EACTS Adult Cardiac Database

Quality Improvement Programme

Database Dictionary

Version 2.0, 13 Dec 2018

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Importance of data

Variables were classified in three categories, according to their importance:

1. **Mandatory**: a limited number of information, which all centres must provide to join and remain in the ACD.

2. **Essential**: very important data, for whom a minimum percentage of completeness is required, leaving to participants' discretion the choice to omit some.

3. **Optional**: mostly new variables, which we strongly encourage centres to provide, but without any formal restrictions.

Patient demographics and other identifiers

Import Link ID

Mandatory **String:** can contain any value as long as it is unique to each patient admission.

This should be unique to each admission to hospital. If the same patient is admitted to hospital multiple times, each admission should have a different ImportLinkID.

If data is recorded in separate tables (e.g. pre op, post op, valve etc.), then a matching ImportLinkID should be recorded in all the tables so the data can be linked.

Patient identifier

Mandatory **String:** can contain any value as long as it is unique to the patient.

This should be a pseudonymised ID which is unique to each patient. If the same patient is admitted to hospital multiple times, each admission should have the same Patient Identifier. The Patient Identifier will be used to identify the patient in future if they return to hospital.

Note: Please do not submit patient names or any other items that would identify the patient.

Age at operation

Mandatory **Integer:** enter a whole number.

Indicate the patient's age in years at the time of surgery. Valid range: 18-110.

Gender

Mandatory **SingleChoice**: the code only.

1 - Male

2 - Female

Country code

Mandatory **TableSingleChoice:** see table **CTY** in the File Specification document.

Hospital code

Mandatory **TableSingleChoice:** see table **HSP** in the File Specification document.

Hospitalisation

Date of admission

Optional **Date:** ODBC date with format yyyy-mm-dd.

Valid date after 2009-01-01 and <= Date of data submission and <=Date of surgery.

Date of surgery

Mandatory **Date:** ODBC date with format yyyy-mm-dd.

Indicate the date of index cardiac surgical procedure which is defined as the initial major cardiac surgical procedure of the hospitalisation.

Valid date after 2010-01-01 and <= Date of data submission.

Date of discharge / death

Mandatory **Date:** ODBC date with format yyyy-mm-dd.

Indicate the date of discharge from the Cardio-Thoracic Department where surgery was performed.

If possible, please specify the discharge destination in the appropriate field.

Valid date <= Date of data submission and >=Date of surgery.

Cardiac History

Angina

Essential **SingleChoice:** the code only.

0 - unspecified
1 - CCS 0
2 - CCS 1
3 - CCS 2
4 - CCS 3
5 - CCS 4

Definition

CCS 0	No angina.
CCS 1	Angina only during strenuous or prolonged physical activity.
CCS 2	Slight limitation, with angina only during vigorous physical activity.
CCS 3	Symptoms with everyday living activities, i.e., moderate limitation.
CCS 4	Inability to perform any activity without angina or angina at rest, i.e., severe limitation.

Dyspnoea

Essential **SingleChoice:** the code only.

Indicate the patient's highest New York Heart Association (NYHA) classification within 2 weeks prior to surgery. NYHA classification represents the overall functional status of the patient in relationship to both heart failure and angina. Choose one of the following:

1 - NYHA 1
2 - NYHA 2
3 - NYHA 3
4 - NYHA 4

Definition

NYHA 1	Patient has cardiac disease but without resulting limitations of ordinary physical activity. Ordinary physical activity (e.g., walking several blocks or climbing stairs) does not cause undue fatigue, palpitation, dyspnoea, or anginal pain). Limiting symptoms may occur with marked exertion.
NYHA 2	Patient has cardiac disease resulting in slight limitation of ordinary physical activity. Patient is comfortable at rest. Ordinary physical activity such as walking more than two blocks or climbing more than one flight of stairs results in limiting symptoms (e.g., fatigue, palpitation, dyspnoea, or anginal pain).
NYHA 3	Patient has cardiac disease resulting in marked limitation of physical activity. Patient is comfortable at rest. Less than ordinary physical activity (e.g., walking one to two level blocks or climbing one flight of stairs) causes fatigue, palpitation, dyspnoea, or anginal pain.
NYHA 4	Patient has dyspnoea at rest that increases with any physical activity. Patient has cardiac disease resulting in inability to perform any physical activity without discomfort. Symptoms may be present even at rest. If any physical activity is undertaken, discomfort is increased.

Symptomatic status at time of surgery

Optional **SingleChoice:** the code only.

0 - No symptoms or angina
1 - Symptoms unlikely to be ischaemia
2 - Stable angina
3 - Unstable angina
4 - Non-ST elevation MI
5 - ST elevation MI

Definition

Symptoms unlikely …	Pain, pressure or discomfort in the chest, neck or arms not clearly exertional or not otherwise consistent with pain or discomfort of myocardial ischaemic origin. This includes patients with non-cardiac pain (e.g., pulmonary embolism, musculoskeletal, or oesophageal discomfort), or cardiac pain not caused by myocardial ischaemia (e.g., acute pericarditis).
Stable angina	Angina without a change in frequency or pattern for the six weeks prior to this surgical intervention. Angina is controlled by rest and / or oral or transcutaneous medications.
Unstable angina	there are three principal presentations of unstable angina: **i.** rest angina, **ii.** new-onset (less than 2 months) angina, and, **iii.** increasing angina (in intensity, duration and / or frequency).
Non-ST elevation MI	The patient was hospitalized for a non-ST elevation myocardial infarction as documented in the medical record. Non-STEMIs are characterized by the presence of both criteria: **i.** cardiac biomarkers (creatinine kinase-myocardial band, Troponin T or I, and / or myoglobin) exceed the upper limit of normal according to the individual hospital's laboratory parameters with a clinical presentation which is consistent or suggestive of ischaemia. ECG changes and / or ischaemic symptoms may or may not be present. **ii.** ii absence of ECG changes diagnostic of a STEMI (see STEMI).
ST elevation MI	The patient presented with a ST elevation myocardial infarction as documented in the medical record. STEMIs are characterized by the presence of both criteria: **i.** ECG evidence of STEMI: New or presumed new ST-segment elevation or new left bundle branch block not documented to be resolved within 20 minutes. ST-segment elevation is defined by new or presumed new sustained ST-segment elevation (0.1 mV in magnitude) in two or more contiguous electrocardiogram (ECG) leads. If no exact ST-elevation measurement is recorded in the medical chart, physician's written documentation of ST elevation is acceptable. If only one ECG is performed, then the assumption that the ST elevation persisted at least the required 20 minutes is acceptable. Left bundle branch block (LBBB) refers to LBBB that was not known to be old on the initial ECG. For purposes of the Registry, ST elevation in the posterior chest leads (V7 through V9), or ST depression in V1 and V2 demonstrating posterior myocardial infarction is considered a STEMI equivalent and qualifies the patient for re-perfusion therapy. **ii.** ii cardiac biomarkers (creatinine kinase-myocardial band, Troponin T or I, and / or myoglobin) exceed the upper limit of normal according to the individual hospital's laboratory parameters a clinical presentation which is consistent or suggestive of ischaemia which is consistent or suggestive of ischaemia.

Time of most recent MI

Essential **SingleChoice**: the code only.

0 - No previous MI
1 - MI <6 hours before operation
2 - MI 6-24 hours before operations
3 - MI 1-7 days before operation
4 - MI 8-30 days before operation
5 - MI 31-90 days before operation
6 - MI >90 days before operation
7 - unspecified <90 days before operation

MI = myocardial infarction

Type of most recent MI

Optional **SingleChoice:** the code only.

1 - STEMI
2 - Non-STEMI

Heart failure within 2 weeks

Optional **SingleChoice:** the code only.

0 - No
1 - Yes

Definition

Congestive heart failure is when there has been documentation in the clinical notes that the patient has been in heart failure in the 2 weeks prior to surgery.

Previous interventions

Previous PCI

Optional **SingleChoice:** the code only.

0 - No previous PCI
1 - PCI <24 hours before surgery
2 - PCI >24 hours before surgery; same admission
3 - PCI >24 hours before surgery; previous admission

Definition

Percutaneous coronary intervention (PCI) is defined as any non-surgical procedure using a catheter to access coronaries via a peripheral artery, to treat a stenosis either with balloon angioplasty and/or deployment of a stent.

Previous cardiac surgery

Essential **MultiChoice:** the code(s) only.

0 - No
1 - Previous CABG
2 - Previous valve
3 - Previous other/unspecified

Definition

Previous cardiac surgery requiring opening of the pericardium.

Number of previous heart operations

Optional **SingleChoice:** the code only.

0 - None
1 - One
2 - Two
3 - Three
4 - Four
5 - Five

Definition

Only count procedures involving opening of the pericardium.

Date of last cardiac surgery

Optional **Date:** ODBC date with format yyyy-mm-dd.

Valid date after 1955-01-01 and <= today and <=Date of surgery.

Pre-operative risk factors

Weight

Essential **Floating point:** enter a numeric value.

Indicate the weight of the patient in kilograms closest to the date of procedure. Valid range: 25-250

Height

Essential **Integer:** enter a whole number.

Indicate the height of the patient in centimetres. Valid range: 107-250

BMI

Optional **Auto calculated**

Body mass index in kg/m^2. Auto calculated using the formula: weight (kg)/height $(m)^2$. Valid range: 10-60.

Smoking history

Essential **SingleChoice:** the code only.

0 - Never smoked
1 - Ex-smoker
2 - Current smoker

Definition	
Never smoked	The patient has never smoked cigarettes.
Ex-smoker	The patient has stopped to smoke > 1 month before the procedure.
Current smoker	The patient regularly smokes one or more cigarette per day.

Diabetes treatment

Essential **MultiChoice:** the code(s) only.

Indicate the patient's diabetes control method as presented on admission. Patients placed on a pre procedure diabetic pathway of insulin drip at admission but whose diabetes was controlled by diet or oral methods are not coded as being treated with insulin. Choose the most aggressive therapy.

0 - None
1 - Diet
2 - Oral
3 - Insulin
4 - Subcutaneous (non-insulin)

Hypertension

Essential **SingleChoice:** the code only.

Indicate if the patient has a history of hypertension that was diagnosed and/or treated by a physician.

0 - No hypertension

1 - Hypertension

9 - Not known

Definition

Indicate whether the patient has a diagnosis of hypertension, documented by one of the following:

a. Documented history of hypertension diagnosed and treated with medication, diet and / or exercise;
b. Prior documentation of blood pressure >140 mmHg systolic or 90 mm Hg diastolic for patients without diabetes or chronic kidney disease, or prior documentation of blood pressure >130 mmHg systolic or 80 mmHg diastolic on at least 2 occasions for patients with diabetes or chronic kidney disease;
c. Currently on pharmacologic therapy to control hypertension.

Hypercholesterolaemia

Optional **SingleChoice:** the code only.

Indicate if the patient has a history of dyslipidaemia that was diagnosed and/or treated by a physician.

0 - No

1 - Yes

9 - Not measured / unknown

Definition

Hypercholesterolemia is defined as elevation of serum cholesterol requiring dietary or drug treatment.

Dialysis/CVVH

Essential **SingleChoice:** the code only.

Includes any form of peritoneal or haemodialysis the patient is receiving prior to surgery. Also, may include Continuous Veno-Venous Hemofiltration (CVVH, CVVH-D), and Continuous Renal Replacement Therapy (CRRT) as dialysis.

0 - No dialysis

1 - Dialysis for acute renal failure

2 - Dialysis for chronic renal failure

3 - Dialysis - unspecified

Definition

Renal failure is defined as an impairment of kidney function as evidenced by increased creatinine level or renal intervention therapy.

ACUTE: started during same admission

CHRONIC: already on dialysis before admission

Last pre-operative creatinine

Essential **Integer:** Enter a whole number.

Indicate the creatinine level in µmol l-1 closest to the date and time prior surgery. Valid range: 1-999

GFR

Optional **Auto calculated**

Glomerular filtration rate. Auto calculated using the formula:

Creatinine clearance (ml/min) = (140-age (years) x weight (kg) x (0.85 if female) / [72 x serum creatinine (mg/dl)]. Valid range: 0-200.

Chronic lung disease

Essential **SingleChoice:** the code only.

0 - No
1 - COPD / emphysema / ashthma

Definition

COPD / emphysema / asthma is when the patient requires medication (inhalers, aminophylline or steroids) for chronic pulmonary disease, has an FEV1 less than 75% predicted value; venous pO2 <60 mmHg, pCO2 >50 mmHg, or has intermittent or allergic reversible airways disease treated with bronchodilators or steroids.

Degree of COPD

Optional **SingleChoice:** the code only.

Indicate whether the patient has chronic lung disease.

1 - Mild
2 - Moderate
3 - Severe

Definition

Mild	FEV1 60% to 75% of predicted, and/or on chronic inhaled or oral bronchodilator therapy
Moderate	FEV1 50% to 59% of predicted, and/or on chronic oral/systemic steroid therapy aimed at lung disease
Severe	FEV1 < 50% and/or Room Air pO2 < 60 or pCO2 > 50

Extra-cardiac arteriopathy

Essential **MultiChoice:** the code(s) only.

0 - No
1 - Peripheral vascular disease
2 - Cerebro-vascular disease
3 - Yes (type unknown/not coded)

Definition

Peripheral vascular disease	Claudication, >50% stenosis/previous or planned intervention on the abdominal aorta, limb arteries, amputation for arterial disease. PVD excludes disease of thoracic aorta.
Cerebro-vascular disease	>50% stenosis of major extracranial or intracranial vessels of the brain, previous or planned intervention on the carotids, previous cervical or cerebral artery revascularisation surgery or percutaneous intervention.

Cerebrovascular events

Optional **MultiChoice:** the code(s) only.

Indicate whether the patient has a history of cerebrovascular event, defined as an acute episode of a focal or global neurological deficit with at least one of the following:

- Change in the level of consciousness,
- Hemiplegia, hemiparesis, numbness, or sensory loss affecting one side of the body,
- Dysphasia or aphasia, hemianopia, amaurosis fugax, or other neurological signs or symptoms consistent with stroke.

0 - None
1 - Stroke
2 - Transient Ischemic Attack (TIA)

Definition

Stroke	duration of a focal or global neurological deficit ≥24 h; OR <24 h if available neuroimaging documents a new haemorrhage or infarct; OR the neurological deficit results in death.
TIA	duration of a focal or global neurological deficit <24 h, any variable neuroimaging does not demonstrate a new haemorrhage or infarct.

Poor mobility

Essential **MultiChoice:** the code(s) only.

0 - No
1 - Yes

Definition

Poor mobility is defined as a severe impairment of mobility secondary to musculoskeletal or neurological dysfunction.

Heart rhythm at admission

Optional **SingleChoice:** the code only.

Please record any abnormal rhythm present at the date of admission.

0 - Sinus rhythm
1- Atrial fibrillation
2 - Atrial flutter
3 - Other

Definition

Atrial fibrillation / flutter	Requiring therapy.
Other	Any abnormal rhythm that does not conform to the definitions of Atrial fibrillation / flutter. Includes Pacemaker-induced rhythm.

Pre-operative Pacemaker

Optional **SingleChoice:** the code only.

Only include permanent pacemaker.

0 - No
1 - Pacemaker
2 - Implantable cardioverter-defibrillator (ICD)
3 - Cardiac Resynchronization Therapy Pacemaker/Defibrillator (CRT-P/D)

History of Atrial Fibrillation

Optional **SingleChoice:** the code only.

0 - No
1 - Paroxysmal
2 - Non-paroxysmal
3 - Unknown

Definition

Paroxysmal	AF that terminates spontaneously or with intervention within 7 days of onset.
Non-paroxysmal	Indicates AF permanent or cardioverted (after more than 7 days of onset). Permane AF is when the patient and clinician make a joint decision to stop further attempts to restore and/or maintain sinus rhythm.

Critical pre-operative state

Essential **MultiChoice:** the code(s) only.

Indicate the clinical preoperative status at the time of procedure.

0 - No.
1 - Ventricular Tachycardia/Ventricular Fibrillation.
2 - Cardiac massage.
3 - Pre-operative invasive ventilation.
4 - Pre-operative Inotropes / IntraAortic Balloon Pump / Mechanical Circulatory Support.
5 - Oliguria/Anuria (except chronic dyalisis).

Pre-operative haemodynamics and catheterisation

Left main stem disease

Essential **SingleChoice:** the code only.

0 - No LMS disease / LMS disease <50% diameter stenosis
1 - LMS disease >50% diameter stenosis
9 - Not investigated

Coronary artery disease - LAD

Optional **SingleChoice:** the code only.

0 - No or system with <50% narrowing pre-operatively
1 - System with >=50% narrowing pre-operatively

Coronary artery disease - Circumflex

Optional **SingleChoice:** the code only.

0 - No or system with <50% narrowing pre-operatively
1 - System with >=50% narrowing pre-operatively

Coronary artery disease - Right

Optional **SingleChoice:** the code only.

0 - No or system with <50% narrowing pre-operatively
1 - System with >=50% narrowing pre-operatively

Endocarditis

Essential **SingleChoice:** the code only.

Indicate the type of endocarditis the patient has. If the patient is currently being treated for endocarditis, the disease is considered active. If no antibiotic medication (other than prophylactic medication) is being given at the time of surgery and the cultures are negative, then the infection is considered treated.

0 - None
1 - Active
2 - Previous

Definition

Active	Patient still on antibiotic treatment for endocarditis at time of surgery.
Previous	No antibiotic medication at time of surgery (other than prophylactic medication).

Ejection fraction category

Essential **SingleChoice:** the code only.

1 - Good (> 49%)
2 - Fair (30-49%)
3 - Poor (20-29%)
4 - Very Poor (< 20%)
9 - Not investigated

Left ventricular ejection fraction by category.

Ejection fraction value

Optional **Integer:** enter a whole number.

Units in %. Valid range: 1-90.

PA systolic category

Essential **SingleChoice:** the code only.

1 – Normal (<31 mmHg)
2 – Moderate hypertension (31-55 mmHg)
3 – Severe hypertension (>55 mmHg)

Pulmonary artery systolic pressure by category.

PA systolic value

Optional **Integer:** enter a whole number.

Pulmonary artery systolic pressure in mmHg. Valid range: 1-150.

RV dysfunction

Optional **SingleChoice:** the code only.

0 - No
1 - Yes

Definition

Indicate right ventricular failure as defined by echocardiogram findings or mentioned in echo report.

Echocardiographic Parameters of RV function

Parameter	View		Abnormal value
	TEE	TTE	
RV:LV area ratio	ME four chamber	Apical four chamber	> 0.6
LV eccentricity index	TG midpapillary short axis	Parasternal midpapillary short axis	> 1
RVFAC	ME four chamber	Apical four chamber	< 35%
TAPSE	Deep TG RV	Apical four chamber	< 1.6 cm
Peak velocity of systolic exursion at the annulus	Deep TG RV	Apical four chamber	< 10 cm/s
Pulmonary artery flow acceleration time	Ascending aortic short-axis	Parasternal RV outflow	< 100 ms

ME - midesophageal; RVFAC = right ventricular fractional area change; TAPSE = tricuspid annular plane systolic exursion; TEE = transesophageal echocardiography; TG = transgrastic; TTE = transthoracic echocardiography

Pre-operative status and support

IV nitrates

Essential **SingleChoice:** the code only.

0 - No

1 - Yes

IV = intravenous.

IV inotropes

Essential **SingleChoice:** the code only.

0 - No

1 - Yes

Ventilated

Essential **SingleChoice:** the code only.

Indicate whether the patient was on invasive ventilation either with endo-tracheal tube or tracheostomy prior to arriving to the operating room.

0 - No

1 - Yes

Cardiogenic shock

Essential **SingleChoice:** the code only.

0 - No

1 - Yes

Definition

Indicate whether the patient was, at the time of procedure, in a clinical state of hypo perfusion sustained for greater than 30 minutes, according to either of the following criteria:

a. Systolic BP < 80 and / or Cardiac Index < 1.8 despite maximal treatment;
b. IV inotropes and / or IABP necessary to maintain Systolic BP > 80 and / or CI > 1.8.

Immunosuppressive therapy within 30 days of operation

Optional **SingleChoice:** the code only.

This includes but is not limited to systemic steroid therapy, anti-rejection medications and chemotherapy.

0 - No

1 - Yes

Resuscitation / cardiac massage within 1 hour of operation

Essential **SingleChoice:** the code only.

0 - No

1 - Yes

Operation

Operation urgency

Essential **SingleChoice:** the code only.

1 - Elective
2 - Urgent
3 - Emergency
4 - Salvage

Definition

Indicate the clinical status of the patient prior to entering the operating room.

Elective The patient's cardiac function has been stable in the days or weeks prior to the operation. The procedure could be deferred without increased risk of compromised cardiac outcome. Routine admission for operation.

Urgent Procedure required during same hospitalization in order to minimize chance of further clinical deterioration.

Emergency Operation before the beginning of the next working day after decision to operate.

Salvage The patient is undergoing cardio-pulmonary resuscitation en route to the operating theatre or prior to anaesthetic induction.

Procedure group

Mandatory **SingleChoice:** the code only.

1 - CABG alone
2 - CABG & valve
3 - CABG & valve & other (cardiac)
4 - CABG & other (cardiac)
5 - Valve alone
6 - Valve and other (cardiac)
7 - Other (cardiac)

Other cardiac procedures

Mandatory **MultiChoice:** the code(s) only.

0 - No other cardiac procedures
1 - Left ventricular aneurysm repair
2 - Ventricular septal defect repair
3 - Atrial septal defect repair
4 – Surgical Ventricular Restoration
5 - Congenital
6 - Cardiac trauma
7 - Cardiac transplant
8 - Permanent pacemaker
9 - AICD
10 - AF ablation surgery
11 - Surgery on root/ascending aorta/arch
19 - Other procedure not listed above

Definition

Only include operations on the heart or the ascending aorta up to and including the aortic arch.

Do not include procedures on the aortic branches or other arteries, descending thoracic aorta, lungs, pulmonary vessels beyond the hilum.

Non-cardiac procedures

Mandatory **MultiChoice:** the code(s) only.

0 - None
1 - Surgery on the descending aorta
2 - Carotid endarterectomy
3 - Other thoracic surgery
4 - Other vascular surgery

Definition

Other thoracic surgery	Thoracic surgical procedures other than those defined elsewhere.
Other vascular surgery	Surgery on arterial vessels other than those described elsewhere.

Acute Aortic Syndrome (Type A)

Essential **SingleChoice:** the code only.

0 - No
1 - Yes

Definition:

Includes also penetrating aortic ulcer (PAU), intramural hematoma (IMH) involving the ascending aorta/arch. Stanford Classification used.

Segments of the aorta treated

Mandatory **MultiChoice:** the code(s) only.

0 - Not applicable
1 - Root
2 - Ascending
3 - Arch
4 - Descending
5 - Abdominal
6 - TEVAR

Aortic procedure

Essential **MultiChoice:** the code(s) only.

0 - Not applicable
1 - Interposition tube graft
2 - Tube graft and separate AVR
3 - Root replacement (composite valve graft & coronary reimplantation)
4 - Root replacement (preservation native valve & coronary reimplantation)
5 - Homograft root replacement
6 - Ross procedure for aortic root pathology
7 - Aortic patch graft
8 - Sinus of valsalva repair
9 - Reduction aortoplasty
10 - Other

Aortic root enlargement

Optional **SingleChoice:** the code only.

0 - No
1 - Yes

Coronary surgery

CABG targets

Essential **MultiChoice:** the code(s) only.

1 - Main LAD
2 - Main RCA
3 - LAD branches
4 - RCA branches
5 - Circumflex branches

Distal Coronary Anastomosis (DCAs) - number of arterial conduits

Essential **Integer:** enter a whole number.

Definition

Number of distal coronary anastomoses performed with arterial conduits. Valid range: 0-9.

DCAs - number of venous conduits

Essential **Integer:** enter a whole number.

Definition

Number of distal coronary anastomoses performed with venous conduits. Valid range: 0-9.

Conduits used as grafts

Essential **MultiChoice:** the code(s) only.

0 - No conduits used
1 - Right IMA
2 - Left IMA
3 - Radial
4 - Long/great SV
5 - Short/small SV
6 - Other

IMA = internal mammary artery.

Target of LIMA (in situ)

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - LIMA to LAD
2 - LIMA to other branches

Target of RIMA (in situ)

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - RIMA to LAD
2 - RIMA to other branches

Valve surgery

Note: Repeat the valve surgery details for each valve treated

Valve treated

Mandatory **SingleChoice:** the code only.

1 - Aortic
2 - Mitral
3 - Tricuspid
4 - Pulmonary

Indication for valve surgery *(previously Valve pathology)*

Essential **SingleChoice:** the code only.

1 - Stenosis
2 - Regurgitation
3 - Mixed
4 - Annular dilation with no regurgitation
5 - Active Endocarditis
6 - Prosthesis dysfunction
7 - Other

Explant type

Optional **SingleChoice:** the code only.

0 - Native valve
1 - Mechanical
2 - Biological
3 - Homograft
4 - Autograft
5 - Ring

Native valve pathology

Optional **SingleChoice:** the code only.

0 - Native valve not present
1 - Congenital
2 - Degenerative
3 - Active infective endocarditis
4 - Previous infective endocarditis
5 - Rheumatic
6 - Annuloaortic ectasia
7 - Ischaemic
8 - Functional regurgitation
19 - Other native valve pathology

Reason for repeat valve surgery

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - Thrombosis
2 - Dehiscence
3 - Embolism
4 - Infection
5 - Intrinsic failure
6 - Haemolysis
7 - Failure of previous valve repair
9 - Other reason

Valve procedure

Mandatory **SingleChoice:** the code only.

1 - Replacement
2 - Repair
3 - Isolated commissurotomy
4 - Excision only
5 - Inspection
6 - Other

Valve repair

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - Repair with ring
2 - Repair without ring
9 - Unknown

Implant type

Essential **SingleChoice:** the code only.

0 - None
1 - Mechanical
2 - Biological
3 - Homograft
4 - Autograft
5 - Ring
6 - Other

Implant code

Optional **TableSingleChoice:** see table **IMP**

Implant code other

Optional **String:** can contain any value.

Valve / ring size

Optional **Integer:** enter a whole number.

Perfusion and myocardial protection

Cardio-pulmonary bypass

Essential **SingleChoice:** the code only.

0 - No
1 - Yes (planned)
2 - Yes (conversion from off-pump)
3 - Yes (unspecified)

Predominant form of myocardial protection

Optional **SingleChoice:** the code only.

1 - Cardioplegic
2 - Non-cardioplegic

Cardioplegia - solution

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - Blood
2 - Crystalloid

Cardioplegia - temperature

Optional **MultiChoice:** The code(s) only.

0 - Not applicable
1 - Warm
2 - Cold

Cardioplegia - infusion mode

Optional **MultiChoice:** the code(s) only.

0 - Not applicable
1 - Antegrade
2 - Retrograde

Cardioplegia - timing

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - Continuous
2 - Intermittent

Non-cardioplegia myocardial protection

Optional **SingleChoice:** the code only.

0 - Not applicable
1 - Fibrillation with perfusion
2 - Cross-clamp and beating heart
3 - Aortic cross-clamp
4 - Cross-clamp with direct coronary perfusion
5 - Beating heart without cross-clamp

Intra-aortic balloon pump used

Essential **MultiChoice:** The code(s) only.

0 - Not used
1 - Used pre-operatively
2 - Used intra-operatively
3 - Used post-operatively

Extracorporeal Life Support (Veno-Arterial ECMO/ECLS)

Essential **MultiChoice:** The code(s) only.

0 - Not used
1 - Used pre-operatively
2 - Used intra-operatively
3 - Used post-operatively

Ventricular Assist Device used

Essential **MultiChoice:** The code(s) only.

0 - Not used
1 - Used pre-operatively
2 - Used intra-operatively
3 - Used post-operatively

Bypass time

Essential **Integer:** enter a whole number.

Total bypass time in minutes. Valid range: 0-4320

Cumulative cross-clamp time

Essential **Integer:** enter a whole number.

Cumulative cross-clamp time in minutes. Valid range: 0-1439

Circulatory arrest time

Essential **Integer:** enter a whole number

Total circulatory arrest time in minutes. Valid range: 0-1439

Surgical access

Essential **MultiChoice:** the code(s) only.

1 - Full median sternotomy
2 - Partial sternotomy
3 - Thoracotomy
4 - Mini-thoracotomy
5 – Other

Definition

Partial sternotomy:	include J, T, inverted J and T sternotomy
Mini thoracotomy:	skin incision ≤ 10 cm

Arterial cannulation site

Optional **MultiChoice:** The code(s) only.

1 - Ascending aorta/Arch
2 - Axillary
3 - Arch branches
4 - Femoral
5 - Others

Venous cannulation site

Optional **MultiChoice:** The code(s) only

1 - Right atrium
2 - Bicaval
3 - Jugular vein
4 - Femoral vein
5 - Others

Post-operative course

New permanent pacemaker implanted

Essential **SingleChoice:** the code only.

Indicate whether patient developed a new dysrhythmia requiring insertion of a permanent device in the postoperative period.

0 - No

1 - Yes

Definition

Include permanent pacemakers, Implantable cardioverter defibrillators (ICD) and combination devices. Do not code if the patient experiences third degree block and has temporary pacemaker wires inserted, but the block resolves and the patient does not require a permanent pacemaker.

Post-operative AF

Essential **SingleChoice:** the code only.

0 - No

1 - Yes

Definition

Indicate whether the patient experienced atrial fibrillation/flutter (AF), lasting longer than one hour, and requiring treatment (either pharmacological or DC cardioversion). Exclude patients who were in AFib at the start of surgery.

Rhythm at discharge

Optional **SingleChoice:** the code only.

0 – Sinus Rhythm

1 – Atrial fibrillation

2 - Atrial flutter

3 - Other

AMI postop

Optional **SingleChoice:** the code only.

0 - No

1 - Yes

Definition

Post-operative acute myocardial infarction, defined as:

New ischaemic symptoms (e.g. chest pain or shortness of breath), or new ischaemic signs (e.g. ventricular arrhythmias, new or worsening heart failure, new ST-segment changes, haemodynamic instability, new pathological Q-waves in at least two contiguous leads, imaging evidence of new loss of viable myocardium or new wall motion abnormality)

AND

Elevated cardiac biomarkers (preferable CK-MB), consisting of at least one sample post-procedure with a peak value exceeding 15× as the upper reference limit for troponin or 5× for CK-MBa. If cardiac biomarkers are increased at baseline (>99th percentile), a further increase in at least 50% post-procedure is required AND the peak value must exceed the previously stated limit.

New CerebroVascular Event

Essential **SingleChoice:** the code only.

0 - None
1 – Transient Ischemic Attack (TIA)
2 - Stroke

Definition

Indicate whether the patient has a history of cerebrovascular event, defined as an acute episode of a focal or global neurological deficit with at least one of the following:

- change in the level of consciousness,
- hemiplegia, hemiparesis, numbness, or sensory loss affecting one side of the body,
- dysphasia or aphasia, hemianopia, amaurosis fugax, or other neurological signs or symptoms consistent with stroke.

Specify the type of cerebrovascular event as follows:

Stroke duration of a focal or global neurological deficit ≥24 h; OR <24 h if available neuroimaging documents a new haemorrhage or infarct; OR the neurological deficit results in death..

TIA duration of a focal or global neurological deficit <24 h, any variable neuroimaging does not demonstrate a new haemorrhage or infarct.

New post-operative dialysis

Essential **SingleChoice:** the code only.

Include dialysis/CVVH

0 - No
1 - Yes

Peak post-operative creatinine

Optional **Integer:** Enter a whole number.

Indicate the maximum creatinine level in µmol l-1 after surgery, within admission. Valid range: 1-999

Prolonged ventilation >48hrs

Essential **SingleChoice:** the code only.

0 - No
1 - Yes

Definition

The hours of postoperative ventilation time include OR exit until extubation, plus any additional hours following reintubation.

Do not include the hours ventilated if a patient returns to the operating room suite and requires re-intubation as part of general anaesthesia but does not require ventilation beyond the time in the operating room (i.e. after OR Exit Time)..

Tracheostomy

Optional **SingleChoice:** the code only.

0 - No

1 – Yes

Sternal wound dehiscence

Optional **SingleChoice:** the code only.

0 - No

1 - Superficial

2 - Deep

3 - Mediastinitis

Definition

Superficial: limited to the skin/subcutaneous tissue.

Deep: involving the muscle and/or the sternal bone.

Mediastinitis: must meet at least 1 of the following criteria:

1. Organisms cultured from mediastinal tissue or fluid obtained during an invasive procedure.
2. Evidence of mediastinitis seen during an invasive procedure or histopathologic examination.
3. Patient has at least 1 of the following signs or symptoms:
   - Fever (>38°C)
   - Chest pain*
   - Sternal instability* and at least 1 of the following:
     - Purulent discharge from mediastinal area
     - Organisms cultured from blood or discharge from mediastinal area
   - Mediastinal widening on imaging test.

   * With no other recognized cause

Pneumonia

Optional **SingleChoice:** the code only.

0 - No

1 - Yes

Definition

Treatment for suspected or confirmed pneumonia.

See link: https://www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf

Urinary tract infection (UTI)

Optional **SingleChoice**: the code only.

0 - No

1 - Yes

Definition

Treatment for suspected or confirmed urinary tract infection. See link:

http://www.rochesterpatientsafety.com/Images_Content/Site1/Files/Pages/UTI_Treatment_Guidelines.pdf

Sepsis

Optional **SingleChoice:** the code only.

0 - No

1 - Yes

Definition

Sepsis is defined as having 2 or more of the SIRS (systemic inflammatory response syndrome) criteria AND a known or suspected infection.

SIRS criteria included:

- HR > 90 (acute and not a chronic condition)
- Temp >38.5 <36.0
- Resp >20 bpm or PaCO2 <32 mmHg
- WBC <4000 or >12000 or >10% Bands.

Re-operation

Essential MultiChoice: The code(s) only.

Indicate whether the patient returned to the operating room for:

0 - No re-operation required

1 - Re-operation for graft problems

2 - Re-operation for valve problems

3 - Re-operation for bleeding or tamponade

4 - Sternal resuturing for any reason

5 - Re-operation for other reasons

Definition

Graft problem	Problems with the coronary artery bypass graft requiring re-intervention.
Valve problem	Problems with a cardiac valve requiring re-intervention.
Bleeding / tamponade	Requiring re-operation.
Other cardiac problems	Any other cardiac problem not defined above requiring re-operation.

Do not capture reopening of the chest or situations of excessive bleeding that occur prior to the patient leaving the operating room at the time of the primary procedure. Tamponade is a situation which occurs when there is compression or restriction placed on the heart within the chest that creates hemodynamic instability or a hypoperfused state. Do not include medically (non-operatively) treated excessive post-operative bleeding/tamponade events.

Include patients that return to an OR suite or equivalent OR environment (i.e., ICU setting) as identified by your institution, that require surgical re-intervention to investigate/correct bleeding with or without tamponade. Include only those interventions that pertain to the mediastinum or thoracic cavity.

Blood transfusion

Optional **SingleChoice: the** code only.

0 - none

1 - One unit

2 - 2 to 3 units

3 - >= 4 units

Definition:

Consider transfusion of whole blood of packed red cells, only during or after surgery.

Discharge details

Patient status at discharge

Mandatory **SingleChoice:** the code only.

0 - Alive
1 - Deceased

Discharge destination

Essential **SingleChoice:** the code only.

0 - Not applicable - patient deceased
1 - Home
2 - Convalescence / nursing home
3 - Another unit within the same hospital
4 - Another hospital

Date of latest follow-up

Optional **Date:** ODBC date with format yyyy-mm-dd.

Status at latest follow-up

Optional **SingleChoice:** the code only.

0 - Alive
1 - Deceased

Operative mortality

Optional **Auto calculated**

Short stay (<6 d)

Optional **Auto calculated**

Long stay (>14 d)

Optional **Auto calculated**