

# Surgeon's Role in the Era of Transcatheter Valve Treatment

**Jian (James) Ye, MD, FRCSC**

**Cardiac Surgeon, Clinical Professor**

**St. Paul's Hospital and Vancouver General Hospital  
University of British Columbia, Vancouver, Canada**

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Centre for  
Heart Valve Innovation  
St. Paul's Hospital, Vancouver



**HEART CENTRE**  
AT ST. PAUL'S HOSPITAL

# **Disclosure Statement of Financial Interest**

**Consultant:**

**Edwards Lifesciences  
JC Medical Inc.**

# Cardiac Surgery

## Dying star or supernova?

Cardiac surgery has been scrutinized and challenged as no other specialty has, particularly over the past 10 years.

Adult cardiac surgery will be taken over by Cardiology?

**Changes ?**

**Challenges?**

# Innovations from open to closed heart surgery

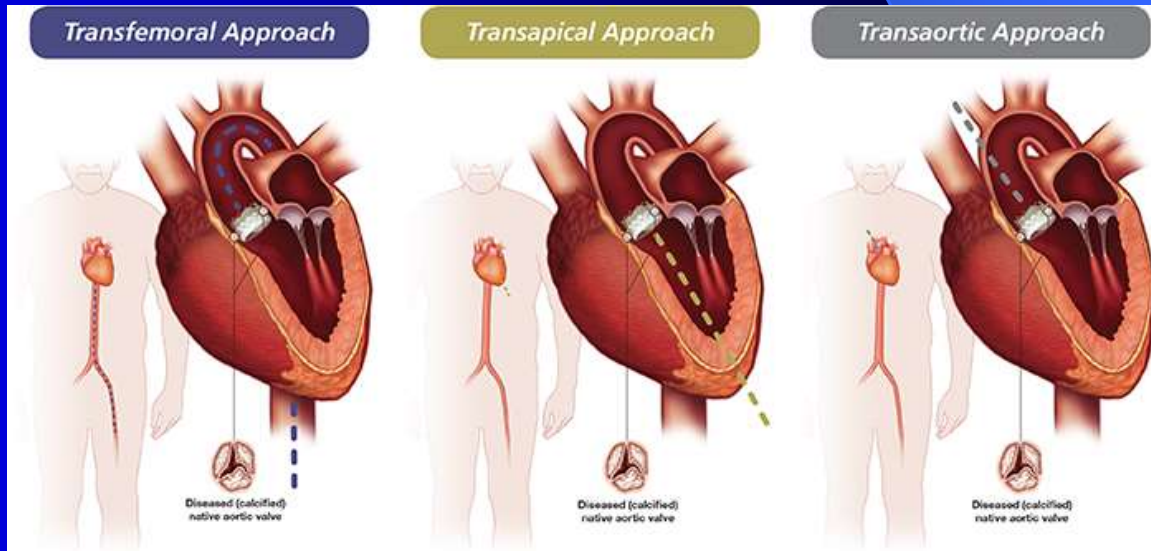
Open surgery	Closed Surgery
ASD and VSD	Percutaneous closure - Cardiologists
Aortic surgery	TEVAR – Cardiac surgeons, Vascular surgeons and Radiologists
CABG	PCI - Cardiologists
AVR	TAVI – Cardiologists and Cardiac surgeons
PVR	TPVI - Cardiologists
Re-do valve replacement	Transcatheter valve-in-valve - Cardiologists and Cardiac surgeons
Atrial appendage closure	Transcatheter closure device -WATCHMAN™ device - Cardiologists
MAZE	Transcatheter ablation - Cardiologists
Septal myomectomy	Transcatheter alcohol ablation - Cardiologists
MV repair or replacement	Transcatheter MV repair or replacement? – Cardiologist and Cardiac Surgeons
TV repair or replacement	Transcatheter TV repair ? – Cardiologists, Cardiac Surgeons?

# Aortic Valve

# TAVI for Aortic Stenosis



## SAPIEN Valve

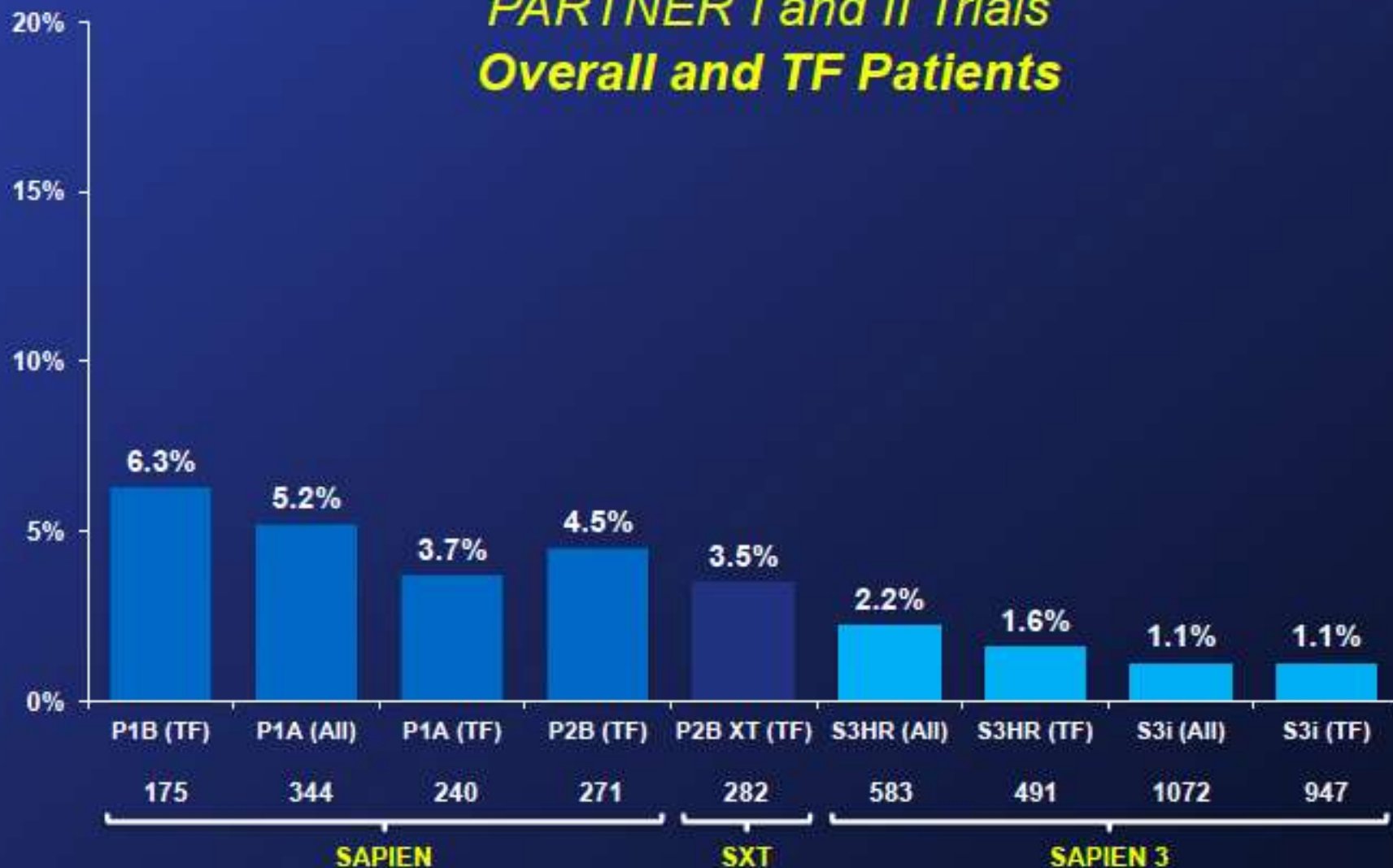


# All-Cause Mortality at 30 Days

## Edwards SAPIEN Valves (As Treated Patients)



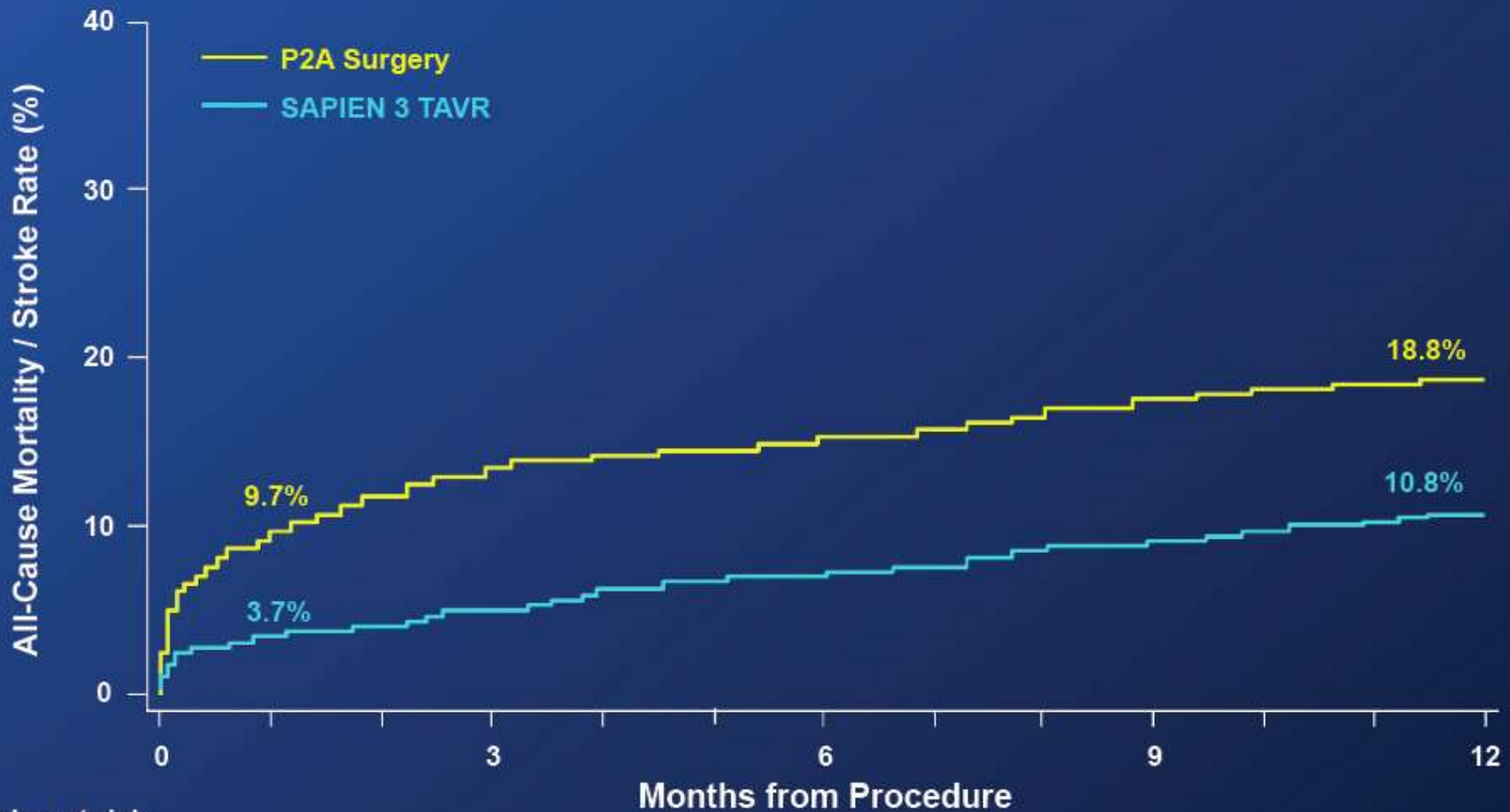
### *PARTNER I and II Trials Overall and TF Patients*





# Unadjusted Time-to-Event Analysis

## All-Cause Mortality and All Stroke (AT)



Number at risk:

P2A Surgery 944

S3 TAVR 1077

805

1012

786

987

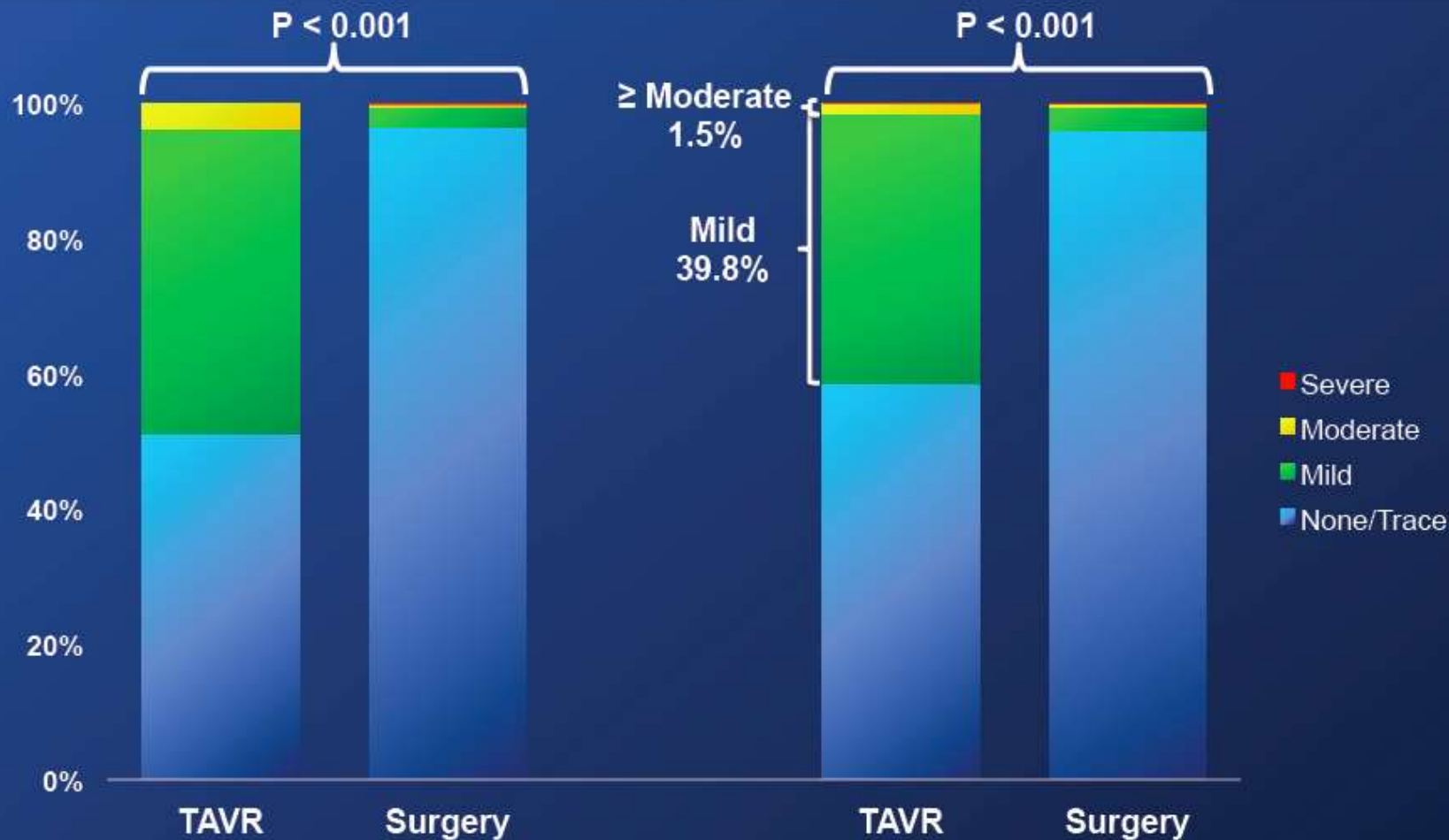
757

962

743

930

# Paravalvular Regurgitation 3-Class Grading Scheme (VI)



No. of echos

30 Days

1 Year

P2A Surgery

755

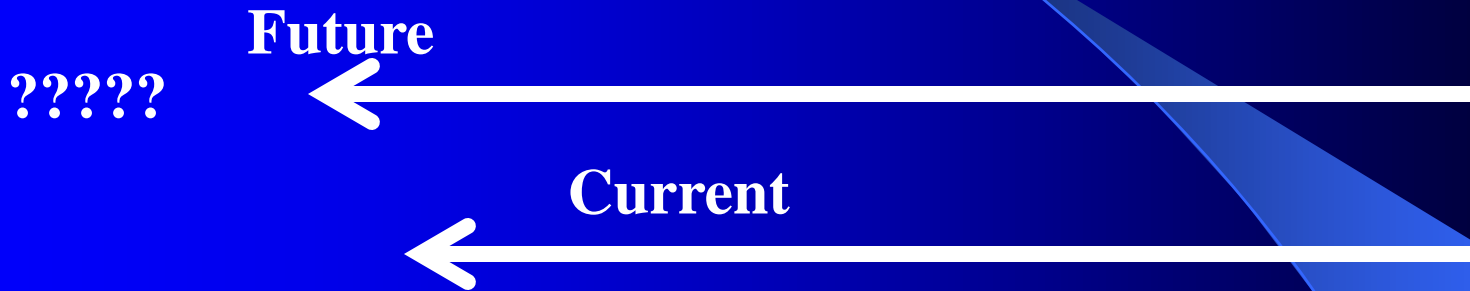
610

S3i TAVR

992

875

# Evolution of Indications



<b>Low risk</b> STS <2% or Age < 65	<b>Int. risk</b> STS 4-8 or Age >80	<b>High risk</b> STS 8-12	<b>Very high risk</b> STS >12	<b>Futile</b> HT decision
Surgery ≥ TAVI	TAVI ≥ Surgery	TAVI	TAVI	Med.

# Estimated Global TAVR Growth



SOURCE: Credit Suisse TAVI Comment –January 8, 2015. ASP assumption for 2024 and 2025 based on analyst model. Revenue split assumption in 2025 is 45% U.S., 35% EU, 10% Japan, 10% ROW

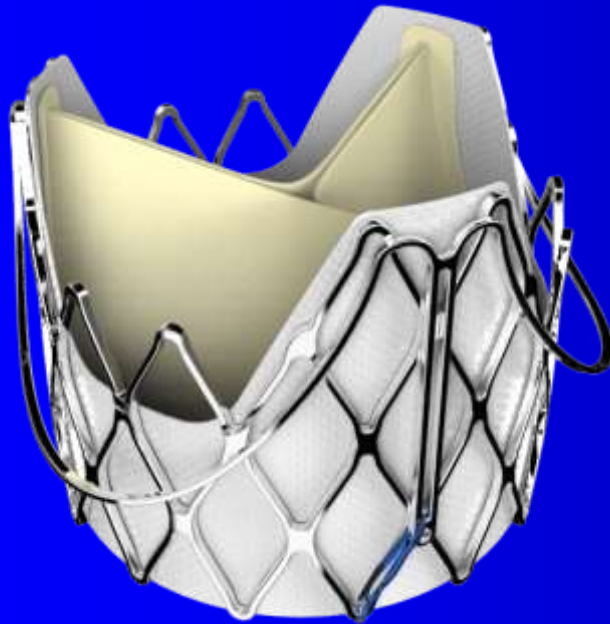
*In the next 10 years, TAVI growth will increase X 4*

*Dr. Alain Cribier*

# Pure Aortic Insufficiency

Percutaneous treatment becomes possible with  
great outcomes

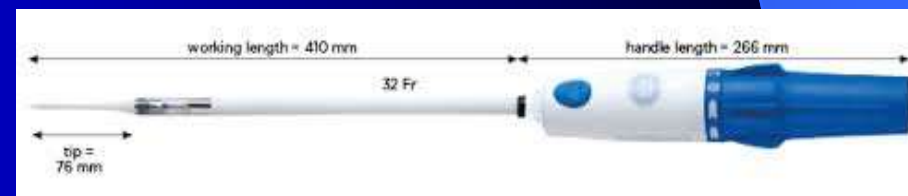
**J-Valve™ Bioprosthesis**



**Jena Valve**



**Ausper Delivery Device**



# J-Valve - AI case



# Aortic Valve

## **Change:**

The majority of AS will be treated by TAVI

## **Challenges:**

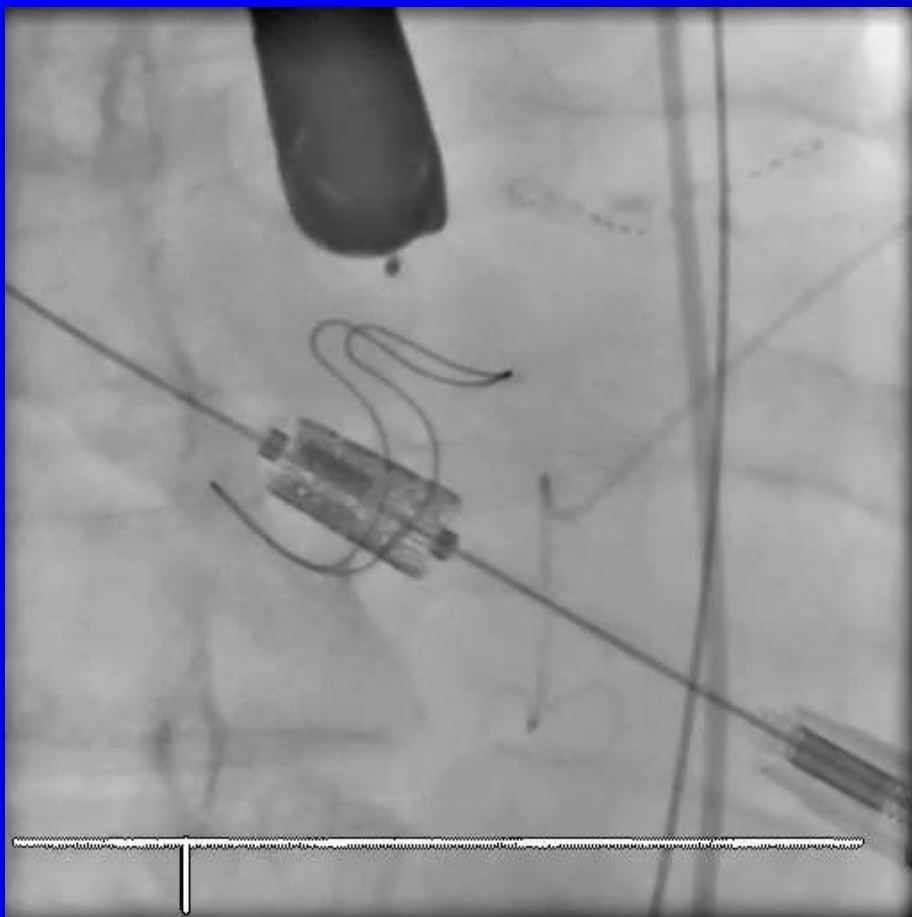
- Minimal number of open AVR cases
- Increased complexity
- Younger patients
- Achieving better outcomes

# Failed Bioprosthetic Valves

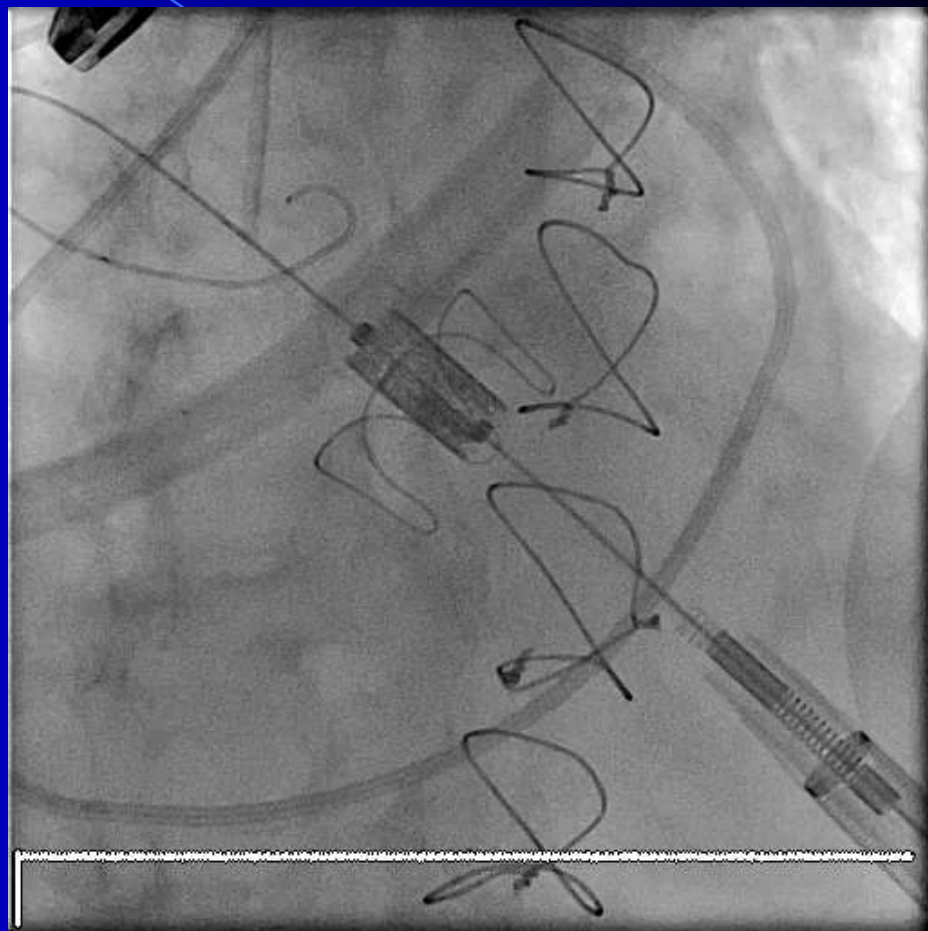




# Valve-in-Valve

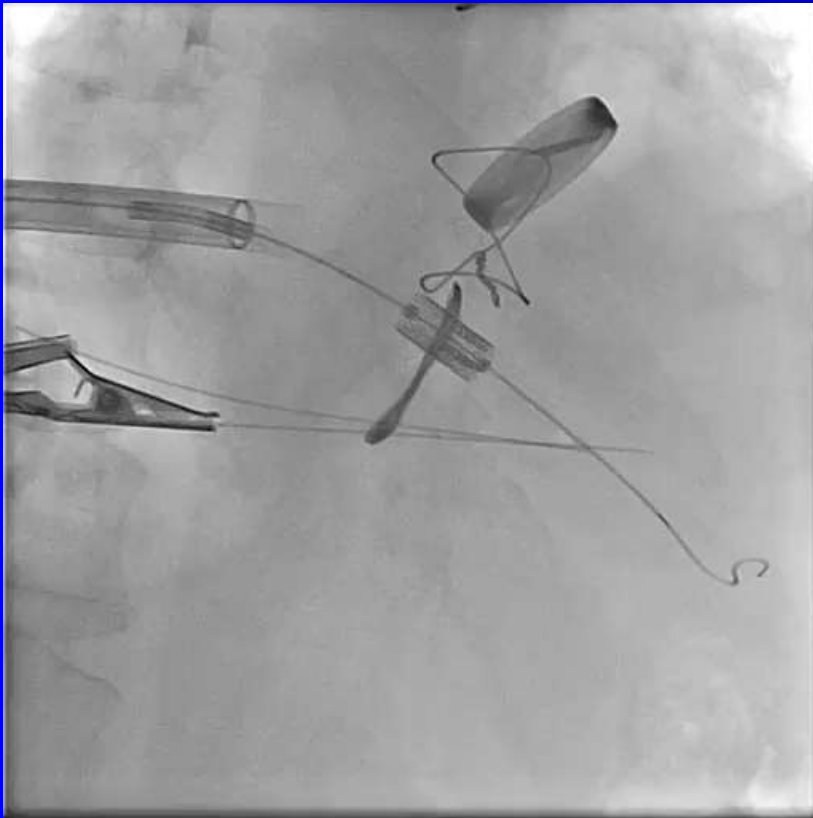


**Aortic**

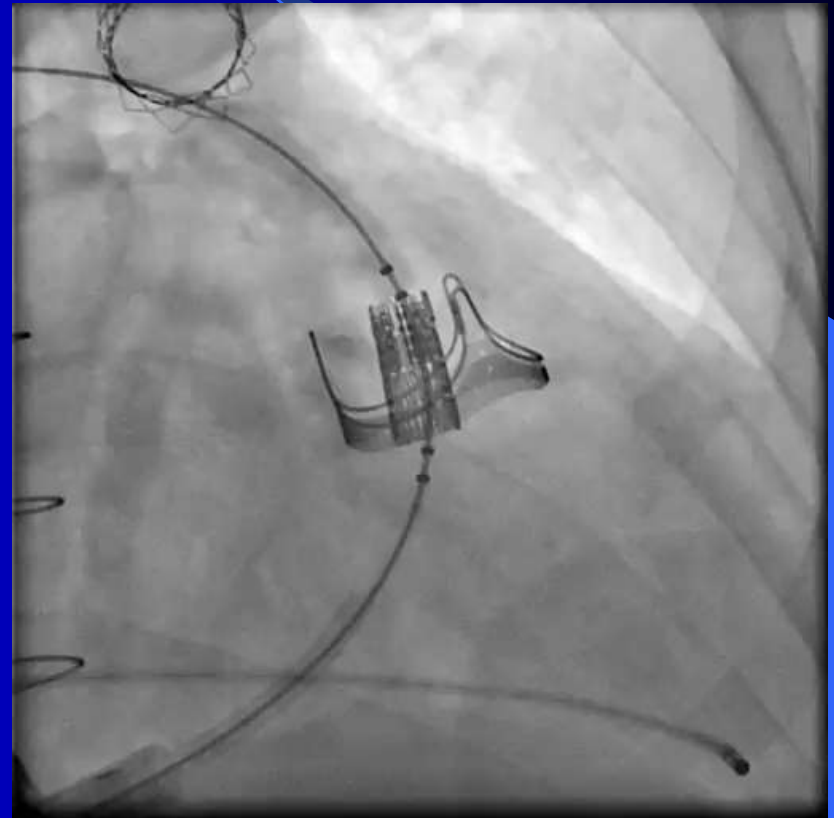


**Mitral**

# Valve-In-Valve



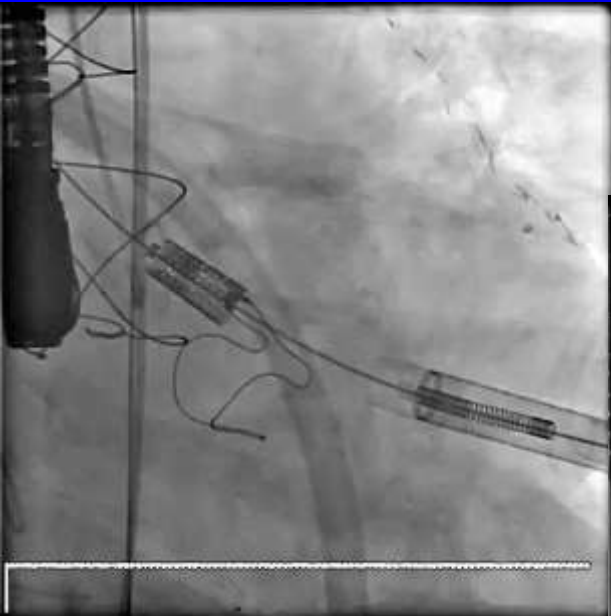
**Tricuspid valve**



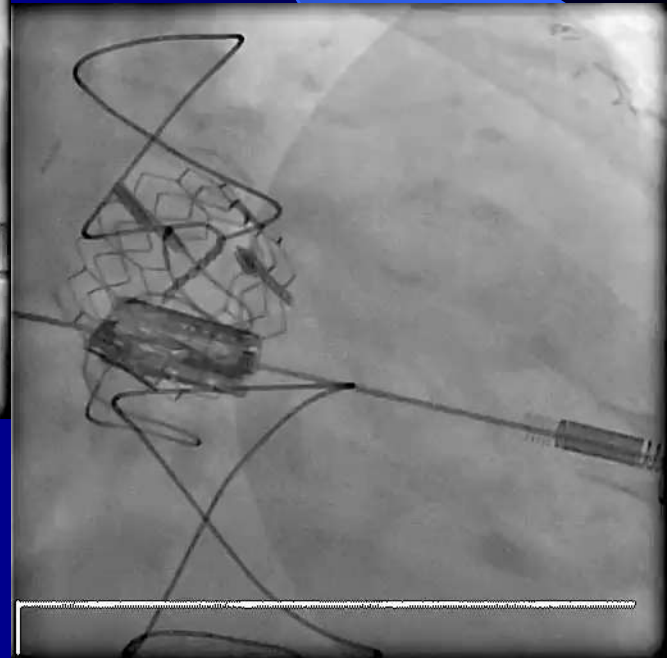
**Pulmonary valve**

# Multiple Valves

TAVI



Mitral V-in-V



# Transcatheter Aortic and Mitral Valve-in-Valve Implantation for Failed Surgical Bioprosthetic Valves

## An 8-Year Single-Center Experience

Jian Ye, MD,\* Anson Cheung, MD,\* Michael Yamashita, MD,\* David Wood, MD,† Defen Peng, PhD,‡  
Min Gao, MD, PhD,‡ Christopher R. Thompson, MD,† Brad Munt, MD,† Robert R. Moss, MD,†  
Philipp Blanke, MD,§ Jonathon Leipsic, MD,§ Danny Dvir, MD,† John G. Webb, MD†

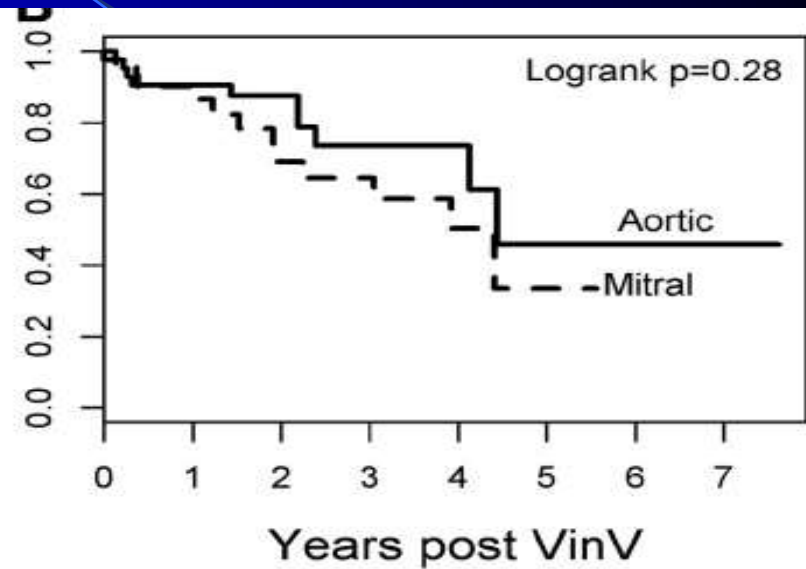
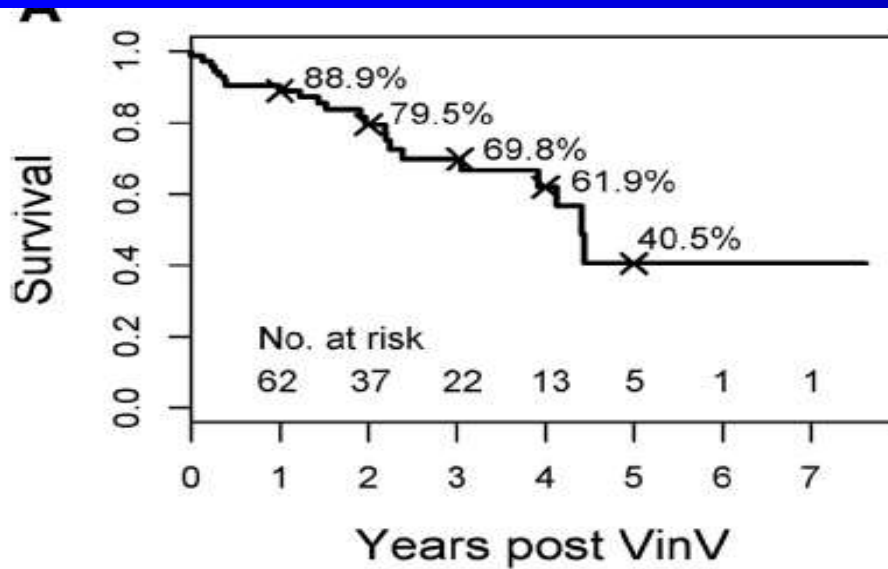
### ABSTRACT

**OBJECTIVES** We report our 8-year experience in transcatheter aortic and mitral valve-in-valve (VinV) implantation.

**BACKGROUND** Feasibility and good early outcomes associated with transcatheter aortic and mitral VinV implantation into failed surgical bioprostheses have been confirmed, but the mid-term and long-term outcomes of transcatheter aortic and mitral VinV is unknown.

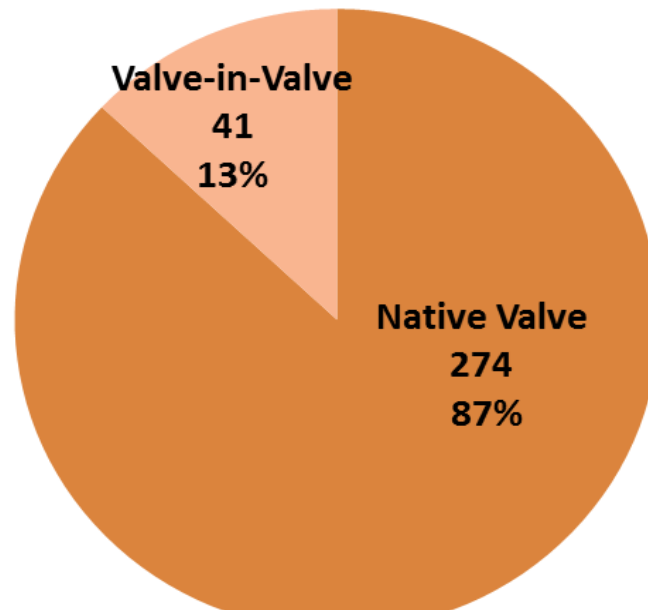
**METHODS** A total of 73 patients with aortic (n = 42) and mitral (n = 31) bioprosthetic valve dysfunction underwent transcatheter VinV implantation between April 2007 and December 2013. Edwards balloon-expandable transcatheter valves (Edwards Lifesciences Inc., Irvine, California) were used. Median follow-up was 2.52 years with a maximum of 8 years.

# Mid-term Survival



# Percutaneous treatment (Valve-in-Valve) will be a preferable treatment for failed bioprostheses

**Native Valve vs. Valve-in-Valve**  
(2014, N=315)



**Vancouver**

# Failed Bioprosthetic Valves

## **Change:**

The majority of AS will probably be treated by TAVI in the near future

## **Challenges:**

- Becoming a rear surgical procedure
- Surgery - more complexity
- New skills for surgical replacement of failed THVs
- Maintaining good outcomes

# Native Mitral and Tricuspid Valve Regurgitation

**Feasibility of transcatheter valve repair or replacement has been confirmed**



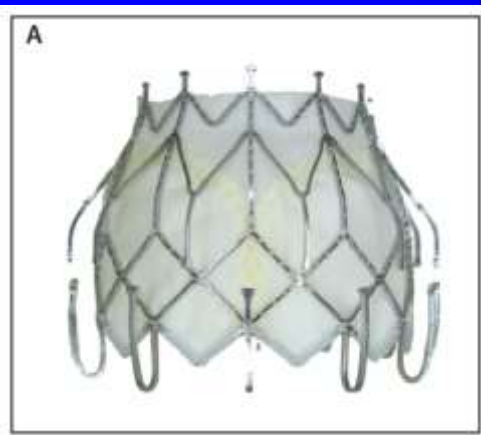
# Transcatheter MVR

June 12, 2012

February 2013

January 2014

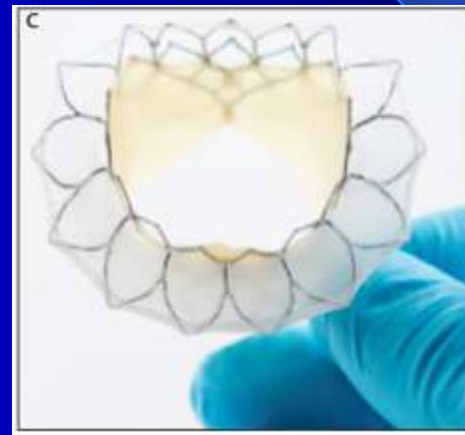
March 2014



CardiAQ



Tendyne



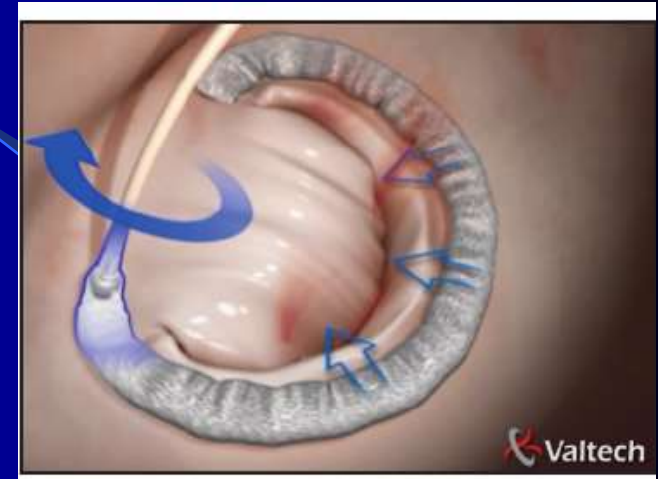
Tiara



FORTIS

First in Human

# Transcatheter MV Repair



**Cardioband**



**Mitralign**

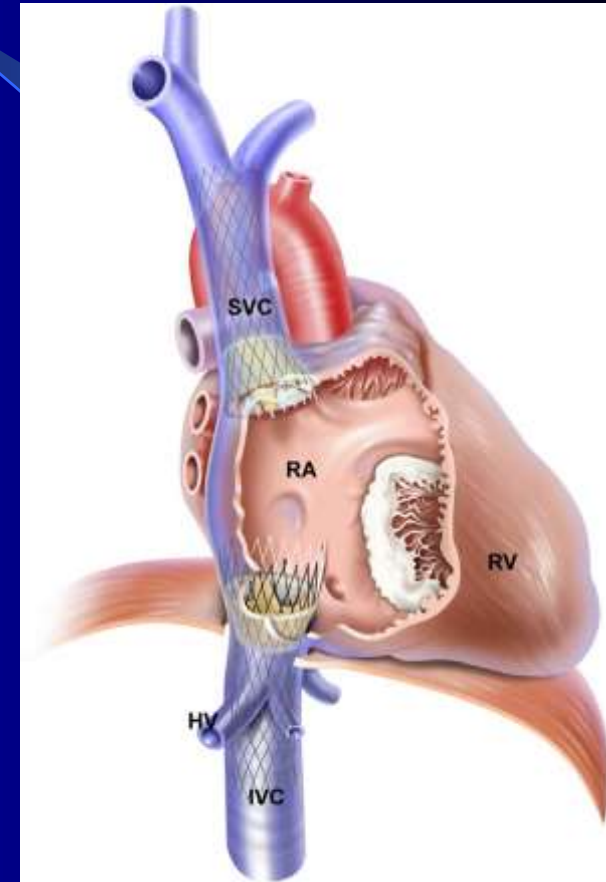
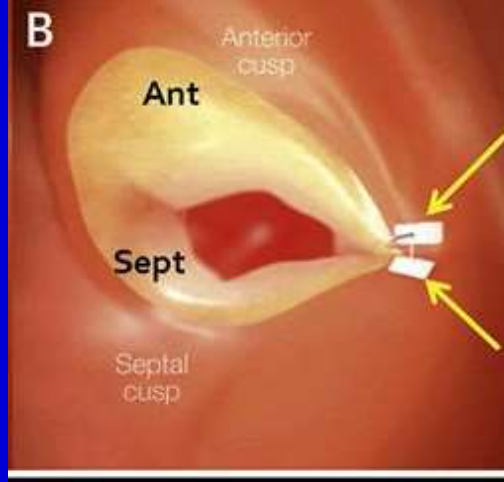
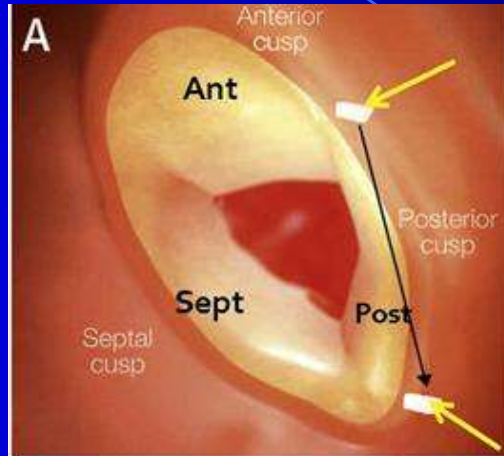


**NeoChord**



**MitraClip**

# Transcatheter Tricuspid Valve Therapies



Compton-Parada, F. et al. J Am Coll Cardiol. 2015; 66(22):2475-83.

**FORMA TV Device**

# Native Mitral and Tricuspid Valve Regurgitation

## **Change:**

Transcatheter valve repair or replacement will become an alternative therapy in some patients.

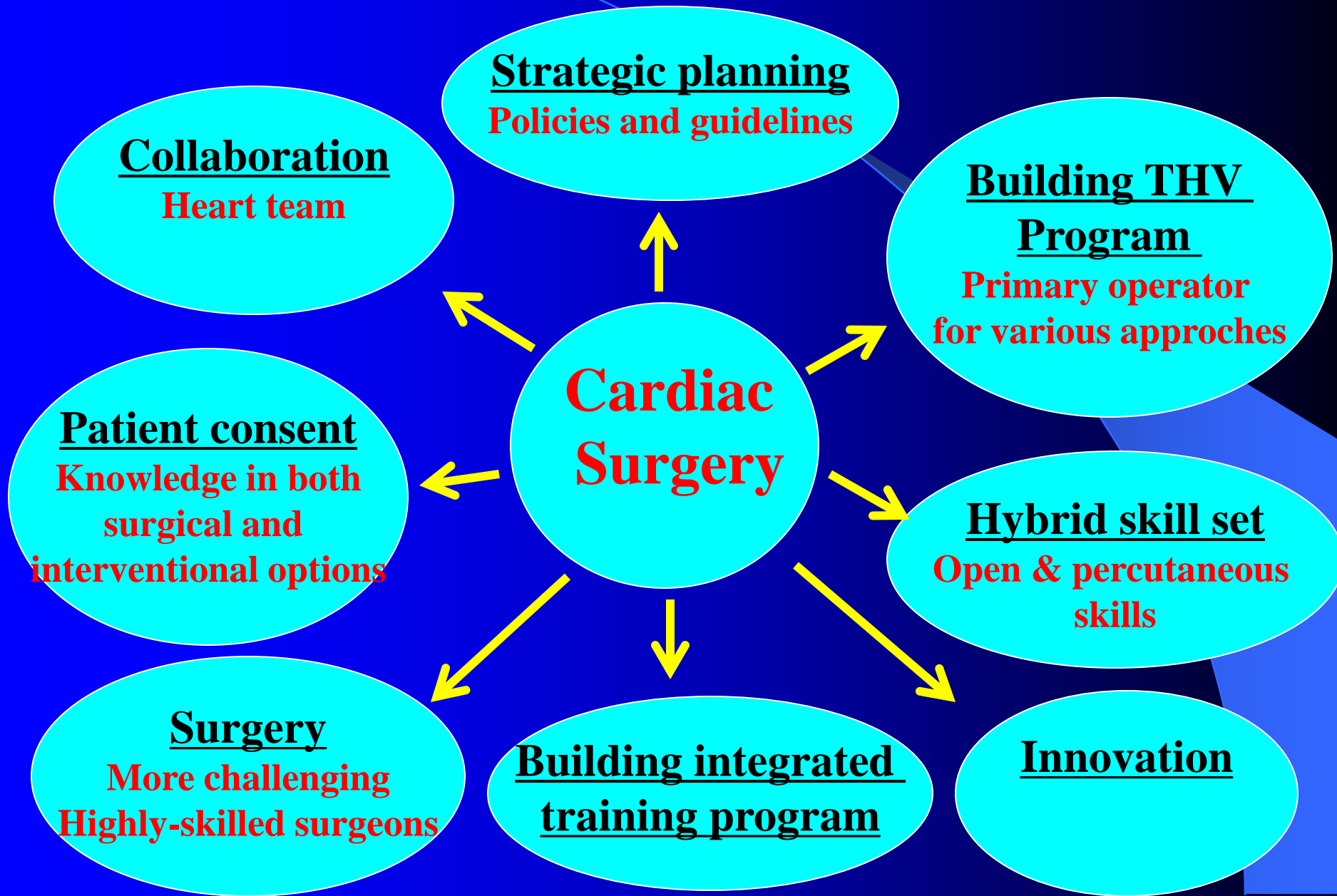
## **Challenges:**

- Selecting patients for transcatheter therapies
- Requiring more highly-skilled valve repair surgeons
- Achieving better outcome of surgical repair

# Future Treatment for Valvular Disease

- **AS:** favorable treatment - TAVI
- **AI:** favorable treatment - TAVI
- **Failed bioprostheses:** favorable treatment - transcatheter ViV
- **Functional MR, or structural MR in high-risk or elderly patients:** favorable treatment - TMVI or other transcatheter therapies?
- **Structural MR:** first choice - surgical MV repair
- **TR:** first choice - surgical repair, transcatheter therapies for high-risk or elderly patients only

# What role will cardiac surgery play?



**Cardiac surgeons are ready  
and willing to find  
opportunity in change !**

THANKS!