Cohort B Guidelines
August, 2011

Cohort B Definitions - A cardiac interventionalist and two cardiovascular surgeons agree that medical or technical factors preclude operation, based on a conclusion that the probability of death or serious, irreversible morbidity exceeds the probability of meaningful improvement. Specifically, the probability of death or serious, irreversible morbidity associated after open AVR should exceed 50%. It must be acknowledged that "inoperable" is frequently an integration of multiple dimensions of an individual patient in whom no simple, single-factor quantifiable line can be drawn between operable and "inoperable."

Surgeons are required to ask themselves "Before TAVR was available, would I have offered this patient surgical AVR?" The answer must always be "no."

The following guidelines describe the various anatomical and technical factors or medical comorbidities which by themselves or in combination lead to a designation of “inoperable” which makes a patient a possible Cohort B trial candidate.

1. Porcelain Aorta
   a. Definition – Heavy circumferential calcification of the entire ascending aorta extending to the arch such that graft anastomosis at the distal ascending aorta/arch using DHCA is impractical and simple aortic cross-clamping is not feasible
   b. Documentation
      i. Multiple non-contrast axial CT images at levels of STJ, tubular ascending aorta between STJ and innominate, innominate artery, and entire transverse arch showing calcification pattern
      ii. 3-D MIP or CPR reconstructions of non-contrast CT images showing entire ascending aorta and arch
      iii. Surgeon’s documentation of inoperability

2. Hostile Chest
   a. Definition – Abnormal chest wall anatomy due to severe kyphoscoliosis or other skeletal abnormalities (including thoracoplasty, Potts’ disease), complications from prior surgery, evidence of severe radiation (especially 60Co Cobalt orthovoltage) damage, e.g., skin burns, bone destruction, muscle loss, diffuse calcification of aorta, aortic and mitral valves, and coronary ostia, radiation lung fibrosis or esophageal stricture, history of multiple recurrent pleural effusions or other reasons that make redo operation through sternotomy or right anterior thoracotomy prohibitively hazardous. History of reconstruction for sternal infection, in the absence of other unusual anatomic features, does not meet the definition.
   b. Documentation
      i. CT scan and chest x-ray images showing abnormal anatomy
      ii. Picture of chest wall to illustrate abnormal radiation damage or abnormal anatomy, if possible
iii. Surgeon’s documentation of inoperability

3. Pulmonary Disease
   a. Definition – Severe COPD, pulmonary fibrosis or restrictive lung disease that make the likelihood of postoperative respiratory failure > 50%
   b. Documentation
      i. PFTs - FEV1 (volume and % predicted), adjusted DLCO (value and % predicted)
      ii. Room air ABG including \( p_aCO_2 \), \( p_aO_2 \)
      iii. CT scan lung window axial images may be helpful in patients with pulmonary fibrosis or severe COPD
      iv. CT surgeon or Pulmonologist assessment of inoperability based on severe lung disease
         – There are no absolute cutoffs that make someone inoperable but instead it should be based on an assessment of the overall clinical picture

4. RIMA/LIMA or other critical conduit(s) crossing midline and/or adherent to posterior table of sternum
   a. Definition – In patients with prior CABG, a patent LIMA or RIMA graft that is adherent to the sternum such that injuring it during re-operation is likely. Although there are no absolute criteria regarding this factor, a patient may be considered inoperable if any of the following are present:
      i. The conduit(s) are radiographically indistinguishable from the posterior table of the sternum
      ii. The conduit(s) are radiographically distinguishable from the posterior table of the sternum but lie within a 2-3 mm of the posterior table.
   b. Documentation
      i. Axial CT scan images illustrating graft crossing the midline so the distance from sternum to graft can be measured.
      ii. Angiogram from the lateral and PA projections and/or a CPR or VR 3-D reconstructed CT scan image showing relationships between graft and sternum

5. Frailty
   a. Definition – A clinical syndrome in which multiple medical comorbidities result in debilitation such that the likelihood of meaningful functional recovery after open AVR is less than 50%. A majority of the PARTNER-II patients must be able to complete 6 minute walk testing by protocol; thus, neuromuscular impairments and motor sequelae of prior strokes argue against their candidacy.
   b. Documentation
      i. Surgeon and Cardiologist documentation of subjective factors that make a patient frail
      ii. Frailty index as defined in CRF – to be classified as frail, being the sole or primary reason for inoperability, must fulfill 3 out of 4 criteria listed below
         1. Grip strength (< 18 kg)
         2. 5 meter walk (> 7 secs)
         3. Serum albumin (< 3.5 mg/dL)
4. Katz ADLs (4/6 or less)

5. Picture of patient, if possible

   iii. Surgeon’s documentation of inoperability

6. Severe Pulmonary Hypertension

   a. Definition – Primary or secondary pulmonary hypertension with PA systolic pressures greater than 2/3 of systemic pressure

   b. Documentation

      i. R and LHC pressures documenting PA and systemic pressures

      ii. Documentation of secondary causes of pulmonary hypertension

      iii. Rarely, can be the sole cause of inoperability

      iv. Surgeon’s assessment of inoperability

7. Dementia

   a. Definition – Neurologic impairment such that day to day functioning is impaired. Patient’s with early or intermediate dementia can be considered for the trial. Patients with severe dementia who are unable to consent for themselves cannot be enrolled. A formal neurologic assessment is recommended but the following guidelines documenting severity can be considered:

      i. Early: May lose keys, occasional forgetfulness, still independent, often driving, may be on Aricept. Should be cohort A or receive open AVR, can’t call a Cohort B

      ii. Intermediate: Patients with mild cognitive dysfunction can be enrolled if they can give fully informed consent for the trial, e.g., more forgetful, still feeds, dresses, not driving, requires constant supervision. May consider for Cohort B; however, since serial neurological assessment is a key part of PARTNER-II trial these patients are not good Cohort B candidates.

      iii. Late: Not living independently, cannot give informed consent, most in SNF or assisted living home requiring lots of attention. Palliative/supportive care only, not a trial candidate

   b. Documentation

      i. Expert referral (neurologist or psychiatrist) required if dementia is primary factor for Cohort B status. Patients with intermediate dementia can be considered non-operative but patients with mild or early dementia will be considered operative candidates

      ii. Listing of neurologic medications patient is taking

      iii. Surgeon’s assessment of inoperability

8. Liver Cirrhosis

   a. Definitions

      i. Biopsy proven cirrhosis with portal hypertension or hepatocellular dysfunction

   b. Documentation
i. MELD Score, Childs class, Hx and date of encephalopathy, esophageal varices, history of UGI bleed, TIPPS, history of portal-caval or spleno-renal shunt
ii. Treatment plan from hepatologist and expected survival
iii. Plan for intraprocedural imaging in patients with esophageal varices
iv. Surgeons assessment of inoperability

9. Severe Cerebrovascular Disease
   a. Definition
      i. Bilateral compromised anterior and vertebrobasilar cerebral circulation which is not revascularizable
   b. Documentation
      i. DSA, CTA or MRA showing vascular pathologic anatomy
      ii. If possible, functional assessment (e.g., Diamox PET scan) to show impaired cerebral flow reserve
      iii. Expert referral required from qualified neurologist to document risks of anesthesia and surgery
      iv. Rarely, is the sole reason for inoperability
      v. Surgeons assessment of inoperability