Updates on the Management of Aortic Stenosis

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Objectives

Review

- Review the incidence and history of aortic stenosis.

Determine

- Determine identification of patients and when to refer.

Learn

- Learn treatment strategies.

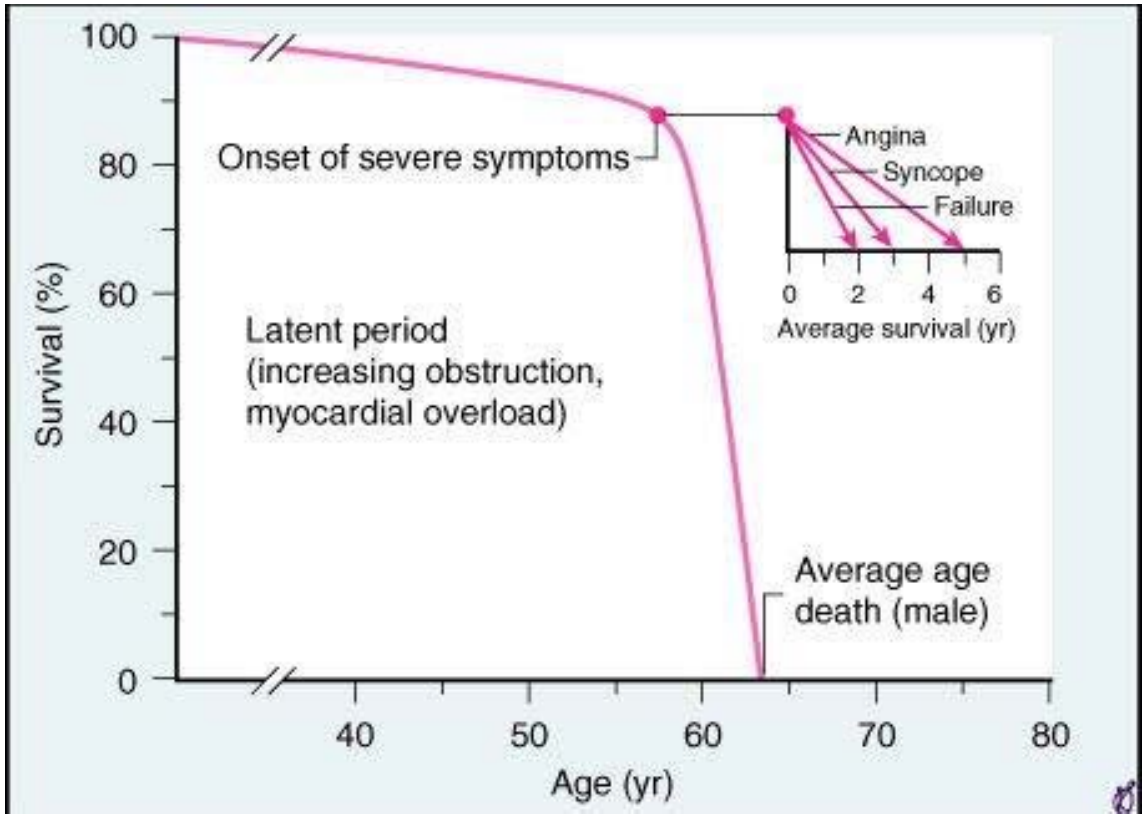
Financial Disclosures

Dr's Hollenbeck & Lee: None

Incidence of Aortic Stenosis, Risk Factors & Symptoms

Incidence of aortic stenosis:
2.5 million >75 yr. old in US (about 12% of population)
300,000 cases per year in the US
Most common valvular disease requiring valve replacement
What are the risk factors?
Older age – degenerative disease
Congenital – bicuspid aortic valve
CV risks- Diabetes, High blood pressure, High cholesterol
Symptoms of severe aortic stenosis:
Shortness of breath, fatigue, chest pain, syncope, arrhythmia

Survival Rate After Onset: 50% Mortality after Two Years



Case Study

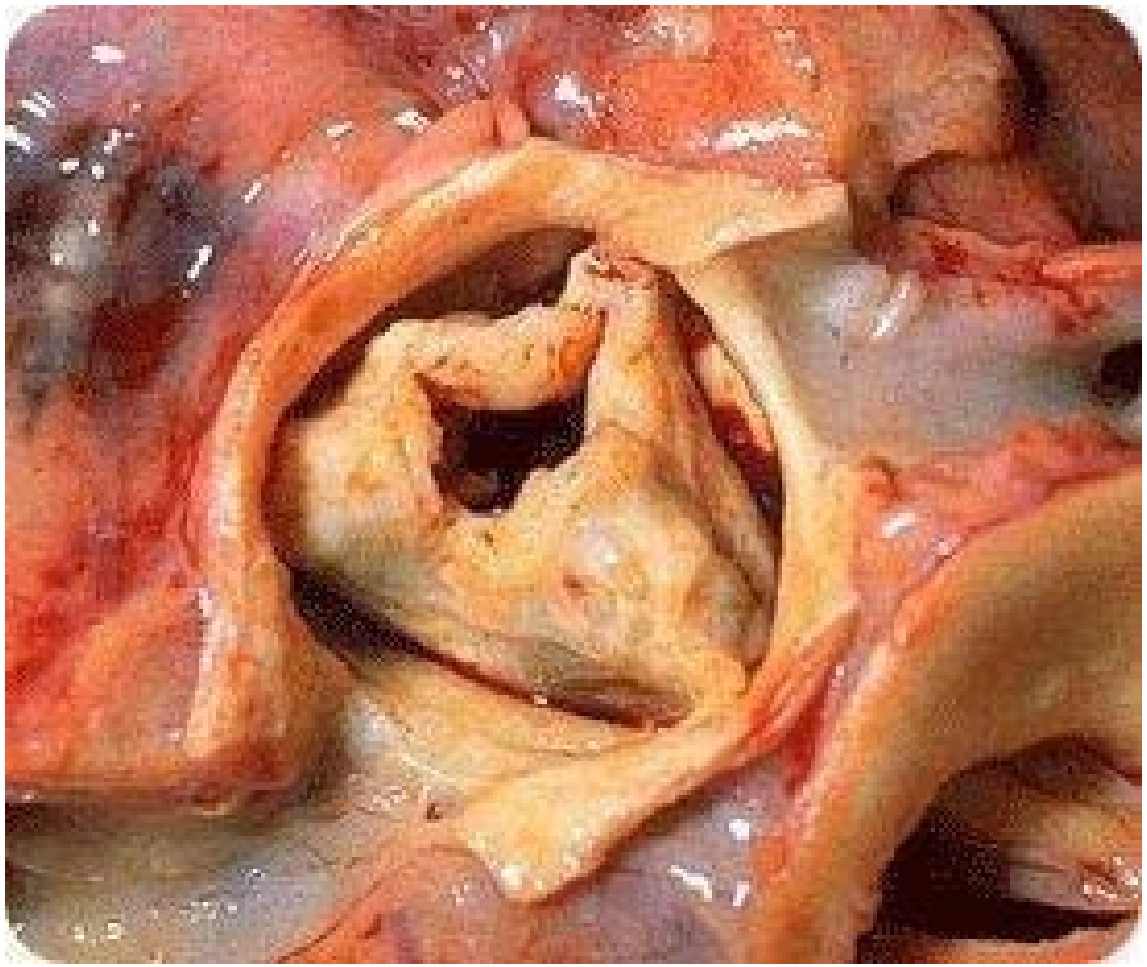
74 yr.-old female presents to your office for her annual exam. On physical exam, all systems were within normal limits, except a systolic murmur was noted. She reported that she gets around okay but is a little tired.

You order an echocardiogram, EKG and blood work.

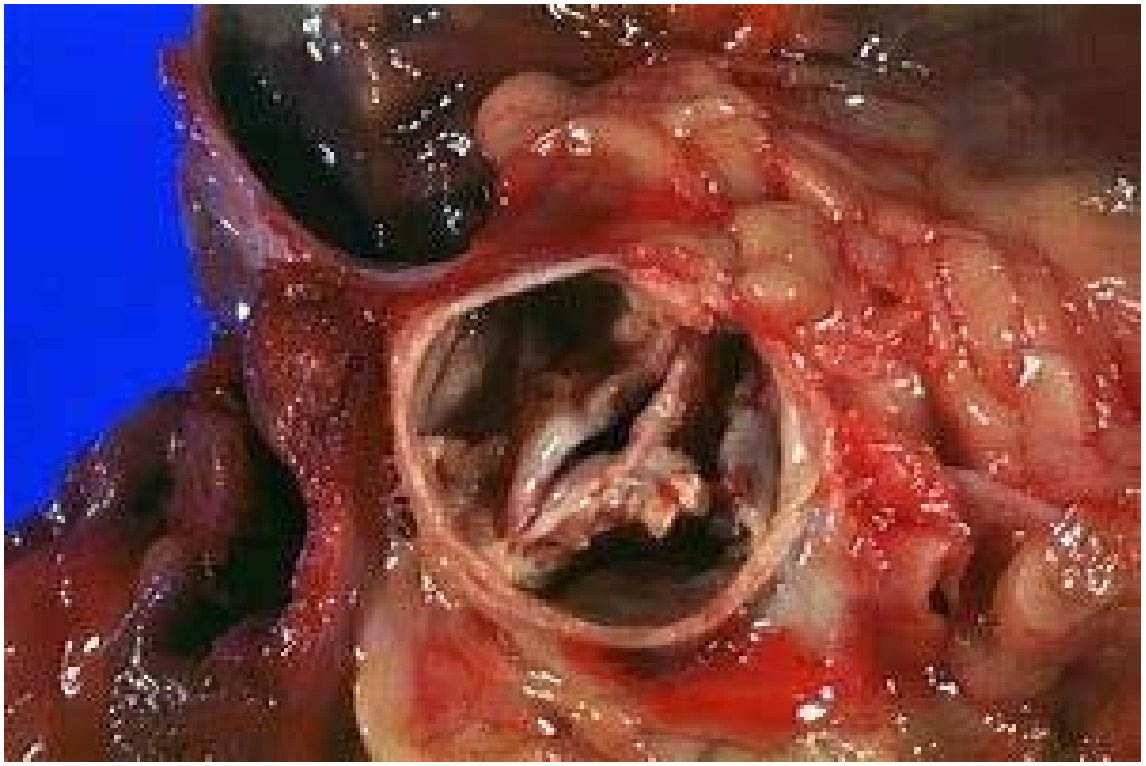
Echocardiogram reveals severe aortic stenosis with a mean gradient of 45 mm Hg, peak velocity of 4.2 m/s and aortic valve area of 1 $cm.^2$

Next steps: Ambulatory referral to Mercy Cardiology, **even if asymptomatic**.

Aortic Stenosis



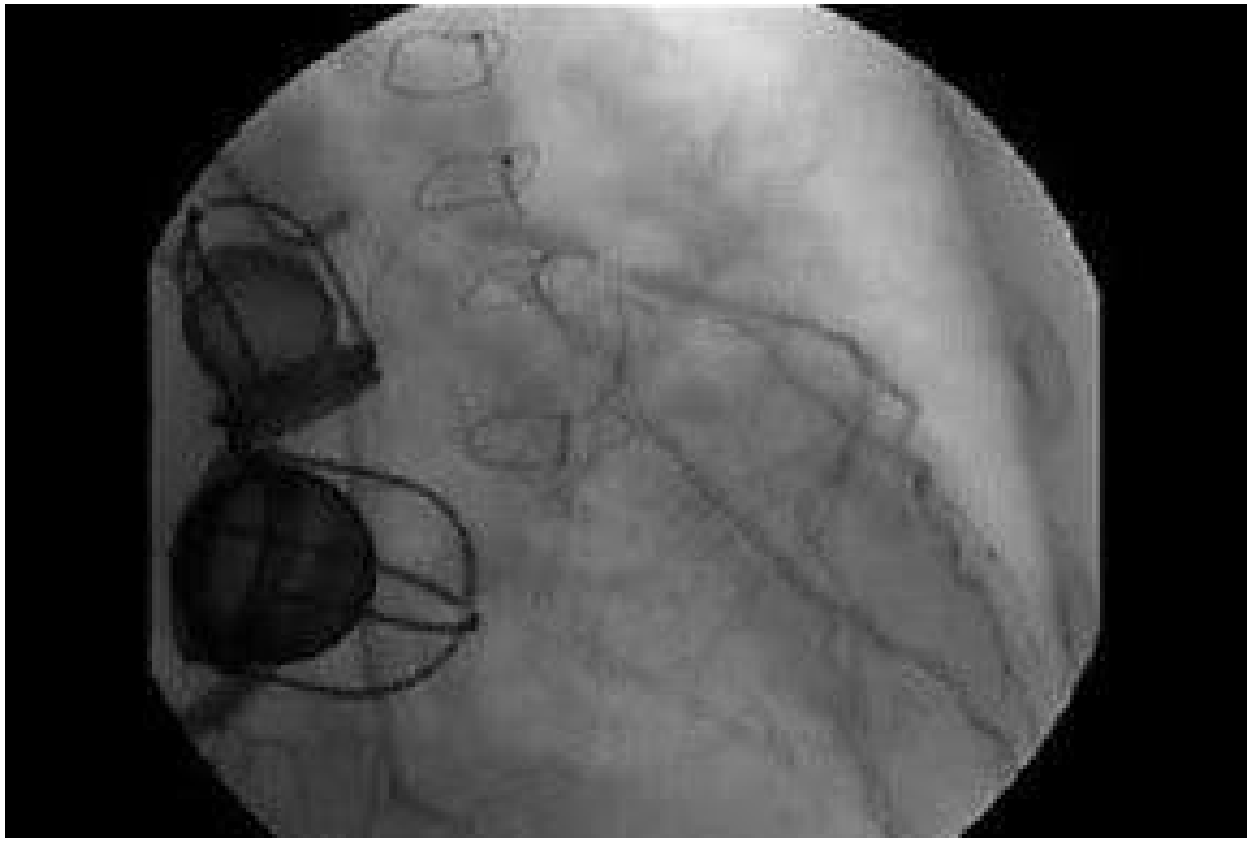
Bicuspid Valvular Disease



History of Aortic Valve Surgery

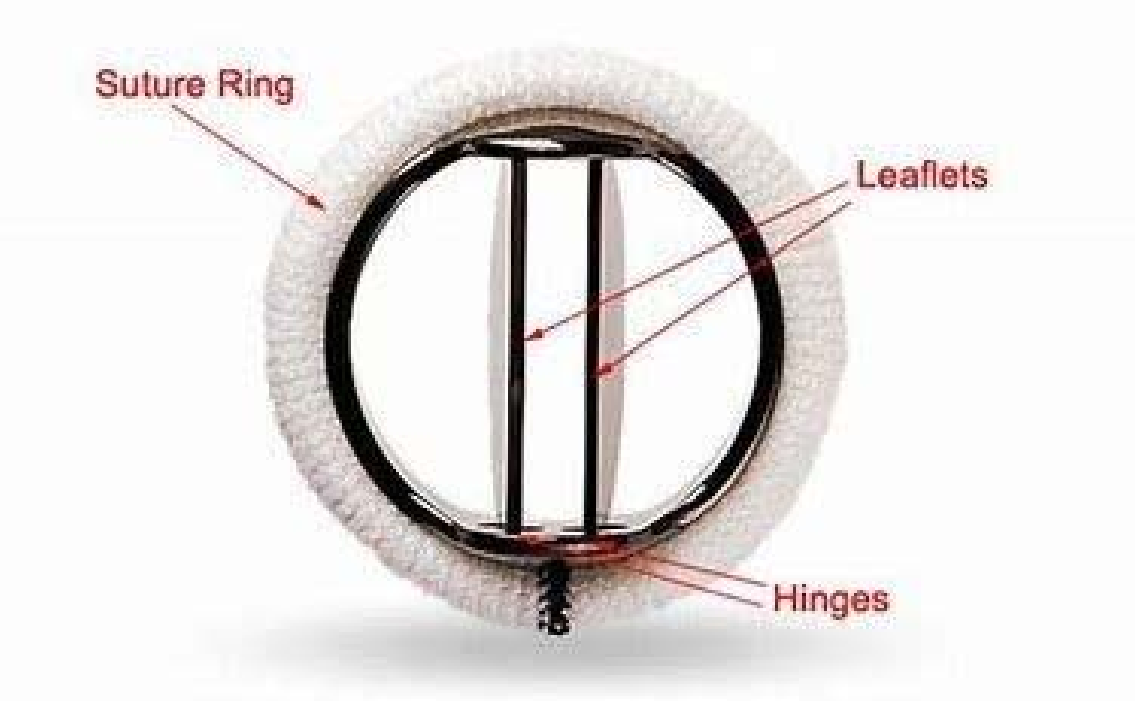
- 1st AVR: In 1960 by Dr. Albert Starr
- Bi-Leaflet Mechanical Valve (Lasts a lifetime)
  Porcine Valve
- Pig Valve
- Pericardial Bovine “stented valves” (On Coumadin for only two months). Last 10-20 years
- TAVR (No longitudinal studies at this point)

First Aortic Valve



As seen on a chest x-ray

Type of Valve



Mechanical Valve

Medtronic-Hall Valve

Model: Medtronic-Hall A7700 (aortic), M7700 (mitral)

Type: Aortic and Mitral Tilting Disk

Materials: Cage-titanium, Disk-Pyrolytic carbon, sewing ring-knitted teflon

Pig Valve

Cow Valve

Surgical Management of Aortic Stenosis

When to refer a patient? When a murmur is identified. Cardiology will review the echocardiogram.

Echocardiogram: Demonstrates moderate aortic stenosis ~Refer to cardiology.

This thought process is similar to Aneurysms of 3.5 cm or greater or carotid disease of less than 70%: Please send to Dr. Lee or Cardiology for assessment and surveillance.

Definition of Severe Aortic Stenosis

Need 2 out of 3:

1. **Peak Velocity:** Greater than or equal to 4 m/s
2. **Mean Gradient:** Greater than or equal to 40 mmHg
3. **Aortic Valve Area:** Less than or equal to 1 cm^2

How do we decide if a patient is low, moderate or high risk for surgery?

Society of Thoracic Surgeons Mortality Risk Calculator:

0-3 % Risk of Mortality: Low Risk for Surgical AVR

3-5% Risk of Mortality: Moderate Risk for Surgical AVR

Greater than 5% Risk of Mortality: High Risk for Surgical AVR

Prohibitive Risk: 10-15%, depending on the patient & the

Multi-D discussion

2017 AHA/ACC Focused Update of the Management of Patients with Valvular Heart Disease

Indications for Surgery

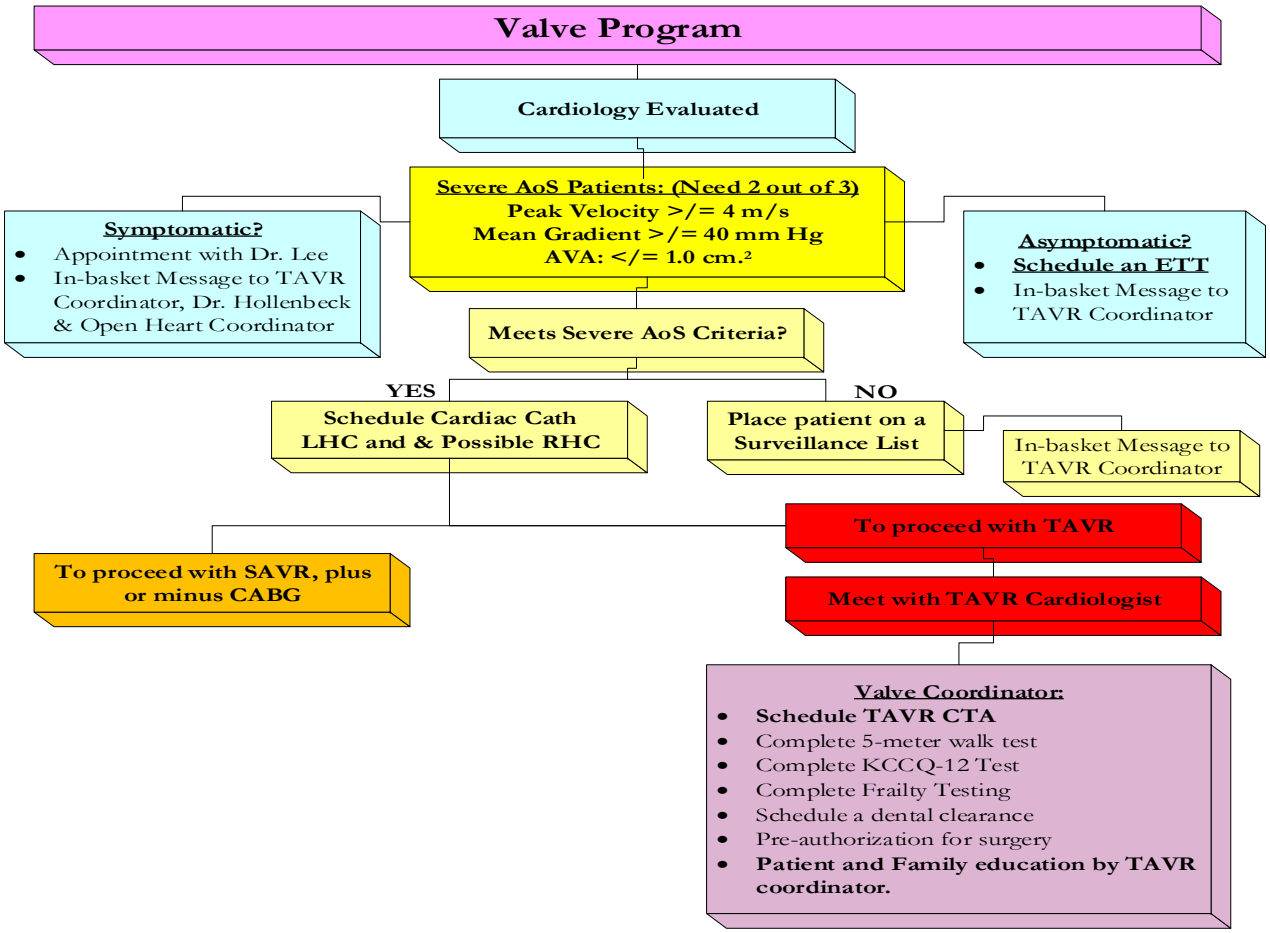
2017 Valve Guidelines

1. **<u>Clinical status</u>:** Symptomatic or asymptomatic
2. Severity of aortic stenosis:
    a. AVA </=1 cm ^{2};
    b. Peak Velocity >/= 4;
    c. Mean gradient > /= 40
3. Isolated aortic valve procedure versus a combined procedure.
4. EF and dimensions
5. Comorbidities

Treatment Options

2017 Valve Guidelines

1. Surgical AVR is still the preferred treatment when the surgical risk is low and intermediate. (symptomatic & asymptomatic). **IB**
2. Discussion of treatment should include a Multi D approach. **IC**
3. Patients with a prohibitive risk for surgery and survival > 12 months that are symptomatic should have TAVR. **IA**
4. TAVR is not recommended in patients in whom existing comorbidities would preclude the expected benefit from correction of AS. (**Pre-op testing**: 5-minute walk test, Frailty testing and KCCQ-12 testing). **III**


Valve Program
Cardiology Evaluated
Severe AoS Patients: (Need 2 out of 3)
Peak Velocity >/= 4 m/s
Mean Gradient >/= 40 mm Hg
AVA: </= 1.0 cm.²
Symptomatic?
Appointment with Dr. Lee
In-basket Message to TAVR Coordinator, Dr. Hollenbeck & Open Heart Coordinator
Asymptomatic?
Schedule an ETT
In-basket Message to TAVR Coordinator
Meets Severe AoS Criteria?
YES
NO
Schedule Cardiac Cath LHC and & Possible RHC
Place patient on a Surveillance List
In-basket Message to TAVR Coordinator
To proceed with TAVR
To proceed with SAVR, plus or minus CABG
Meet with TAVR Cardiologist
Valve Coordinator:
Schedule TAVR CTA
Complete 5-meter walk test
Complete KCCQ-12 Test
Complete Frailty Testing
Schedule a dental clearance
Pre-authorization for surgery
Patient and Family education by TAVR coordinator.

Lifelong Follow-up after Aortic Valve Surgery

Echo every year

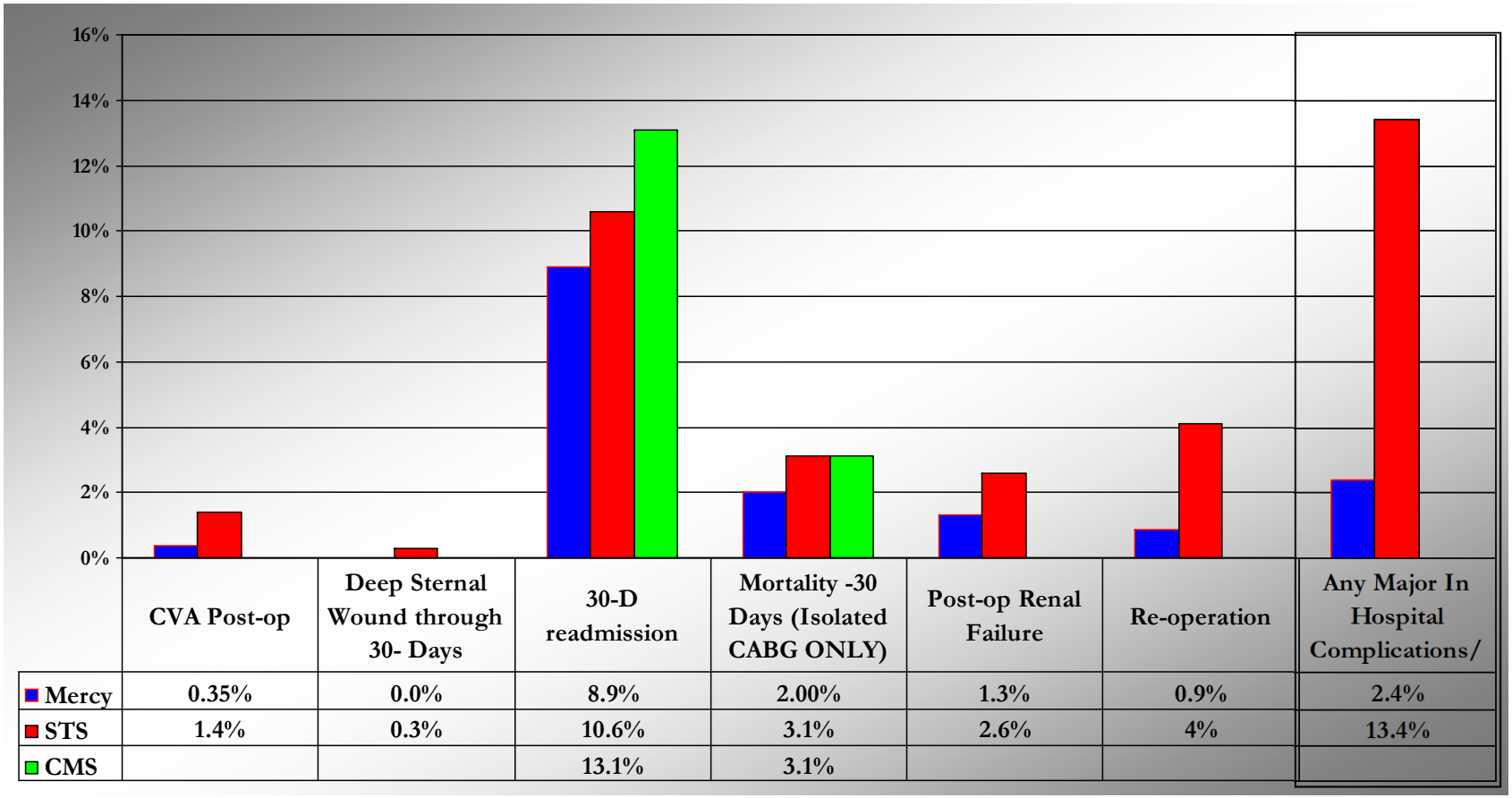
Always at risk for infection: With dental cleaning or any dental procedures will need prophylaxic antibiotics.

Managing anticoagulation can be very tricky with a mechanical valve that develop a GI bleed, need a colonoscopy, etc.

Open Heart Patients: Outcomes

Open Heart Cases (YTD) Compared to STS and CMS

Nov. 2017- May 31st, 2019 (n=198)



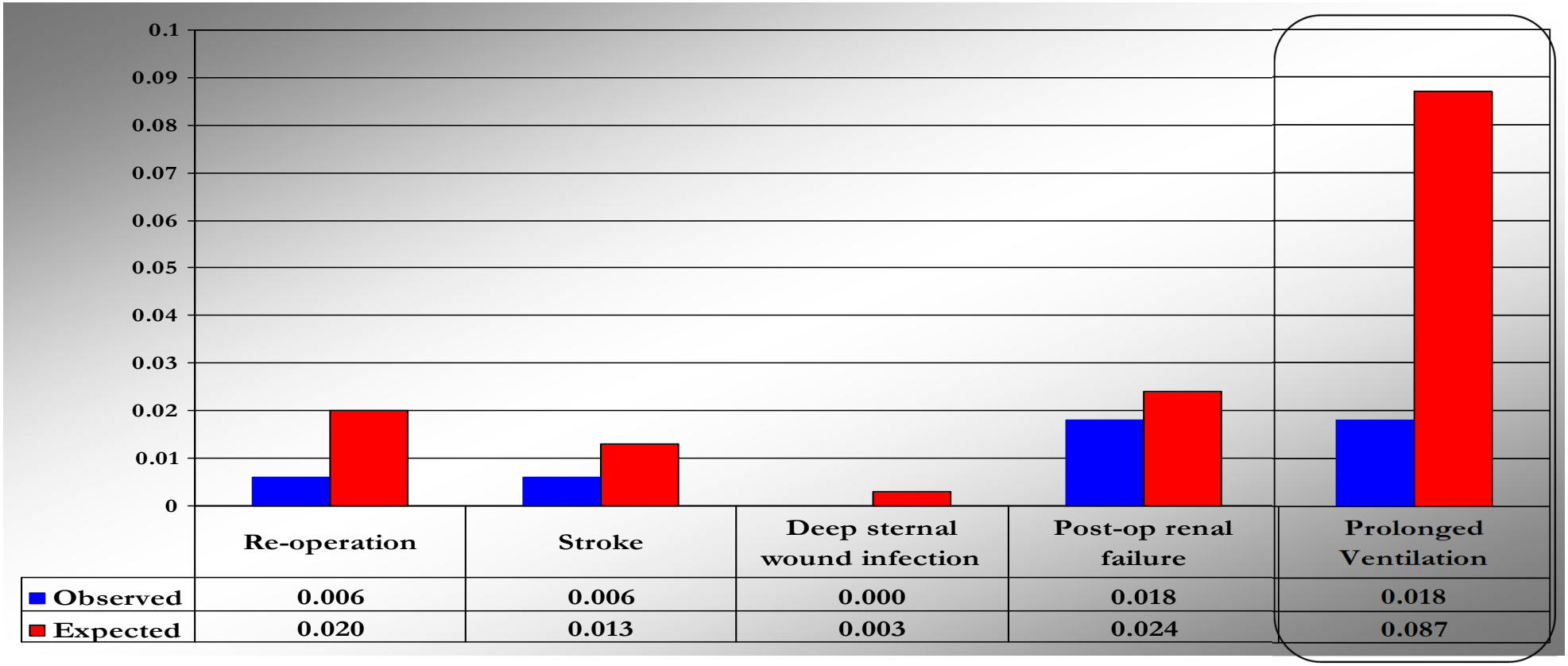
	CVA Post-op	Deep Sternal Wound through 30- Days	30-D readmission	Mortality -30 Days (Isolated CABG ONLY)	Post-op Renal Failure	Re-operation	Any Major In Hospital Complications/
Mercy	0.35%	0.0%	8.9%	2.00%	1.3%	0.9%	2.4%
STS	1.4%	0.3%	10.6%	3.1%	2.6%	4%	13.4%
CMS			13.1%	3.1%			

Isolated CABG ONLY *(n=167)*

Mercy's Complications: Observed Verses Expected

(Risk-adjusted Outcomes Based on their Co-Morbidities)

Nov. 2017- June 30th, 2019



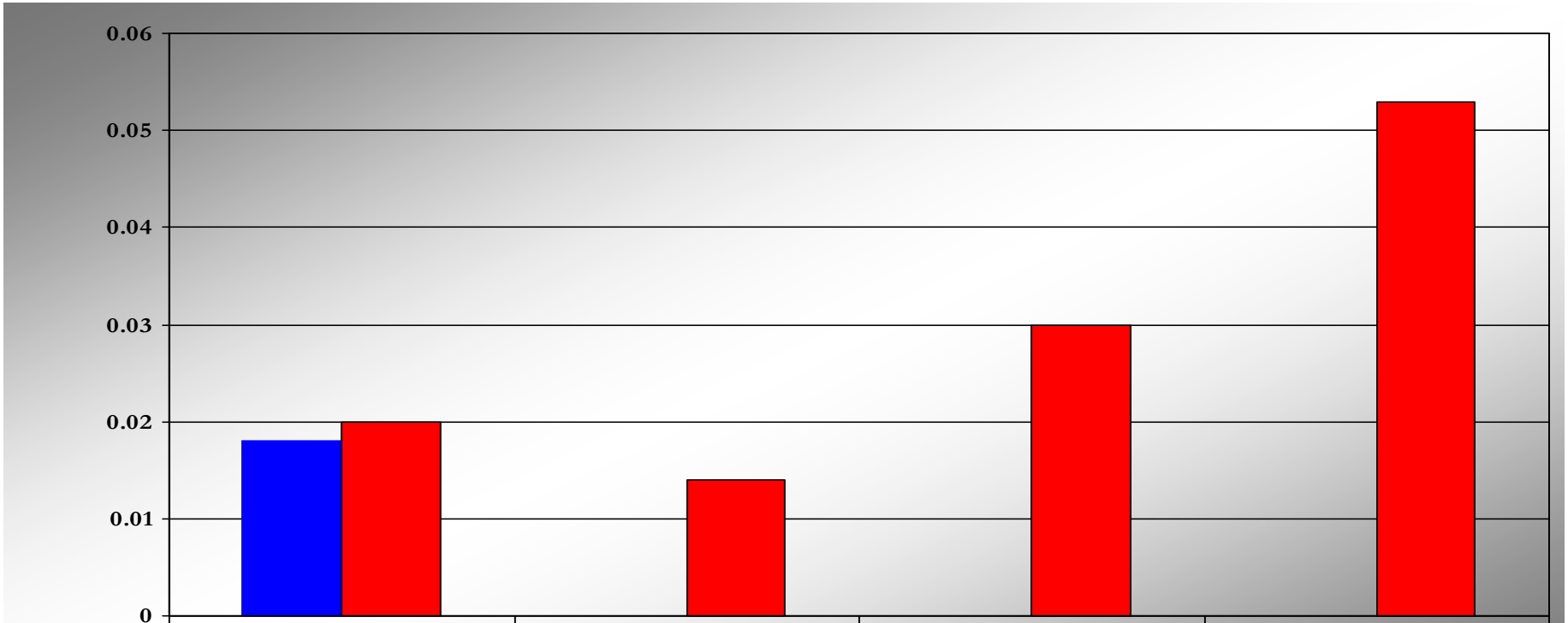
	Re-operation	Stroke	Deep sternal wound infection	Post-op renal failure	Prolonged Ventilation
Observed	0.006	0.006	0.000	0.018	0.018
Expected	0.020	0.013	0.003	0.024	0.087

Mortality: All Open Heart Patients

Mercy's Complications: Observed Verses Expected

(Risk-adjusted Outcomes Based on their Co-Morbidities)

Nov. 2017- June 30th 2019



	Mortality (CABG)	Mortality (AVR)	Mortality (AVR & CABG)	Mortality (MVR)
Observed	0.018	0.000	0.000	0.000
Expected	0.020	0.014	0.030	0.053

TAVR Program

Transcatheter Aortic Valve Replacement

CMS Criteria for TAVR: *Dramatic Change in June 2019*

OLD CRITERIA:

- 50 AVRs in one rolling year.
- 400 PCI/year
- **Two CVT surgeon's to review patient as well as one interventional cardiologist.**

NEW CRITERIA:

1. 50+ open heart surgeries in the previous year prior to TAVR; ***AND***
2. 20+ Aortic Valve related procedures in 2 years prior to TAVR program initiation
3. PCI: 300+ per year

One CV Surgeon and One TAVR Interventional Cardiologist: NEW

1. Needs to be an **independent assessment/exam of the patient** and document the rationale for choosing one or the other
2. Face to face with the patient

Frailty Test

Five chair rises <15 seconds		0 Points
Five chair rises ≥15 seconds		1 Point
Unable to complete		2 Points

No cognitive impairment		0 Points
Cognitive impairment		1 Point

Hemoglobin	≥13.0 g/dL ♂ ≥12.0 g/dL ♀	0 Points
Hemoglobin	<13.0 g/dL ♂ <12.0 g/dL ♀	1 Point

Serum albumin	≥3.5 g/dL	0 Points
Serum albumin	<3.5 g/dL	1 Point

EFT Score	1-Year Mortality TAVR	SAVR
0-1	6%	3%
2	15%	7%
3	28%	16%
4	30%	38%
5	65%	50%

EFT Points: _____

Core Valve: Medtronic

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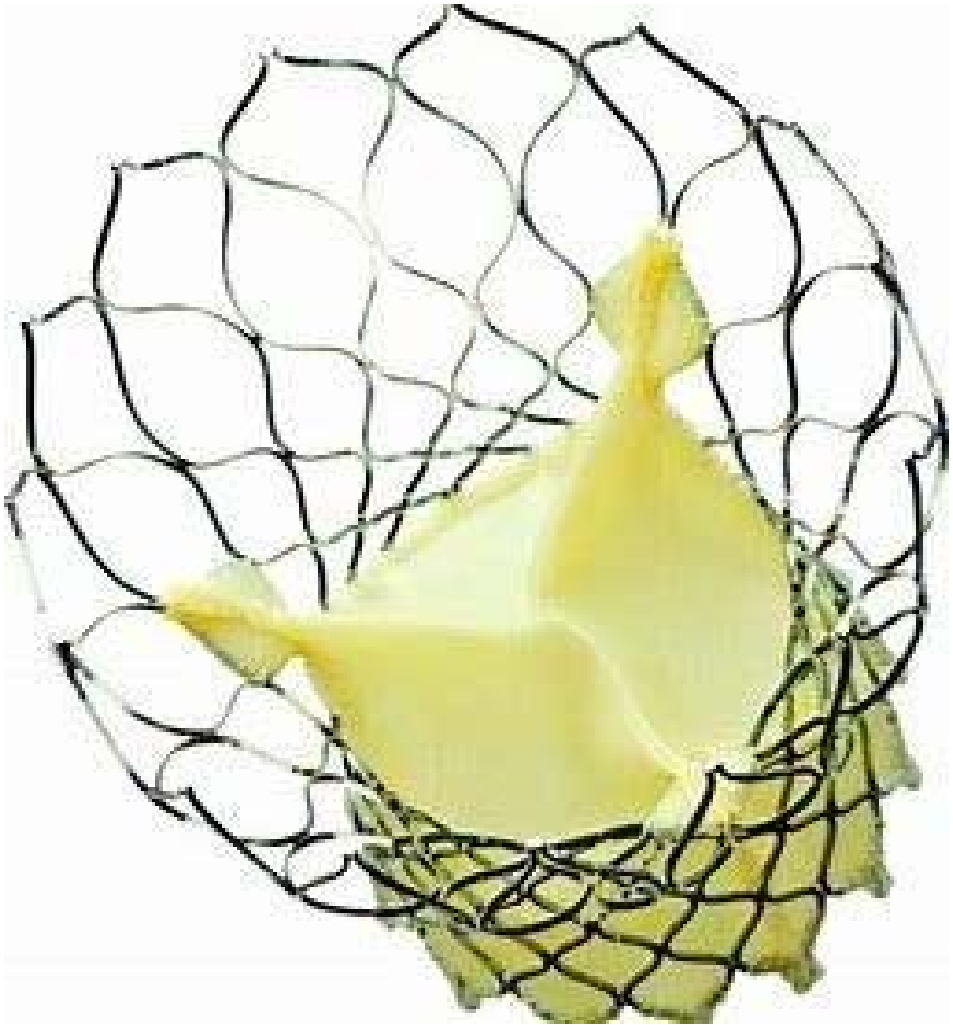
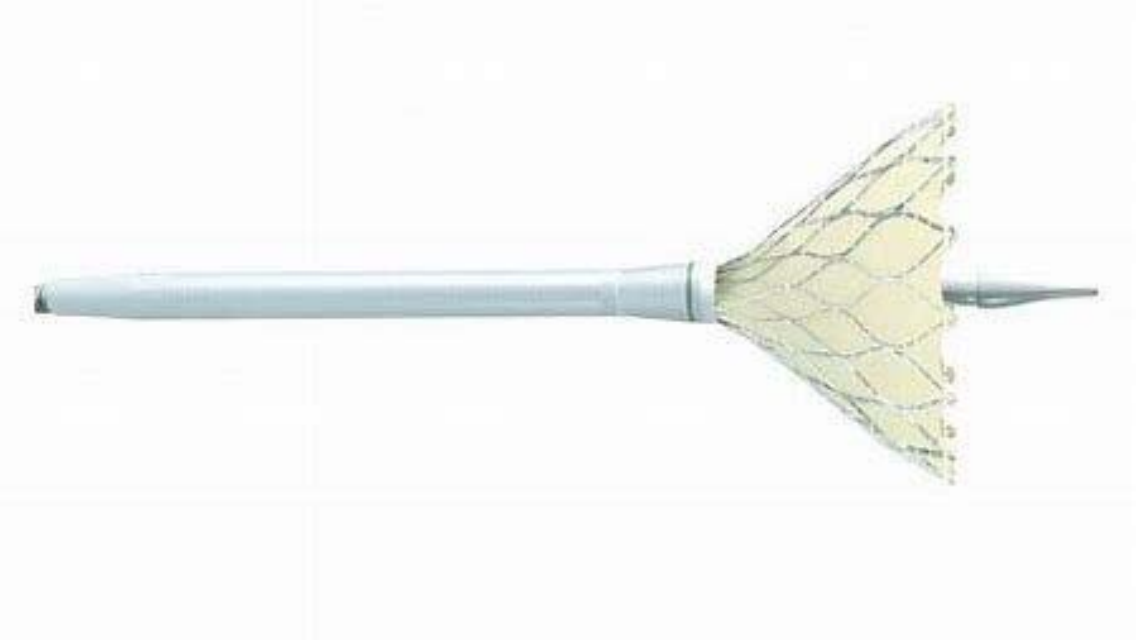
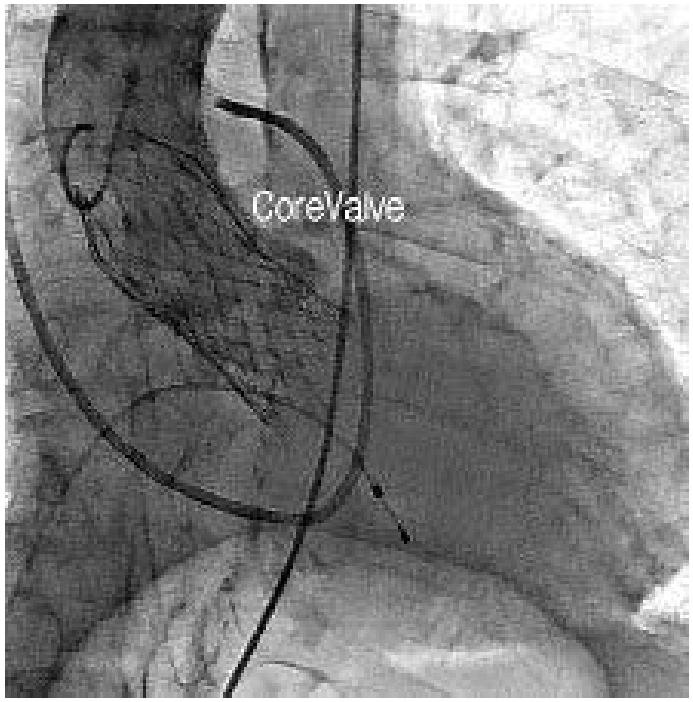
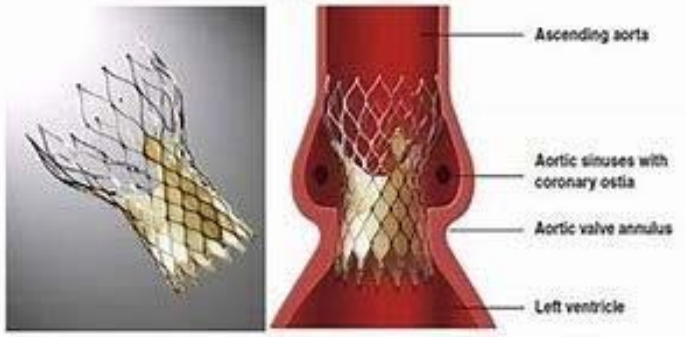


Core Valve Delivery System

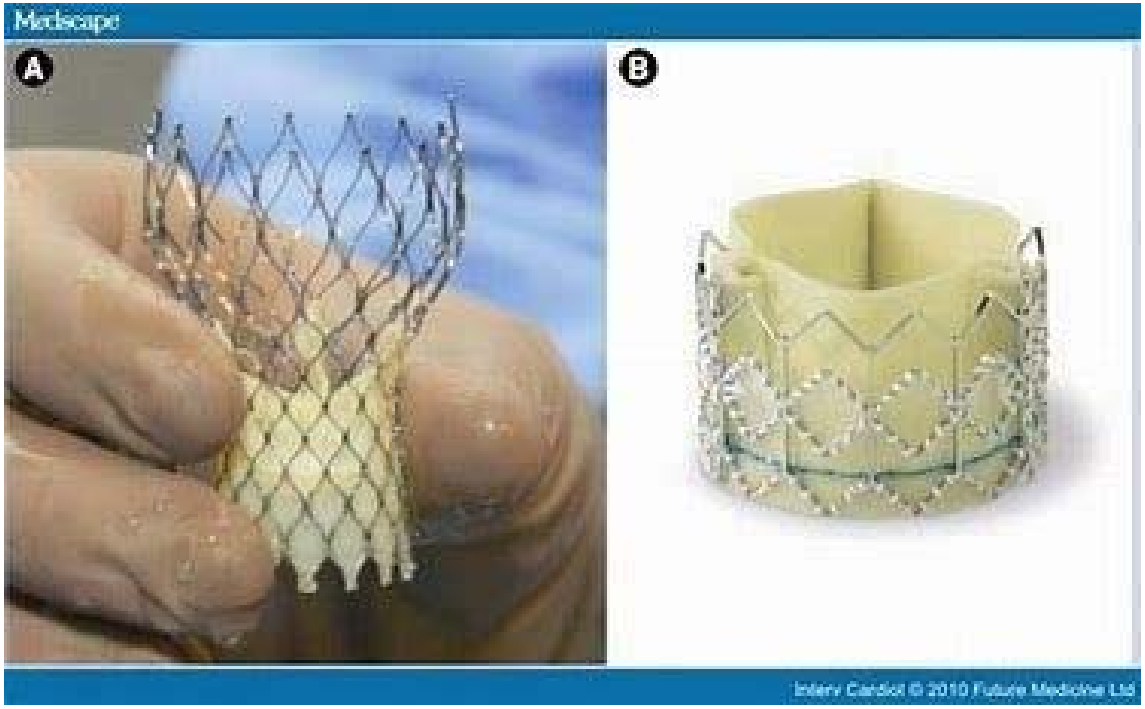


Core Valve: Medtronic

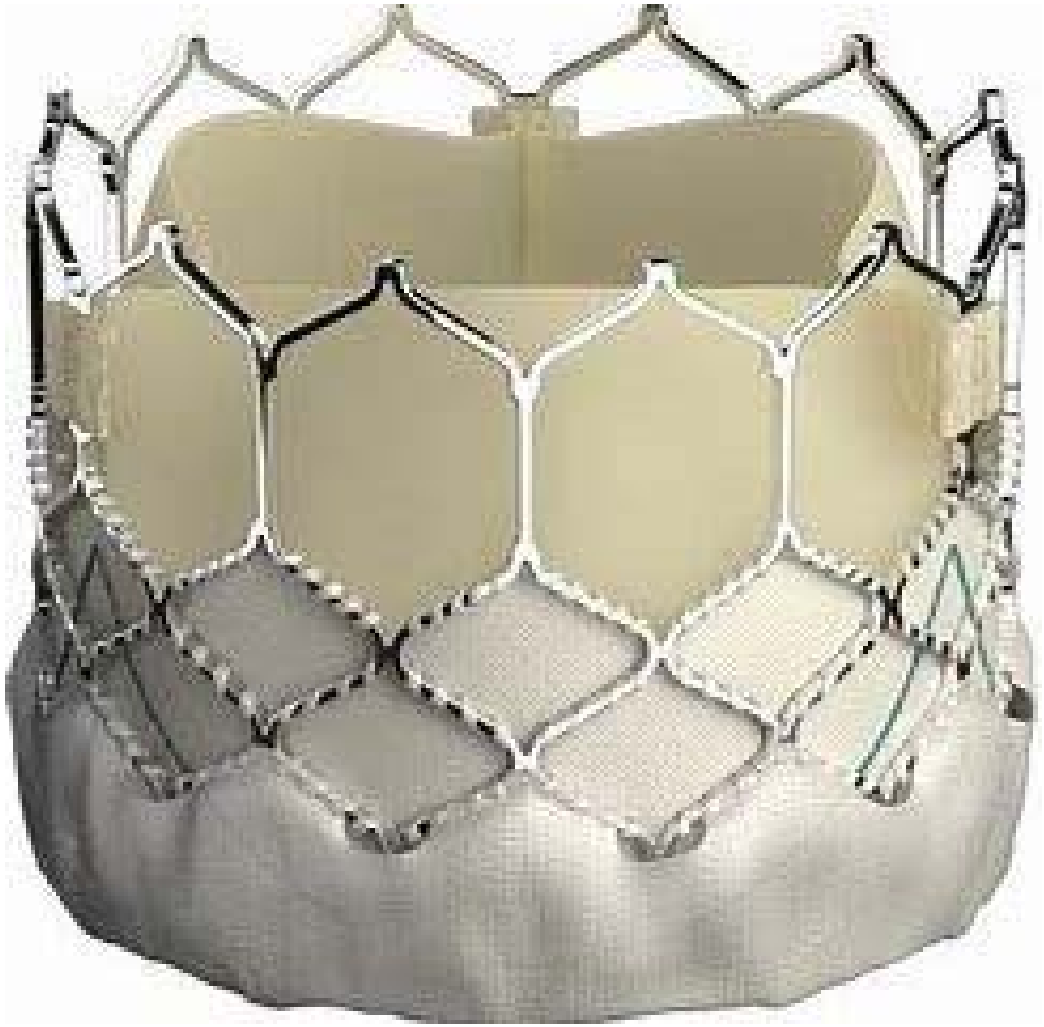




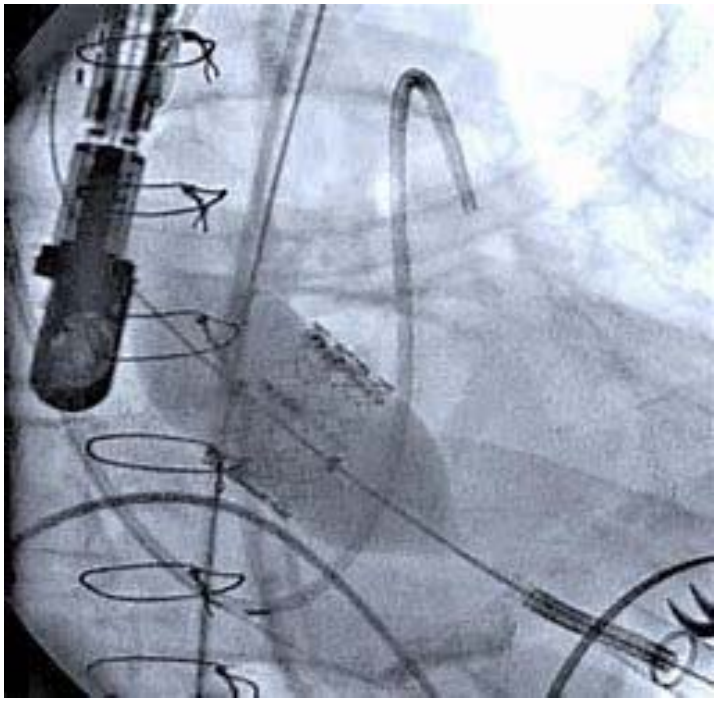
Life Edwards Sapien & Core Valve by Medtronic TAVR Valves (Side by Side)



Life Edwards-Sapien TAVR Valve



Life Edwards Science-Sapien Valve



TAVR Outcomes Reported to CMS

TAVR Outcomes: MUST be Reported Nationally to CMS:
CVA
All-cause mortality
TIA
Major Vascular Events
AKI
Repeat SVAR/TAVR
New pacemaker implant (added)
QOL assessment
CMS Looking at long term outcomes