



HHP Webinars

Lifetime Management of Aortic Stenosis at Hawai'i Pacific Health

CONFERENCE INFORMATION

GENERAL OBJECTIVES

This offering is intended for physicians and other health care professionals.

By the end of the course, the participant will be able to:

- Recognize when to seek cardiology referral for patients with aortic stenosis
- Identify the indications for intervention in the management of aortic stenosis
- Demonstrate the risks and benefits of both surgical and transcatheter aortic valve intervention
- Recognize the various strategies for "lifetime management" of aortic valve disease

CONTINUING EDUCATION



In support of improving patient care, Hawai'i Pacific Health is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

For Physicians we are offering CME

Hawai'i Pacific Health designates this live activity for a maximum of 1.0 *AMA PRA Category 1 Credits*™ for physicians. Physicians should only claim credit commensurate with the extent of their participation in the activity.

For Nurses we are offering ANCC Contact Hours

Hawai'i Pacific Health designates this live activity for 1.0 contact hour for nurses. Nurses should only claim credit commensurate with the extent of their participation in the activity.

Please note that in order to receive continuing education credits for this offering, you must:

- Claim credit commensurate with the extent of your participation in the activity.
- Complete and submit the evaluation survey that will be emailed to you within one week of the offering.
- Speakers cannot claim credit for their own presentations.
- Your CE certificate will be immediately available to you upon completion of your evaluation.

DISCLOSURE INFORMATION:

Per CE requirements, a disclosure report is included below listing any relationships that faculty, planners and others in control of educational content may have with an ineligible company. An Ineligible Company, as defined by the ACCME, is a company, whose primary business is producing, marketing, selling, re-selling or distributing healthcare products used by or on patients.

The following Faculty, Planners, and Others in control of educational content have reported no relationships with any ineligible company as defined by the ACCME new "Standards for Integrity and Independence in Accredited Continuing Education":

Faculty Member/Company

Andrew Baldwin, MD

Jared Oyama, MD

Relationship

None

None

Planning Committee Member

Jennifer Lo, MD

Walter Schroeder, PharmD

Matthew Sasaki

Rachelle Meza, RN, BSN

Relationship

None

None

None

None

Webinar Information



- You have been automatically muted
 - You cannot unmute yourself
- You will be able to submit questions via the Q&A section
- This webinar counts for 2025 HQIP credit in the HHP Network Engagement – Webinars measure

Hawai'i Health Partners Webinar



Lifetime Management of Aortic Stenosis at Hawai'i Pacific Health

Thursday, May 22, 2025

5:30pm – 6:30pm



Jared Oyama, MD

Medical Director

Cardiac Catheterization Laboratory, SBMC



Andrew Baldwin, MD

Medical Director

Cardiothoracic Surgical Services, SBMC

Lifetime Management of Aortic Stenosis at Hawai'i Pacific Health

HHP Webinar Series
May 22, 2025

Andrew C.W. Baldwin, MD
Jared K. Oyama, MD



This presentation is for educational purposes only.

There are no financial interests to disclose.

There are no conflicts of interest associated with the following material or any relationships with associated businesses or corporate entities.

The material presented is not an endorsement or advertisement for any specific medical device or company.

Objectives



- Recognize when to seek cardiology referral for patients with aortic stenosis
- Review established guidelines for aortic stenosis management
- Demonstrate the broad risks and benefits of both surgical and transcatheter valve interventions
- Recognize the various strategies for the lifetime management of aortic stenosis

Background



- The most commonly encountered valvular heart disease in adults
- Predominantly a disease of the elderly
- It is progressive
- It is treatable (even in the very old)

Background



American Heart Association®

Target: Aortic Stenosis™

Aortic Stenosis

Aortic stenosis is one of the most common and serious valve disease problems. The heart pumps blood through the aortic valve to the body. Over time, calcium buildup can narrow the valve opening and restrict blood flow from the heart to the body.

Stenosis means narrowing.

It makes the heart work harder and can cause:



Fatigue



Shortness of breath



Chest pain



Rapid fluttering heartbeat

**MORE THAN
13%**

**of Americans
75 and older have
aortic stenosis.**

- Common in people over age 65
- Untreated, it can lead to heart failure and death.

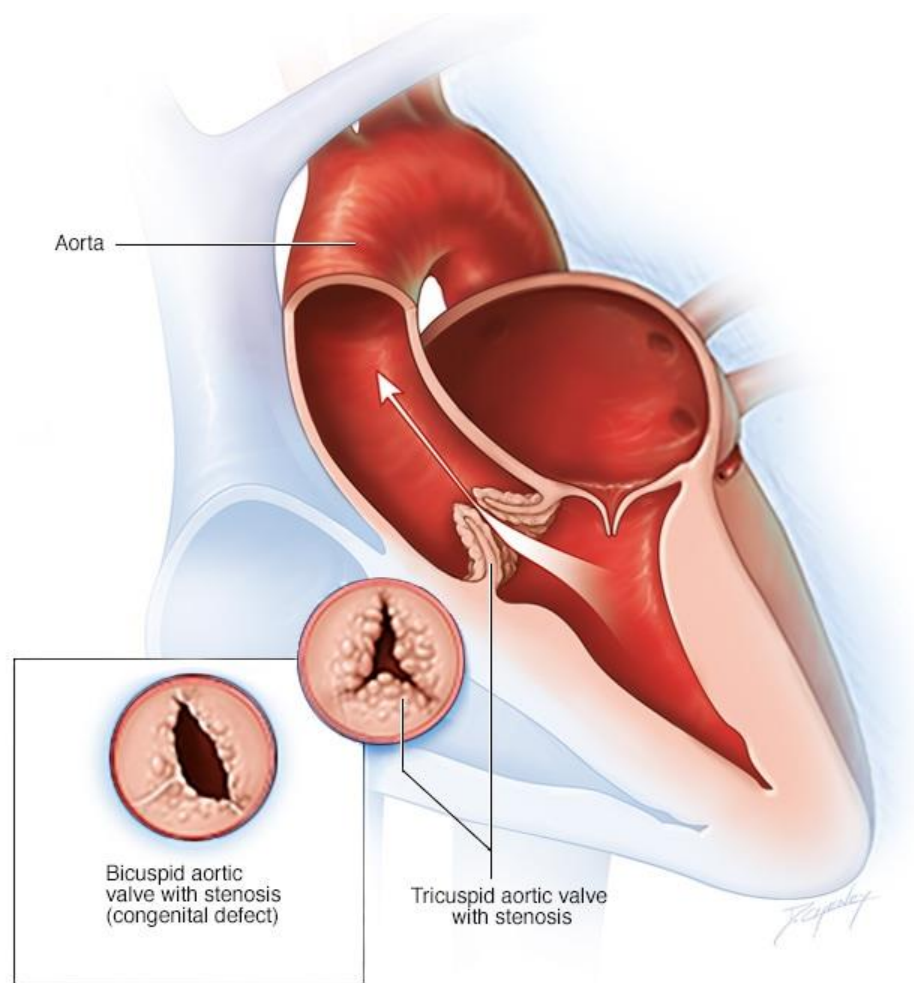
Get regular checkups

Your health care team can monitor your valve by taking images of your heart, called an **echocardiogram** or “echo.”



From heart.org

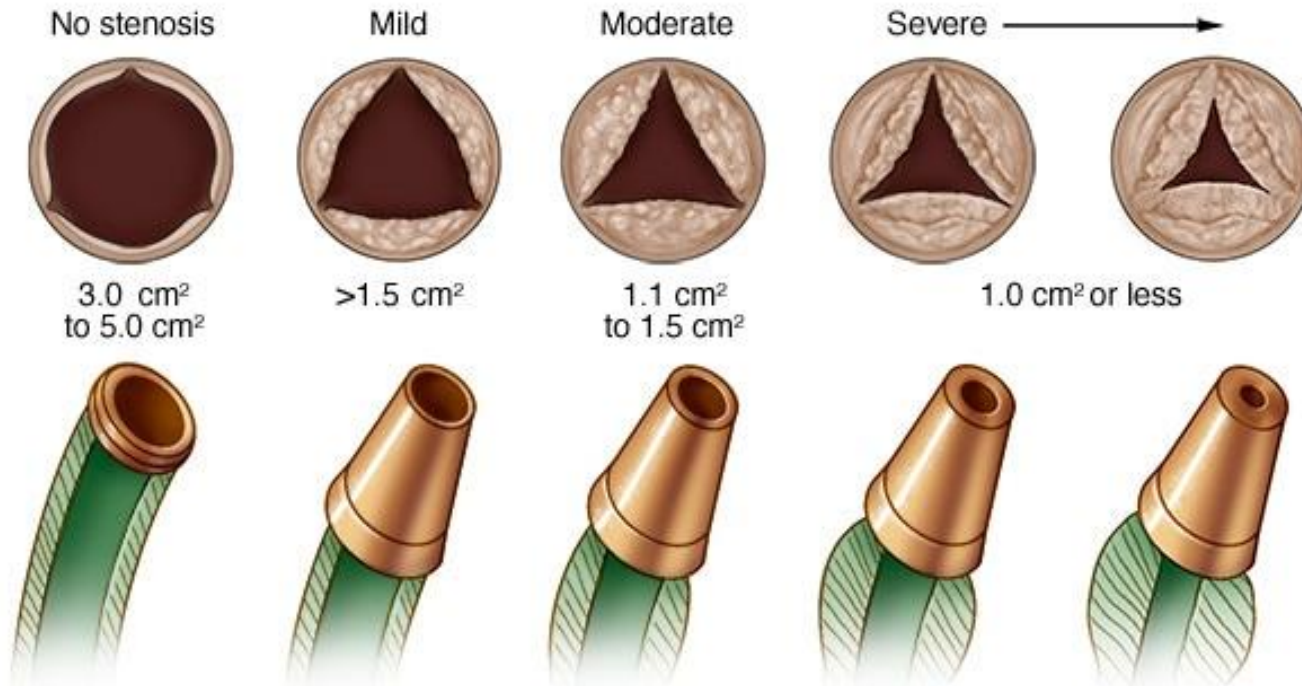
Background



From mayoclinic.org



When to refer?



From mayoclinic.org

Background

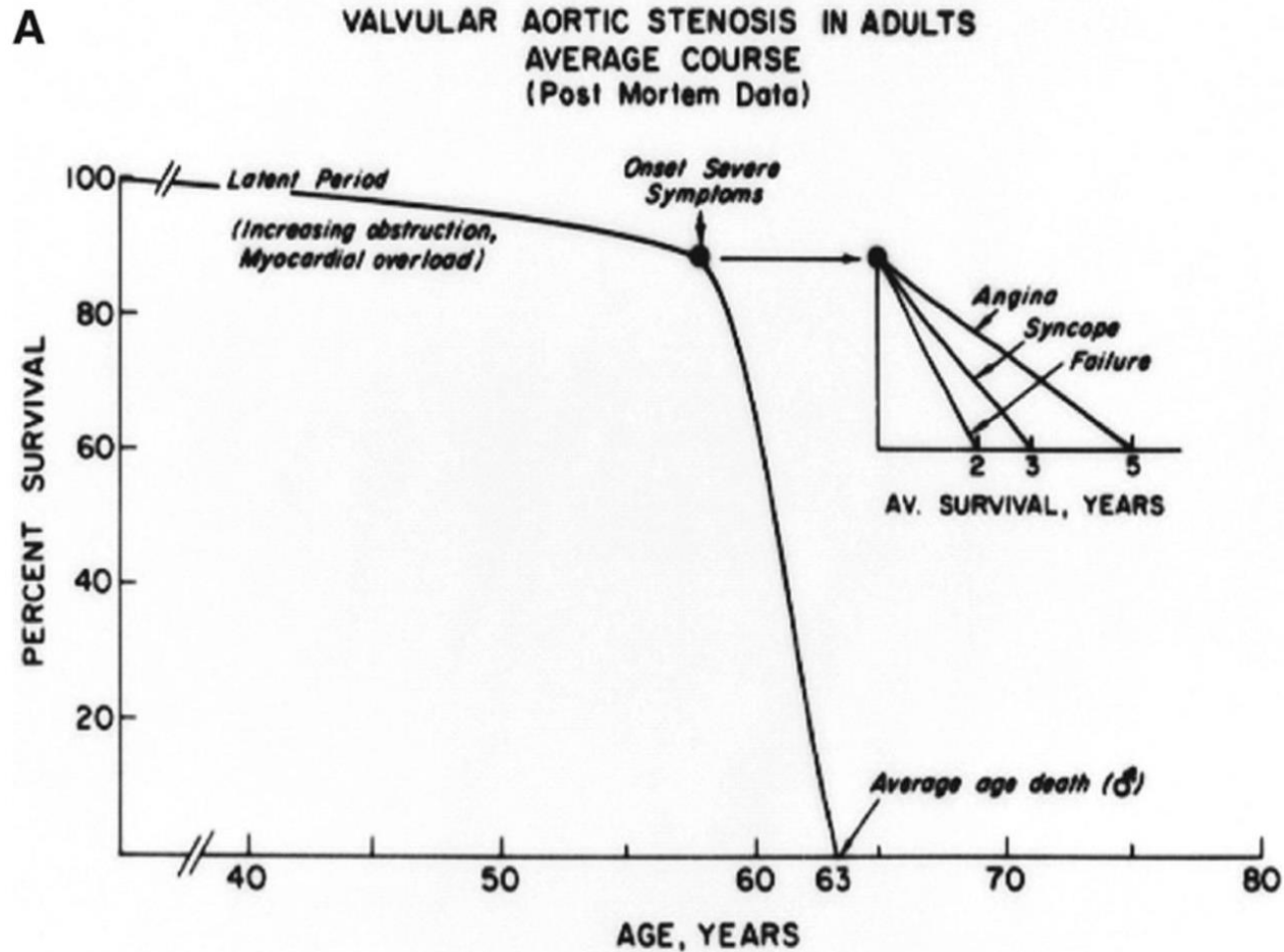


- Stages of Aortic Stenosis

Stage	Definition	Echo Parameters
A	At risk for aortic stenosis	Bicuspid valve or aortic sclerosis
B	Progressive (mild to moderate) AS	AVA >1.0 cm ² and MG < 40 mmHg
C	Severe asymptomatic aortic stenosis	AVA ≤ 1.0 cm ² or MG ≥ 40 mmHg
D	Severe symptomatic aortic stenosis	

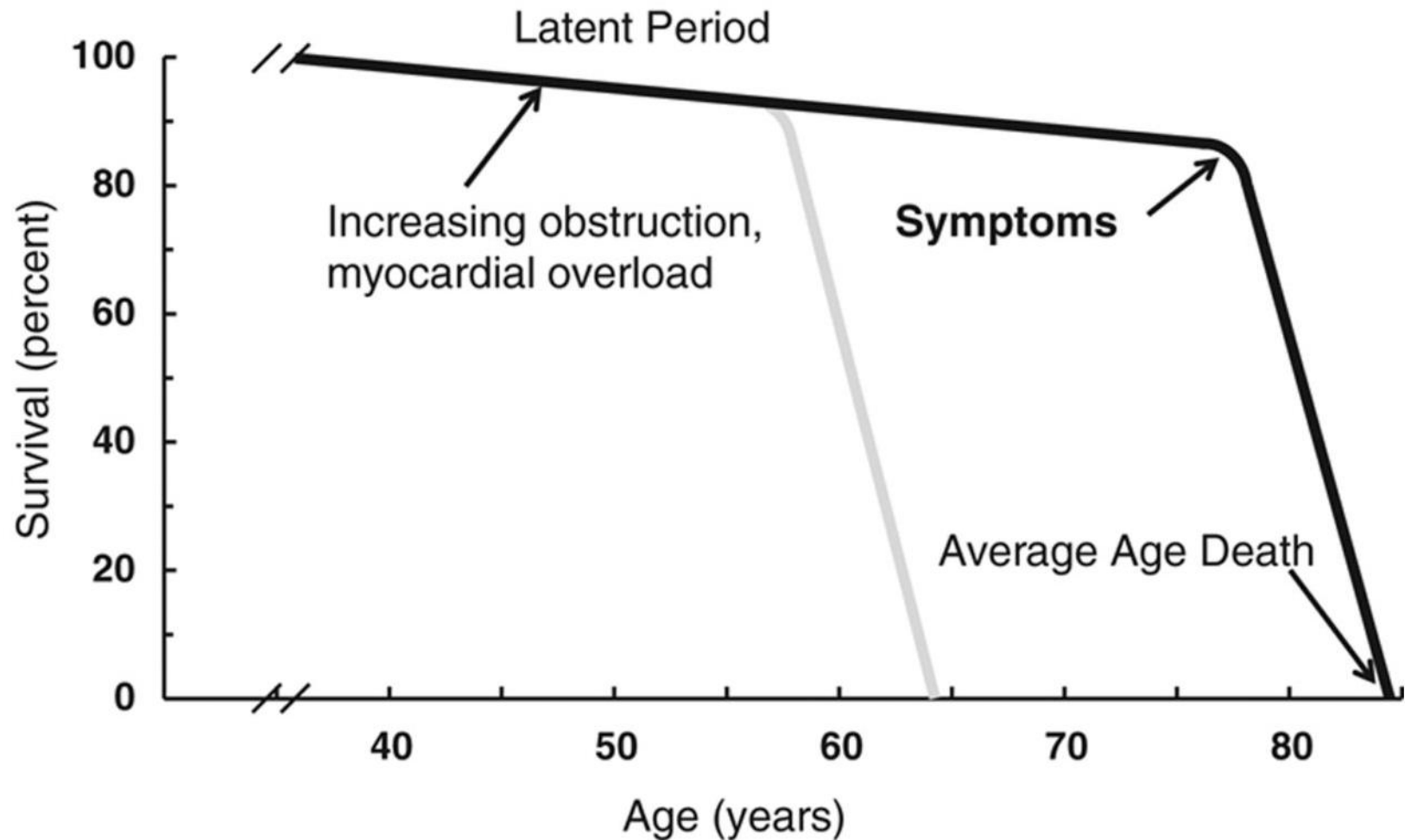
Circulation 2021;143:e72-e227

Background



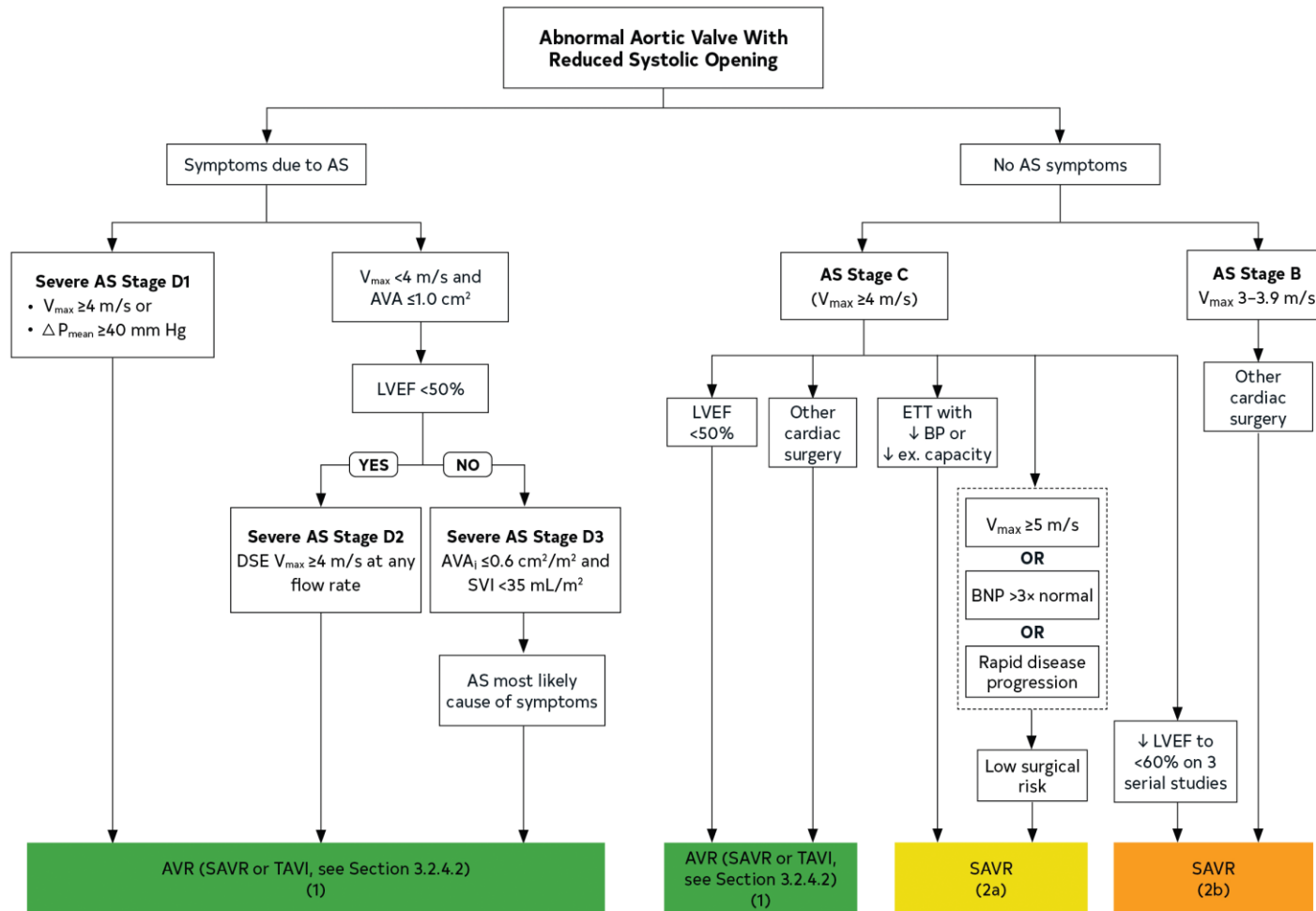
Circ Res 2013;113:179-185

Background



Circ Res 2013;113:179-185

Timing of Intervention



Circulation 2021;143:e72-e227



**Severe
Aortic Stenosis**



Symptoms

(dyspnea, angina, syncope,
presyncope)

-OR-

Really Bad Valve

(very high gradients, LV dysfunction,
hypotensive treadmill test)

Timing of Intervention



Guidelines |



Clinical Topics

Latest In Cardiology

Education and Meetings

Tools and P

But
Wait!

FDA Update: Agency Approves TAVR Valves For Asymptomatic Severe AS

May 01, 2025

ACC News Story

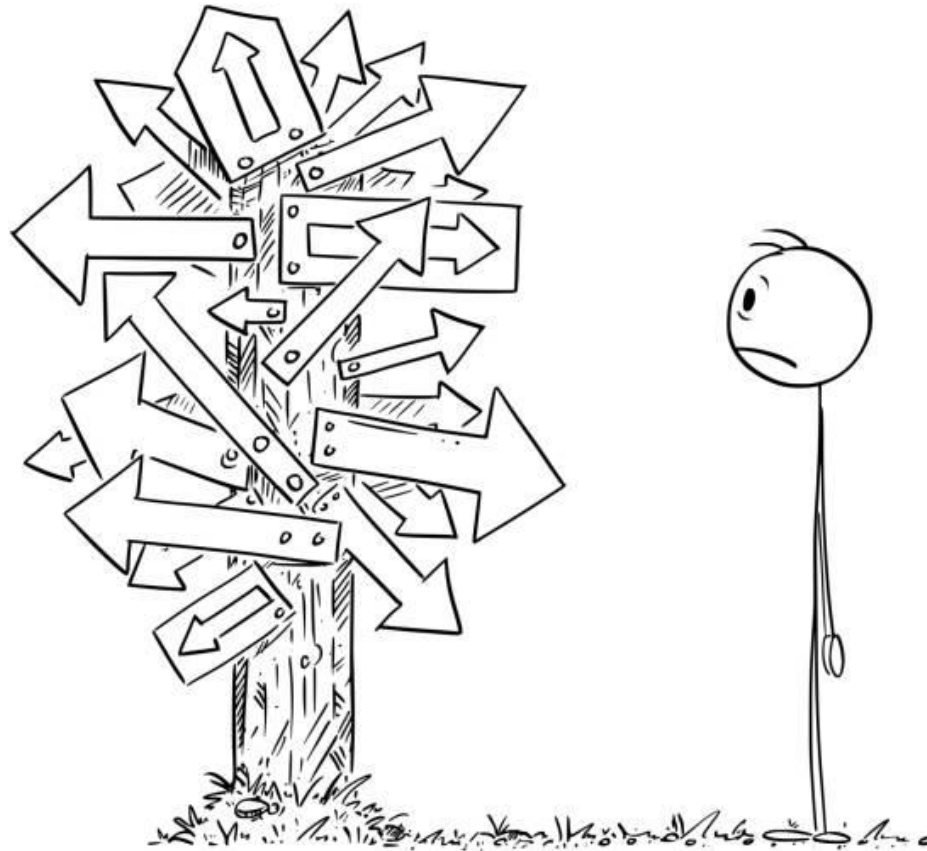
Print

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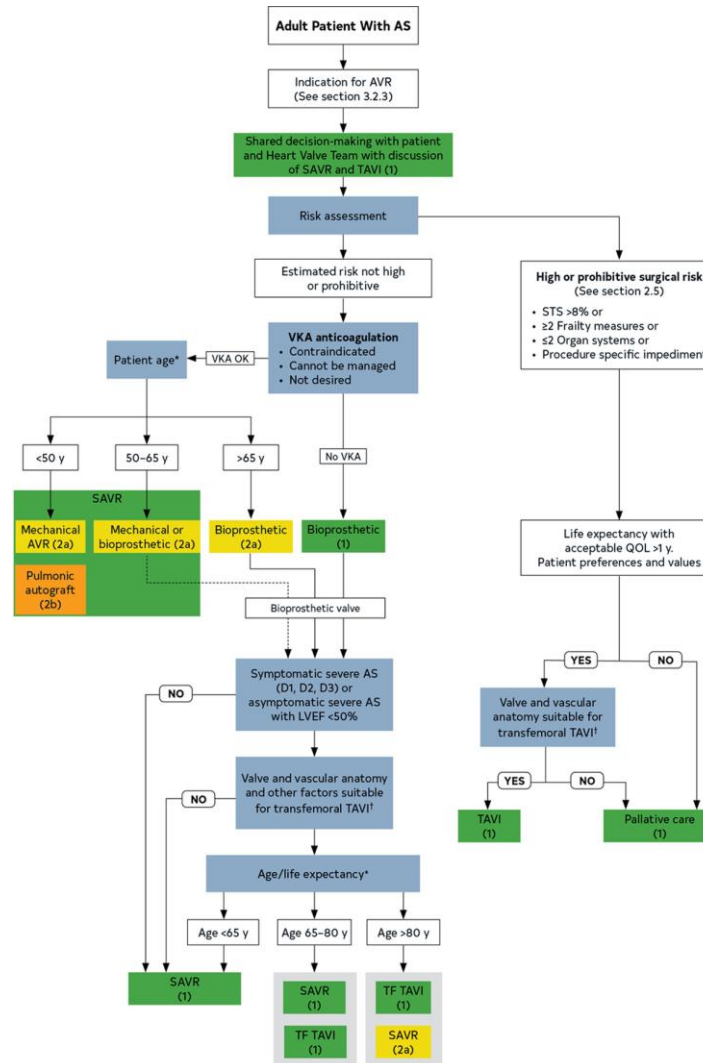
The U.S. Food and Drug Administration (FDA) [has approved](#) the Sapien 3, Sapien 3 Ultra and Sapien 3 Ultra Resilia TAVR valves from Edwards Lifesciences to treat patients with asymptomatic severe aortic stenosis (AS).

This decision comes following results from the [EARLY TAVR trial](#) , presented at TCT 2024 and published in *The New England Journal of Medicine*, which found that patients with asymptomatic severe AS who underwent TAVR with the Sapien 3 valve had a reduced risk of unplanned hospitalization, all-cause mortality and stroke compared to those monitored with clinical surveillance.

From acc.org

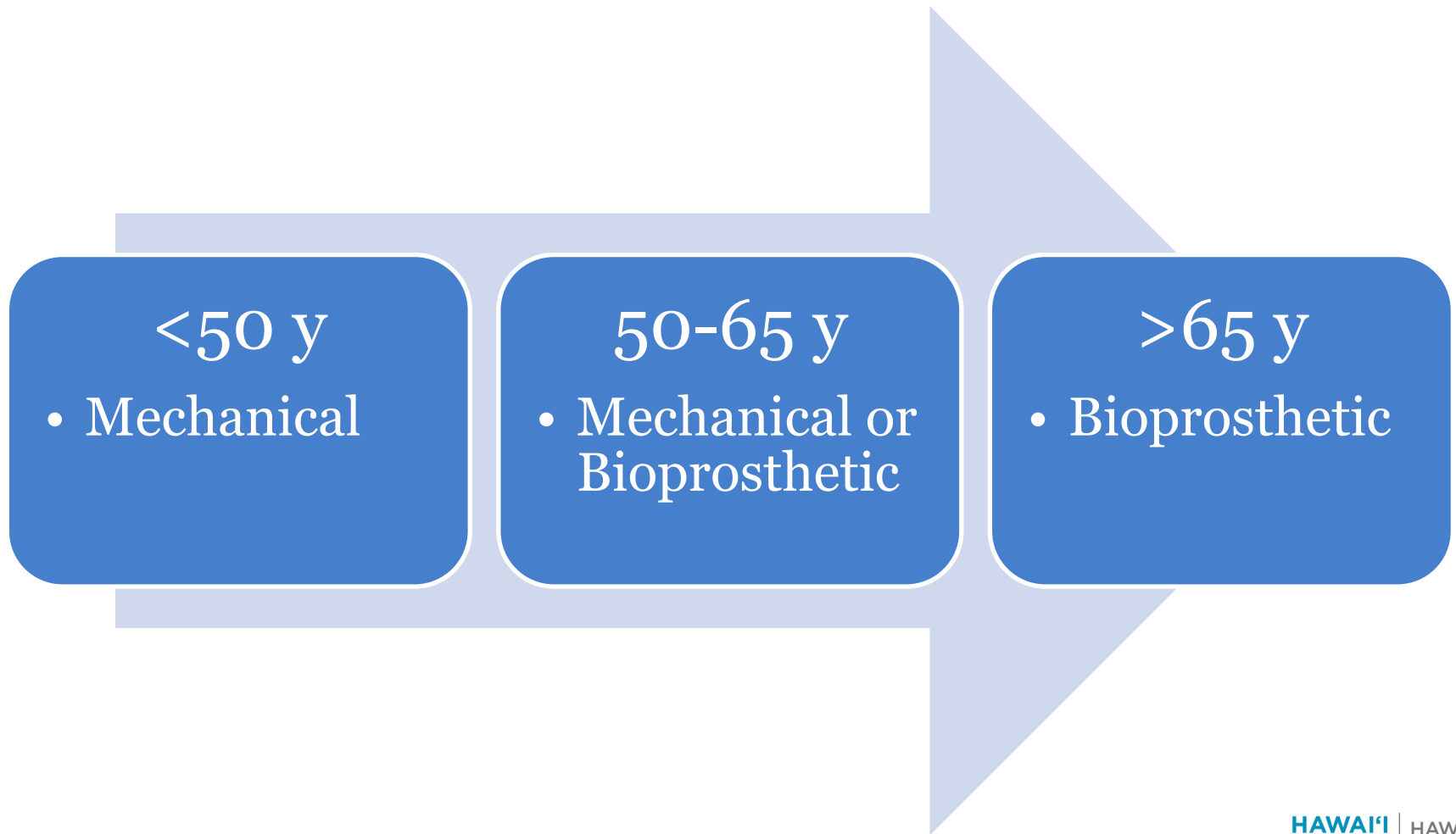


Treatment Selection

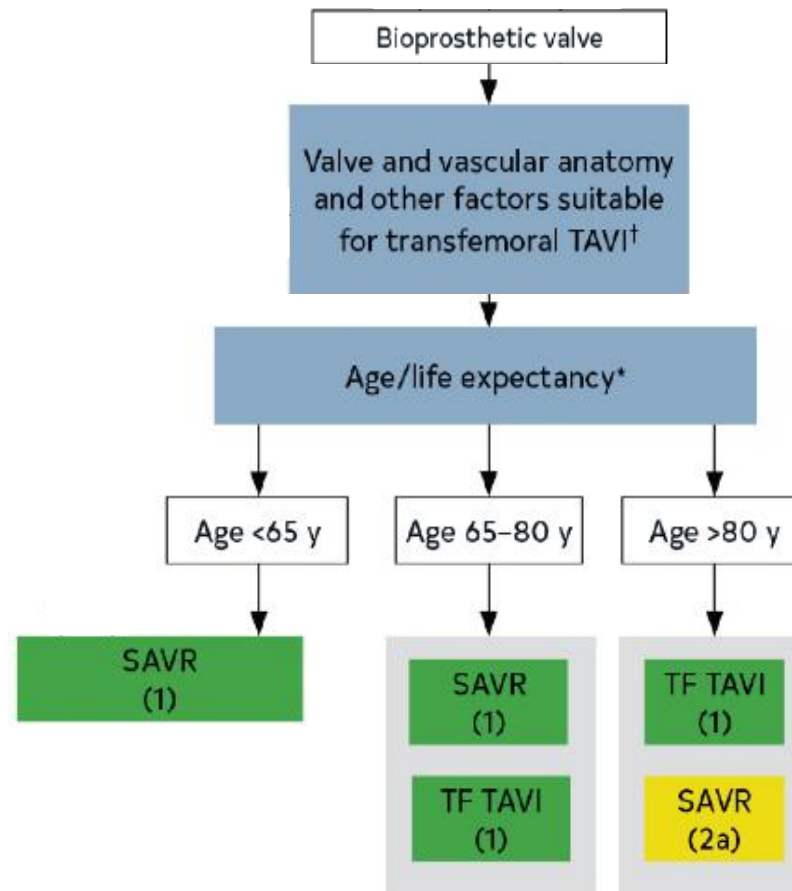


Circulation 2021;143:e72-e227

Treatment Selection



Treatment Selection



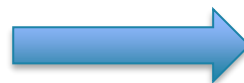
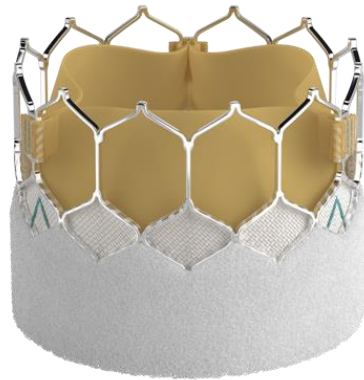
Adapted from Circulation 2021;143:e72-e227

Treatment Selection - TAVR Indications

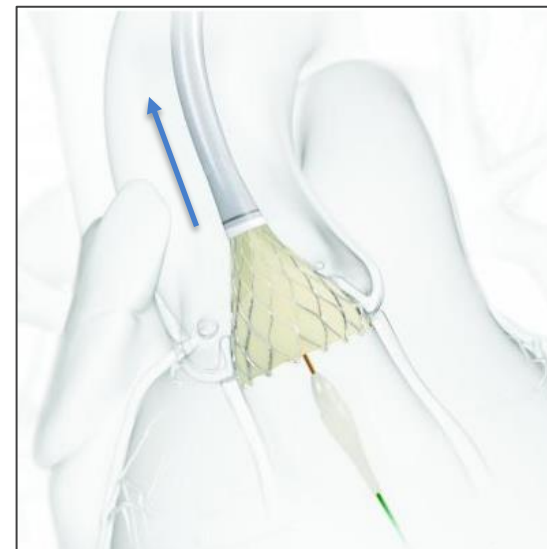
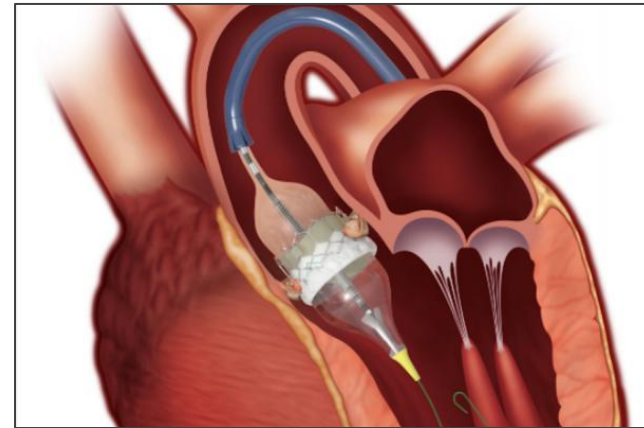
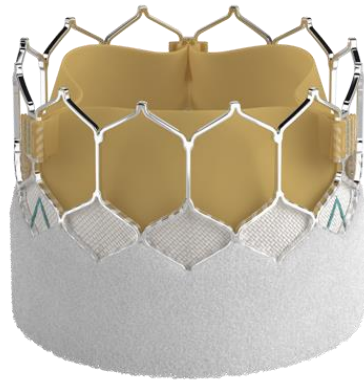


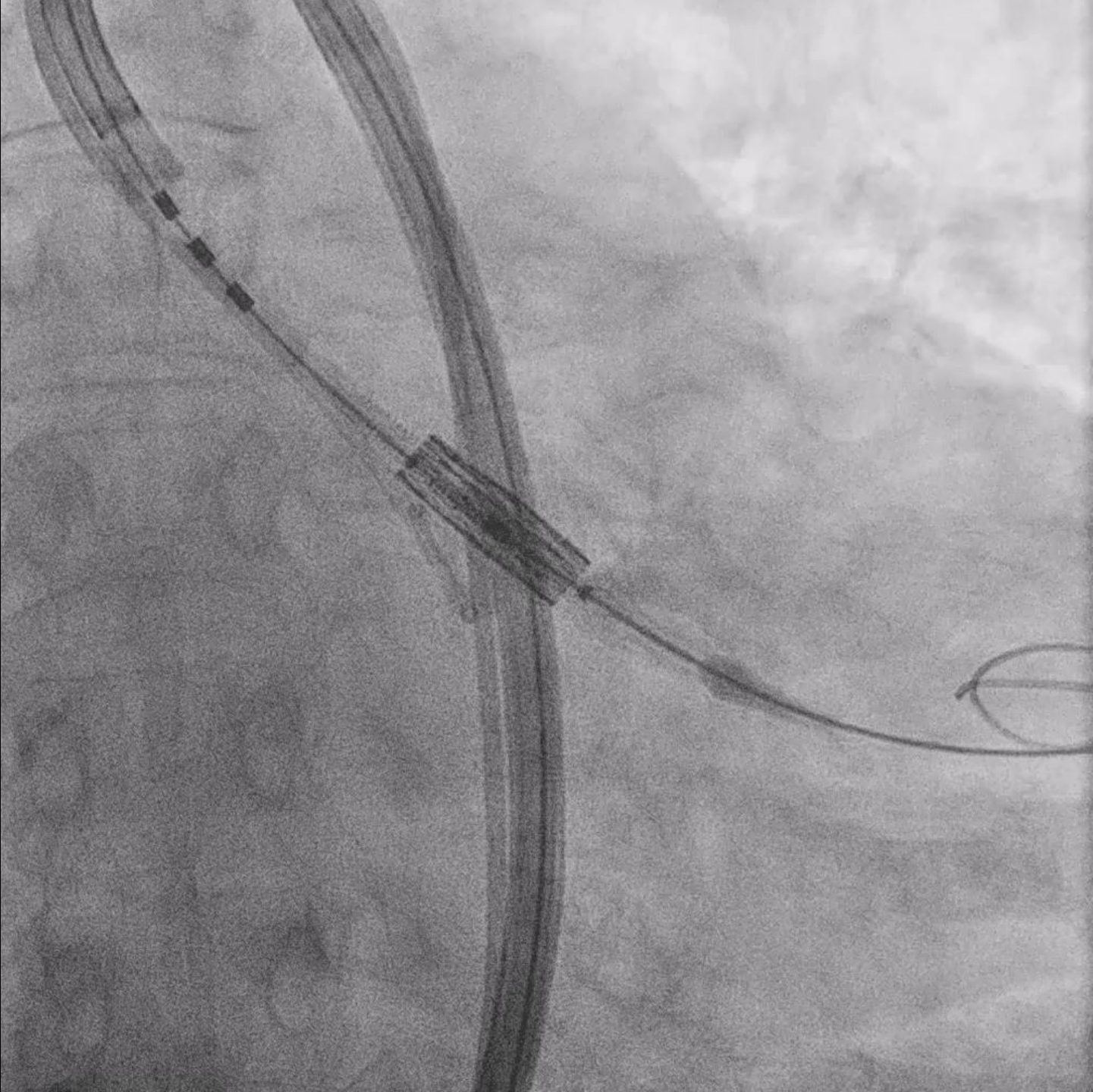
- Severe aortic stenosis with symptoms
- Surgical bioprosthetic valve failure (valve-in-valve)
- Severe aortic stenosis, even without symptoms **–NEW–**
 - Edwards Sapien 3 system only
- TAVR is NOT indicated for aortic regurgitation
- Common questions
 - Is there an upper age limit?
 - Bicuspid aortic valves?
 - Rheumatic aortic stenosis?

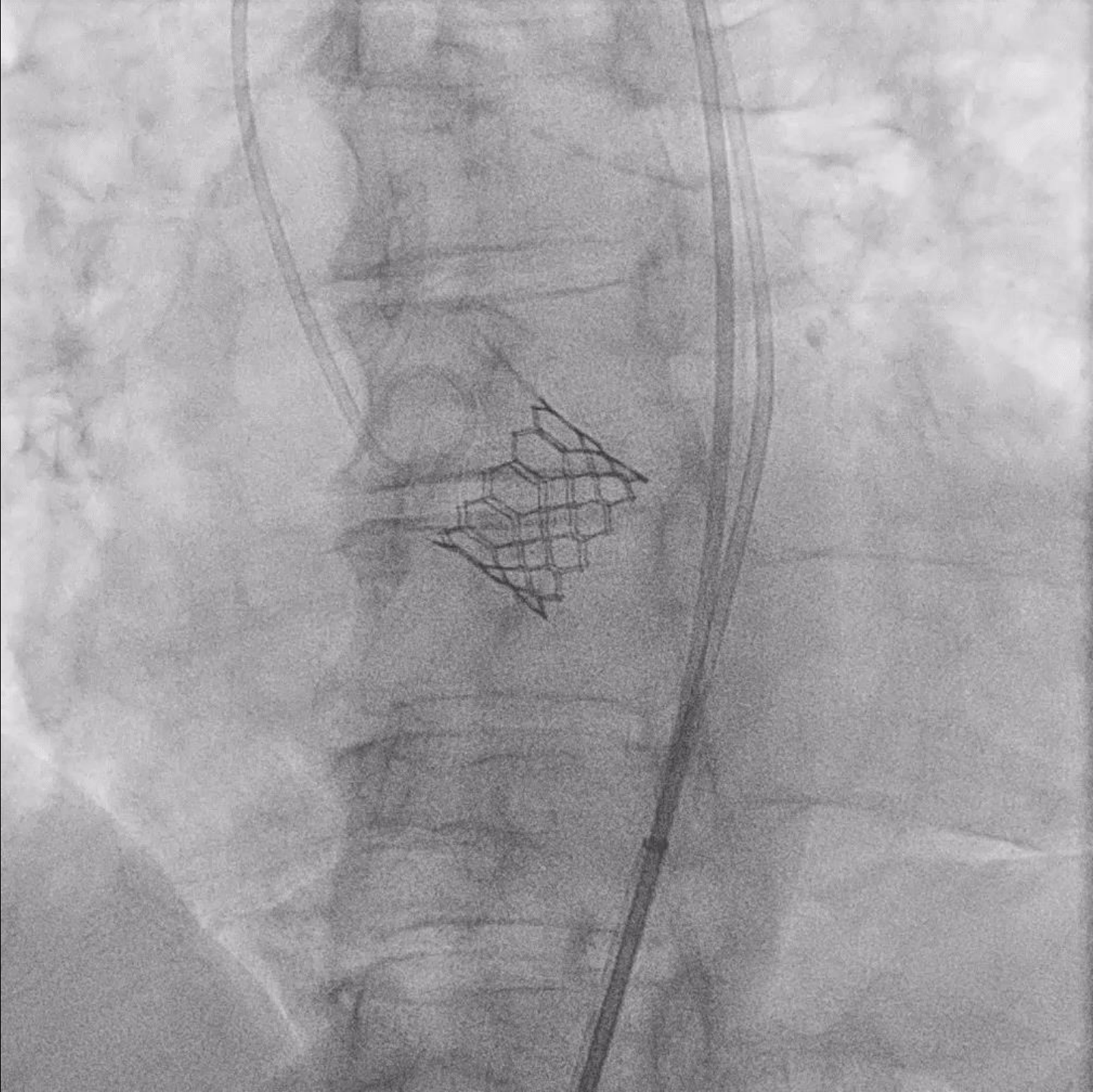
Treatment Selection - TAVR

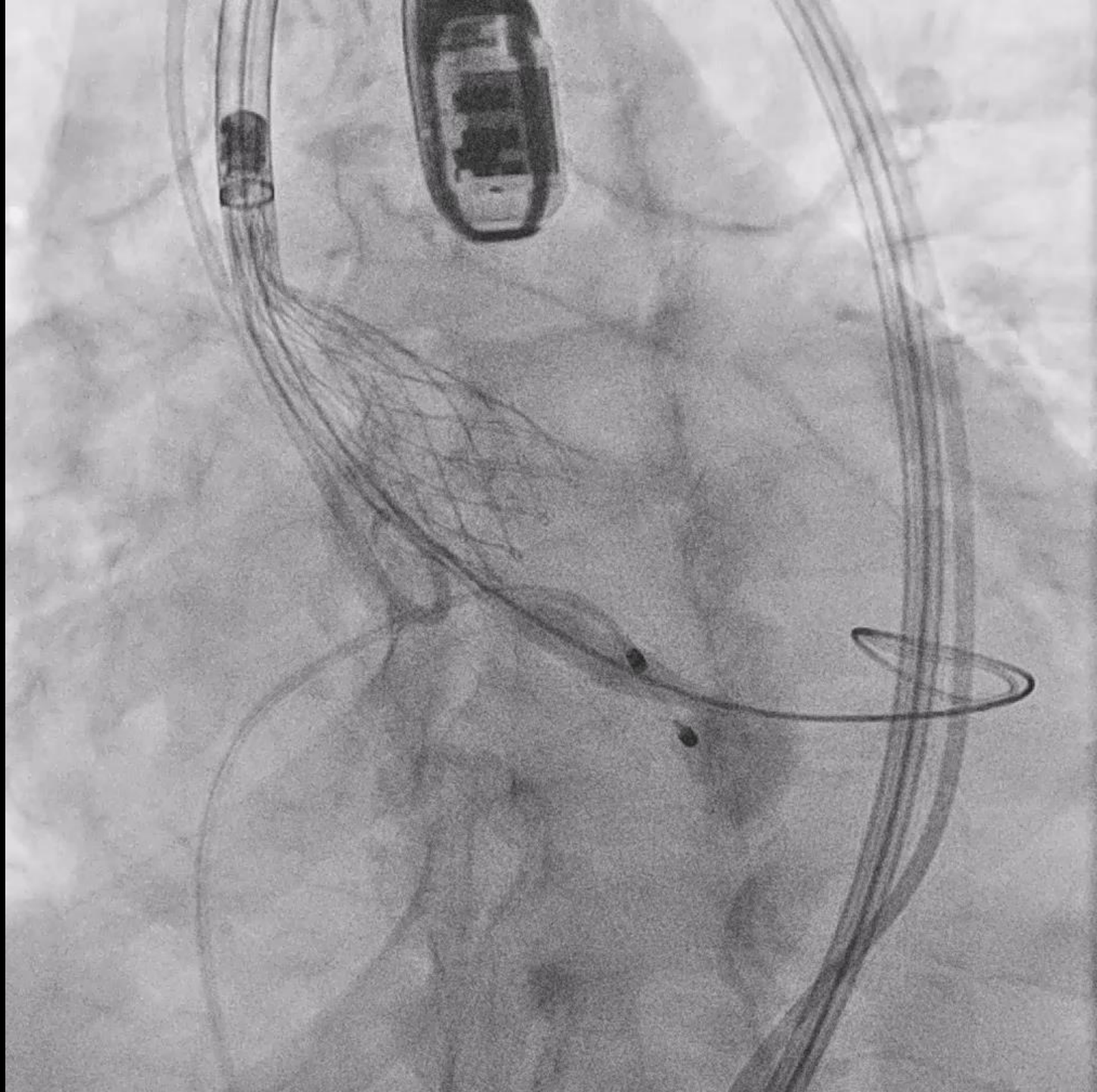


Treatment Selection - TAVR



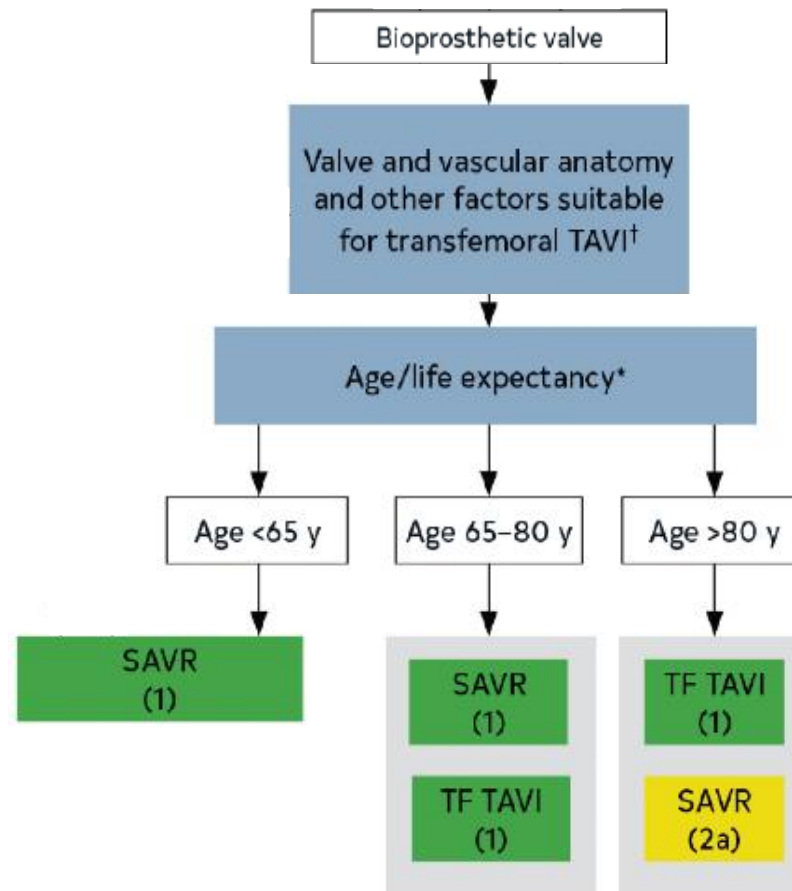








Treatment Selection



Adapted from Circulation 2021;143:e72-e227

TAVR - Outcomes

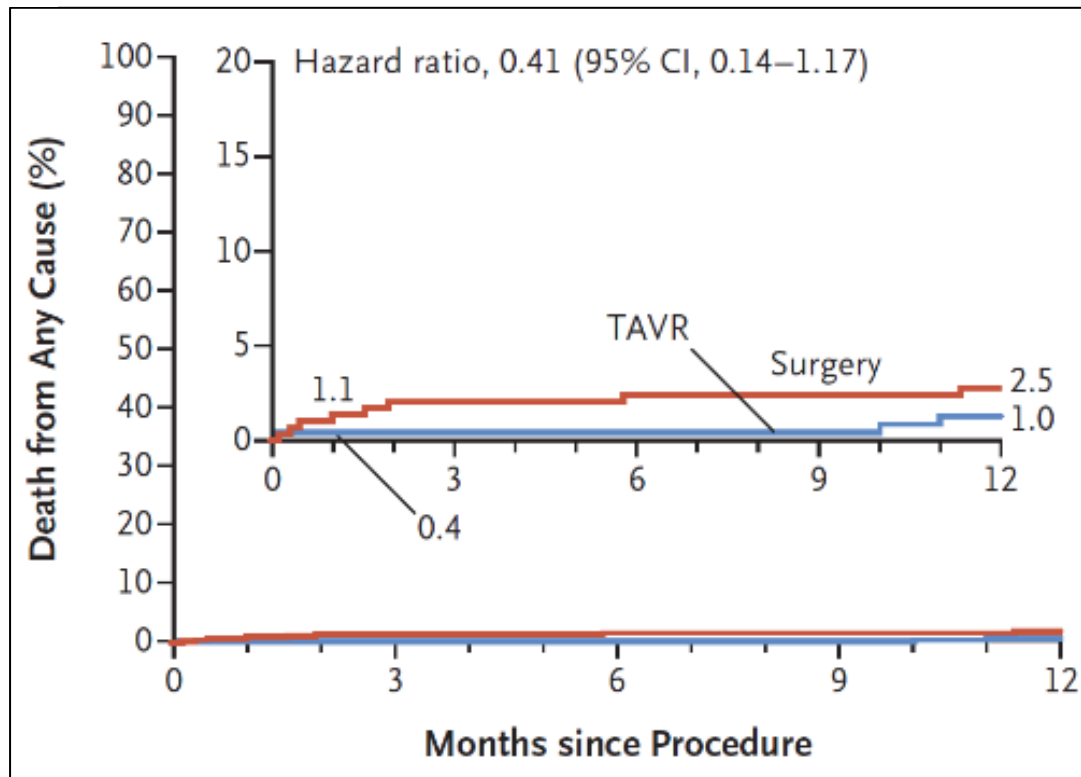


The NEW ENGLAND
JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 2, 2019 VOL. 380 NO. 18

Transcatheter Aortic-Valve Replacement with a Balloon-Expandable Valve in Low-Risk Patients

M.J. Mack, M.B. Leon, V.H. Thourani, R. Makkar, S.K. Kodali, M. Russo, S.R. Kapadia, S.C. Malaisrie, D.J. Cohen, P. Pibarot, J. Leipsic, R.T. Hahn, P. Blanke, M.R. Williams, J.M. McCabe, D.L. Brown, V. Babaliaros, S. Goldman, W.Y. Szeto, P. Genereux, A. Pershad, S.J. Pocock, M.C. Alu, J.G. Webb, and C.R. Smith, for the PARTNER 3 Investigators*



N Engl J Med 2019;380:1695-1705

TAVR - Outcomes

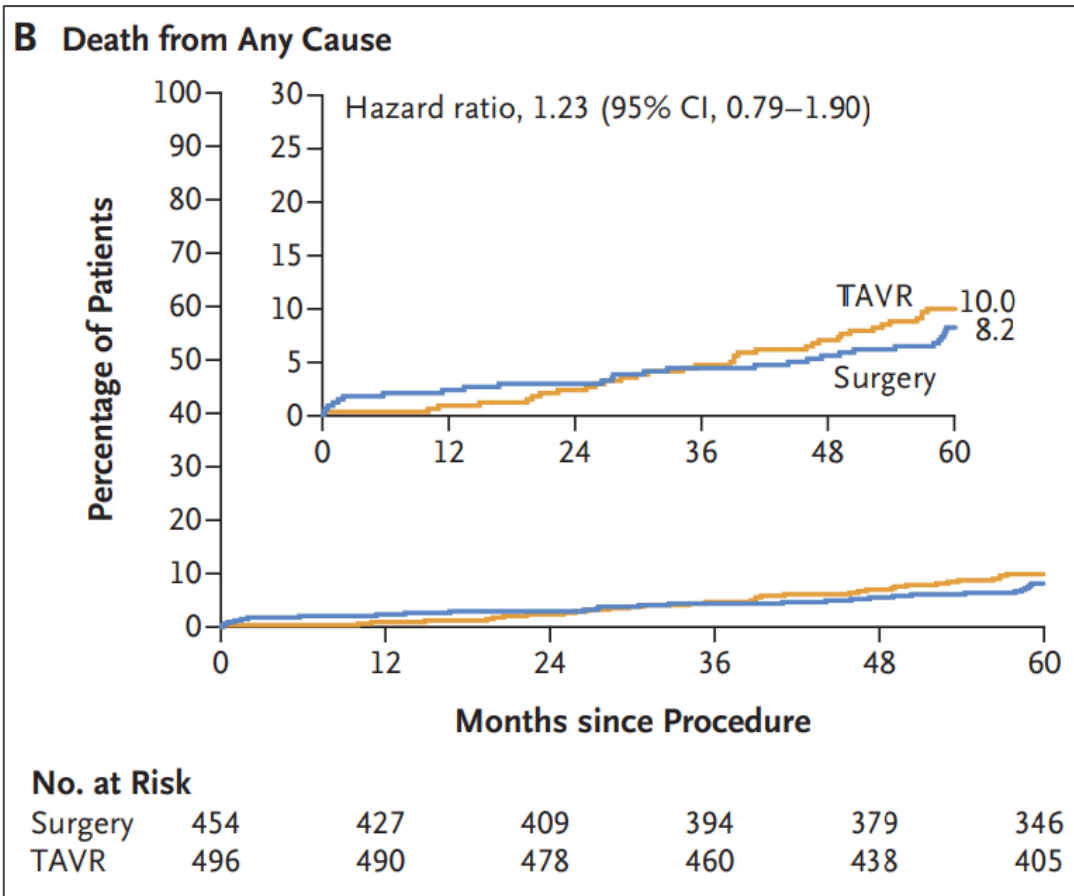


THE NEW ENGLAND JOURNAL OF MEDICINE

ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement in Low-Risk Patients at Five Years

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N Engl J Med 2023;389:21

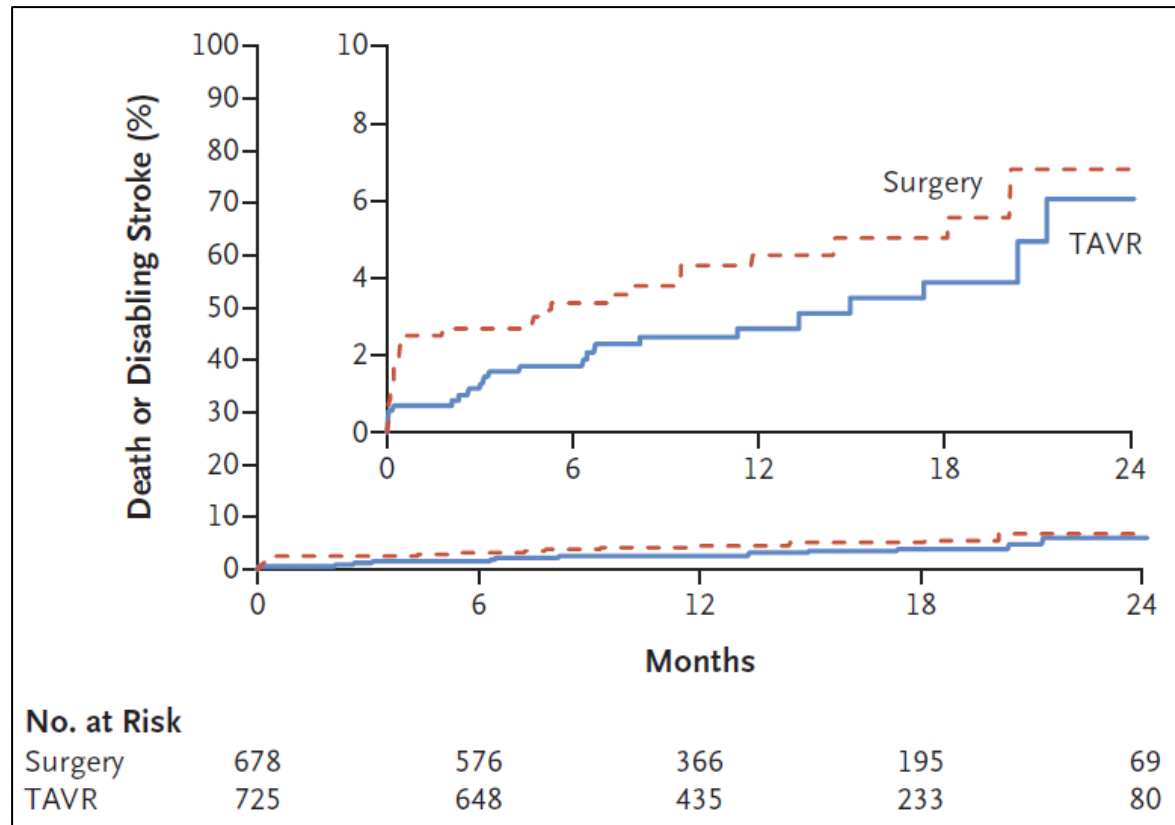
TAVR - Outcomes



ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Self-Expanding Valve in Low-Risk Patients

Jeffrey J. Popma, M.D., G. Michael Deeb, M.D., Steven J. Yakubov, M.D., Mubashir Mumtaz, M.D., Hemal Gada, M.D., Daniel O'Hair, M.D., Tanvir Bajwa, M.D., John C. Heiser, M.D., William Merli, D.O., Neal S. Kleiman, M.D., Jude A. Ashew, M.D., Paul Sorajja, M.D., Joshua Rovin, M.D., Stanley J. Chetcuti, M.D., David H. Adams, M.D., Paul S. Teirstein, M.D., George L. Zorn III, M.D., John K. Forrest, M.D., Didier Tchérché, M.D., Jon Resar, M.D., Antony Walton, M.D., Nicolo Piazza, M.D., Ph.D., Basel Ramlawi, M.D., Newell Robinson, M.D., George Petrossian, M.D., Thomas G. Gleason, M.D., Jae K. Oh, M.D., Michael J. Boulware, Ph.D., Hongyan Qiao, Ph.D., Andrew S. Mugglin, Ph.D., and Michael J. Reardon, M.D., for the Evolut Low Risk Trial Investigators*



N Engl J Med 2019;380:1706-1715

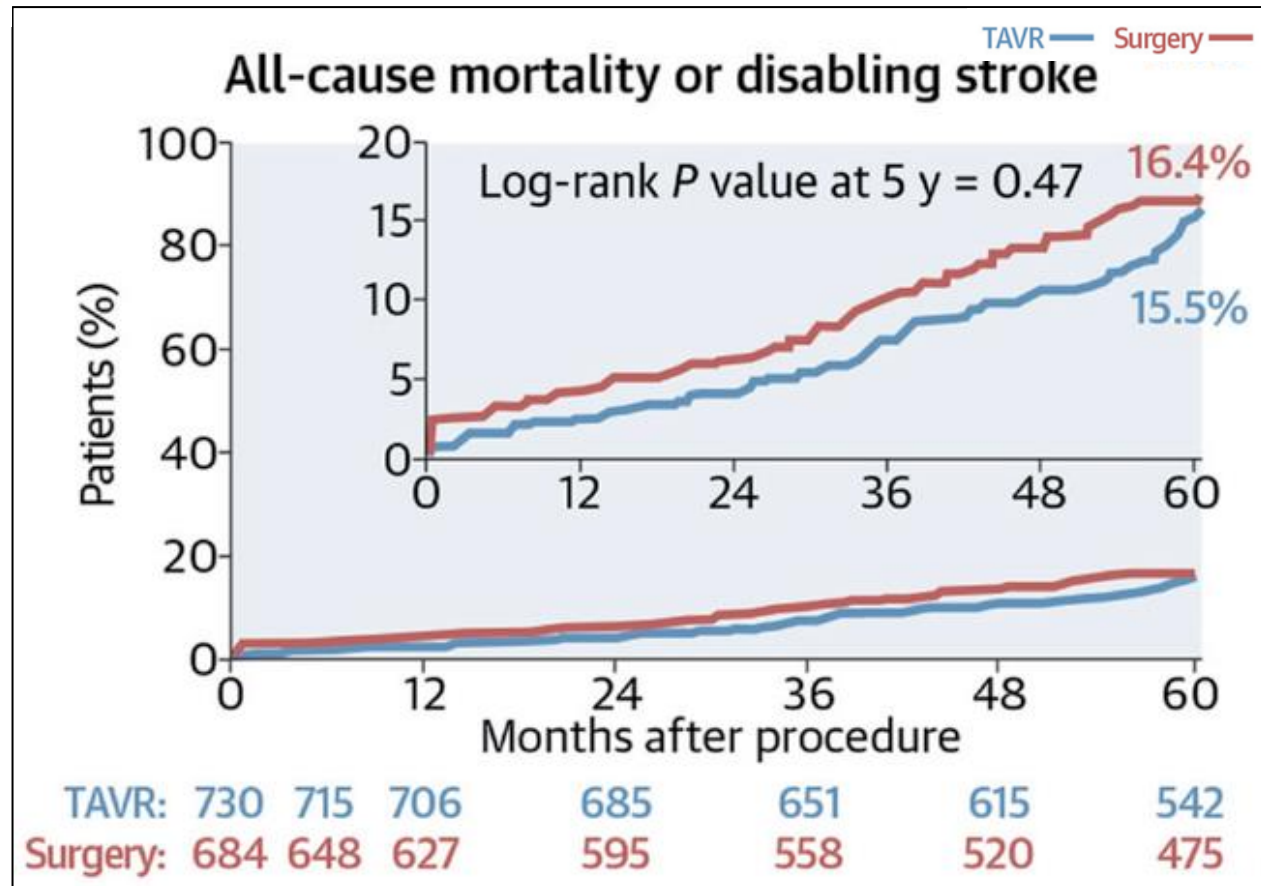
TAVR - Outcomes



5-Year Outcomes After Transcatheter or Surgical Aortic Valve Replacement in Low-Risk Patients With Aortic Stenosis

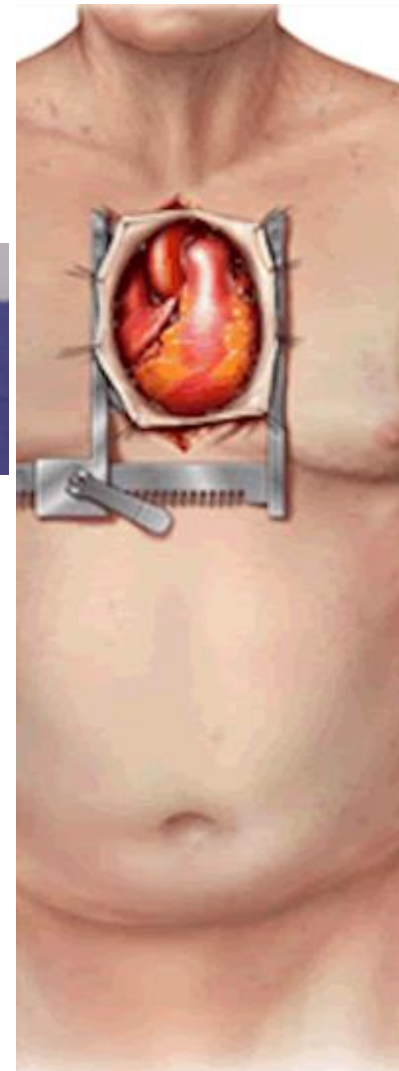
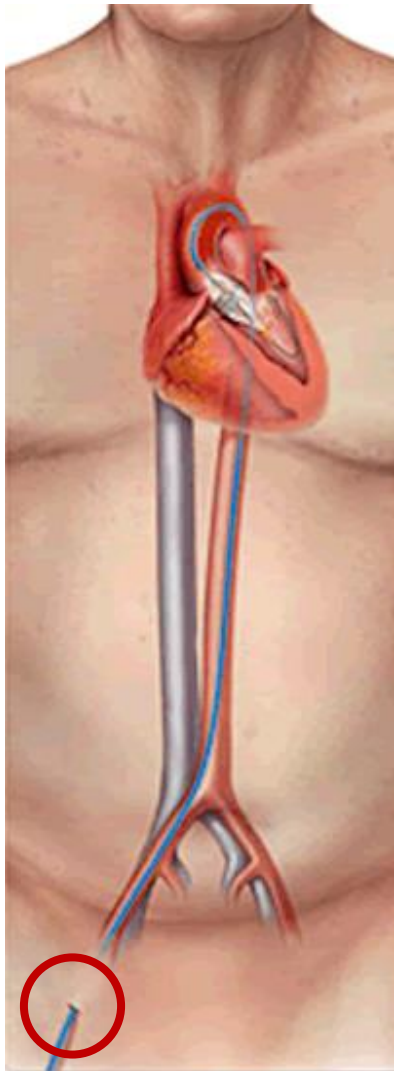


John K. Forrest, MD,¹ Steven J. Yakubov, MD,¹ G. Michael Deeb, MD,¹ Hernal Gada, MD,² Mahesh A. Muntaz, MD,³ Basel Ramawi, MD,⁴ Travis Bajwa, MD,⁵ John Crook, MD,⁶ William Morla, DO,⁵ Stephanie Leung Wai Sang, MD,⁷ Neal S. Kleinman, MD,⁸ George Petrossian, MD,⁹ Newell B. Robinson, MD,¹⁰ Paul Soraja, MD,¹¹ Ayman Iskander, MD,¹² Pierre Berthoumiou, MD,¹³ Didier Tchetché, MD,¹⁴ Christopher Feindel, MD,¹⁵ Eric M. Horlick, MD,¹⁶ Shigeru Saito, MD,¹⁷ Jae K. Oh, MD,¹⁸ Yoonjin Jung, PhD,¹⁹ Michael J. Reardon, MD,²⁰ the Low Risk Trial Investigators



JACC 2025;85:1523-1532

Treatment Selection

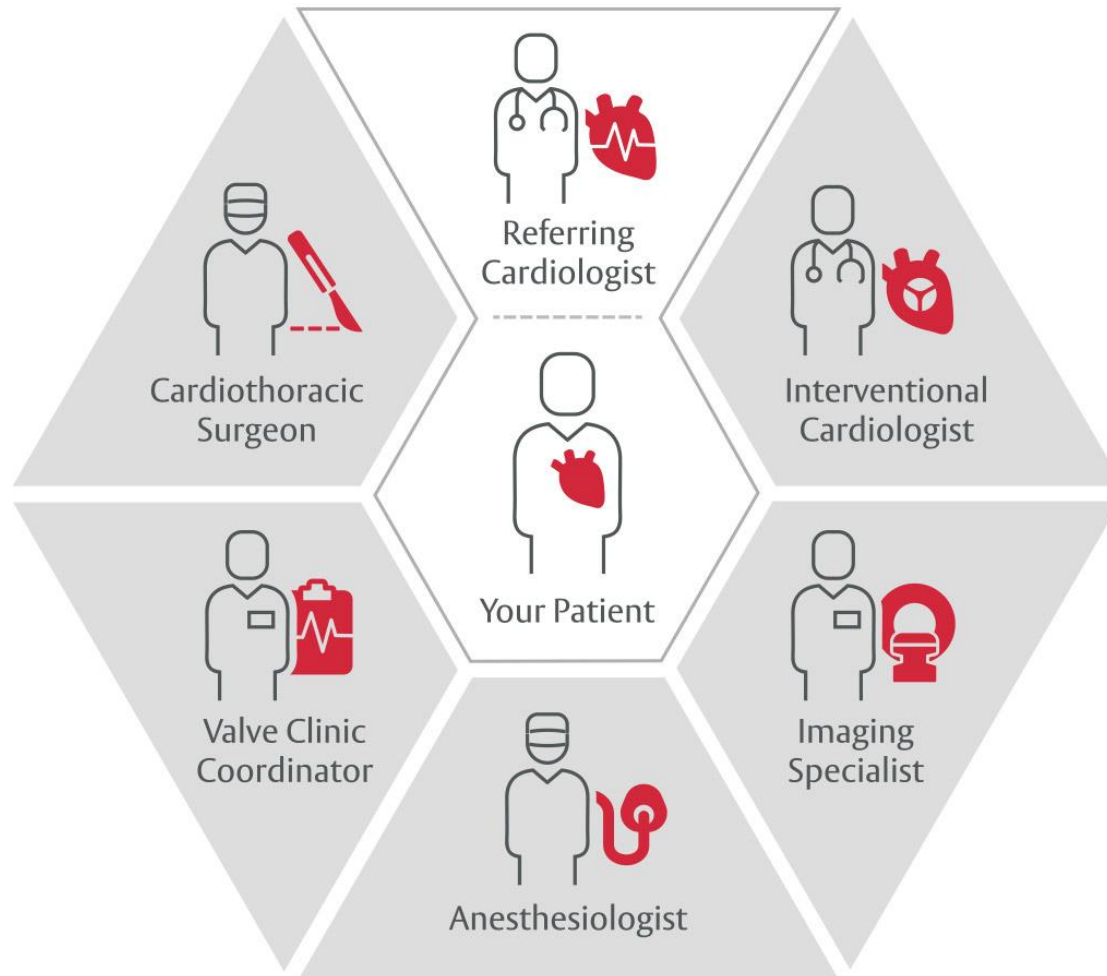


Treatment Selection - Factors



- Age
- Anatomic considerations
 - Bicuspid versus trileaflet
 - Calcification
 - Root size
- Comorbid cardiovascular conditions
 - Coronary artery disease
 - Other valvular abnormalities
 - Thoracic aortic aneurysm
- Comorbid noncardiac conditions
 - Peripheral artery disease
 - Prior chest radiation
 - Lung disease
 - Obesity

Treatment Selection – Heart Team



From heartvalves.com

Treatment Selection

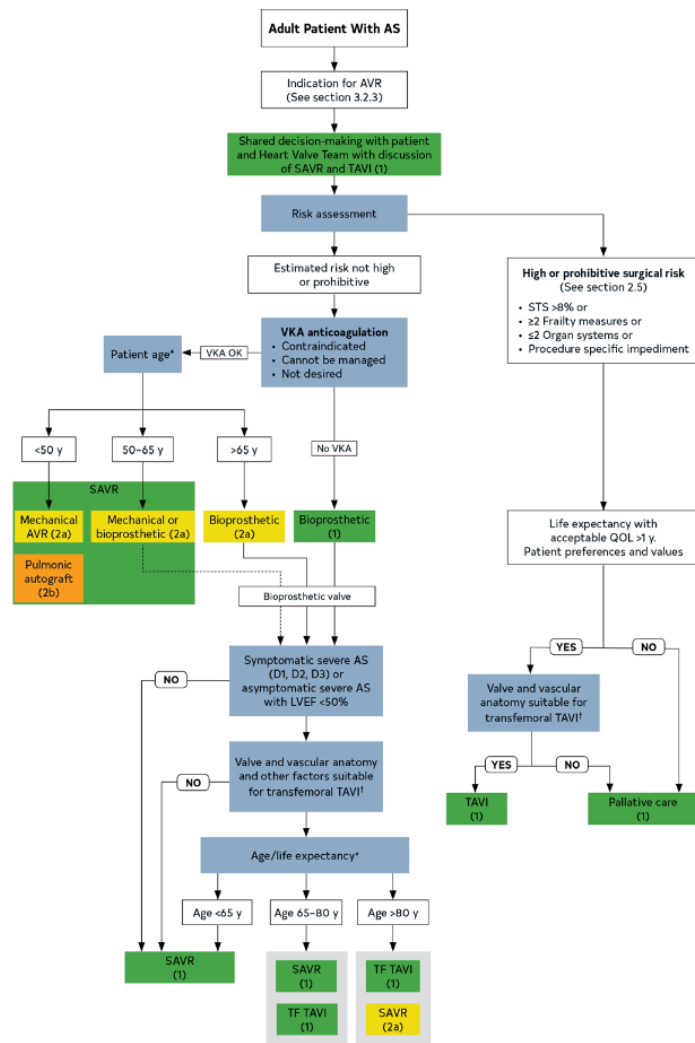


Treatment Selection



- What is Lifetime Management?

Guidelines Recommending Surgical AVR



Recommendations for Choice of SAVR Versus TAVI for Patients for Whom a Bioprosthetic AVR Is Appropriate

Referenced studies that support the recommendations are summarized in [Online Data Supplement 11 to 13](#).

COR	LOE	Recommendations
1	A	1. For symptomatic and asymptomatic patients with severe AS and any indication for AVR who are <65 years of age or have a life expectancy >20 years, SAVR is recommended. ¹⁻³
1	A	2. For symptomatic patients with severe AS who are 65 to 80 years of age and have no anatomic contraindication to transfemoral TAVI, either SAVR or transfemoral TAVI is recommended after shared decision-making about the balance between expected patient longevity and valve durability. ^{1,4-8}
1	B-NR	5. For asymptomatic patients with severe AS and an abnormal exercise test, very severe AS, rapid progression, or an elevated BNP (COR 2a indications for AVR), SAVR is recommended in preference to TAVI. ^{1-3,11}
1	A	6. For patients with an indication for AVR for whom a bioprosthetic valve is preferred but valve or vascular anatomy or other factors are not suitable for transfemoral TAVI, SAVR is recommended. ^{1-3,11}

Guidelines Recommending Surgical AVR



Adult Patient With AS

Severe AS / AI

Shared decision-making with patient and Heart Valve Team with discussion

Age <60 = **mechanical valve**

- ↑ Durability
- ↓ Risk of future reoperation
- Lifelong coumadin

Age >65 = **bioprosthetic valve**

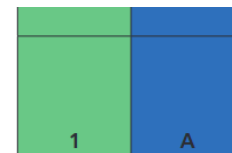
- 10-15 year durability
- No obligatory anticoagulation
- Surgical or transcatheter options



Recommendations for Choice of SAVR Versus TAVI for Patients for

Avoidance of mandatory anticoagulation has clear benefits

Avoidance of surgery also sounds great



>20 years, SAVR is recommended.¹⁻³

2. For symptomatic patients with severe AS who are 65 to 80 years of age and have no anatomic contraindication to transfemoral TAVI, either SAVR or transfemoral TAVI is

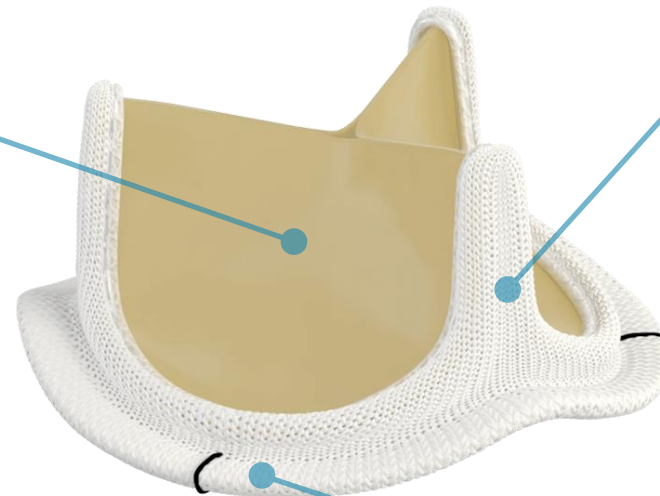
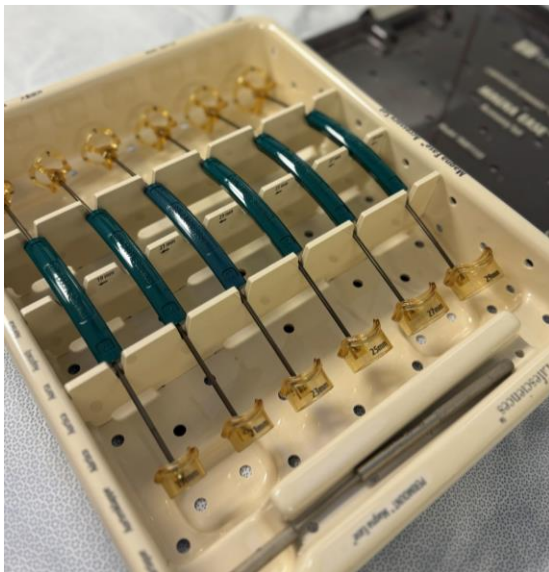
- What about age 60-65?
- How do we decide between surgery and transcatheter valves?
- What happens after a bioprosthetic valve fails?

Bioprosthetic Aortic Valve Replacement



Leaflets
(bovine pericardium)

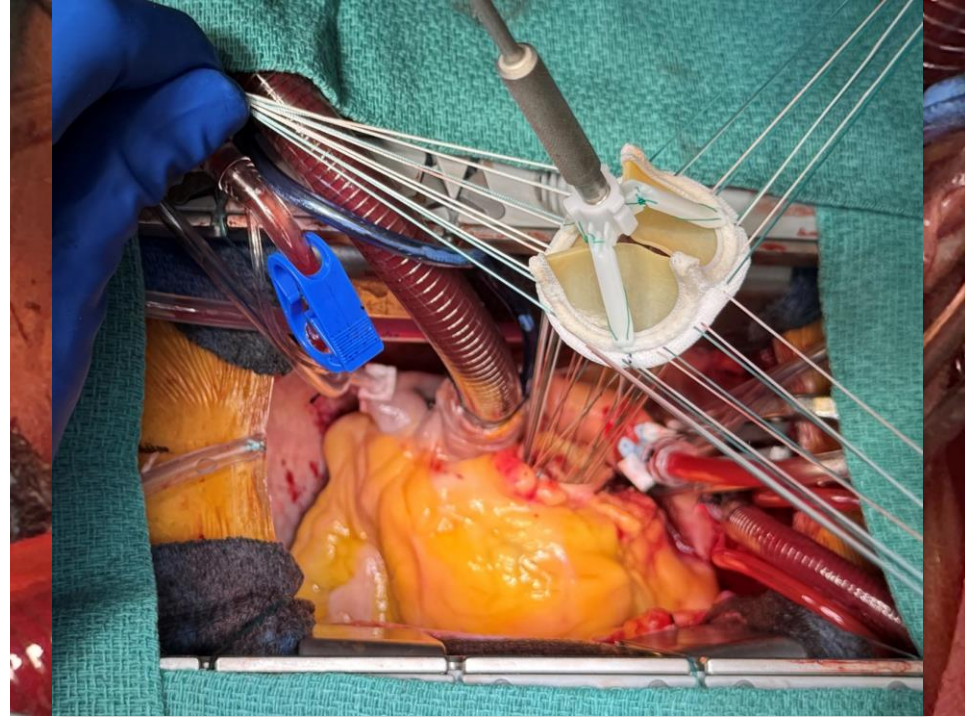
Frame / Struts



Sewing Ring

Sizes range from 19 – 29mm (diameter)

Surgical Aortic Valve Replacement



- Trans-aortic exposure
- Native valve excised
- Supra-annular position
- Interrupted pledgetted mattress sutures

Surgical Aortic Valve Replacement



Edwards INSPIRIS RESILIA



- Bovine pericardial tissue
- Based on well-researched Perimount platform
- Proprietary RESILIA preservation treatment designed to reduce tissue calcification
- Fluoroscopically-visible size markers



VFit structural design allows for annular expansion with radial force
(facilitating future valve-in-valve TAVR)

Role of SAVR in Lifetime Management of AS



Must recognize advantages and disadvantages of
both SAVR and TAVR

- Drawbacks to standard surgical AVR approaches
- Risks associated with TAVR-first strategies



Impact of Aortic Annulus Size on Valve Hemodynamics and Clinical Outcomes After Transcatheter and Surgical Aortic Valve Replacement

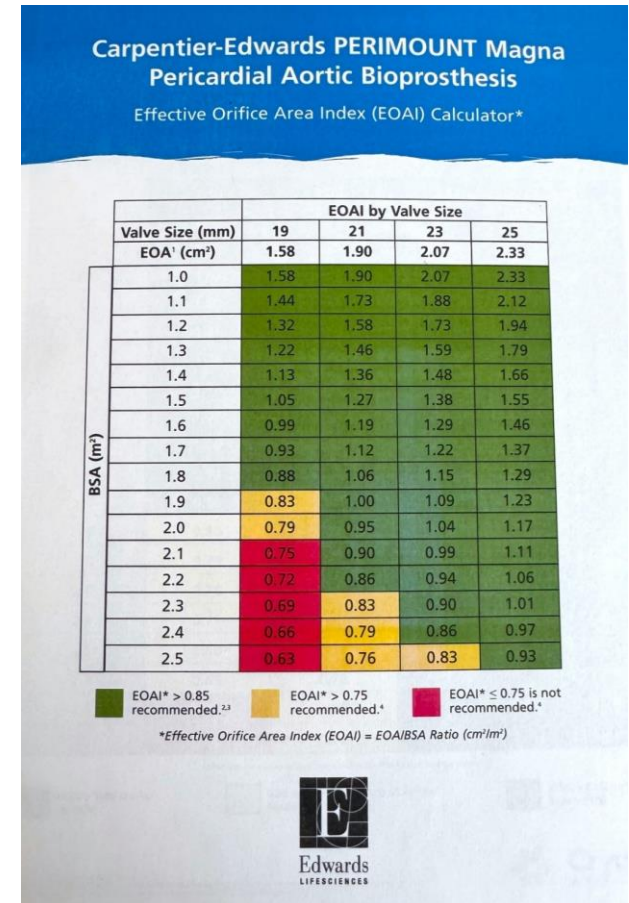
Insights From the PARTNER Trial

- Multiple clinical trials have demonstrated problematic trends in SAVR
- Most common valve sizes (60-70%) – 21mm and 23mm
- Correlated with higher incidence of severe PPM
- Severe postop PPM associated with poor long-term outcomes
- Smaller valve size also associated with severe PPM following ViV TAVR

The Importance of Bioprosthetic Valve Size

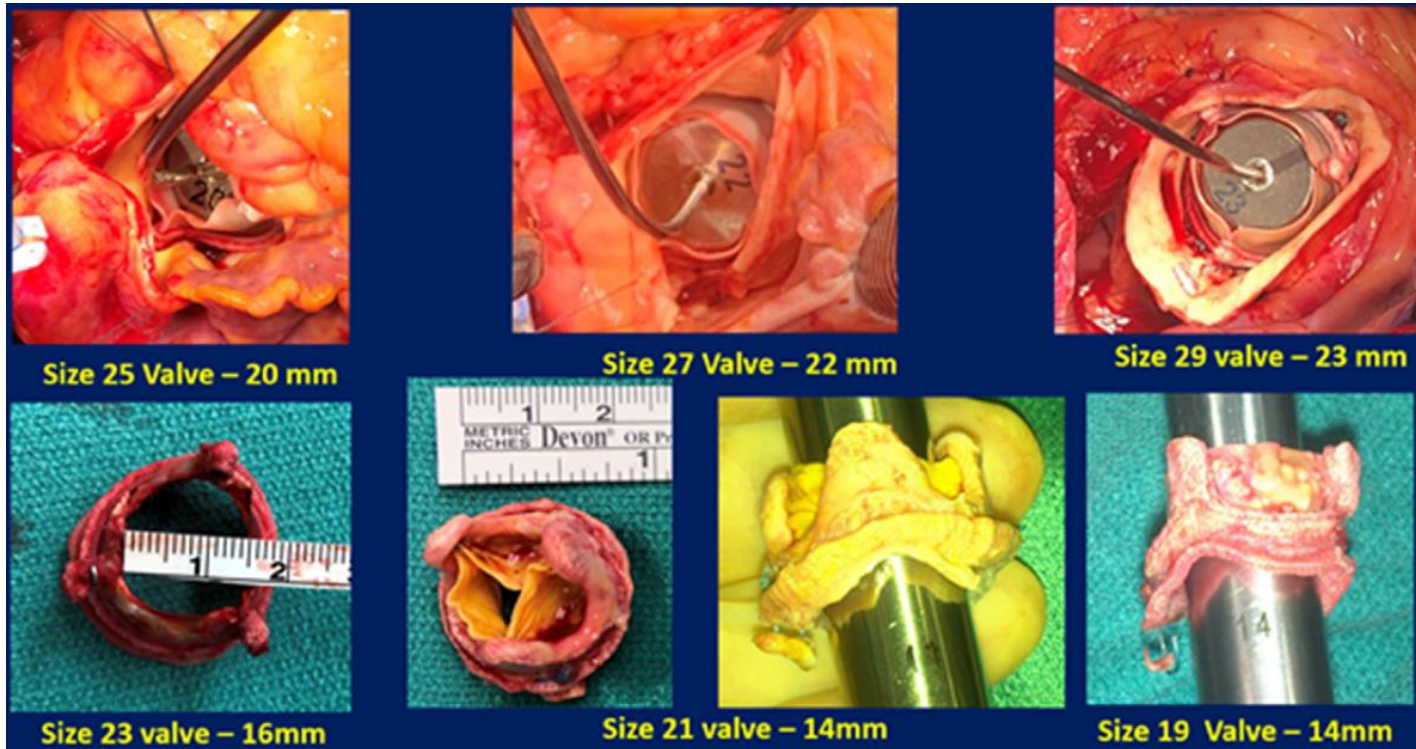


- Industry-provided sizing charts (valve-specific)
- **Green** – valve size capable of providing a recommended effective orifice area (EOAI) indexed according to body surface area
- Valves traditionally chosen based on smallest size capable of providing adequate EOAI
- Annular enlargement techniques historically employed only if the native annulus could not accommodate minimum valve size



EOA – area through which blood flows through the valve
EOAI > 0.85 results in “insignificant” degree of Patient-Prosthesis Mismatch

Inaccuracy of Product Labeling



- Inner diameter 5-7mm smaller than label
- Average native annulus size 21-23mm
- 23mm bioprosthesis valve → 17mm true internal diameter

TAVR Explantation Increasingly Common



Surgical Explantation After TAVR Failure

Mid-Term Outcomes From the EXPLANT-TAVR
International Registry

Surgical Explantation of Transcatheter Aortic Bioprostheses

An Analysis From the Society of Thoracic Surgeons Database

**Incidence, Characteristics, Predictors, and
Outcomes of Surgical Explantation After
Transcatheter Aortic Valve Replacement**

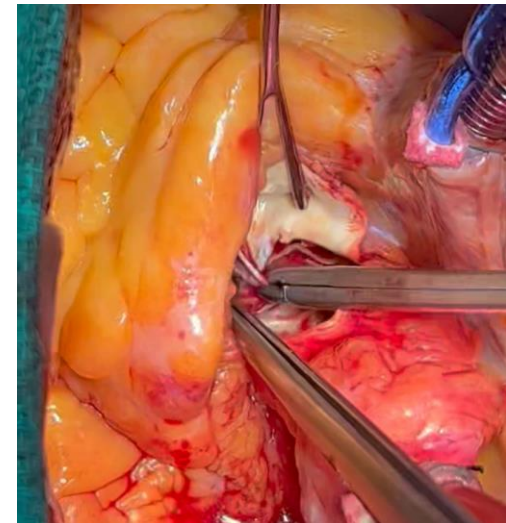
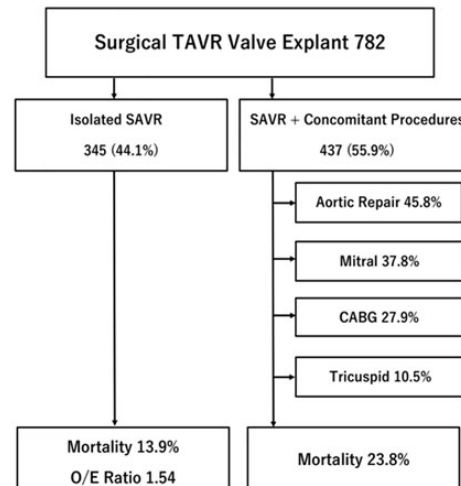
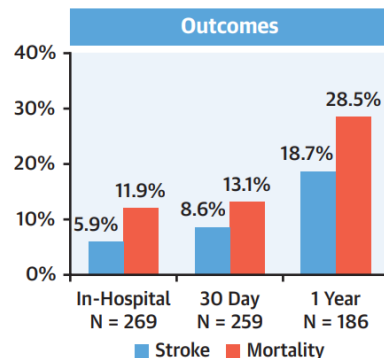
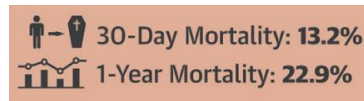
**Explant vs Redo-TAVR After Transcatheter Valve
Failure: Mid-Term Outcomes From the
EXPLANTORREDO-TAVR International Registry**

**HAWAII'
PACIFIC
HEALTH** | HAWAII'
HEALTH
PARTNERS

TAVR Explantation ↑ Mortality Risk



- Multiple studies have demonstrated higher-than-expected mortality during TAVR explantation (~13% operative mortality)
- Not an argument against the use of TAVR
- Rather, an argument in favor of lifetime management strategies



Not-So-Simple Decisions

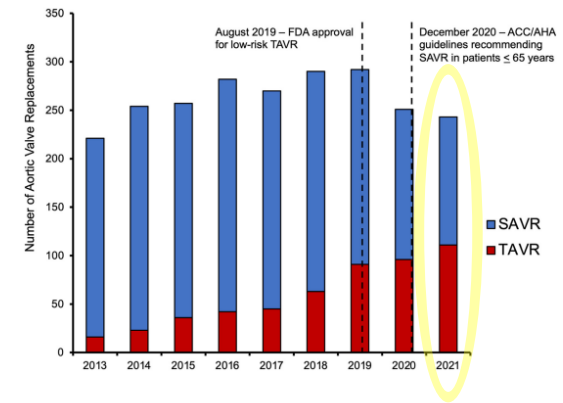


J. MAXWELL CHAMBERLAIN MEMORIAL PAPER FOR ADULT CARDIAC SURGERY

Guidelines vs Practice: Surgical Versus Transcatheter Aortic Valve Replacement in Adults ≤60 Years



Sundos Alabbadi, PharmD,¹ Jad Malas, MD,² Qiudong Chen, MD,² Wen Cheng, MD,² Derrick Y. Tam, MD, PhD,² Robbin G. Cohen, MD,² Michael E. Bowdish, MD, MS,² Natalia Egorova, PhD,¹ and Joanna Chikwe, MD²



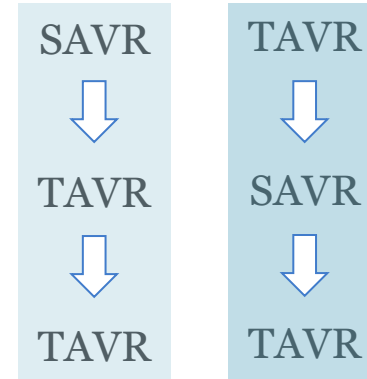
Nearly 50% of patients < age 60 undergo TAVR in California

- The question is *not* “do you want heart surgery”?
- The question is “what is the best option for each patient”?
- Now that technology is available, we need to apply it responsibly
- TAVR at an early age may expose patients to unnecessary risk later in life

Lifetime Strategy for Bioprosthetic Valves



Lifetime Management Strategy



60 year-old patient



72 years-old



84 years-old



Average bioprosthetic valve lifespan ~12yrs

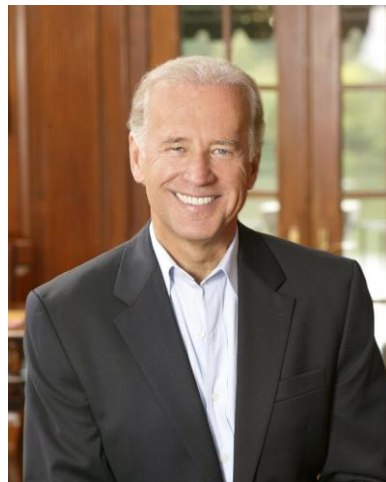
Hawai'i with longest
life expectancy in USA
80.7

- High mortality for TAVR explant
- ↑ Risk for PPM following ViV TAVR within small-diameter prosthesis

Is There a “Good Time” for Surgery?



- Surgical risks are lower at younger ages with fewer comorbidities



2005



2025

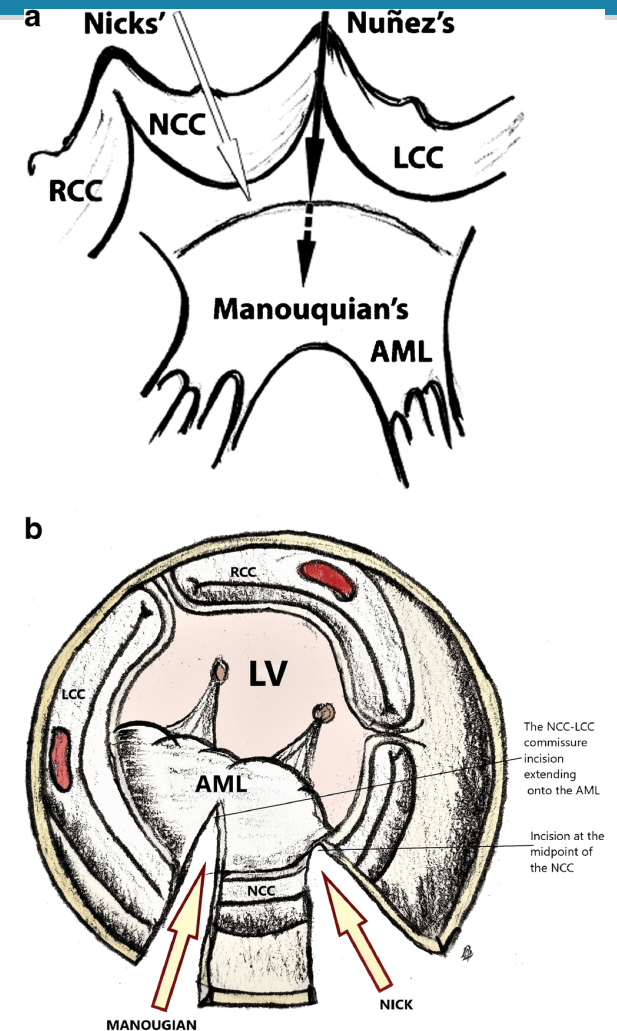
Is There a “Good Time” for Surgery?



- Surgical risks are lower at younger ages with fewer comorbidities
- Surgery allows for excision of native valve and calcium deposits
- New-generation surgical valves employ TAVR-friendly designs
- Surgery allows for *manipulation of valve / annular size*
- Can we use an early-surgery approach to optimize future TAVR?

Aortic Annular Enlargement

- Traditionally used in cases where native annulus is too small to accommodate prosthetic valve capable of achieving minimum EOAI
- Incision into the aortic annulus allows for a wedge-shaped pericardial patch to enlarge the diameter
- Typically permits upsizing by **1 valve size**
- Perceived as a “last resort” option for undersized valves

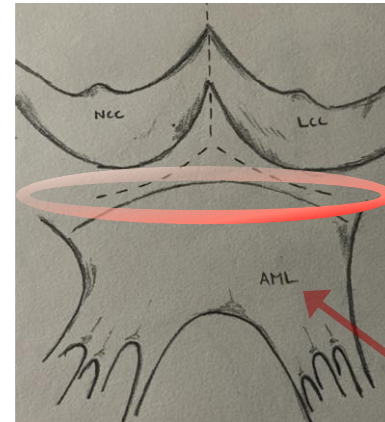
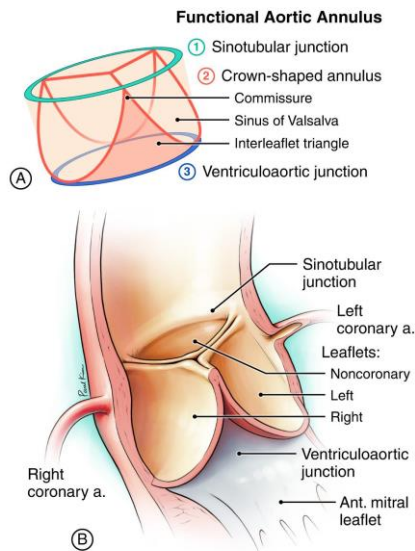


The “Bo Yang” Procedure



A novel simple technique to enlarge the aortic annulus by two valve sizes

Bo Yang, MD, PhD, Ann Arbor, Mich



Aortic Annulus

Anterior Leaflet of Mitral Valve

Aortic Root

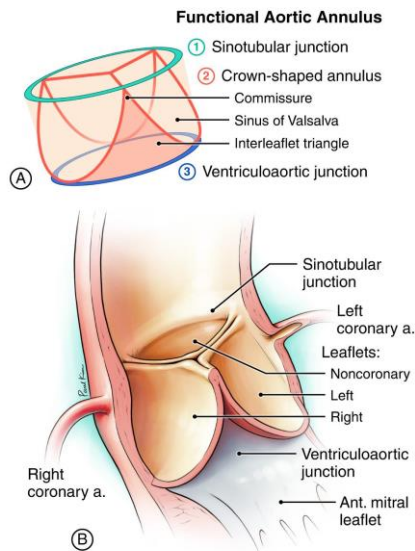
Complex 3-Dimensional Anatomy

The “Bo Yang” Procedure



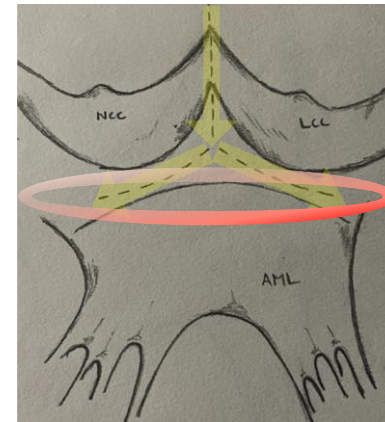
A novel simple technique to enlarge the aortic annulus by two valve sizes

Bo Yang, MD, PhD, Ann Arbor, Mich



Aortic Root

Complex 3-Dimensional
Anatomy



Y-INCISION

Between left and
noncoronary cusps

To the left and right
fibrous trigones

Anterior leaflet of mitral valve is preserved

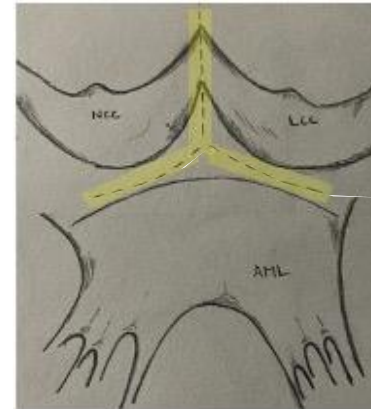
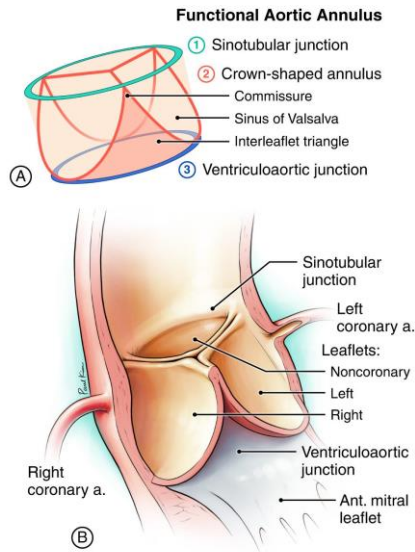
The “Bo Yang” Procedure



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Expansion of annular geometry



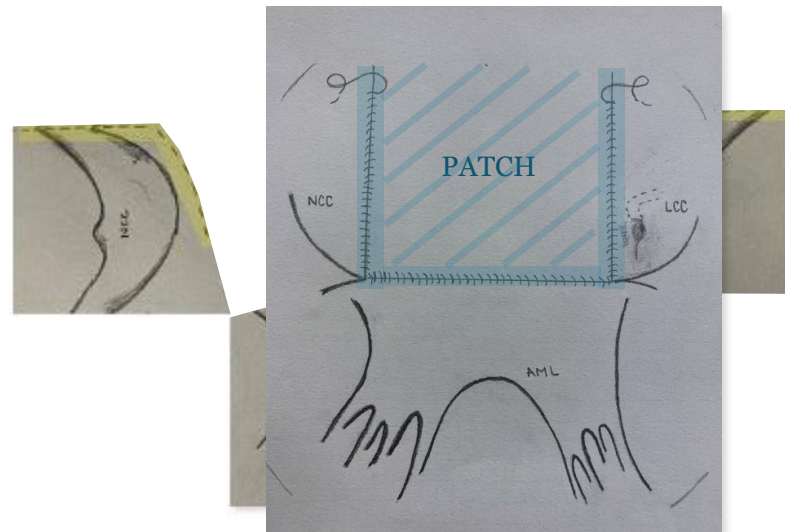
Aortic Root

Complex 3-Dimensional
Anatomy

The “Bo Yang” Procedure



A novel simple technique to enlarge the aortic annulus by two valve sizes



Hemashield polyester woven patch

Less calcification than bovine pericardium, simplifies operation

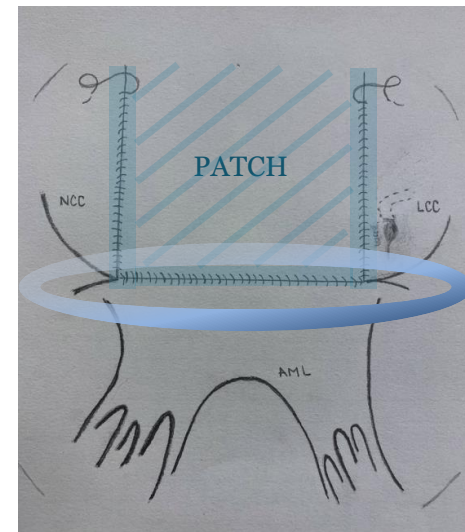
The “Bo Yang” Procedure



A novel simple technique to enlarge the aortic annulus by two valve sizes



Larger “neo-annulus”



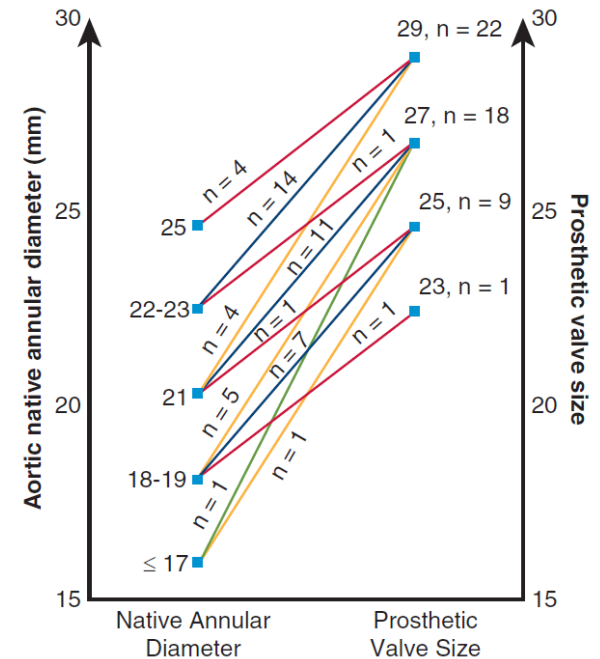
Hemashield polyester woven patch

Less calcification than bovine pericardium, simplifies operation

“Bo Yang” Outcomes



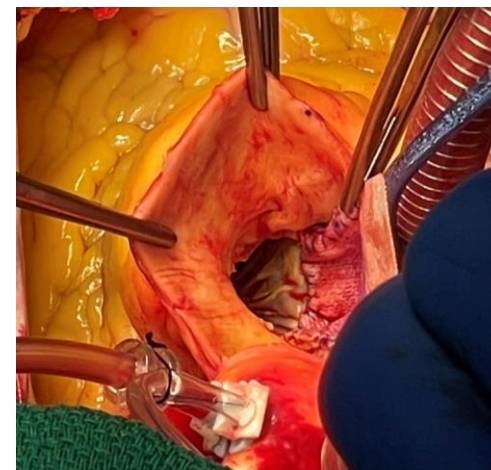
- First published 2020
- Demonstrated to allow annular enlargement by 3-4 valve sizes
- 50-case series published 2022
 - 80% with size 27 or greater
 - No postoperative mortality
 - No change in perioperative morbidity metrics
 - No increase in pacemaker implantation



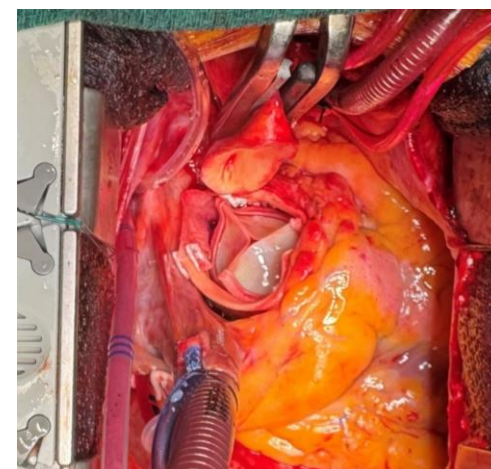
Surgical Management of AS at Straub Benihoff



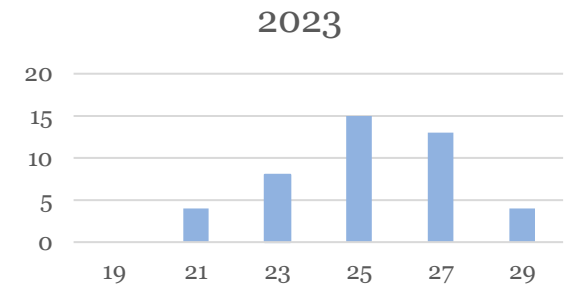
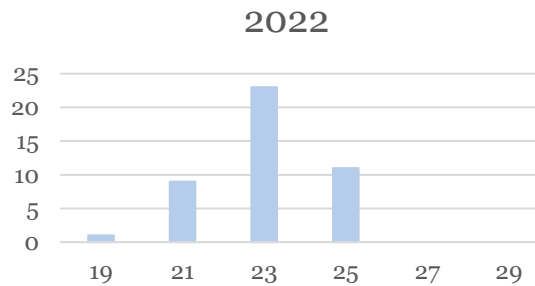
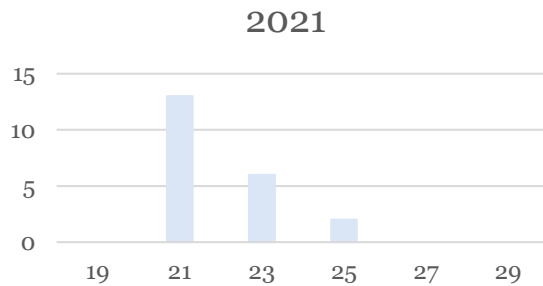
- Inspiris bioprosthetic valves
- Adoption of Bo Yang technique 2023
- Similar outcomes to reported data
- Heart Team approach to candidacy



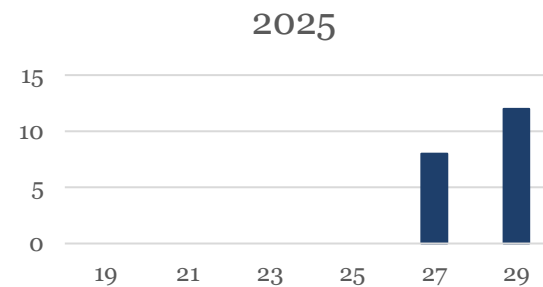
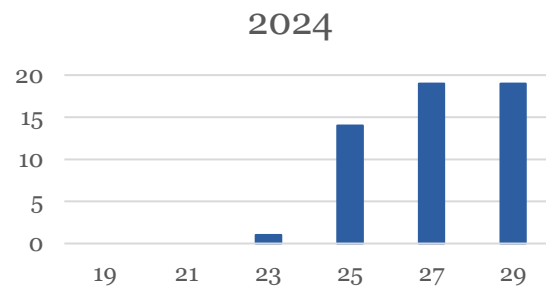
				AORTIC	19	0
TOTAL BIOPROSTHETIC VALVE REPLACEMENTS				20	21	0
	AVERAGE SIZE			28.2	23	0
	Most Common			29	25	0
					27	8
					29	12



SBMC Bioprosthetic Valve Size Trends

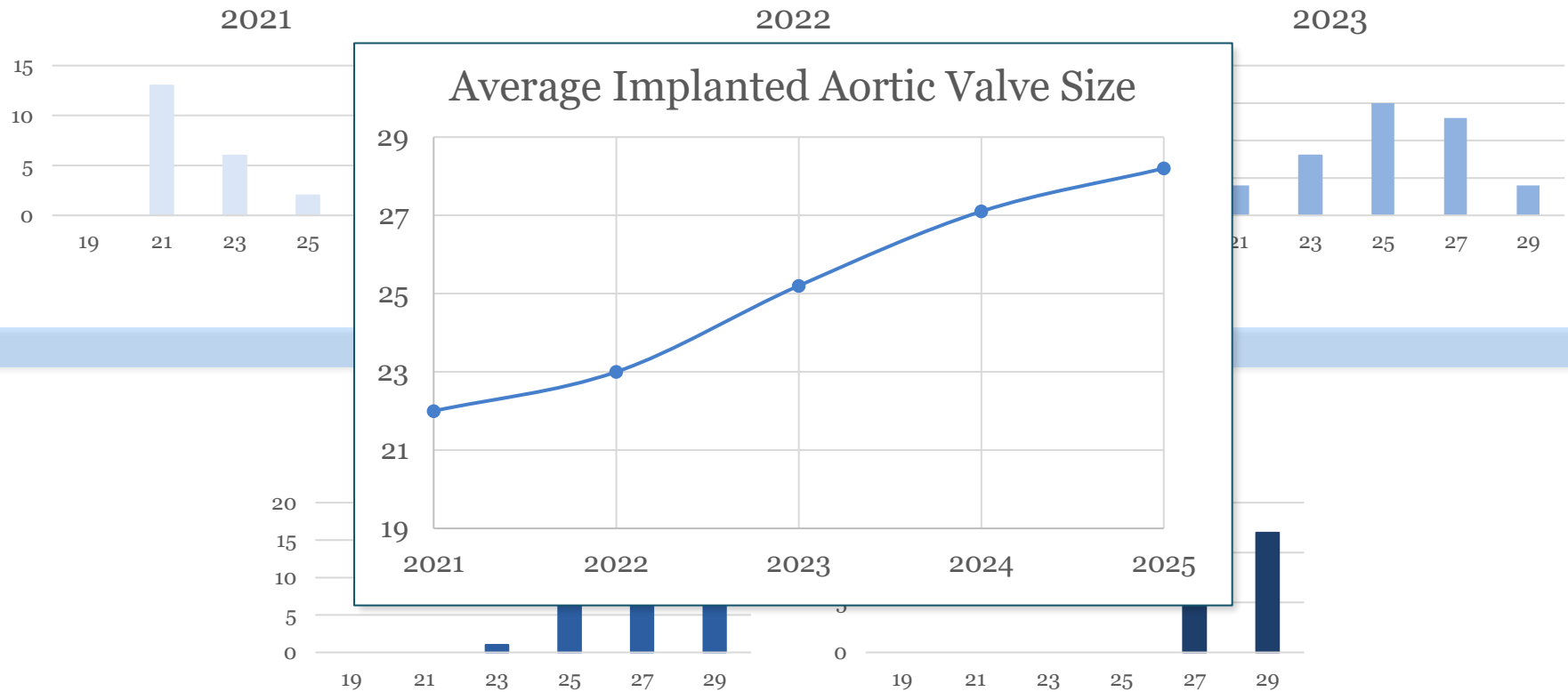


Adoption of “Bo Yang” technique



2025 – all valves sized 27mm or higher (n = 20)

SBMC Bioprosthetic Valve Size Trends



2025 – all valves sized 27mm or higher (n = 20)

Conclusions



- All patients with aortic valvular disease should be managed using a multidisciplinary approach
- Transcatheter and surgical valve replacement each offer unique risks and benefits
- The limited durability of bioprosthetic valves requires careful consideration of the strategy for sequential interventions over a patient's lifetime
- The choice of approach is not as simple as “cracking the chest” or “the one without surgery”
- Using a team-based multidisciplinary process, SBMC has established a cutting-edge approach for the lifelong management of aortic stenosis

Next HHP Webinar: (for HQIP credit)

Thursday, June 12 from 12:30-1:30p

Atrial Fibrillation

Dr. John Kao and Dr. Pattara Rattanawong

To view upcoming HHP webinars and future events, please visit our [Hawai'i Health Partners website](#) for the “**Events Calendar**” from the “For Providers” dropdown.

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Education & CME Credit

What is an ACO?

Telehealth



For Specialists Only:

Annual Assessment of Chronic Conditions #1 - For HQIP Credit

Presentation will be emailed from
Info@HawaiiHealthPartners.org on **May 30**.

Deadline to view recording and complete test questions
is **June 27**.

This measure is separate from HHP Network
Engagement – Webinars measure



Provider Review Period: June 2 - 30

Final performance for the 2024 HHP QPP/SSP (now HQIP) will be available on Monday, June 2.

Please review your 2024 dashboard and send discrepancies/inquiries to Info@HawaiiHealthPartners.org during this period.



Thank you for joining us!

- A recording of the meeting will be available afterwards
- Unanswered question?
 - Contact us at info@hawaiihealthpartners.org