environment and protecting them from avoidable harm			
Provider to learn from and improve performance related to Never Events SUIs, Safety Thermometer and critical care bundles.	Never Events. None tolerated. Benchmark and review of all in quality surveillance meetings.	Reporting through NRLS. Annual audit done by Trusts	As per Standard NHS Contract General Conditions Clause 9 (GC9) Remedial Action Plan