



PATIENT ASSESSMENT FOR TRANSCATHETER AORTIC VALVE REPLACEMENT

Team Based Care

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THE MULTIDISCIPLINARY TAVR TEAM



Cardiovascular Surgeon

Cardiologist :

- Medical
- Interventional
- Echocardiography

Neurologist

Anesthesia

Nurse Practitioner

**Research Nurse &
Coordinators**

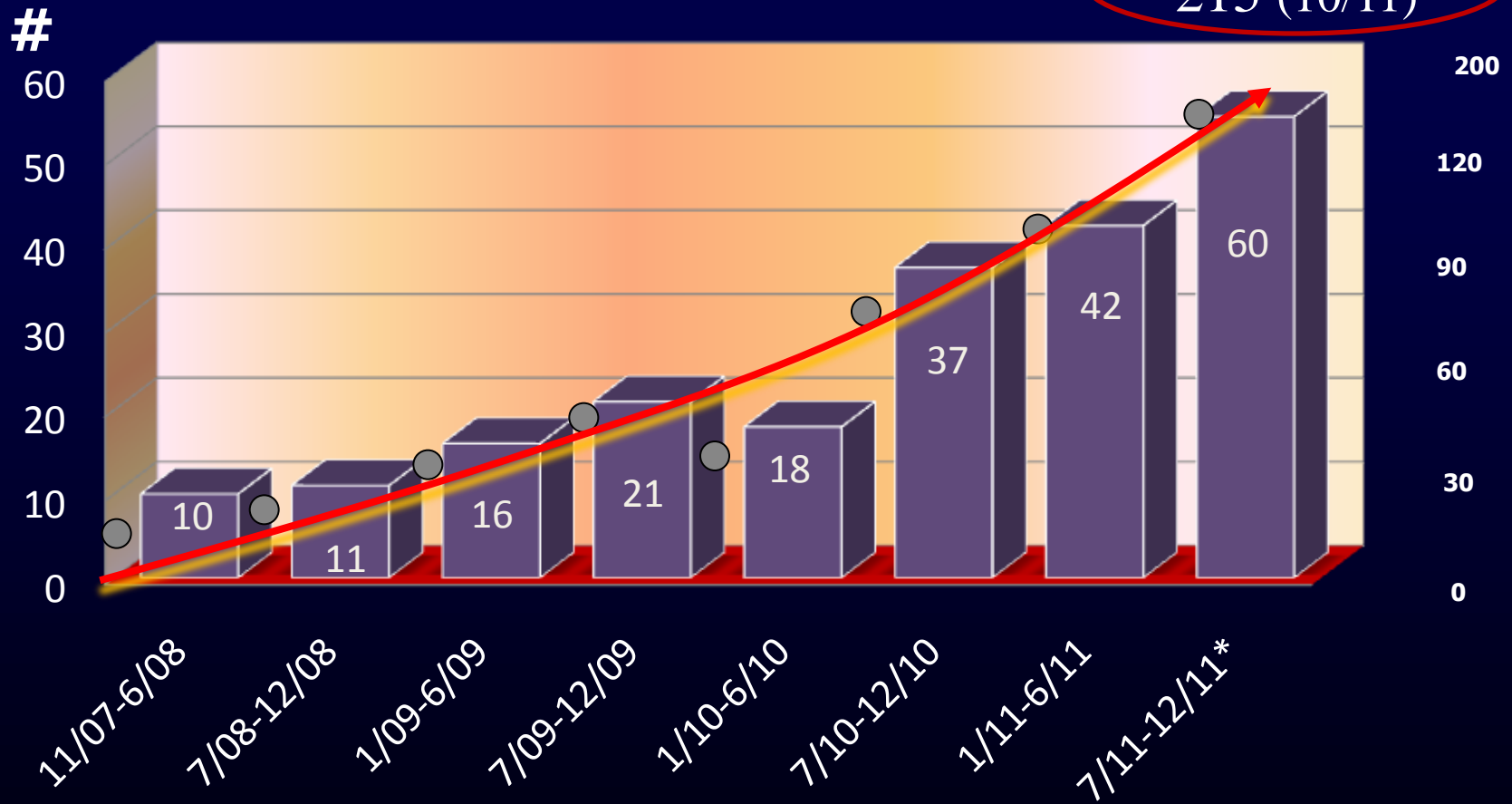
OR & Cath lab staff

Administrative Support



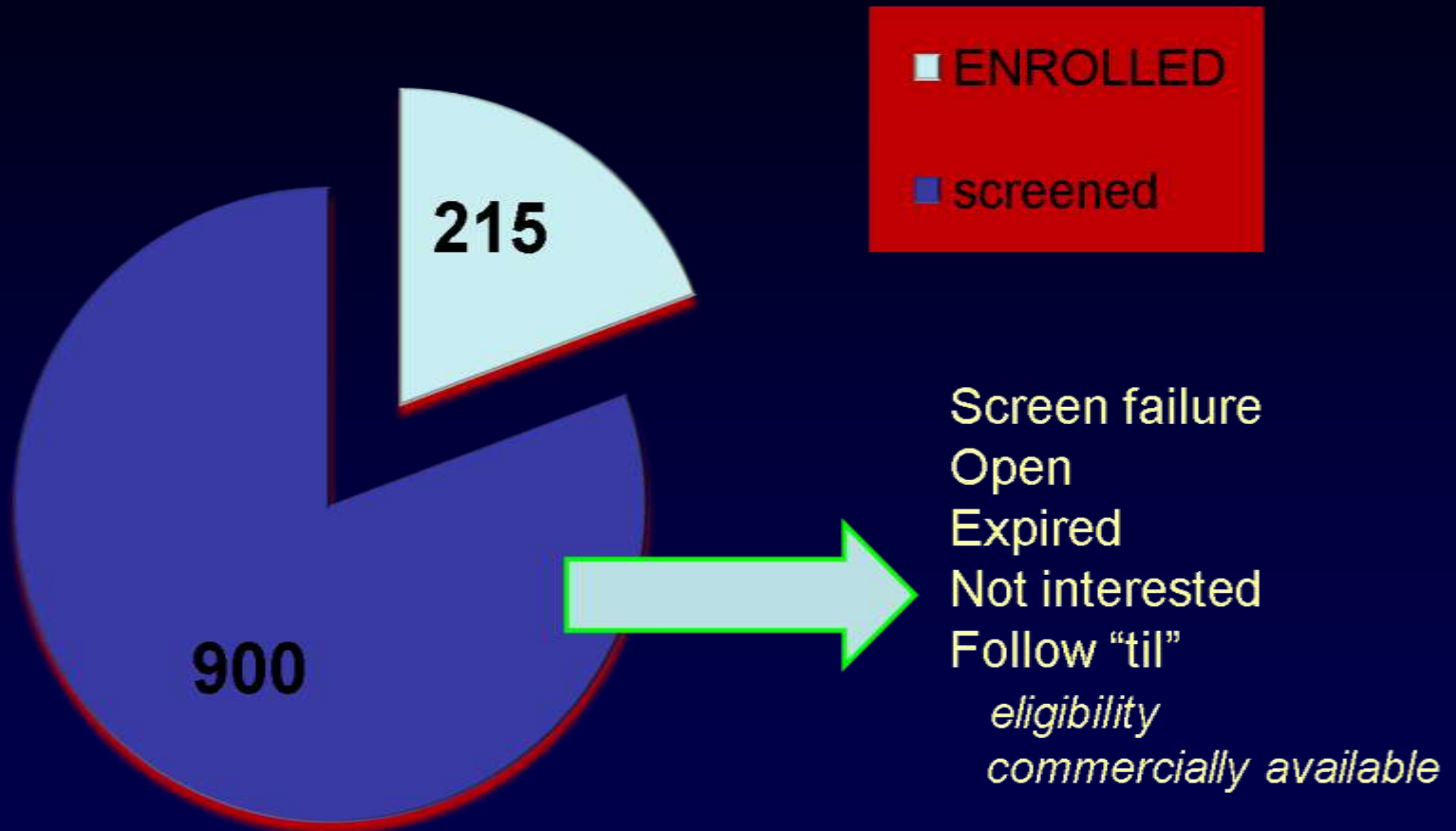
HUP TAVR Procedures: The Tip of the Iceberg

Cum





Number Patients Evaluated





PREVELANCE ESTIMATES: AS

25% of people age 65-74

48% of people over age 84

Mild AS: 10.5 %

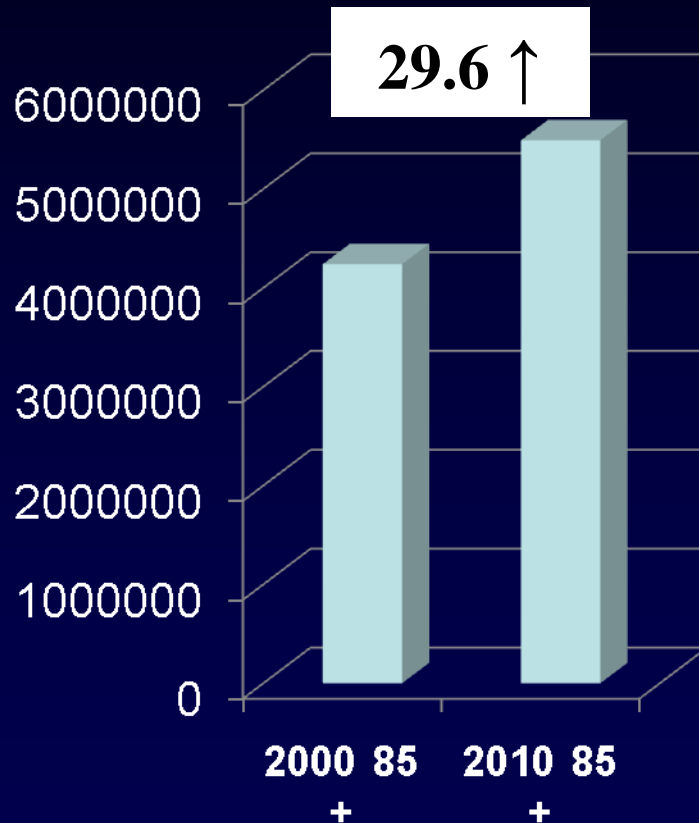
Moderate AS: 2.9 %

Severe AS: 2.5 %



AGING POPULATION and AORTIC STENOSIS

Percent change in US Population 2010-2011



US Census bureau predicts that from 2009-2050, the world's 85 and over population will grow 5 fold from 40 million to 219 million

Source US Census Bureau 6/23/09

http://www.census.gov/newsroom/releases/archives/international_population/cb09-97.html

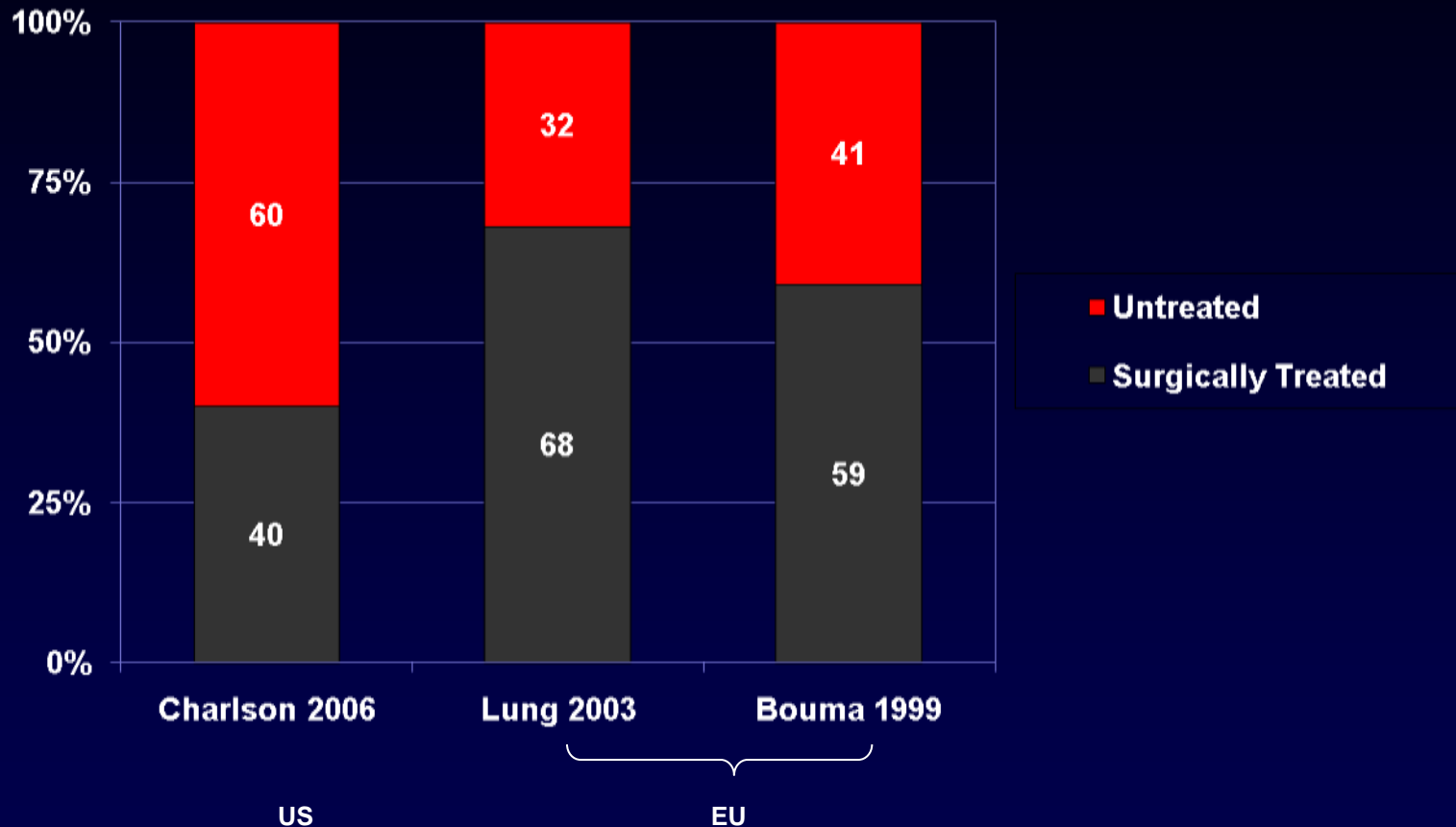


WHO SHOULD HAVE AORTIC VALVE REPLACEMENT SURGERY?

“AVR must be considered in all elderly patients who have symptoms caused by AS..”



Many patients with Severe AS are NOT surgically treated



* EuroHeart Survey: Single Valve Disease (AS, MR)

1. Charlson E et al. Decision-making and outcomes in severe symptomatic aortic stenosis. *J Heart Valve Dis* 2006;15:312-321
2. Lung B et al. A prospective survey of patients with valvular heart disease in Europe: The Euro Heart Survey on Valvular Heart Disease. *European Heart Journal* 2003;24:1231-1243
3. Bouma B J et al. To operate or not on elderly patients with aortic stenosis: the decision and its consequences. *Heart* 1999;82:143-148



Previously, Surgery not offered because:

- Age (>85)
- CAD and EF <30%
- Creatinine >200 μ mol/L
- Decreased lung function (abnormal FEV₁)
- Excess Hypertrophy
- Porcelain Aorta
- Neurological/psychiatric deficits which restrict independence or outside activity
- Deconditioning/ Debilitation

Source: Pretre et al.. Cardiac valve surgery in the octogenarian. *Heart* 2000;93:116-121;

Bonow et al., AHA/ACC Guidelines for Management of Valvular Heart Disease 2006;48:e1-e148 *J. Am. Coll. Cardiol.*



Now, TAVR is an option in patients who previously had no option

Assess:

- Study: Inclusion/ Exclusion
- Eyeball test
- STS score
- Factors Beyond the STS
- Access options
- Expectations, Reality



INCLUSION / Exclusion Criteria – key points

Inclusion:

- Patient has severe aortic valve stenosis per echo: mean gradient >40 mmHg or jet velocity greater than 4.0m/s and an aortic valve area of <0.8 cm² or indexed EOA <0.5 cm²/m²
- NYHA ≥ 2
- Probability of death or serious, irreversible morbidity $> 50\%$
- Patient or patient's legal representative has been informed of the nature of the study and has provided written informed consent



Exclusion Criteria: Cardiac Factors

- MI \leq 1 month before treatment
- Congenital unicuspid or bicuspid aortic valve or non-calcified aortic valve
- Mixed aortic valve disease
- Cardiac procedure resulting in a permanent implant performed within 30 days of the procedure or within 6 months if drug eluting coronary stent implanted
- Severe mitral insufficiency
- Untreated clinically significant coronary artery disease
- Need for emergency surgery
- Hypertrophic cardiomyopathy
- Severe ventricular dysfunction
- ECHO evidence of intracardiac mass, thrombus or vegetation
- Native aortic annulus size $<18\text{mm}$ or $>25\text{mm}$
- Active endocarditis or other active infections within 6 months of procedure
- Bulky calcified aortic valve leaflets in close proximity to coronary ostia



Exclusion Criteria: Extra Cardiac

- Leukopenia, acute anemia, thrombocytopenia, bleeding diathesis or coagulopathy
- Hemodynamic or respiratory instability within 30 days of screening
- Active peptic ulcer or active GI bleeding within 3 months prior to procedure
- A known contraindication to anticoagulation or inability to be anticoagulated for the study procedure
- CVA, TIA or cluster within 6 months of the procedure
- Renal insufficiency and/or end-stage renal disease requiring dialysis at the time of screening
- Estimated life expectancy <12 months due to non-cardiac conditions
- Significant aortic disease, such as abdominal aortic or thoracic aneurysm, marked tortuosity, aortic arch atheroma
- Iliofemoral vessel characteristics that would preclude safe placement of the study introducer sheath such as severe obstructive calcification, severe tortuosity or vessels size

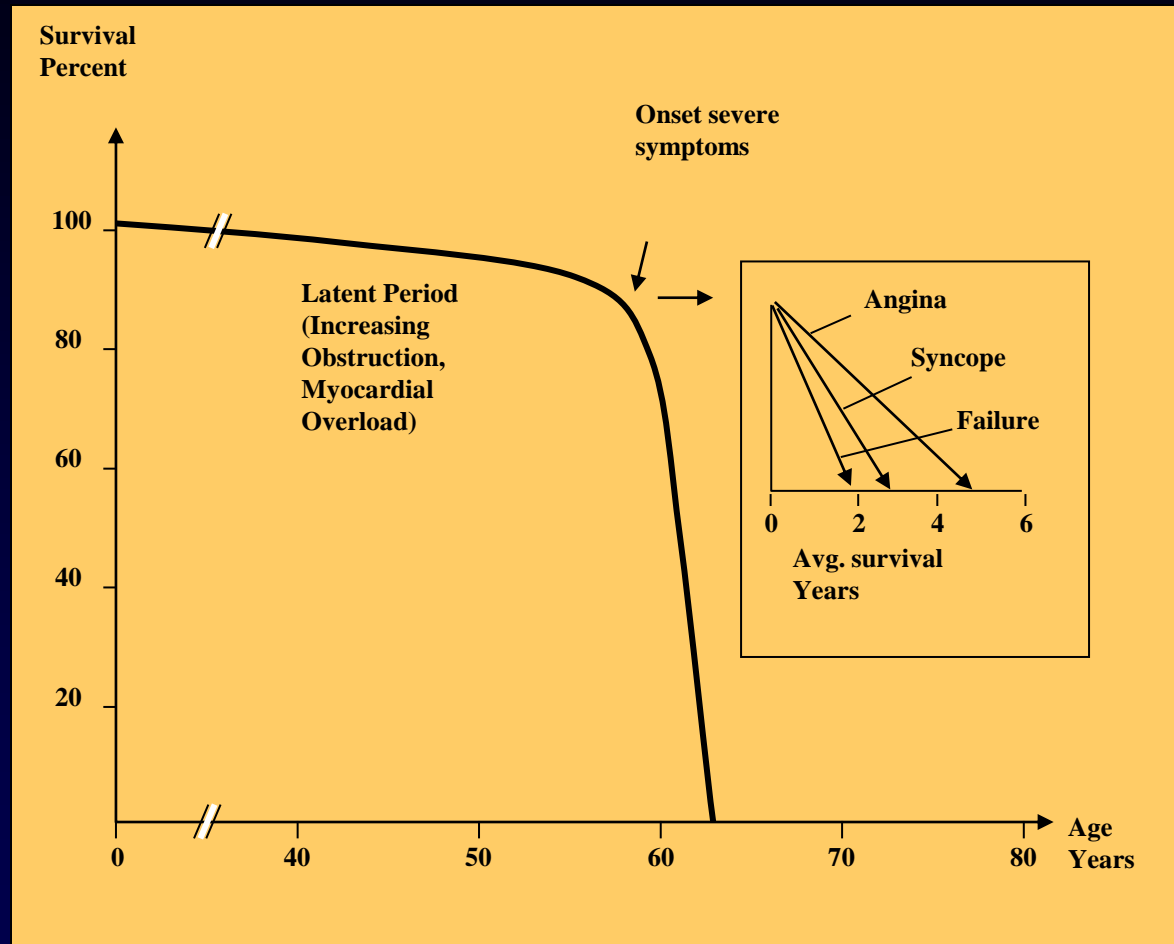


The Look Test: Operable or not?





Where is this patient in relation to disease?




Source: Chart: Ross J Jr, Braunwald E. Aortic stenosis. *Circulation* 1968;38 (Suppl 1) C.M. Otto. Valve Disease: Timing of Aortic Valve Surgery. *Heart* 2000



STS Calculator

Calculates patient risk of mortality and other morbidities based on preoperative risk variables

**Online STS Risk Calculator** Dataset: 2.61 [Definitions](#) [Support](#)

[Help](#) [More about Risk Calculator](#) [New](#) [Print](#)

Today's Date 10/9/2011

Procedure

Coronary Artery Bypass Yes No Missing

Ventricular Assist Device Yes No Missing

Valve Surgery Yes No Missing

Aortic

- No
- Replacement
- Repair/Reconstruction
- Root Reconstruction with Valve Conduit
- Replacement + aortic graft conduit (not a valve conduit)
- Root Reconstruction with Valve Sparing
- Resuspension Aortic Valve with replacement of ascending Aorta
- Resuspension Aortic Valve without replacement of ascending Aorta
- Resection Sub-Aortic Stenosis
- Missing

Mitral

- No
- Annuloplasty Only
- Replacement

Calculations	
Procedure Name	Isolated AVRepl
Risk of Mortality	15.9%
Morbidity or Mortality	44.3%
Long Length of Stay	26.2%
Short Length of Stay	6.8%
Permanent Stroke	6.7%
Prolonged Ventilation	34.7%
DSW Infection	0.1%
Renal Failure	17.5%
Reoperation	15.9%



Beyond STS

Lung Disease

Cancer current/ prior radiation to chest

Frailty

Excess Hypertrophy

Extensive MAC

Bleeding Risk

Dementia

Desire

Family Input



Unique anesthesia Issues





FRAILTY

ADLs

Albumin

Grip Strength

15 Foot Walk

Frailty Index

How frail is too frail?



The TAVR Work Up

- ECHOCARDIOGRAM
- DOBUTAMINE STRESS ECHO (low gradient AS)
- CTA CHEST/ABDOMEN/PELVIS (with & without contrast)
- CARDIAC CATHETERIZATION
- PFT
- CAROTID ULTRASOUND
- PVR

Co morbid
conditions

An occasional challenge in an elderly population!



Evaluating Access : CT Review:



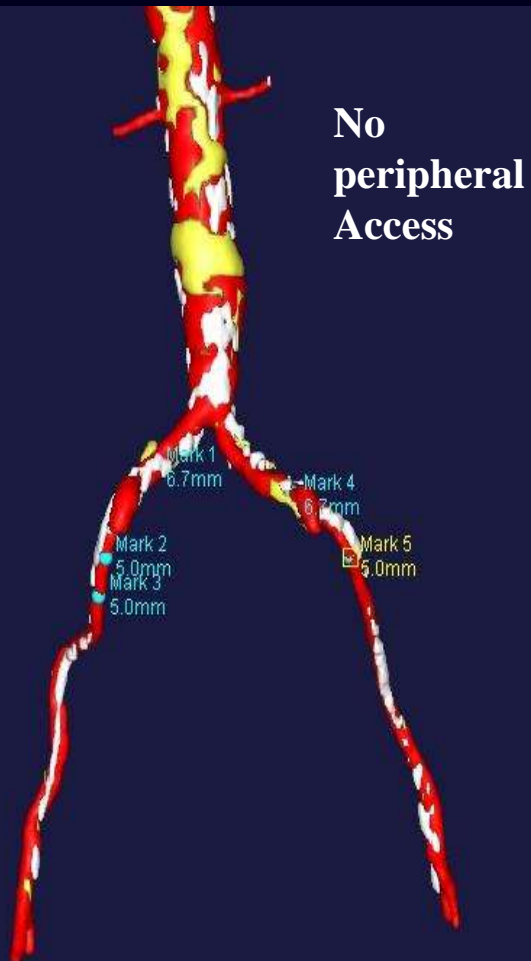
Large iliofemoral vessels on contrast images

Calcified bifurcation on non contrast images

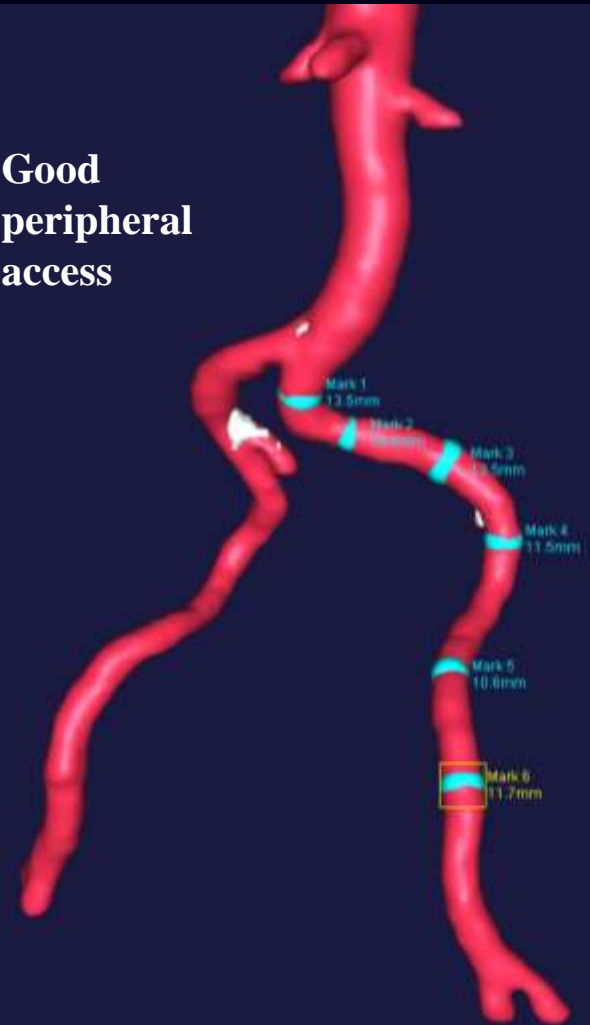




Evaluating Access : M2S reconstruction

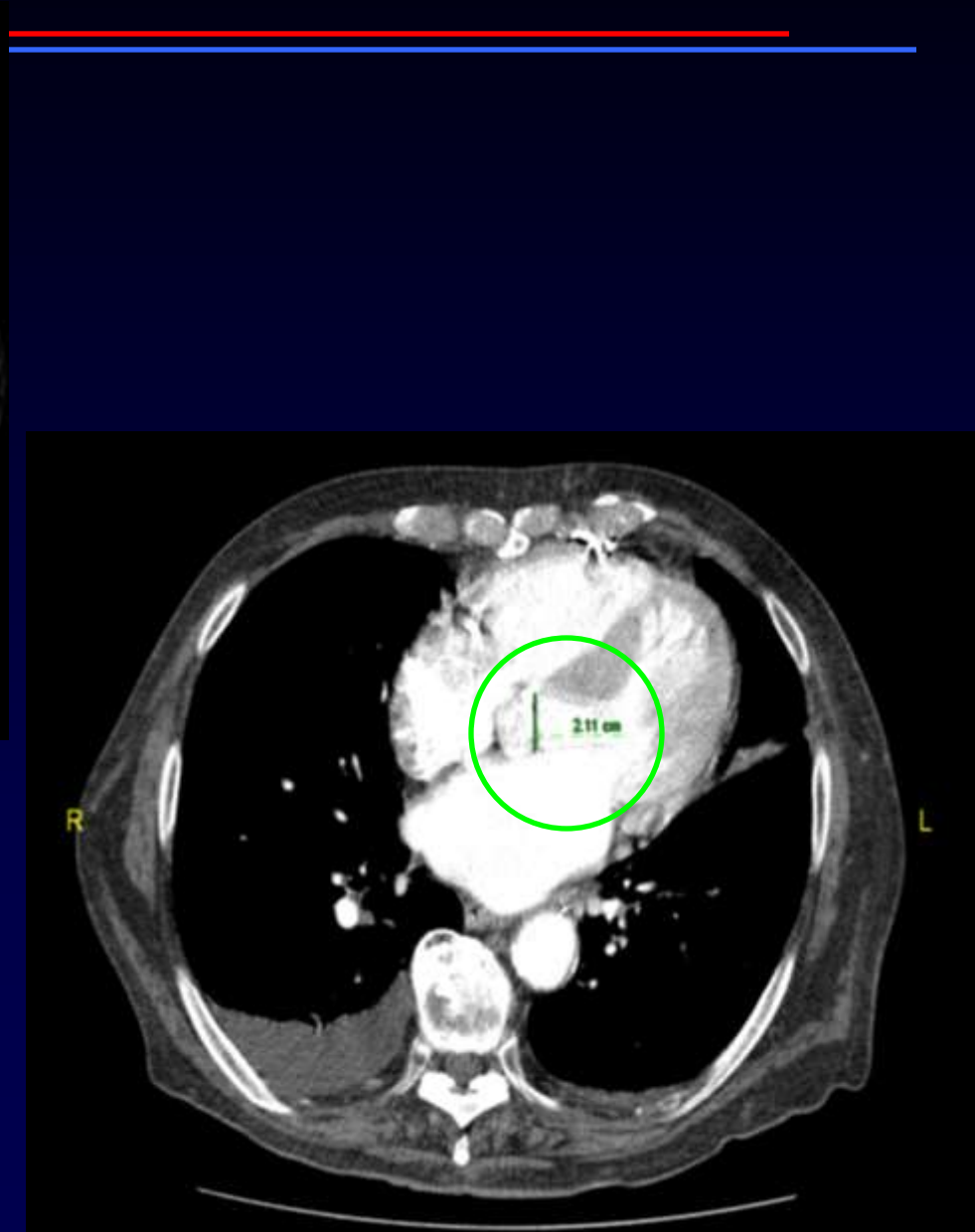
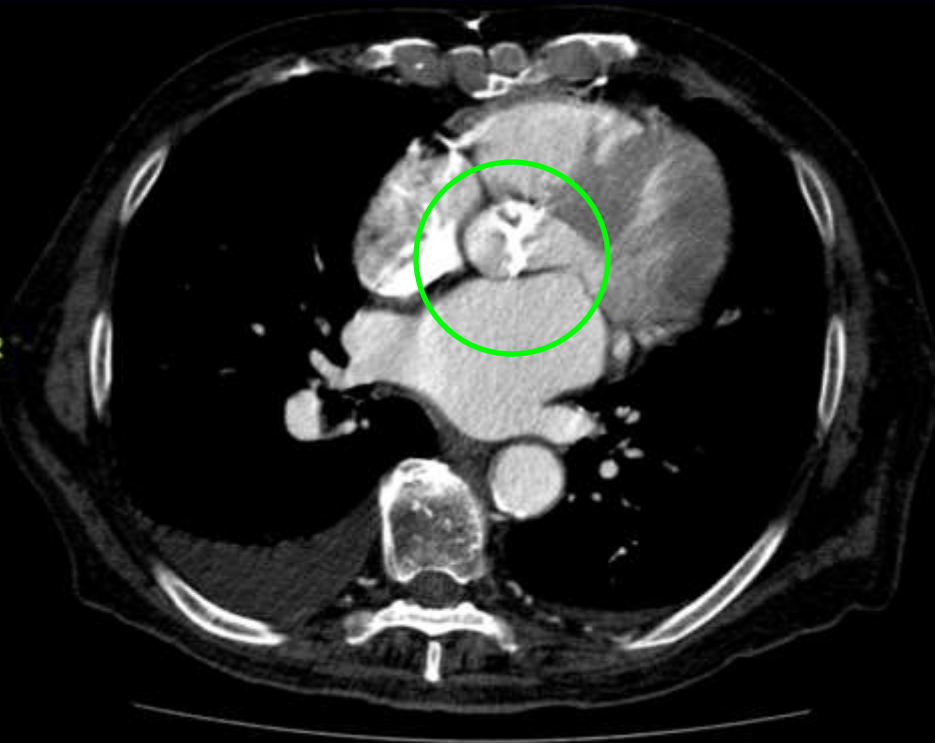


Good peripheral access



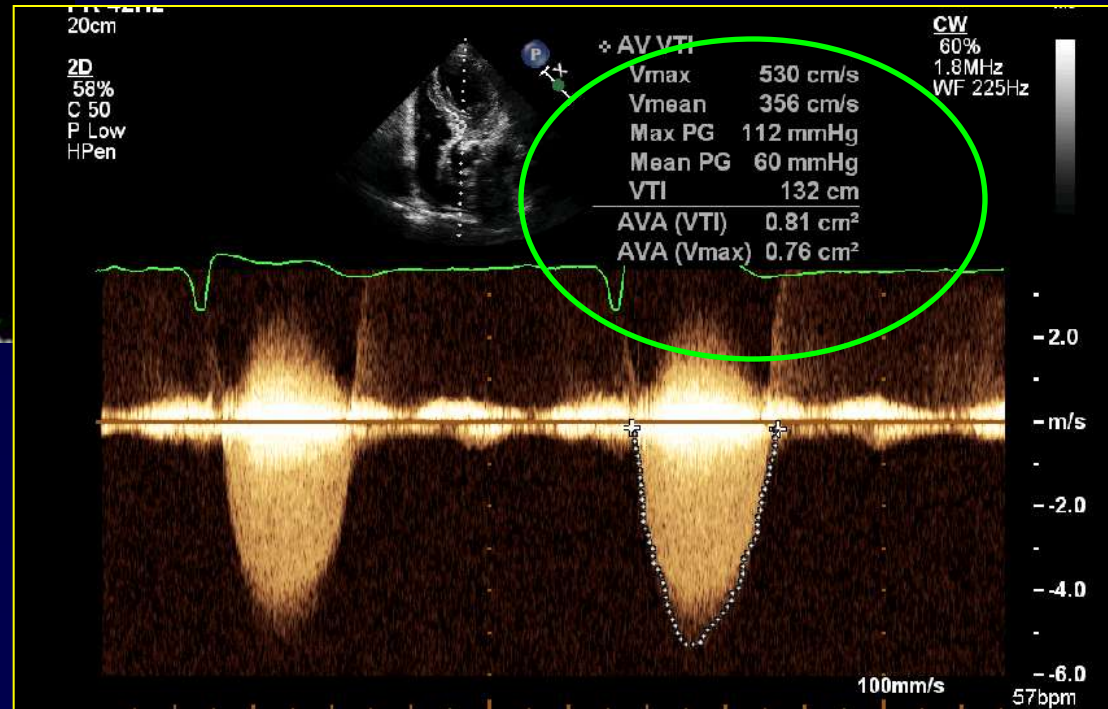


CT Review: Calcific AS / LVOT



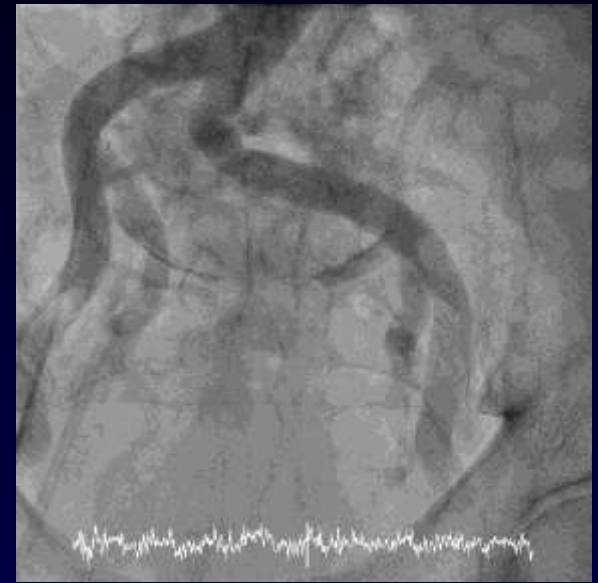


Echo Assessment: LVOT/ Valve/ EF





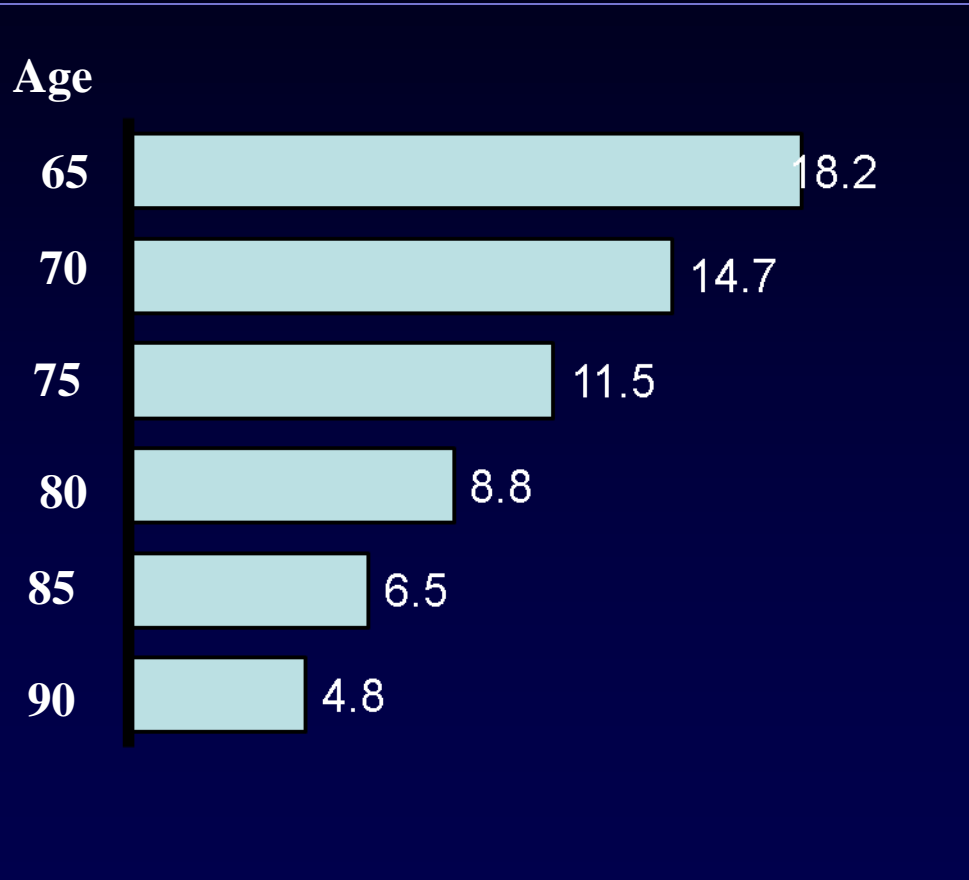
Cardiac Catheterization



**Hemodynamic
Assessment**



Life expectancy for US population Years



Managing realistic expectations relative to life expectancy and coexisting comorbid conditions:

**COPD
Arthritis
Debilitation**



Key Points to Patient /Family Education:

- Managing patient and family expectations relative to existing co morbid conditions:
- This is not non-invasive!
surgical risk, stoke risk, vascular complication
- Preoperative management & communication
 - *with patient and team!*