

NORTHERN NEW ENGLAND CARDIOVASCULAR DISEASE STUDY GROUP

SS# _____
 Zip code _____
 Surgeon _____
 Date of admission _____
 Date of Surgery _____
 Discharge date _____

USE ADDRESSOGRAPH if possible

First Name _____
 Last name _____
 DOB _____
 Medical record number _____

TYPE OF PROCEDURE- ALL

Primary procedure(s) (1=CABG; 2=Valve;
 3=CABG/Valve)
 Other procedure (0=none; 1=VSD; 2=ASD;
 3=Carotid endar.; 4=LV aneur repair; 5=aortic graft/tube; 6=Surg. tx of
 arrhythmias; 7=AICD placement; 8= TMR; 66=Other,describe
 _____)

Use the code 888 for unknown
**Answer questions in white boxes for all procedures; answer additional
 questions if valve or off pump procedure in grey boxes.**

PRE-OP DATA-ALL PROCEDURES

Sex (0=male; 1=female)
 Height (cm)
 Weight (kg)
 Smoker in last year (0=no; 1=yes)
 Known CAD (0=no; 1=yes)
 NYHA class pre-op (1-4)
 COPD requiring tx (0=no; 1=yes)
 Renal failure req. dialysis
 prior to surgery (0=no; 1=yes)
 CHF prior to surgery (0=no; 1=yes, this admit;
 2=prior to admit; 3=current & past)
 Peptic ulcer prior to surgery (0=no; 1=yes)
 Vascular disease (0=no; 1=yes, cerebrovasc dis; 2=yes
 LE dis; 3=yes, both; 4=yes, no info;
 5= aortic aneurysm)
 Known carotid disease (0=no; 1=yes bruit only; 2=yes, by
 imaging(>75% occlusion or prior
 carotid endarterectomy)
 Diabetes (0=no; 1=yes, no seq; 2=yes, w/seq)
 If DM, what tx (0=none; 1=diet only;
 2=oral meds; 3=insulin)
 Hypertension (0=no; 1=yes, on medication;
 2=yes, no medicaton)
 Atrial fibrillation (0=no; 1=yes, new onset;
 2=yes, chronic; 3=yes, history only)
 Cancer (exclud. nonmelanoma
 skin cancer) (0=no; 1=yes)
 Prior neurologic event (0=no; 1=TIA; 2=CVA;
 3=TIA&CVA)
 History of bleeding disorder (0=no; 1=yes)
 Cardiomegaly (0=no; 1=yes)
 Unstable angina this admit (0=no; 1=yes)
 M.I. prior to surgery (0=no; 1= \leq 24 hrs; 2= >24hr & \leq 7
 days; 3= >7 \leq 365; 4= >365)
 Failed medical treatment ... (0=no; 1=yes)
 Objective evidence of
 cardiac ischemia (0=no; 1=yes)
 Pre-op LVH (by EKG) (0=no; 1=yes)
 Pre-op IVCD (by EKG) (0=none; 1=LBBB; 2=RBBB;
 3=other IVCD)

PRIOR PROCEDURES- ALL PROCEDURES

Prior CABG (0=no; 1=yes)
 Prior angioplasty (or attempt) (0=no; 1=yes)
 Prior aortic valve surgery (0=no; 1=prior valve
 replacement; 2=prior
 Prior mitral valve surgery valvuloplasty; 3=other
 Prior tricuspid valve surgery prior valve surgery)
 Prior pulmonic valve surgery

PRE-OP MEDICATIONS/THERAPY- ALL PROCEDURES

Beta blockers w/in 24hrs (0=no; 1=yes)
 Ca⁺⁺ channel blockers w/in 24hrs (0=no; 1=yes)
 ACE inhibitors w/in 24hrs (0=no; 1=yes)
 IV NTG or Oral NTG/patch w/in 24hrs (0=no; 1=yes, IV NTG;
 2=yes, Oral NTG/Patch;
 3=yes, both)
 IV heparin w/in 24hrs (0=no; 1=yes)
 If heparin, was it stopped
 before arrival to OR? (0=no; 1=yes)
 Aspirin w/in 7 days (0=no; 1=yes)
 Thrombolytic therapy w/in 48 hrs (0=no; 1=yes)
 IIB/IIIa agents used within 24 hrs (0=no; 1=yes)

PRE-OP LAB DATA- ALL PROCEDURES

Last pre-op WBC
 Pre-bypass Hct (%)
 Last pre-op creatinine (mg/dL)
 Last pre-op albumin (g/dL; 66=unknown)

CARDIAC CATHETERIZATION DATA- ALL PROC.

Ejection fraction (%)
 LVEDP (pre-dye, post A-wave) (mm Hg)
 Left main disease, % stenosis (%; 0=if none)
 Dominance (0=right/balanced/
 indeterminate; 1=left)
 LAD stenosis \geq 70% (0=no; 1=yes)
 Proximal LAD stenosis \geq 70% (0=no; 1=yes)
 Circumflex stenosis \geq 70% (0=no; 1=yes)
 RCA stenosis \geq 70% (0=no; 1=yes)
 PDA stenosis \geq 70% (0=no; 1=yes)

CARDIAC CATHETERIZATION DATA- VALVE ONLY

Pre-op PCWP (mmHg)
 P.A. systolic pressure (mmHg)
 P.A. diastolic pressure (mmHg)
 Mean P.A. pressure (mmHg)
 End-systolic LV dimension (mm)
 End-diastolic LV dimension (mm)

PRE-OP- VALVE ONLY

Etiology of valve disease ... (0=none; 1=degenerative; 2=rheumatic; 3=congenital; 4=endocard.; 5=ischemic; 6=aortic dissection, 7=mech. valve fail.; 8= tissue valve fail.; 66=other)

Symptoms: Angina (0=no; 1=yes)
 SOB or CHF (0=no; 1=yes)
 Syncope (0=no; 1=yes)
 Asymptomatic (0=no; 1=yes)
 Other symptoms (0=no; 1=yes)

AOR MIT TRI PUL

Pre-op stenosis
 (0=none/trace; 1=mild; 2=moderate; 3=critical; 4=stenosis, amt unkn;

Pre-op regurgitation
 (0=none/trace; 1=mild; 2=moderate; 3=critical; 4=regurgitation, amt unkn),

Acute or chronic regurgitation
 (1=acute; 2=chronic; 8=not applicable)

AOR MIT TRI PUL

Pre-op valve area (sq cm)
 Pre-op mean gradient (mmHg)

TYPE OF PROCEDURE-VALVE ONLY

AOR MIT TRI PUL

Valve replacement
 (0=none; 1=std.replacement; 2=Ross proc.; 3=root, replacement

66=other, describe _____)

Valve repair
 (0=none; 1=repair w/ring; 2=repair w/o ring ; 3= commissurotomy; 66=other, describe _____)

Valve type
 Tissue: 1=homograft/autograft (Ross); 2=homograft only; 3=pericardial; 4=stented porcine; 5=stentless porcine; 66=other, describe _____)

Mechanical: 21=Medtronic Hall; 22=St. Jude; 23=Carbomedics; 66=other, describe _____)

Device size (mm)

Model# Serial#

Aortic valve device
 Mitral valve device
 Tricuspid valve device
 Pulmonic valve device

PROCEDURE DATA-ALL PROCEDURES

Priority at operation (1=emergency; 2=urgent; 3=non-urgent)

Was an IABP inserted (0=no; 1=yes, preop; 2=yes, intraop; 3=yes, postop)

Reason for IABP (1=unstable refractory angina; 2=cardiogenic shock; 3=failure to wean; 4=high risk patient; 5=refractory ventricular failure; 6=mechanical complications due to MI; 66=other)

Aorta assessment (0= not done; 1=TEE; 2=epiaortic ultrasound; 3=palpation)

Atheroma Grade (1=mild; 2=moderate; 3=severe; 4=uninterpretable)

Type of incision (0=sternotomy; 1=ministernotomy; 2=anter-thoracotomy; 3=posterior-lateral; 4=other thoracotomy)

Method of pericardiectomy .. (0=midline; 1=pericardial flap)

Pump support (0= off pump; 1=aortic access; 2=femoral access; 3=axillary access)

Radial artery used (0=no; 1=yes)

Gasto-epiploic artery used .. (0=no; 1=yes, ped; 2=yes, free)

Inferior epigastric used (0=no; 1=yes)
 Endoscopic conduit harvest (0=no; 1=yes, vein; 2=yes, artery; 3=yes, both)
 Left IMA used (0=no; 1=yes, ped; 2=yes, free)

PROCEDURE DATA- ALL PROCEDURES- CONTINUED

Right IMA used (0=no; 1=yes, ped; 2=yes, free)

If IMA not used, why not? .. (1=pt too old; 2=LAD<50%; 3=IMA already used; 4=pt. too unstable; 5=IMA unsuitable; 66=other)

No. of distal anastomoses ...
 If only a single bypass, was it for LM stenosis (0=no; 1=yes)

Metabolic support used (0=none; 1=GIK; 2=T3; 3=GIK & T3, 4= IK; 66=other)

PUMP DATA- ALL ON-PUMP PROCEDURES

Cardioplegia: Type (0= blood; 1=crystalloid)

Delivery Route (0=antegrade; 1=retrograde; 2=both)

Temperature (0=warm; 1=cold; 2=warm/cold/warm; 3=warm/cold; 4=cold/warm)

“Hot shot” used (0=no; 1=yes)

Total clamp time (minutes)

Total pump time (minutes)

Did patient return to bypass pump? (0=no; 1=yes)

If yes, for how long? (minutes)

If returned to bypass, why (0=hemodynamic instability; 1=other surgical reason)

PROCEDURE DATA- OFF PUMP ONLY

Conversion from off pump . (0=no; 1=yes)

Reason for conversion to CPB (1=patient unstable; 2=graft failure; 3=poor exposure; 66=other)

Arterial cannulation (0=aorta; 1=femoral; 2=axillary; 66=other)

Venous cannulation (0=right atrium; 1=bicaval; 2= femoral; 3=jugular; 4=other)

Venous return (0=gravity; 1=vacuum-assisted venous drainage; 2=kinetically-assisted venous drainage)

POST-OP DATA- ALL PROCEDURES

Time to extubation (hours after lv. OR)

Was pt. re-intubated? (0=no; 1=yes)

Cardiac index: On arrival to ICU (1/min/m²)

After 4 hrs in ICU ... (1/min/m²)

Inotropes: On arrival to ICU (number of)

After 4 hrs in ICU (number of)

Inotropes at 48 hours (number of)

Highest post-op creatinine .. (mg/dL)

IN-HOSPITAL OUTCOMES- ALL PROCEDURES

Return to OR? (0=no; 1=yes,bleeding; 2=yes, graft revision; 3=other)

Post-op TIA? (0=no; 1=yes)

Intra- or post-op CVA? (0=no; 1=yes)

Mediastinitis or sternal dehisc requiring re-op? ... (0=no; 1=yes)

Post-op leg wound infection (0=no; 1=yes)

Post-op afib requiring tx? ... (0=no; 1=yes)

Post-op dialysis-new (0=no; 1=yes)

Post-op pneumonia (0=no; 1=yes)

Status at discharge (0=alive; 1=dead)

FLEX SPACE- ALL PROCEDURES

Post-op Q wave MI? (0=no; 1=yes)

Troponin T at 24hrs postop (ng/mL)

Transfusion of RBC Pre-op Intra-op Post-op (#units, 0=none)

DEFINITIONS
TYPE OF PROCEDURE

Other procedures: VSD: Ventricular Septal Defect repair; ASD: Atrial Septal Defect repair; Surgical treatment of arrhythmias: ablation or resection of conduction system; AICD placement: Automatic Implantable Cardioverter/Defibrillator implantation; Combinations: any two or more; TMR: Transmyocardial Revascularization; Other: any significant cardiovascular surgery not included in this list.

PRE-OP

Smoker: Five or more cigarettes a day at any time during the past year.

Known CAD: Angina, previous MI or >50% stenosis of a major vessel

NYHA classification: Functional class I. Patients who have heart disease without limitation of physical activity. Ordinary activity does not cause symptoms. Functional class II. Patients with heart disease with slight limitation of physical activity. Ordinary physical activity causes fatigue, dyspnea, palpitation or angina pectoris. Functional class III. Patients with heart disease who have marked limitation of activity and experience symptoms with less than ordinary activity. They do not have symptoms at rest. Functional class IV. Patients who cannot engage in any physical activity without symptoms and may have symptoms at rest.

Chronic obstructive pulmonary disease: COPD, or asthma requiring inhalers, theophyllines/aminophyllines, or steroids.

Renal failure prior to surgery: On peritoneal or hemo-dialysis.

CHF prior to surgery: Physician's statement in medical record indicating Congestive Heart Failure during current admission, and prior to surgery; clinically manifested by one or more features including exertional dyspnea or fatigue, bilateral pedal edema, orthopnea, paroxysmal nocturnal dyspnea, acute pulmonary edema, or rales.

Peptic ulcer prior to surgery: Known current problem requiring treatment.

Liver disease: mild, no sequelae: cirrhosis, chronic active hepatitis, or primary biliary cirrhosis, without sequelae described below; **moderate to severe, with sequelae:** cirrhosis, chronic active hepatitis, primary biliary cirrhosis, with any of the following sequelae: ascites, esophageal varices, portal hypertension, or hepatic encephalopathy.

Vascular disease as a) cerebrovascular disease: prior CVA, prior TIA, prior carotid surgery, carotid stenosis by history or radiographic studies, or carotid bruit; **as b) lower extremity (LE) disease:** claudication, amputation, prior lower extremity bypass, absent pedal pulses or lower extremity ulcers

Diabetes: Documented in medical record or patient history. **Diabetes with no sequelae:** Diabetes without sequelae described as follows.

Diabetes with sequelae: Diabetes with renal disease, retinopathy, peripheral neuropathy, gastroparesis, or peripheral circulatory disease.

Diabetes oral medications: Acarbose, Amaryl, Chlorpropamide diabinese, Diabeta, Euglucon, Glimepiride, Glipizide, Glucagon, Glucophage, Glucotrol, Glyburide, Glynase, Humulin, Insulin, Metform, Metformin hydrochloride, Micronase, Novolin, Prioglitazone, Protaphane HM, Rezulin, Troglitazone

Hypertension: Documented in medical record or patient history.

Atrial Fibrillation: Sustained atrial fibrillation requiring treatment with digoxin, beta/calcium channel blockers, anti-arrhythmics or cardioversion.

Cancer: Physicians statement in medical record indicating leukemia, lymphoma or solid cancer as a current medical problem.

Prior Neurologic event: 1=TIA: abrupt onset of focal or global neurological symptoms caused by ischemia or hemorrhage resolving within 24hrs;

2=CVA: Loss of neurological function caused by ischemic event persisting more than 24 hours or leaving residual signs

Hx of bleeding disorder: Hemophilia, thrombocytopenia, DIC.

Cardiomegaly: A heart/lung ratio on CxR >50%; a moderately or severely dilated heart on echo; a dilated heart on radionuclide studies.

Other comorbidity: Significant current comorbid condition requiring treatment, existing prior to surgery, not included among categories above.

Unstable angina: Physician's statement in medical record indicating unstable angina during current admission, and prior to surgery; clinically manifested by new onset angina, rest angina, angina of increasing frequency and/or intensity, angina lasting ≥20 minutes despite medication occurring within two weeks of an MI.

MI prior to surgery: The development of a) new Q waves on EKG, or b) new ST-T changes with a significant rise (defined locally) in CPK with positive (defined locally) isoenzymes.

Failed medical therapy: Patients with NYHA or CCS Class II-IV angina who show evidence of ischemia while on medical therapy, have angina that is inadequately responsive to medical therapy (patient and physician agree that angina significantly interferes with the patient's occupation or ability to perform usual activities), are intolerant of medical therapy because of uncontrollable side effects. Patients with unstable or post-infarction angina who can not be safely weaned from intravenous heparin or nitroglycerine.

Objective evidence of ischemia: On ETT at ≤ stage 2 Bruce or 6 METS a) ≥1 mm ST segment depression in ≥2 leads; b) EKG changes lasting ≥3 minutes into recovery; c) ≥10 mm Hg decrease in systolic BP or BP response to exercise ≤130 mm Hg; d) ventricular tachycardia; e) angina. On thallium ETT a) reversible defects in ≥2 area or a large defect in one area; b) increased lung uptake; c) cavity dilatation. On stress Echo a change in systolic wall function from normal to hypo/akinetic, hypokinetic to akinetic or recruitment of function in at least 2/16 segments. On stress, radionuclide testing a) a reduction in EF ≥0.10; b) development of segmental wall motion abnormalities; c) cavity dilatation. Unstable or post-MI angina.

Pre-op LVH (by EKG): From EKG report

Pre-op IVCD (by EKG): From EKG report

PRE-OP MEDICATIONS/THERAPY

Drug list: (this is not an all inclusive list, therefore may not include the drugs you use at your center)

Beta-blocker- Atenolol, Inderal, Labetolol, Lopressor, Metoprolol, Moexipril HCL, Nadalol, Pindolol, Propranolol, Tenormin, Univasc, Toprol (long acting)

Ca+ channel blockers- Amlodipine, Calan, Cardizem, Diltiazem, DynaCirc/Isradipine, Felodipine, Isoptin, Nifedipine, Nimodipine, Procardia, Ramipril, Verapamil, Norvasc

ACE inhibitors- Accupril, Benazepril, Capoten, Captopril, Enalapril, Lisinopril, Lutensin, Ramipril, Vasotec, Zestril, Quinapril

IV NTG- Tridil, Nitroglycerin, Nitro-Bid

Oral/Patch NTG- Deponit, Imdur, Ismo, Isordil, Isosorbide Dinitrate, Isosorbide Mononitrate, Minitran, Nitro-dur, Sorbitrate, Transderm Nitro,

Thrombolytics therapy (anti-thrombotic)- Injection of thrombolytic agent i.e., Alteplase (tpa), Apsac, Retevase/Reteplase, Streptokianase, TNK/tenecteplase, Urokinase

IIb/IIIa agents- Abciximab/ReoPro, Eptifibatide/Integrilin, Plavix, Tirofiban/Aggrestat

DEFINITIONS (continued)

LAB DATA

Last pre-op WBC: Last pre-operative measurement of WBC taken before procedure.

Last pre-op HCT: Last pre-operative measurement of hematocrit taken in the operating room.

Pre-op creatinine: Last pre-operative creatinine measurement taken before procedure. Documented in medical record or patient history.

Pre-op albumin: Last pre-operative albumin measurement taken before procedure. Documented in medical record or patient history.

CARDIAC CATHETERIZATION DATA

Left main disease, % stenosis: If a range is specified on angiography report give an integer midpoint of the range.

Dominance: PDA is subsumed under the right coronary distribution in right dominant anatomy, and under the circumflex distribution in left dominant anatomy. Balanced or indeterminate (not ascertainable or missing) anatomy is treated as right dominant for purposes of classification of single/double/triple vessel disease. An intermediate or ramus is considered a diagonal branch of the LAD distribution.

LAD: Left Anterior Descending artery. **RCA:** Right Coronary Artery. **PDA:** Posterior Descending Artery.

Proximal LAD stenosis: A $\geq 70\%$ stenosis in the LAD prior to the 1st septal perforator.

PROCEDURE DATA

Priority: Emergency: Medical factors relating to the patient's cardiac disease dictate that surgery should be performed within hours to avoid unnecessary morbidity or death. Examples: failed PTCA with acute coronary insufficiency and/or hemodynamic instability, similar situation in absence of PTCA. This case should take precedence in time over an elective case, open a new room, or be done at night, if necessary. **Urgent:** Medical factors require patient to stay in hospital to have operation before discharge. The risk of immediate morbidity and death are not present. Examples: threatening pathologic anatomy such as high grade Left Main Coronary Disease, particularly with moderately severe symptoms or history of life threatening arrhythmia (VF) related to ischemia. May have intra-aortic balloon pump (IABP) or intravenous (IV) nitroglycerin (NTG) as part of treatment program. This case might be done in the next available surgical slot but would not necessarily take precedence over an elective case and could possibly wait for several days. **Non-urgent:** Medical factors indicate the need for operation but the clinical picture allows discharge from the hospital with readmission at a later date for more elective surgery. Little risk of incurring morbidity or death outside of the hospital with good medical management and restricted physical activities.

IABP: Intraortic balloon pump: implant of pulsation balloon device. **Intra-op:** while in the operating room, **Post-op:** after departure from the operating room.

Atheroma grade: Mild= localized thickening less than 3 mm; Moderate= intimal thickening of 3-5 mm; Severe= an area of thickening of greater than 5 mm in one or more segments and one or more of the following: marked calcification, protruding or mobile atheroma, ulcerated plaques, thrombi, or circumferential involvement of most or all of the aorta.

Single artery by-pass of left main: Aortocoronary bypass of lesion in left main coronary artery with no other significant lesions bypassed, as documented in the operative report.

Metabolic support: GIK: glucose-insulin-potassium; T3: thyroid hormone; IK: use of insulin and potassium

PUMP DATA

Temperature: warm = $\geq 35^{\circ}\text{C}$, cold = $< 28^{\circ}\text{C}$

Was "hot shot" used:

Total pump time: Time (in minutes) from point pump is turned on until it is turned off, or sum of these if bypass reinitiated.

Return to pump: Returned to cardiopulmonary bypass after initial complete separation.

Total clamp time: The sum of all time(s) when the aortic cross clamp is in place.

POST-OP DATA

Time to initial extubation: Hours from leaving O.R. to extubation

Cardiac index: On arrival: This is the first index taken in the ICU

Inotropes on arrival: Number of inotropes the patient is on when he arrives to the ICU

Inotropes: epinephrine, milrinone, amrinone, dobutamine, dopamine, levophed

Highest post-op creatinine- highest recorded post-op creatinine

IN-HOSPITAL OUTCOMES

Return to OR: Treatment of post-op thoracic bleeding: Performance of median sternotomy to assess bleeding after initial departure from OR.

TIA: abrupt onset of focal or global neurological symptoms caused by ischemia or hemorrhage resolving within 24hrs.

CVA: Cerebrovascular Accident: Diagnosis documented by MD and defined by the following: new focal neurological deficit which appears and is still at least partially evident more than 24 hours after its onset, occurring during or following the CABG procedure and established prior to discharge.

Mediastinitis/sternal dehiscence: Mediastinitis (two of the following with no other recognized cause: (a) Organisms and white blood cells seen on gram stain aspirated fluid. (b) Positive deep culture; (c) Radiographic evidence of infection) or sternal dehiscence requiring re-operation.

Post-op leg wound infection: Leg incision infection requiring dressings and treatment with antibiotics.

Post-op afib requiring treatment: Significant atrial arrhythmia requiring either medications or pacing.

Post-op dialysis: A new peritoneal or hemo-dialysis that occurred after the procedure.

Post-op pneumonia: The presence of a new lobar infiltrate on chest x-ray and pure growth of a recognized respiratory pathogen or 4+ growth of a recognized pathogen in the presence of mixed growth.

FLEX SPACE

Pre-op transfusion of red blood cells: any transfusion of RBC during this admission by pre-op, intra-op and post-op.