BACTS Registry Data Specifications
QUIP Version, June 2016

Mandatory dataset BACTS in yellow
QUIP modifications are in green.

Database dictionary and data definitions

This document is designed to accompany the BACTS Registry. This registry is a copy of the European Association for Cardio-Thoracic Surgery’s Adult Cardiac Surgery Database (Version 1.0). There have been only some minor modifications.

We realize that we cannot fulfill the data needs for every cardiac surgeon, but we feel that this dataset will be a significant improvement compared to the BACTS-CPT registration.

The FileMaker Pro application has some extra fields, that are not included in the BACTS Registry Dataset but that have been added for convenience.

The questions have been recorded in the same order as the data collection form. All the question titles and response options are listed exactly as in the published form, with embellishments in parentheses where more detail is required. The titles in bold caps are the headers, exactly as used in the Excel-file. All data options and codes are described. The excel-file should contain only the headers and the codes (not the descriptions).

Upload the excel-file to www.bactsregistry.org

These are the mandatory fields: PATIENT ID, BIRTH, GENDER, SURGEON 1, date of SURGERY, REDO, PROCEDURE, OTHER CARDIAC DETAIL, NON CARDIAC DETAIL. Rows with missing “mandatory fields” will not be accepted. The mandatory fields are used to eliminate double inputs. The whole dataset is the minimal dataset.

The definitions found in the document are taken either from the STS dataset definitions, which can be downloaded in pdf format from the STS website at: http://www.sts.org/sections/stsnationaldatabase/datamanagers/adultcardiacdb/datacollection/index.html or from the EuroSCORE website: http://www.euroscore.org

The EuroSCORE II modifications are incorporated in the registry.

The BACTS Registry is designed for adult cardiac surgery. All congenital cardiac surgery should be reported in the EACTS Congenital Database: www.eactscongenitaldb.org

In 2012 EACTS established a Quality Improvement Programme (QUIP) to encourage improvement of clinical outcomes for patients, and to promote the importance of integrating quality improvement initiatives in to daily clinical practice.

BACTS encourages the centers to participate in the QUIP ADULT CARDIAC DATABASE (ACD). In order to facilitate this participation we have adapted the BACTS registry and added some fields and answers. However, when BACTS and QUIP definitions differ we have maintained the BACTS definitions.

The BACTS Database Committee
database@bacts.org
Patient demographics and other identifiers

HOS ID - Hospital code
Text
A code for the hospital that is unique within the contributor country. This code will be recoded into a secret code by the database manager of the BACTS-DBC after submission of the data.

COUNTRY : country code of surgical Unit
Text; single value
B Belgium

PATIENT ID : Patient ID (Unique patient identifier)
String

BIRTH : Date-of-birth
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <=Today

AGE : Age at operation
Integer; single value

GENDER : Gender
Text; single value
M Male
F Female

RACE : Race
Numeric; single value
1 Asian
2 Black
3 White
4 Other
5 Unknown

SURGEON 1 : Surgeon 1
Text; format x-xxxxx-xx-140
RIZIV/INAMI number
The RIZIV/INAMI number will be recoded into a secret code by the database manager of the BACTS-DBC after submission of the data. No analysis will be done on the surgeon level.

SURGEON 2 : Surgeon 2
Text; format x-xxxxx-xx-140
RIZIV/INAMI number
The RIZIV/INAMI number will be recoded into a secret code by the database manager of the BACTS-DBC after submission of the data. No analysis will be done on the surgeon level.

Hospitalization

ADMISSION : Date-of-admission
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <=Today

SURGERY : Date-of-surgery/operation
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <=Today
DISCHARGE: Date-of-discharge/death
  Date; format dd/mm/yyyy
  Valid date after 01/01/1880 and <= Today
Definitions
Discharge from the hospital in which the current surgery was performed.

Cardiac history

CCS: Angina - CCS class (status pre-surgery)
  Numeric; single value
  0  CCS 0  No angina
  1  CCS 1  No limitation of physical activity
  2  CCS 2  Slight limitation of ordinary activity
  3  CCS 3  Marked limitation of ordinary physical activity
  4  CCS 4  Symptoms at rest or minimal activity

NYHA: Dyspnoea - NYHA grade (status pre-surgery)
  Numeric; single value
  1  NYHA I  No limitation of physical activity
  2  NYHA II Slight limitation of ordinary physical activity
  3  NYHA III Marked limitation of ordinary physical activity
  4  NYHA IV Symptoms at rest or minimal activity

SYMPTOMS: Symptomatic status at admission
  Numeric; single value
  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

MI: Number of Previous myocardial infarctions
  Numeric; single value
  0  None
  1  One
  2  Two or more
  9  Not known
Definitions
Patient hospitalized with a myocardial infarction (MI) documented in the medical record. Two of
the following four criteria are necessary:
  a. Prolonged (>20 min.) typical chest pain not relieved by rest and/or nitrates
  b. Enzyme level elevation: either
    - CK-MB >5% of total CPK
    - CK greater than twice normal
    - LDH subtype 1 > LDH subtype 2
    - troponin >0.2 μg ml⁻¹
  c. Any wall motion abnormalities as documented by LV Gram, Echo, Muga Scan and or
    EF <45%
  d. Serial ECG (at least two) showing changes from baseline or serially in ST-T and/or Q
    waves that are 0.03 seconds in width and/or > or + one third of the total QRS complex
    in two or more contiguous leads

TYPE MI: Type of most recent myocardial infarction
  Numeric; single value
  1  STEMI
  2  Non-STEMI
RECENT MI: Most recent myocardial infarction
Numeric; single value
0 No previous MI
1 MI < 6 hours before operation
2 MI 6-24 hours before operation
3 MI 1-7 days before operation
4 MI 8-21 days before operation
5 MI 22-90 days before operation
6 MI > 90 days before operation
Definitions
Recent MI (EuroSCORE): myocardial infarction within 90 days.

CONG HEART: Congestive heart failure
Numeric; single value
0 No
1 Yes
Definitions
A low ejection fraction alone, without clinical evidence of heart failure does not qualify as heart failure.

Previous interventions

PCI: Previous percutaneous coronary intervention (PCI)
Numeric; single value
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

DATE PCI: Date of last PCI
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <= Today

PREVIOUS SURGERY: Previous cardiac, vascular or thoracic surgical interventions
Text; zero or one or more values; separated by commas without spaces
0 No previous surgery
1 previous CAB
2 previous Valve
9 Other
Definitions
CAB: Previous Coronary Artery Bypass surgery by any approach
Valve: Previous surgical replacement and/or repair of a cardiac valve, by any approach
Other: Any other previous cardiac surgery which traversed the anterior mediastinum, including surgery on the ascending aorta and/or arch

DATE CARDIAC: Date of last cardiac surgery
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <= Today

Pre-operative risk factors

WEIGHT: Weight
Real number; 99
Weight in kilogrammes

HEIGHT: Height
Real number; 199
Height in centimetres
SMOKING: Smoking history
Numeric; single value
0 Never Smoked
1 Ex-smoker
2 Current smoker
Definitions
A history confirming any form of tobacco use in the past (cigarettes, cigar, tobacco chew, etc.). Patients with a use of tobacco (cigarettes, cigar, tobacco chew etc.) within one month of surgery are considered to be current smokers.

DIABETES: Diabetes treatment
Numeric; single value
0 Not diabetic
1 Diet control
2 Oral therapy alone
3 Insulin (with or without oral therapy)
Definitions
A history of diabetes, regardless of duration of disease or need for anti-diabetic agents. Method of diabetic control, at time of intervention. Code the control method patient presented with on admission. Patients placed on a pre-operative diabetic pathway of insulin drip but were controlled with diet or oral method at admission are not coded as insulin dependent.

AHT: Hypertension
Numeric; single value
0 No hypertension
1 Treated or BP>140/90 on >1 occasion prior to admission
9 Not known
Definitions
Does the patient have 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. Blood pressure >140 systolic or >90 diastolic on at least 2 occasions
   c. Currently on anti-hypertensive medication

CHOLEST: Hypercholesterolaemia
Numeric; single value
0 No hypercholesterolaemia
1 Hypercholesterolaemia
9 Not measured/unknown
Definitions
Whether the patient has a history of hypercholesterolemia diagnosed and/or treated by a physician. Criteria can include documentation of:
   a. TC >200
   b. LDL >=130
   c. HDL <30
   d. Admission cholesterol >200 mg dl⁻¹

RENAL: Renal (disease at time of surgery) (EuroSCORE)
Text; zero or one or more other values; separated by commas without spaces
0 No renal disease
1 Functioning transplant
2 Creatinine > 200 μmol l⁻¹ or 2,27 mg/dl
3 Dialysis for acute renal failure: onset within 6 weeks of cardiac surgery
4 Dialysis for chronic renal failure: onset more than 6 weeks prior to cardiac surgery

CREAT MOL or CREAT MG: Last pre-operative creatinine
Real number; one decimal place e.g. 99.9
Creatinine in μmol l⁻¹ or mg/dl
RENAL II : Renal Impairment (EuroSCORE II)
Numeric; single value
0 Normal (CC > 85ml/min)
1 Moderate (CC 50 - 85 ml/min)
2 Severe (CC < 50 ml/min)
3 Dialysis (regardless of CC)

Definitions
There are now 3 categories based on creatinine clearance (CC) calculated using Cockroft-Gault formula. Unlike serum creatinine in the old EuroSCORE model, some of the weighting for age is directly incorporated into this factor, as age is a component of the creatinine.
1 Moderately impaired renal function (50-85 ml/min)
2 Severely impaired renal function (<50 ml/min) off dialysis
3 On dialysis (regardless of the serum creatinine level)

COPD : Chronic lung disease
Text; zero or one or more other values; separated by commas without spaces
0 No pulmonary disease
1 COPD/emphysema
2 Asthma

Definitions
COPD: longterm use of bronchodilators or steroids for lung disease (EuroSCORE)

COPD DEGREE : Degree of COPD
Numeric; single value
1 Mild
2 Moderate
3 Severe

ARTERIOP : Extra-cardiac arteriopathy
Text; zero or one or more other values; separated by commas without spaces
0 No
1 Peripheral vascular disease
2 Cerebro-vascular disease

Definitions
Peripheral vascular disease: (EuroSCORE)
  a. as indicated by claudication either with exertion or rest
  b. amputation for arterial insufficiency
  c. aorto-iliac occlusive disease reconstruction
  d. peripheral vascular bypass surgery, angioplasty, or stent
  e. documented AAA, AAA repair, or stent;
  f. carotid occlusion or >50% stenosis
  g. positive non-invasive testing

Cerebro-vascular disease: documented by any one of the following:
  a. unresponsive coma > 24 hours;
  b. CVA (symptoms > 72 hours after onset);
  c. RIND (recovery within 72 hours);
  d. TIA (recovery within 24 hours);
  e. non-invasive carotid test with > 75% occlusion; prior carotid surgery

ARTERIOP DETAIL : Peripheral vascular arteriopathy details
Text; zero or one or more other values; separated by commas without spaces
1 Claudication
2 Amputation for arterial disease
3 Documented aortic aneurysm with or without repair
4 Positive non-invasive test
5 Previous or planned intervention on the abdominal aorta; limb arteries
**CVA**: Cerebro-vascular disease type

Text; zero or one or more other values; separated by commas without spaces

0 Not applicable
1 Coma
2 CVA: Carbrovascular Accident. A loss of neurological function caused by an ischaemic event with residual symptoms at least 72 hours after onset.
3 RIND: Reversible Ischaemic Neurological Deficit. A loss of neurological function caused by ischaemia with symptoms at least 24 hours after onset but with complete return of function within 72 hours.
4 TIA: Transient ischaemic Attack. A loss of neurological function caused by ischaemia that was abrupt in onset but with complete return of function within 24 hours.
5 Non-invasive >75% stenosis
6 Previous carotid surgery

**CVA WHEN**: Numeric; single value

1 CVA within 2 weeks
2 CVA >2 weeks ago

**TIA WHEN**: Numeric; single value

1 TIA within 2 weeks
2 TIA >2 weeks ago

**MOBILITY**: Poor mobility due to any non-cardiac reason / Neurological dysfunction

Numeric; single value

0 No
1 Yes

Definitions (EuroSCORE II),
Yes: Severely impaired of mobility secondary to musculoskeletal or neurologic dysfunction
NOTE: EuroSCORE I and II definitions differ !!!

**NEUROLOGIC**: Neurological dysfunction

Numeric; single value

0 No
1 Yes

Definitions (EuroSCORE I),
Yes: Any neurological problem that severely affects ambulation or day-to-day functioning.
NOTE: EuroSCORE I and II definitions differ !!!

**CAROTID**: Carotid bruits

Numeric; single value

0 No
1 Yes

**CAROTID STENOSIS**: Carotid stenosis

Numeric; single value

0 No or <50% stenosis
1 Yes - 50-79% stenosis
2 Yes - 80-99% stenosis
3 Yes - carotid occlusion
4 Prior carotid surgery
**RHYTHM :** Pre-operative heart rhythm  
Numeric; single value  
0  Sinus rhythm  
1  VT / VF (Ventricular fibrillation or ventricular tachycardia)  
2  Atrial fibrillation/flutter (within two weeks prior to surgery)  
3  Complete heart block/pacing  
4  Other abnormal rhythm  

**Definitions**  
Present within two weeks of the procedure:  
- VT / VF sustained Ventricular Tachycardia or Ventricular Fibrillation requiring cardioversion and/or IV amiodarone  
- Atrial fibrillation/flutter requiring therapy  

**Pre-operative haemodynamics and catheterisation**  

**CATHE :** Left- or right-heart catheterisation  
Text; zero or one or more values; separated by commas without spaces  
0  Never  
1  This admission  
2  Previous admission  

**DATE CATHE :** Date of last catheterisation  
Date; format dd/mm/yyyy  
Valid date after 01/01/1880 and <=Today  

**VESSELS :** Number of diseased coronary vessels  
Numeric; single value  
0  No vessel with >50% diameter stenosis  
1  1 vessel with >50% diameter stenosis  
2  2 vessels with >50% diameter stenosis  
3  3 vessels with >50% diameter stenosis  
9  Not investigated  

**NOTE:** Left main disease (>=50%) is counted as TWO vessels (LAD and Circumflex, which may include a Ramus Intermedius). For example, left main and RCA would count as three total. (STS)  

**MAIN STEM :** Left main stem disease  
Numeric; single value  
0  No LMS disease / LMS disease ≤50%  
1  diameter stenosis LMS disease >50% diameter stenosis  
9  Not investigated  

**LAD :** Left anterior artery disease LAD  
Numeric; single value  
0  No narrowing or system <50% narrowing pre-operatively  
1  system with >50% diameter stenosis  

**CX :** Circumflex coronary artery disease  
Numeric; single value  
0  No narrowing or system <50% narrowing pre-operatively  
1  system with >50% diameter stenosis  

**RCA :** Right coronary artery disease RCA  
Numeric; single value  
0  No narrowing or system <50% narrowing pre-operatively  
1  system with >50% diameter stenosis
LVF : Ejection fraction category
Numeric; single value
1 Good (>50%)
2 Moderate (31-50%)
3 Poor (21-30%)
4 Very Poor (<21%)
9 Not investigated
Definitions
EuroSCORE II definitions are used

EF : Ejection fraction value
Real number; integer i.e. 99
Ejection fraction expressed as a percentage

PA SYS : PA systolic – pulmonary artery pressure
Real number; integer i.e. 99
PA systolic expressed as a mmHg

PHT : Pulmonary hypertension
Numeric; single value
0 No
1 Moderate (31-55 mmHg)
2 Severe (> 55 mmHg)
Definition (EuroSCORE II)
Systolic PA pressure
Moderate: PA systolic pressure (31-55 mmHg)
Severe: PA systolic pressure (>55 mmHg)
NOTE: EuroSCORE I and II definitions differ $$$

AV PEAK : AV (aortic valve) peak-to-peak gradient
Real number; integer i.e. 99
AV gradient expressed as a mmHg
Definition
Invasive peak-to-peak gradient

AV MEAN : AV (aortic valve) mean gradient
Real number; integer i.e. 99
AV gradient expressed as a mmHg
Definition
Non-invasive mean gradient

LVEDP : LVEDP (Left ventricular end diastolic pressure)
Real number; integer i.e. 99
LVEDP expressed as a mmHg

PAWP : Mean PAWP / LA (pulmonary artery wedge pressure / left atrial pressure)
Real number; integer i.e. 99
PAWP / LA expressed as a mmHg

Pre-operative status and support

IV NITR : IV nitrates (pre-operatively)
Numeric; single value
0 No
1 Yes

HEPARIN : Heparin of any kind (pre-operatively)
Numeric; single value
0 No
VENTILAT: Ventilated (pre-operatively)
   Numeric; single value
   0  No
   1  Yes

INOTROP: IV inotropes (pre-operatively)
   Numeric; single value
   0  No
   1  Yes

SHOCK: Cardiogenic shock
   Numeric; single value
   0  No
   1  Yes

Definitions
   Is the patient, at the time of procedure, in a clinical state of hypoperfusion 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.

CRIT PREOP: Critical preoperative state
   Numeric; single value
   0  No
   1  Yes

Definitions (EuroSCORE)
   any one or more of the following:
   a. ventricular tachycardia or fibrillation or aborted sudden death,
   b. preoperative cardiac massage,
   c. preoperative ventilation before arrival in the anaesthetic room,
   d. preoperative inotropic support,
   e. intraaortic balloon counterpulsation or
   f. preoperative acute renal failure (anuria or oliguria<10 ml/hour)

ENDOCARDITIS: Active endocarditis
   Numeric; single value
   0  No
   1  Yes (active endocarditis)

Definitions (EuroSCORE)
   Yes: active endocarditis, patient still under antibiotic treatment for endocarditis at time of surgery
   Previous endocarditis: treated endocarditis

IMMUNOSUPP: Immunosuppressive therapy within 30 days of operation
   Numeric; single value
   0  No
   1  Yes

CPR: Resuscitation/Cardiac massage within 4 hour of operation
   Numeric; single value
   0  No
   1  Yes
Operative details

STATUS: Operative urgency

Numeric; single value
1. Elective
2. Urgent
3. Emergency
4. Salvage

Definitions
1. **Elective**: routine admission from the waiting list; procedure can be deferred without risk
2. **Urgent**: not scheduled for routine admission from the waiting list; requiring surgery on the current admission; cannot be sent home without surgery
3. **Emergency**: unscheduled patients with ongoing refractory compromise; there should be no delay in surgical intervention irrespective of the time of day
4. **Salvage** patients: requiring cardio-pulmonary resuscitation en route to the operating theatre or prior to anaesthetic induction. This does not include cardiopulmonary resuscitation following induction of anaesthesia

NOTE: EuroSCORE I(old) Emergency = carried out on referral before the next working day. Answer 3 or 4

REASON URG: Main reason for urgency

Numeric; single value
1. Anatomy
2. Acute evolving MI (within 24 hours of surgery)
3. Cardiogenic shock
4. Aortic dissection
5. Unstable / worsening angina / ongoing ischaemia
6. Pulmonary oedema (requiring intubation)
7. Valve dysfunction
8. Transplantation
9. Respiratory failure

Definitions
Valve dysfunction contains also endocarditis with or without valve incompetence

REDO: Number of previous heart operations

Numeric; single value
0. None
1. One
2. Two
3. Three
4. Four
5. Five

Definitions
Requiring opening of the pericardium

PROCEDURE: Procedure groups

Numeric; single value
1. CAB alone
2. Valve alone
3. CAB & valve
4. CAB & other
5. Valve & other
6. CAB & valve & Other
7. Other
**CABG PROCEDURE** (CABG procedure)
Text; zero or one or more values; separated by commas without spaces
0  No
1  main LAD
2  main RCA
3  LAD branches
4  RCA branches
5  Circumflex branches

**OTHER CARD PROC** : Other cardiac procedure
Numeric; single value
0  No
1  Yes
Definitions
See the list of options available under the question “Other cardiac procedures details”

**OTHER NON CARD PROC** : Other non-cardiac procedure
Numeric; single value
0  No
1  Yes
Definitions
See the list of options available under the question “Other non-cardiac procedures details”

**WEIGHT INTERVENTION** : Weight of intervention (EuroSCORE)
Numeric; single value
0  Isolated CABG
1  single non CABG
2  two procedures
3  three procedures
Definitions
Weight of intervention – include major interventions on the heart such as CABG, valve repair or replacement, replacement of part of the aorta, repair of a structural defect, maze procedure, resection of a cardiac tumor

**Coronary surgery**

**DISTAL ART** : Distal coronary anastomoses - arterial conduits
Real number; integer i.e. 99
Number of arterial distal coronary anastomoses

**DISTAL VENOUS** : Distal coronary anastomoses - venous conduits
Real number; integer i.e. 99
Number of venous distal coronary anastomoses

**ARTERIES** : Artery / Arteries used as graft
Text; zero or one or more other values; separated by commas without spaces
0  No arteries used
1  Left IMA
2  Right IMA
3  Left radial
4  Right radial
5  Right GEPA
6  Other artery
Valve surgery (complete for each valve operated upon)

STEN AV – STEN MV – STEN TV – STEN PV : Stenosis

Numeric; single value
0 No
1 Yes

GRADE AV – GRADE MV – GRADE TV – GRADE PV : Pathology grade:
0 Not applicable
1 Mild
2 Moderate
3 Severe
9 Unknown

INSUF AV – INSUF MV – INSUF TV – INSUF PV : Insufficiency

Numeric; single value
0 None
1 Trivial
2 Mild
3 Moderate
4 Severe

PATH AV – PATH MV – PATH TV – PATH PV : Valve pathology:
1 Stenosis
2 Regurgitation
3 Mixed
4 Annular dilation without regurgitation
5 Normal

EXPL AV – EXPL MV – EXPL TV – EXPL PV : Explant type

Numeric; single value
0 Native valve
1 Mechanical
2 Bioprosthesis
3 Homograft
4 Autograft
5 Ring

NATIVE AV – NATIVE MV – NATIVE TV – NATIVE PV : Native valve pathology

Numeric; single value
0 Not present
1 Congenital
2 Degenerative
3 Active endocarditis
4 Previous endocarditis
5 Rheumatic
6 Annuloaortic ectasia (aortic valve only)
8 Ischaemic
9 Functional
10 Trauma
19 Other native valve pathology
REPEAT AV – REPEAT MV – REPEAT TV – REPEAT PV: Reason for repeat valve surgery

Numeric; single value
0 Not applicable
1 Thrombosis
2 Dehiscence
3 Embolism
4 Infection
5 Intrinsic failure
6 Haemolysis
7 Failure previous repair
8 Other
9

PROC AV – PROC MV – PROC TV – PROC PV: Valve procedure

Numeric; single value
1 Replacement
2 Repair
3 Isolated commissurotomy
4 Excision only
5 Inspection
6 Other

REPAIR AV – REPAIR MV – REPAIR TV – REPAIR PV: Repair Valve procedure

Numeric; single value
0 Not applicable
1 Repair with ring
2 Repair without ring
3 Unknown

IMPL AV – IMPL MV – IMPL TV – IMPL PV: Implant type

Numeric; single value
0 None
1 Mechanical
2 Bioprosthesis
3 Homograft
4 Autograft
5 Ring
6 Other

IMPL AV – IMPL MV – IMPL TV – IMPL PV: Implant valve/ring code

Text; single value from table available from the EACTS website
Values available from the BACTS website: see separate document “Valve codes”

PROS AV – PROS MV – PROS TV – PROS PV: Implant valve/ring code

Text; single value from table available from the EACTS website
Values available from the BACTS website: see separate document “Valve codes”

SIZE AV – SIZE MV – SIZE TV – SIZE PV: Implant valve/ring size

Real number; integer i.e. 23
Implant size in mm
Other cardiac and other non-cardiac procedures

OTHER CARDIAC DETAIL: Other cardiac procedures details
Text; zero or one or more other values; separated by commas without spaces
0 None
1 Left ventricular aneurysm repair
2 Ventricular septal defect
3 Atrial septal defect
4 Batista
5 Surgical Ventricular Restoration
6 Congenital
7 Transmyocardial laser revascularisation
8 Cardiac trauma
9 Cardiac transplant
10 Permanent pacemaker
11 AICD
12 Epicardial lead
13 AF Ablation surgery
14 Surgical Maze
15 Septal Myectomy
16 Cardiac tumor
17 Acute pulmonary embolectomy
18 Pulmonary endarterectomy
19 Pulmonary transplant
20 Ventricular septal rupture (post-infarction VSD)
21 Free wall rupture (post-infarction)
22 BIVAD,
23 LVAD,
24 RVAD
25 ECMO
26 ECLS
27 Pericardiectomy
29 Other

Definitions
Other excludes the procedures listed under the question “Other non-cardiac procedures details”

NON CARDIAC DETAIL: Other non-cardiac procedures details
Text; zero or one or more other values; separated by commas without spaces
0 None
1 Aorta (surgery on the aorta)
2 Other thoracic
3 Carotid endarterectomy
9 Other vascular

Definitions
Others excludes the procedures listed under the question “Other cardiac procedures details”

SEGMENT AORTA : Segments of the aorta
Text; zero or one or more other values; separated by commas without spaces
0 None
1 Root
2 Ascending aorta
3 Arch
4 Descending aorta
5 Abdominal aorta
AORTIC PROCEDURE: Aortic Procedure
Text; zero or one or more other values; separated by commas without spaces
0 Not applicable
1 Interposition tube graft
2 Tube graft and separate AVR / AVP
3 Root replacement with composite valve graft and coronary reimplantation
4 Root replacement with preservation of native valve and coronary reimplantation
5 Homograft root replacement
6 Ross procedure for aortic root pathology (not isolated AVR)
7 Aortic patch graft
8 Sinus of valsalva repair
9 Reduction aortoplasty
10 EVAR (Endovascular Aortic Repair)

AORTIC ROOT ENLARGEMENT
Numeric; single value
0 No
1 Yes

Perfusion and myocardial protection

CPB: Cardiopulmonary bypass
Numeric; single value
0 No
1 Yes - planned
2 Yes - conversion from off-pump

PROTECTION: Predominant form of myocardial protection
Numeric; single value
1 Cardioplegia
2 Non-cardioplegia

CARDIOPLEGIA: Cardioplegia: Solution
Numeric; single value
0 Not applicable
1 Blood
2 Crystalloid

PLEGIA TEMP: Cardioplegia: Temperature
Text; zero or one or more other values; separated by commas without spaces
0 Not applicable
1 Warm
2 Cold

PLEGIA MODE: Cardioplegia: Infusion mode
Text; zero or one or more other values; separated by commas without spaces
0 Not applicable
1 Antegrade
2 Retrograde

PLEGIA TIMING: Cardioplegia: Timing
Numeric; single value
0 Not applicable
1 Continuous
2 Intermittent
NON PLEGIA: Non-cardioplegia myocardial protection
Numeric; single value
0 Not applicable
1 Fibrillation with perfusion
2 Cross-clamp
3 Cross-clamp with direct coronary perfusion
4 Beating heart without cross-clamp

IAPB: Intra-aortic balloon pump (IABP) used
Text; zero or one or more other values; separated by commas without spaces
0 No
1 Pre-operatively
2 Intra-operatively
3 Post-operatively

IABP REASON: Reason for IABP use
Numeric; single value
0 Not applicable
1 Haemodynamic instability
2 PTCA support
3 Cardio-pulmonary bypass wean
4 Unstable angina
5 Prophylactic

VAD: Ventricular assist device used
Numeric; single value
0 No
1 VAD used pre-operatively
2 VAD used intra-operatively
3 VAD used post-operatively

CPB TIME: Bypass time
Real number; integer i.e. 99
Bypass time expressed in minutes
Definitions
Off-pump: bypass time = 0

XC TIME: Cumulative cross-clamp time
Real number; integer i.e. 99
Cumulative cross-clamp time expressed in minutes

ARREST: Total Circulatory arrest
Numeric; single value
0 Not applicable
1 yes: circulatory arrest without cerebral perfusion
2 yes: circulatory arrest with cerebral perfusion

ARREST TIME: Total circulatory arrest time
Real number; integer i.e. 99
Total circulatory arrest time expressed in minutes
Post-operative complications

**REOP** : Re-operation
   Text; zero or one or more other values; separated by commas without spaces
   0 No re-operation required
   1 Re-operation for graft problems
   2 Re-operation for valve problems
   3 Re-operation for bleeding / tamponade
   4 Sternal resuturing for any reason
   5 Re-operation for other cardiac problems

**STROKE** : New post-operative stroke
   Numeric; single value
   0 No
   1 Transient
   2 Permanent

**DIALYSIS** : New post-operative dialysis
   Numeric; single value
   0 No
   1 Yes

**MOF** : Multi-system failure
   Numeric; single value
   0 No
   1 Yes

**WOUND** : postoperative wound infection
   Text; zero or one or more other values; separated by commas without spaces
   0 No
   1 Superficial sternal wound infection
   2 Deep sternal infection
   3 Mediastinitis
   4 Leg wound

**DESTINATION** : Discharge
   Numeric; single value
   0 Not applicable - patient deceased
   1 Home
   2 Convalescence / nursing home
   3 Another unit within the same hospital
   4 Another hospital

**STATUS DISCHARGE** : Patient status at discharge
   Numeric; single value
   1 Alive
   2 Deceased

If deceased, date-of-death
   See date-of-discharge
   Date; format dd/mm/yyyy
   Valid date after 01/01/1880 and <=Today
CAUSE DEATH: Primary cause of death
Numeric; single value
0 Not applicable
1 Cardiac
2 Neurological
3 Renal
4 Vascular
5 Infection
6 Pulmonary
7 Valvular
9 Other

Follow-up data

DATE FU: Date of last follow-up
Date; format dd/mm/yyyy
Valid date after 01/01/1880 and <=Today

STATUS FU: Patient status at last follow-up
Numeric; single value
1 Alive
2 Deceased

Definitions
preferentially > 30 days
## EuroSCORE

<table>
<thead>
<tr>
<th>Patient-related factors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>(per 5 years or part thereof over 60 years)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>1</td>
</tr>
<tr>
<td><strong>Chronic pulmonary disease</strong></td>
<td></td>
</tr>
<tr>
<td>longterm use of bronchodilators or steroids for lung disease</td>
<td>1</td>
</tr>
<tr>
<td><strong>Extracardiac arteriopathy</strong></td>
<td></td>
</tr>
<tr>
<td>any one or more of the following: claudication, carotid occlusion or &gt;50% stenosis, previous or planned intervention on the abdominal aorta,limb arteries or carotids</td>
<td>2</td>
</tr>
<tr>
<td><strong>Neurological dysfunction disease</strong></td>
<td></td>
</tr>
<tr>
<td>severely affecting ambulation or day-to-day functioning</td>
<td>2</td>
</tr>
<tr>
<td><strong>Previous cardiac surgery</strong></td>
<td></td>
</tr>
<tr>
<td>requiring opening of the pericardium</td>
<td>3</td>
</tr>
<tr>
<td><strong>Serum creatinine</strong></td>
<td></td>
</tr>
<tr>
<td>&gt;200m micromol/L preoperatively</td>
<td>2</td>
</tr>
<tr>
<td><strong>Active endocarditis</strong></td>
<td></td>
</tr>
<tr>
<td>patient still under antibiotic treatment for endocarditis at the time of surgery</td>
<td>3</td>
</tr>
<tr>
<td><strong>Critical preoperative state</strong></td>
<td></td>
</tr>
<tr>
<td>any one or more of the following: ventricular tachycardia or fibrillation or aborted sudden death, preoperative cardiac massage, preoperative ventilation before arrival in the anaesthetic room,preoperative inotropic support, intraaortic balloon counterpulsation or preoperative acute renal failure (anuria or oliguria&lt;10 ml/hour)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Cardiac-related factors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Unstable angina</strong></td>
<td></td>
</tr>
<tr>
<td>rest angina requiring iv nitrates until arrival in the anaesthetic room</td>
<td>2</td>
</tr>
<tr>
<td><strong>LV dysfunction</strong></td>
<td></td>
</tr>
<tr>
<td>moderate or LVEF30-50%</td>
<td>1</td>
</tr>
<tr>
<td>poor or LVEF &lt;30</td>
<td>3</td>
</tr>
<tr>
<td><strong>Recent myocardial infarct</strong></td>
<td></td>
</tr>
<tr>
<td>(&lt;90 days)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Pulmonary hypertension</strong></td>
<td></td>
</tr>
<tr>
<td>Systolic PA pressure&gt;60 mmHg</td>
<td>2</td>
</tr>
<tr>
<td><strong>Operation-related factors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Emergency</strong></td>
<td></td>
</tr>
<tr>
<td>carried out on referral before the beginning of the next working day</td>
<td>2</td>
</tr>
<tr>
<td><strong>Other than isolated CABG</strong></td>
<td></td>
</tr>
<tr>
<td>major cardiac procedure other than or in addition to CABG</td>
<td>2</td>
</tr>
<tr>
<td><strong>Surgery on thoracic aorta</strong></td>
<td></td>
</tr>
<tr>
<td>for disorder of ascending, arch or descending aorta</td>
<td>3</td>
</tr>
<tr>
<td><strong>Postinfarct septal rupture</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
**Important**: The previous additive ¹ and logistic ² EuroSCORE models are out of date. A new model has been prepared from fresh data and is launched at the 2011 EACTS meeting in Lisbon. The model is called EuroSCORE II ³ - this online calculator has been updated to use this new model. If you need to calculate the older "additive" or "logistic" EuroSCORE please visit the old calculator by clicking here.

### EuroSCORE II

<table>
<thead>
<tr>
<th><strong>Patient related factors</strong></th>
<th><strong>Cardiac related factors</strong></th>
<th><strong>Operation related factors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong> (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Renal impairment</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extracardiac arteriopathy</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Poor mobility</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Previous cardiac surgery</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chronic lung disease</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Active endocarditis</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical preoperative state</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes on insulin</strong></td>
<td>select</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **NYHA** | | |
| | select | |
| **CCS class 4 angina** | select | |
| 0 | | |
| **LV function** | select | |
| 0 | | |
| **Recent MI** | select | |
| 0 | | |
| **Pulmonary hypertension** | select | |
| 0 | | |
| **Emergcy** | select | |
| 0 | | |
| **Isolated CABG** | select | |
| 0 | | |

### Notes about euroSCORE II

1. **Age** - in completed years. Some of the weighting for age is now incorporated into the renal impairment risk factor, so it is important that all risk factors are entered to give reliable risk estimations - see note [2]. Of over 20,000 patients in the EuroSCORE database, only 21 patients were aged over 90 - therefore the risk model may not be accurate in these patients. Please exercise clinical discretion in interpreting the score. The oldest patient in the EuroSCORE database was 95 - EuroSCORE II is not validated in patients over this age.

2. **Renal impairment** - there are now 3 categories based on creatinine clearance calculated using Cockcroft-Gault formula. Unlike serum creatinine in the old EuroSCORE model, some of the weighting for age is directly incorporated into this factor, as age is a component of creatinine clearance. The 3 categories are:
   - on dialysis (regardless of serum creatinine level)
   - moderately impaired renal function (50-85 ml/min)
   - severely impaired renal function (<50 ml/min) off dialysis

   \[
   \text{Creatinine clearance (ml/min)} = \left(\frac{140 - \text{age (years)}}{\text{weight (kg)}} \times \left(\frac{0.85 \text{ if female}}{0.85 \text{ if female}}\right)\right) / \left(\frac{0.72 \times \text{serum creatinine (µmol/l)}}{0.72 \times \text{serum creatinine (µmol/l)}}\right)
   \]

### Cockcroft-Gault creatinine clearance calculator - for euroSCORE II renal impairment

<table>
<thead>
<tr>
<th><strong>Plasma creatinine</strong> (µmol/L, only)</th>
<th><strong>Weight</strong> (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Age</strong> (years)</th>
<th><strong>Sex</strong> (m or f - lowercase only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 95 for EuroSCORE II</td>
<td>m or f - lowercase only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Creatinine clearance (ml/min)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Click in box for result</td>
</tr>
</tbody>
</table>

* Weight and creatinine have not been directly included in the main EuroSCORE II calculator because they are not direct risk factors in the EuroSCORE II model, other than they contribute to creatinine clearance.
3. Extracardiac arteriopathy - one or more of the following

- claudication
- carotid occlusion or >50% stenosis
- amputation for arterial disease
- previous or planned intervention on the abdominal aorta, limb arteries or carotids

4. Poor mobility - severe impairment of mobility secondary to musculoskeletal or neurological dysfunction

5. Chronic lung disease - long term use of bronchodilators or steroids for lung disease

6. Active endocarditis - patient still on antibiotic treatment for endocarditis at time of surgery

7. Critical preoperative state - ventricular tachycardia or ventricular fibrillation or aborted sudden death, preoperative cardiac massage, preoperative ventilation before anaesthetic room, preoperative indropes or IABP, preoperative acute renal failure (anuria or oliguria <10ml/hr)

8. CCS class 4 angina - angina at rest

9. Recent MI - myocardial infarction within 90 days

10. Pulmonary hypertension - systolic pulmonary artery pressure, now in 2 classes

   - moderate: PA systolic pressure (31-55 mm Hg)
   - severe: PA systolic pressure (>55mm Hg)

11. Urgency - now four classes:

   - elective: routine admission for operation.
   - urgent: patients who have not been electively admitted for operation but who require intervention or surgery on the current admission for medical reasons. These patients cannot be sent home without a definitive procedure.
   - salvage: patients requiring cardiopulmonary resuscitation (external cardiac massage) on route to the operating theatre or prior to induction of anaesthesia. This does not include cardiopulmonary resuscitation following induction of anaesthesia

12. Weight of the intervention - include major interventions on the heart such as

   - CABG
   - valve repair or replacement
   - replacement of part of the aorta
   - repair of a structural defect
   - maze procedure
   - resection of a cardiac tumour

References


3. The manuscript which supports the new model is being submitted for publication. The new model has been validated by the EuroSCORE Project Group and awaits validation by users worldwide. It was presented at EACTS in Lisbon on 3rd October 2011.

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