



Structural Heart Disease, patologia
dal crescente peso sociale:

le opportunità offerte dalla
CARDIOCHIRURGIA MICROINVASIVA



Regione
Lombardia

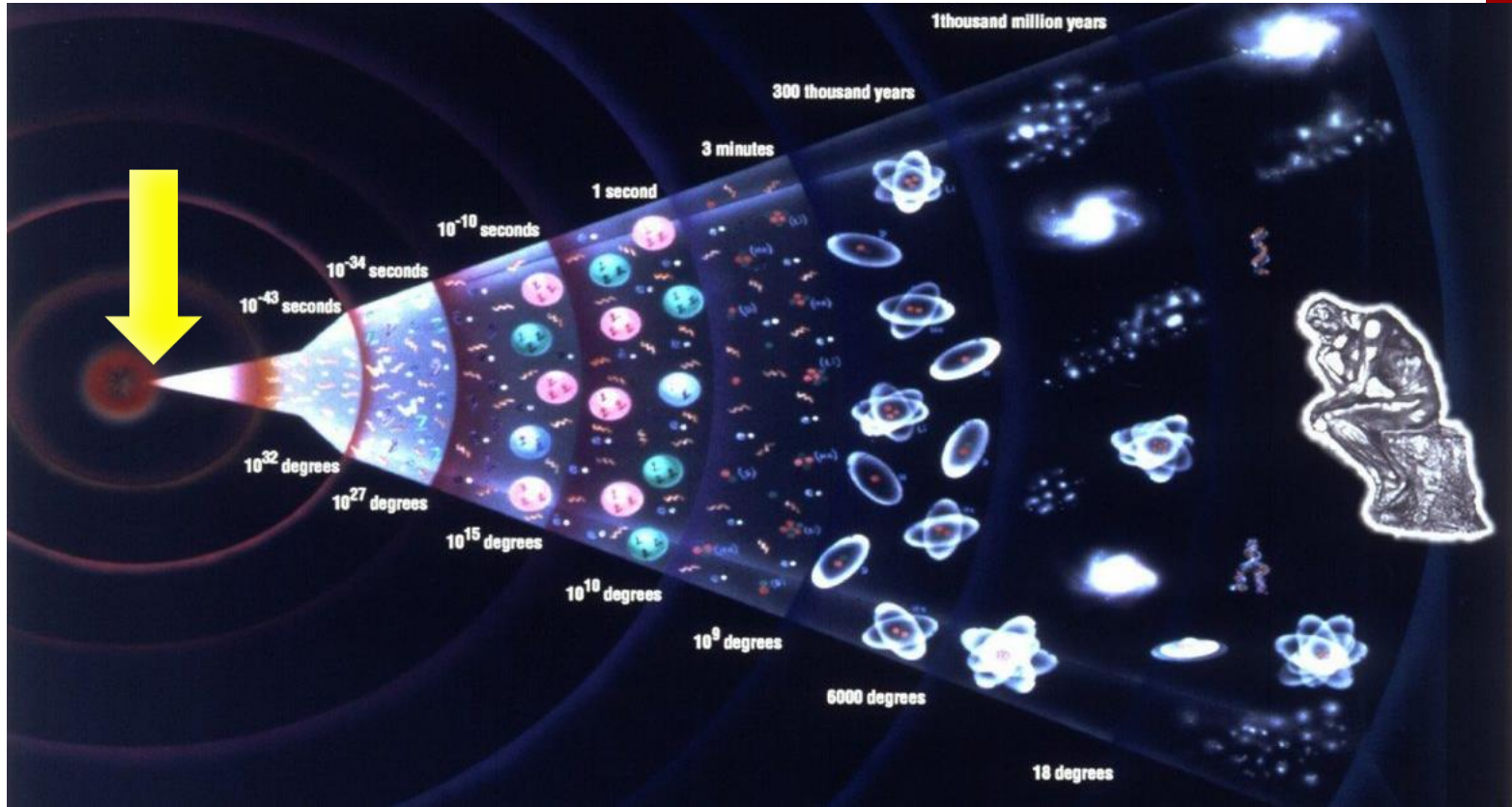
Gino Gerosa

Presidente Società Italiana di Cardiochirurgia



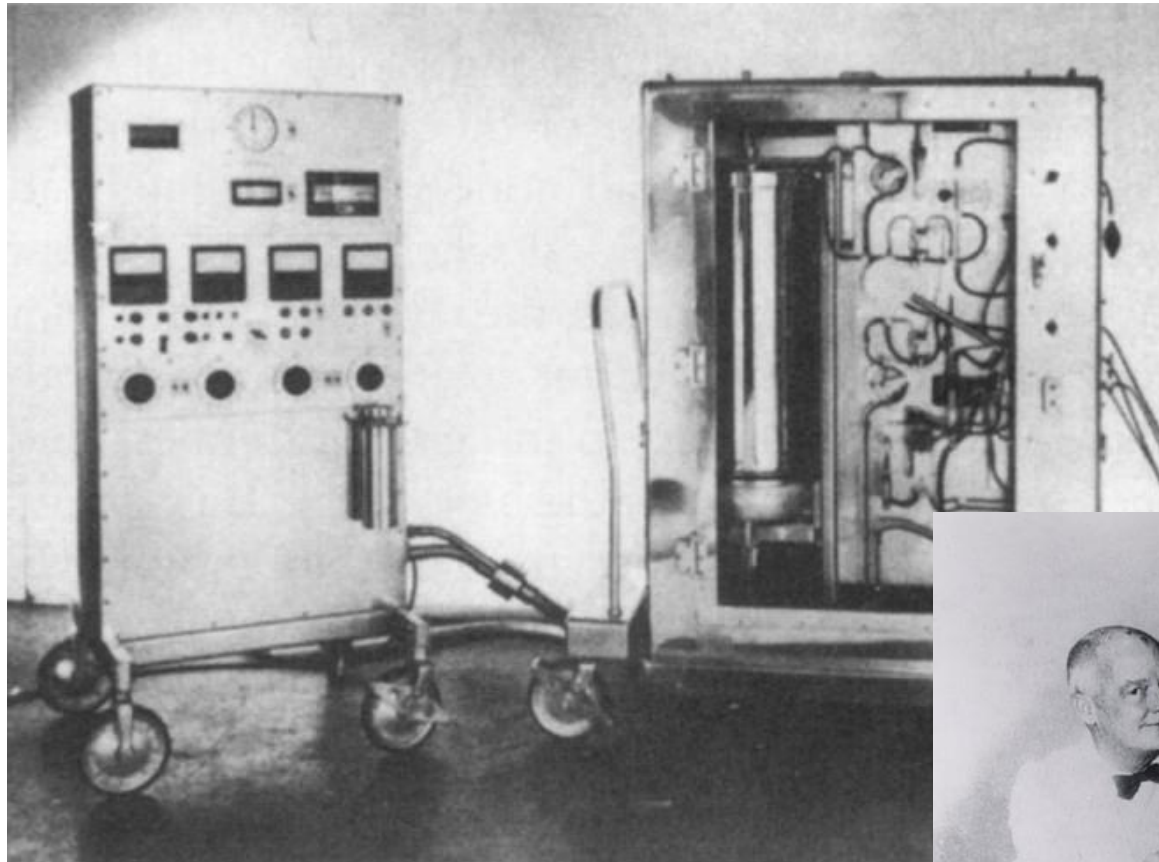
Milano, 18 Settembre 2019

BIG BANG



Prima rivoluzione in cardiocirurgia

1953

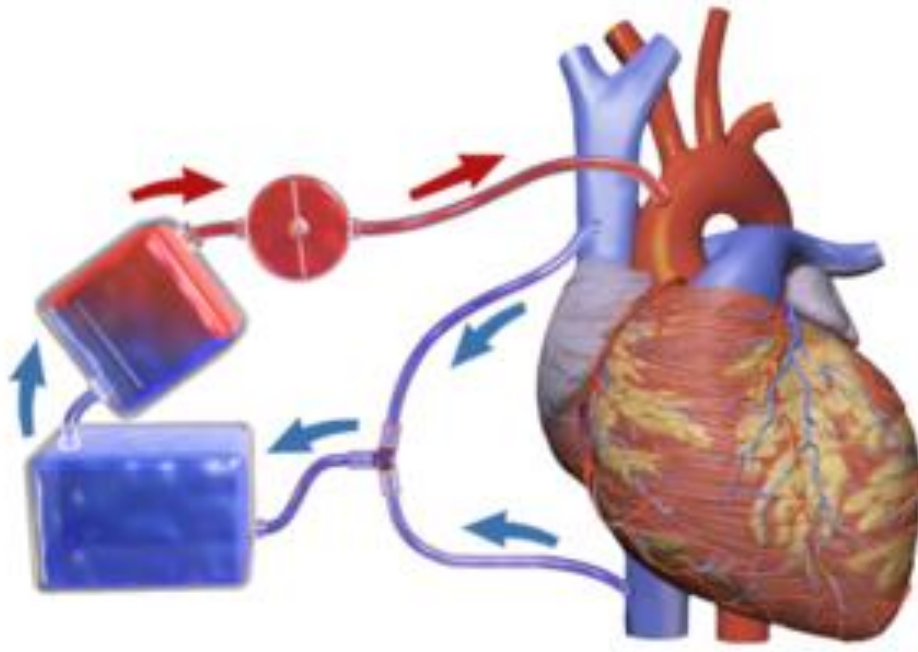


Il Dott. Gibbon e la sua paziente Cecelia Bavolek in
posa davanti alla macchina cuore-polmoni 10 anni
dopo il primo intervento a cuore aperto

1963

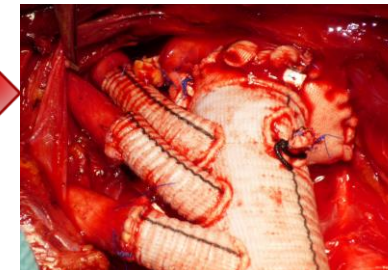
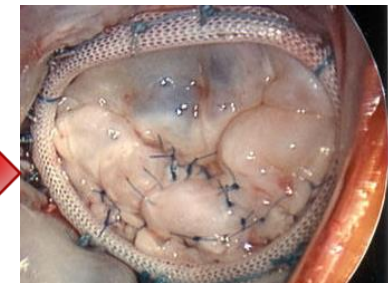
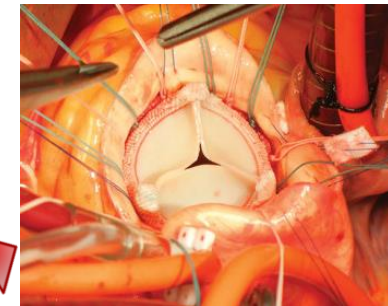


Circolazione extra-corporea

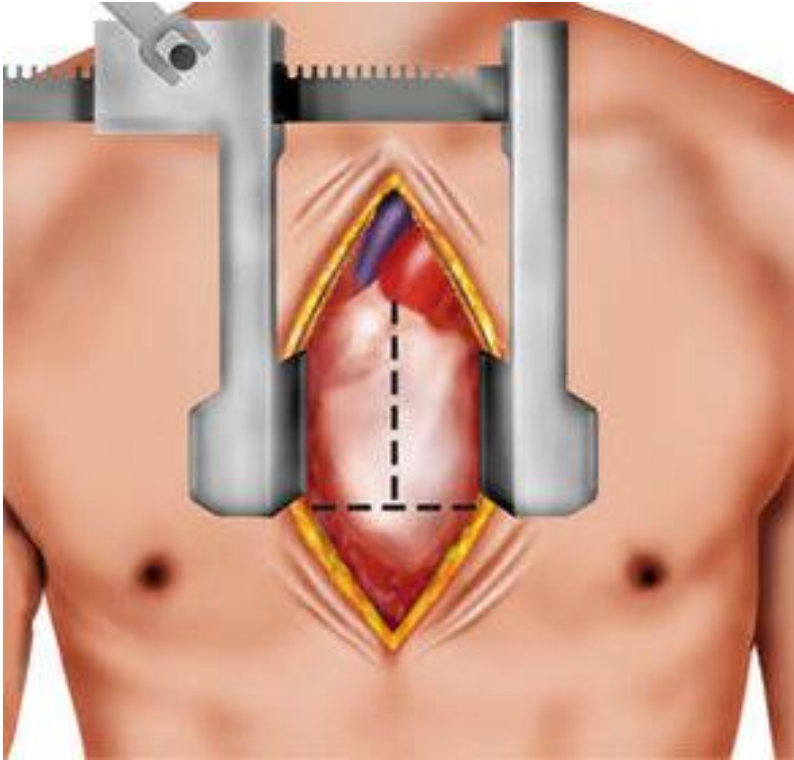


Correzione chirurgica delle cardiopatie strutturali (SHD)

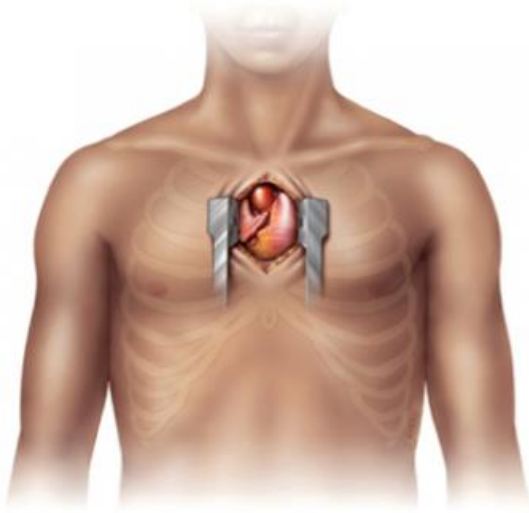
- Cardiopatie Congenite
- Cardiopatie acquisite dell'età adulta
 - Patologie valvolari
 - Riparazione o sostituzione valvolare aortica
 - Riparazione o sostituzione valvolare mitralica
 - Patologia aortica
 - Sostituzione aorta ascendente e arco aortico



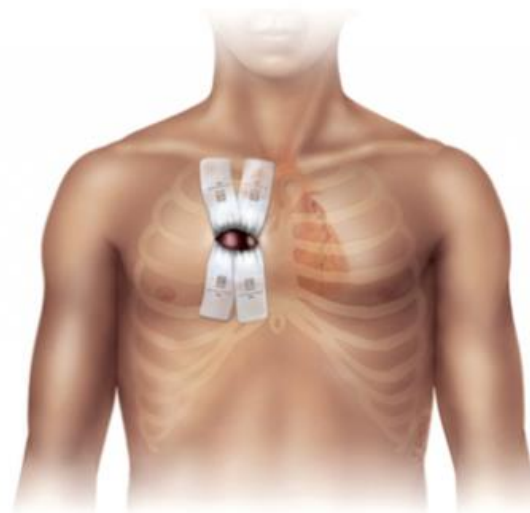
Cardiochirurgia tradizionale - Sternotomia



Cardiochirurgia MINI-invasiva



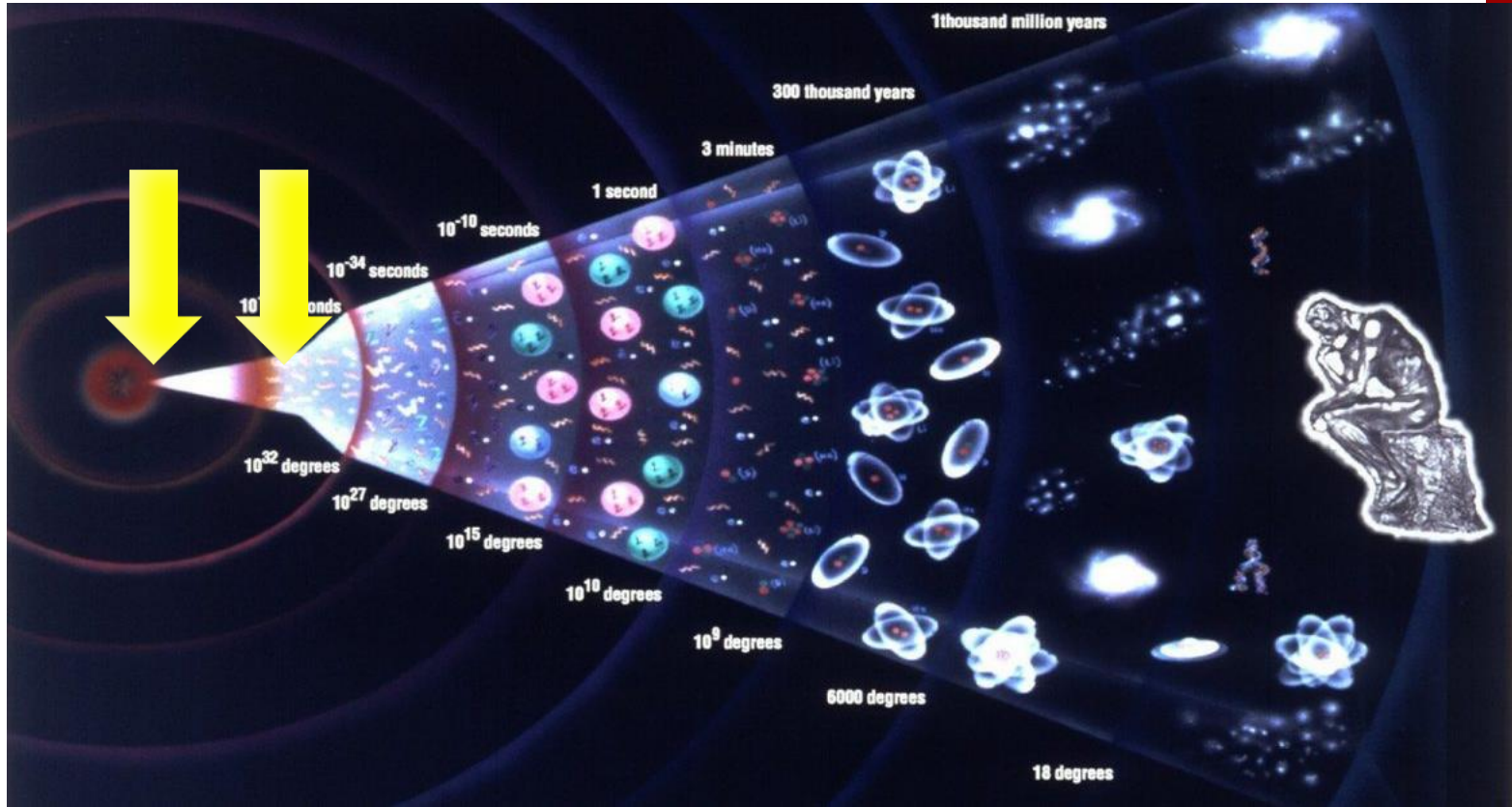
Partial J-sternotomy



Right Mini-thoracotomy



BIG BANG



... 70 years later...



La seconda rivoluzione della
cardiologia dopo la Circolazione
Extracorporea è

**L'assenza della
Circolazione Extracorporea**

Small, Mini, Micro...

Miniaturization has always been the name of the game. In recent years we have been flooded by a progressively growing number of reports on “the world’s smallest objects”, but at the present rate of technological development these records will probably not last for very long. Here are three examples of the tiniest objects in the world at the moment.



MINI USB



MICRO USB



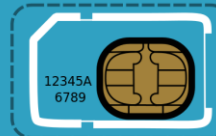
Micro

Mini

Regular

Differences between HDMI Ports

Mini SIM



Micro SIM




Cardiochirurgia MINI-invasiva vs. Cardiochirurgia MICRO-invasiva

MINI

- *Cuore aperto*
- *Circolazione extracorporea*
- *Procedure più lunghe e complesse*
- *Sempre incisione cutanea*
- *Sempre anestesia generale*

MICRO

- *Cuore Battente*
- *Assenza di circolazione extracorporea*
- *Procedure più rapide*
- *Tecnica percutanea o incisione molto piccola*
- *Anestesia locale*



La cardiochirurgia MICRO-invasiva
consente di **replicare** gli interventi
eseguiti con tecnica standard senza
l'ausilio della circolazione
extracorporea, a cuore battente e
senza aprire il torace

Vantaggi



- Minor impatto della procedura chirurgica sull'organismo
 - Anestesia
 - Circolazione extracorporea
 - Sanguinamento

- Ripresa postoperatoria più rapida

Cardiac Surgery (R)Evolution

Cardiochirurgia tradizionale



Cardiochirurgia
Mini-invasiva



Cardiochirurgia
Micro-invasiva

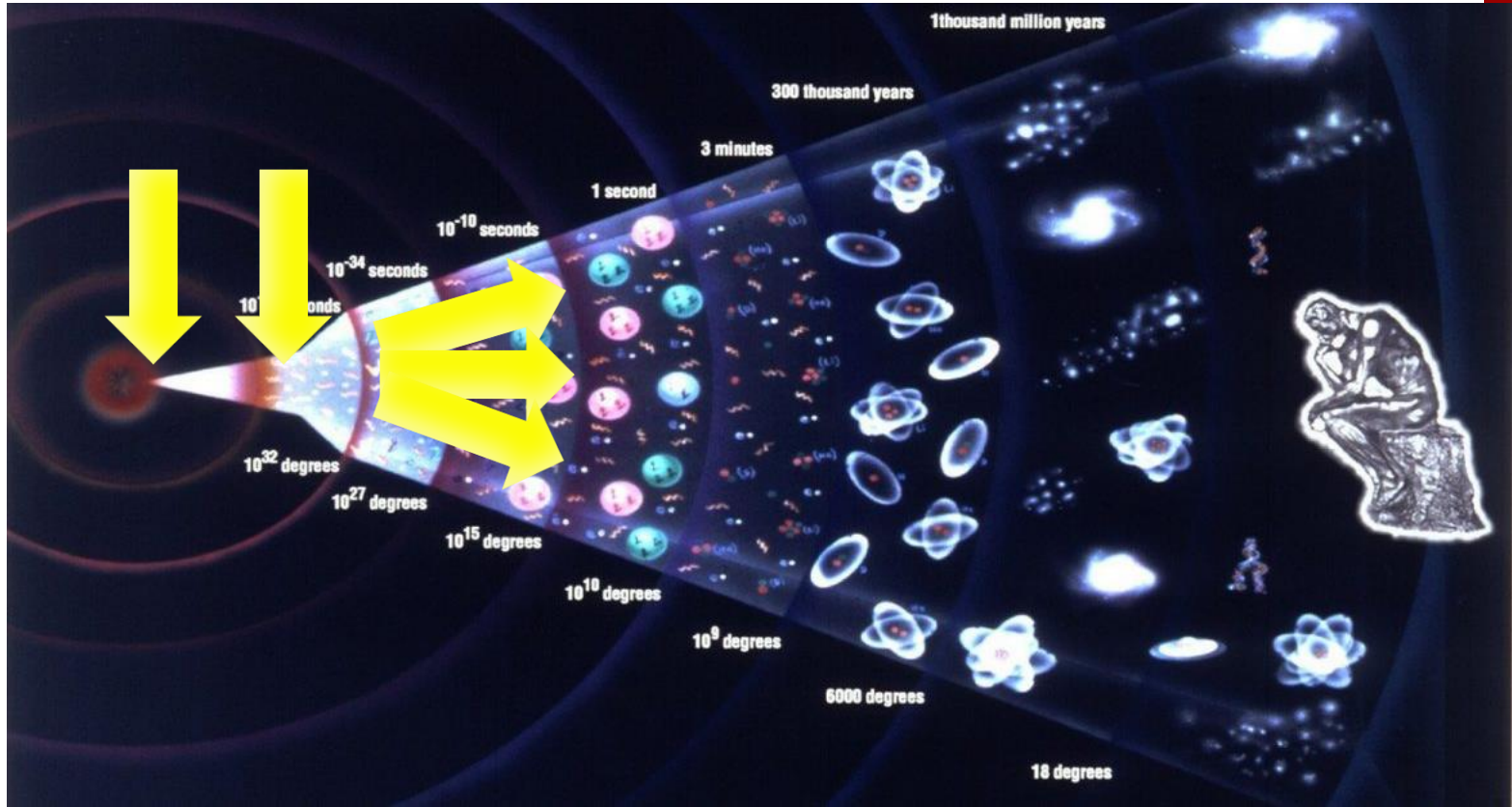


Editorial

Shifting a Paradigm of Cardiac Surgery: From Minimally Invasive to Micro-Invasive

Augusto D'Onofrio, Gino Gerosa

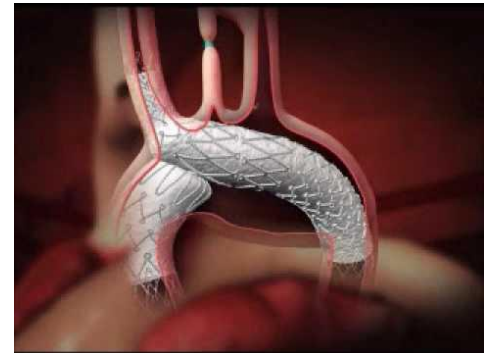
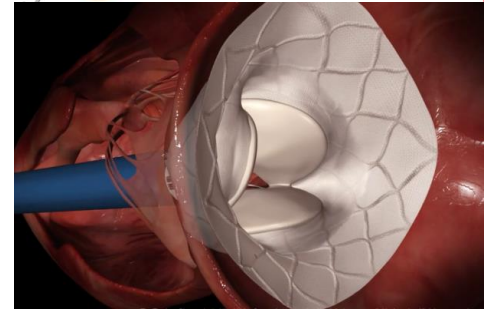
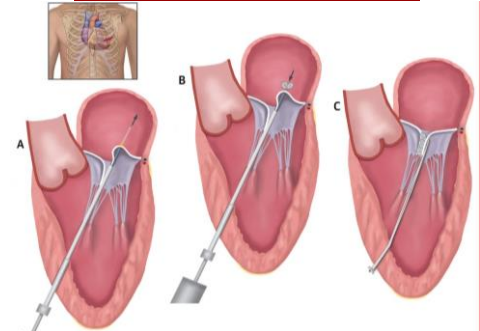
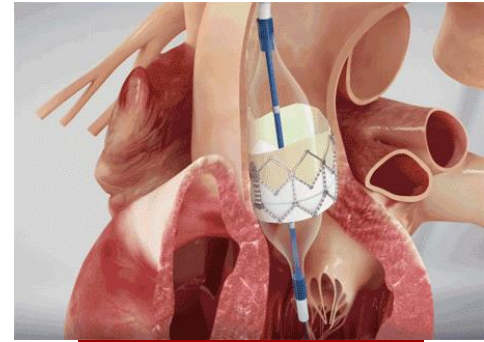
Division of Cardiac Surgery, University of Padova, Padova, Italy



... the real (R)evolution begins...

Procedure MICRO-invasive

- Impianto valvolare aortico transcattetero (TAVI)
- Riparazione valvola mitrale (Corde, anello, lembi)
- Impianto valvolare mitralico transcattetero
- Stenting aorta ascendente e arco aortico
- Rimodellamento ventricolare sinistro



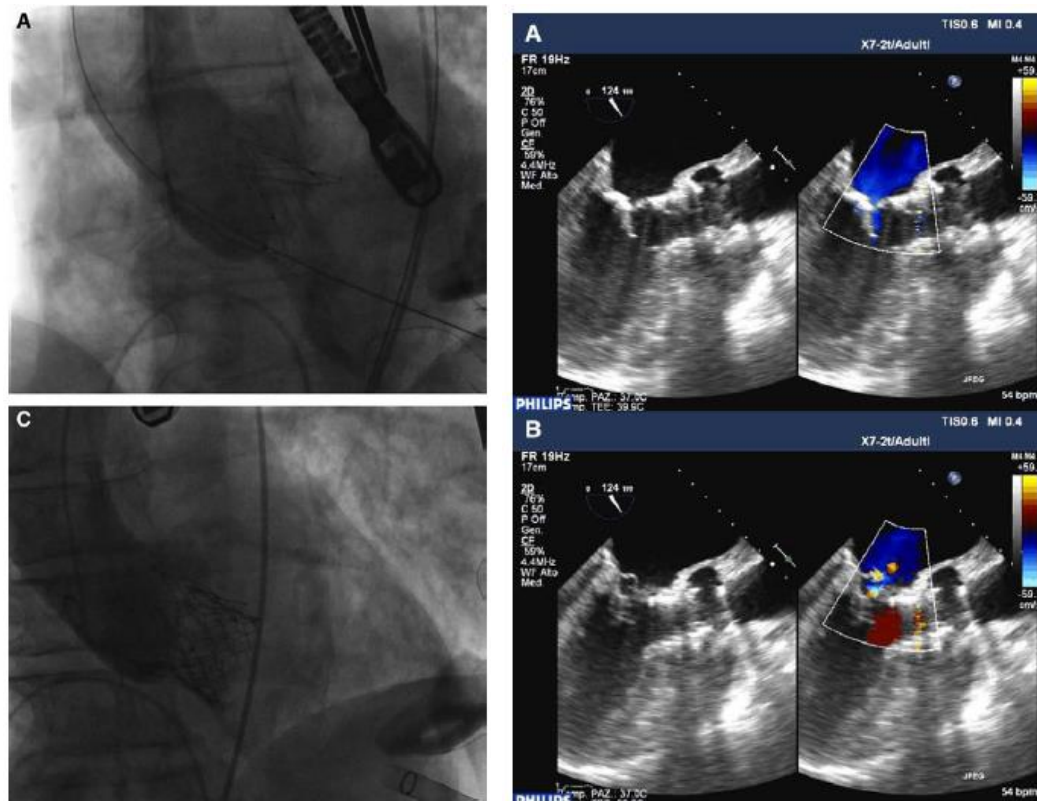
One-Stage Off-Pump Transapical Mitral Valve Repair and Aortic Valve Replacement

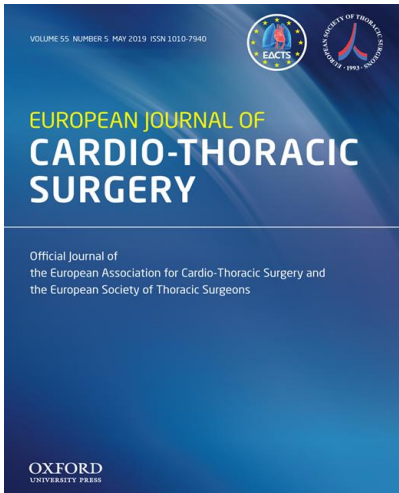
Gino Gerosa, MD; Augusto D'Onofrio, MD, PhD; Erica Manzan, MD; Laura Besola, MD; Eleonora Bizzotto, MD; Fabio Zucchetta, MD; Giuseppe Tarantini, MD, PhD; Demetrio Pittarello, MD; Andrea Colli, MD, PhD

TA-TAVI + NeoChord

Circulation

May 2015





Technique versus technology and the (r)evolution of cardiac surgery: a professional journey from classical surgery to embracing intervention

Augusto D'Onofrio and Gino Gerosa*

Eur J Cardiothorac Surg. 2017 Nov 1;52(5):835-837

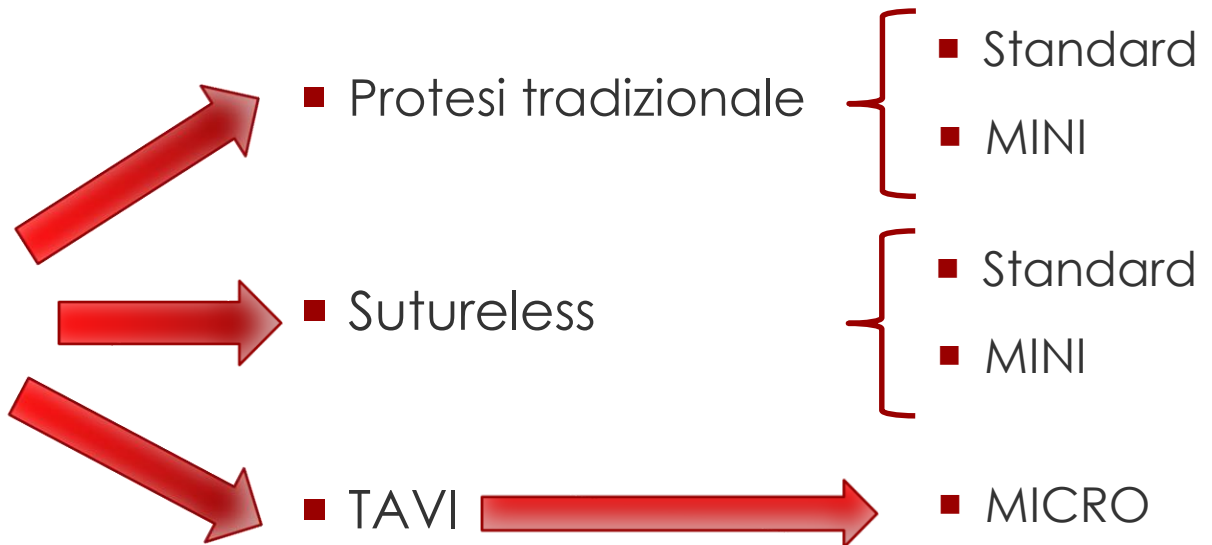
Tecnica vs. tecnologia

TECNICA (STATICA)



- La terapia della stenosi aortica è **l'IMPIANTO** di una protesi valvolare

TECNOLOGIA (DINAMICA)



- I Cardiochirurghi hanno da sempre **IMPIANTATO** protesi valvolari aortiche utilizzando molti **ACCESSI** diversi:
 - Sternotomia mediana
 - Ministernotomia
 - Toracotomia destra

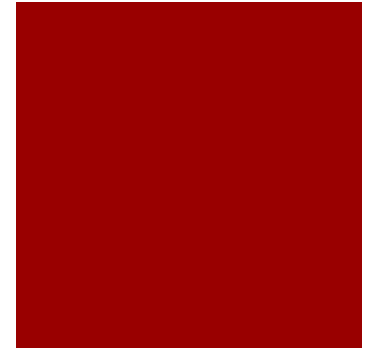
- L'evoluzione tecnologica consente di impiantare protesi con ulteriori **ACCESSI** differenti
 - Trans-femorale
 - Trans-aortico
 - Trans-apicale
 - Trans-succlavio



PAZIENTE

PROCEDURA





PAZIENTE

PROCEDURA

Cronaca

HOME POLITICA ECONOMIA SPORT SPETTACOLI TECNOLOGIA MOTORI TUTTE LE SEZIONI D REP TV

Prevenzione e qualità della vita

Diagnosi e terapie

Novità dalla ricerca

Testimonianze

ONC LINE



A 103 anni campione di salto in lungo, Peppe: "L'atletica è gioia"



La prova di Giuseppe Ottaviani (ansa)

Giuseppe Ottaviani ha fatto un balzo di 66 centimetri

■ Età

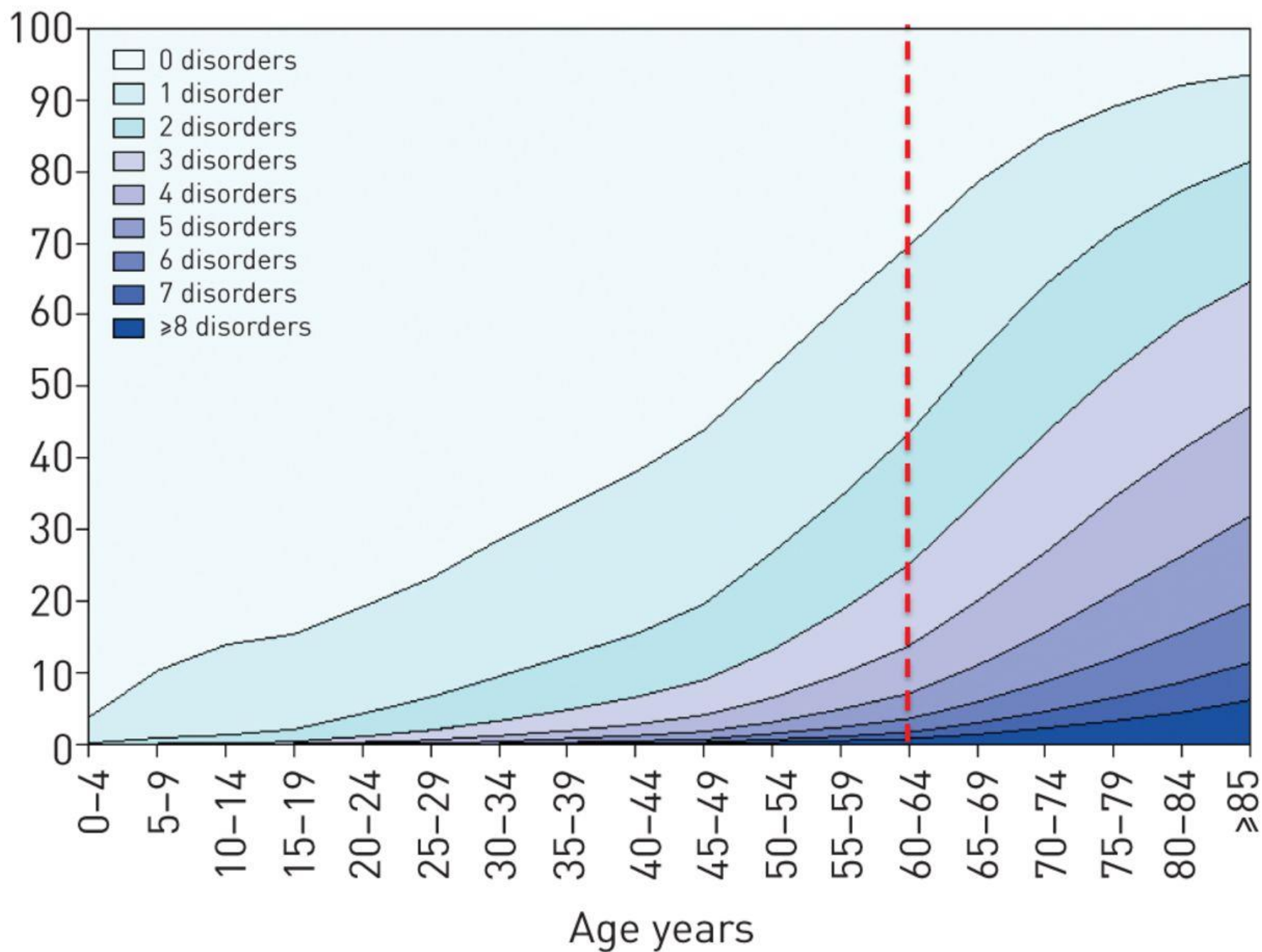
■ Patologie associate

■ Fragilità

■ Anatomia



Patients %

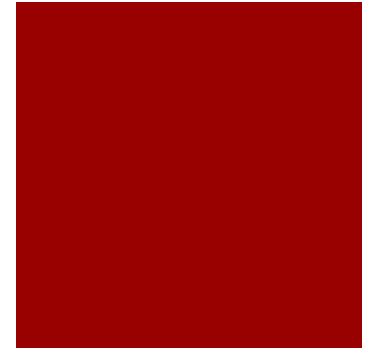


FUTILITA'



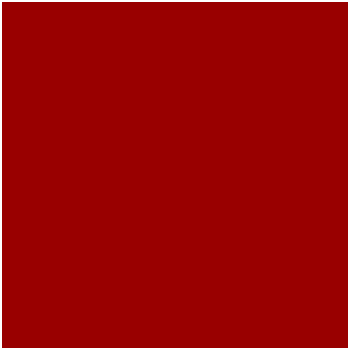
FUTILITY

JUST BECAUSE IT'S NOT IMPOSSIBLE DOESN'T MEAN
THAT YOU CAN DO IT.



PAZIENTE

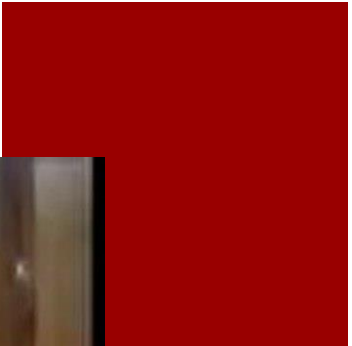
PROCEDURA

- 
- Cardiochirurgia tradizionale
 - MINI
 - MICRO

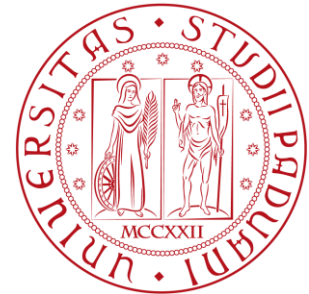
Scelta della procedura

- Previsione di successo procedurale
- Rapporto rischio-beneficio
- Complicanze
- Recupero postoperatorio
- ***Cost-effectiveness e sostenibilità***

Per molti... ma non per tutti.



Accepted Manuscript



THE ANNALS
OF
THORACIC SURGERY



Surgeon Involvement in Transcatheter Aortic Valve Replacement in the United States: A 2016 Society of Thoracic Surgeons Survey

(Short Title) **STS TAVR Survey Results**

Joseph E. Bavaria, MD, Richard L. Prager, MD, Keith S. Naunheim, MD, Mark S. Allen, MD, Robert S. D.

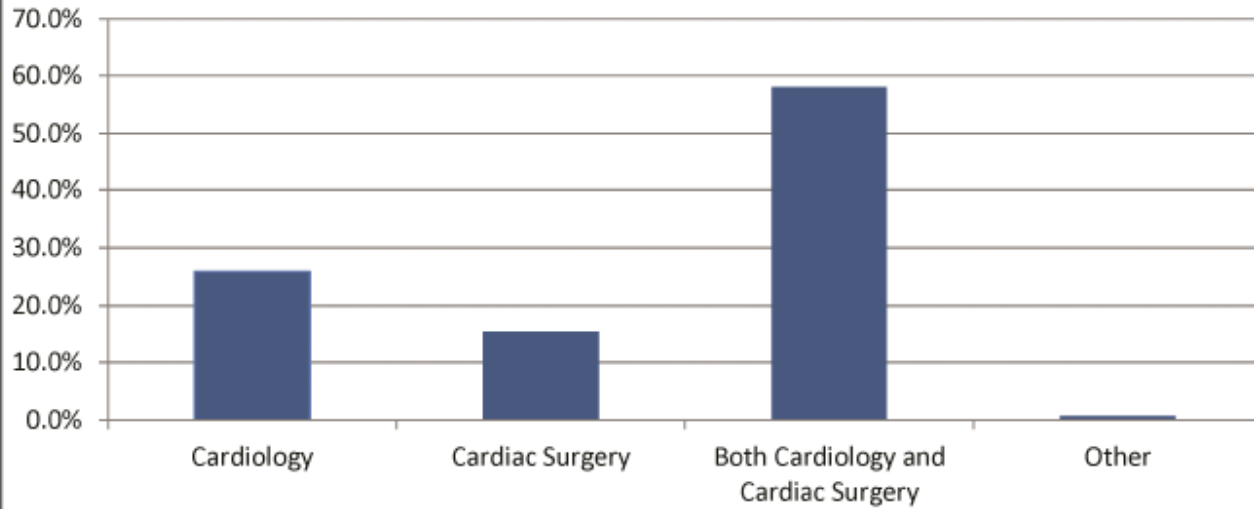
Higgins, MD, MSHA, Vinod H. Thourani, MD, Thomas E. MacGillivray, MD, Natalie Boden, MBA, and Joseph

F. Sabik, III, MD on Behalf of the STS Executive Committee

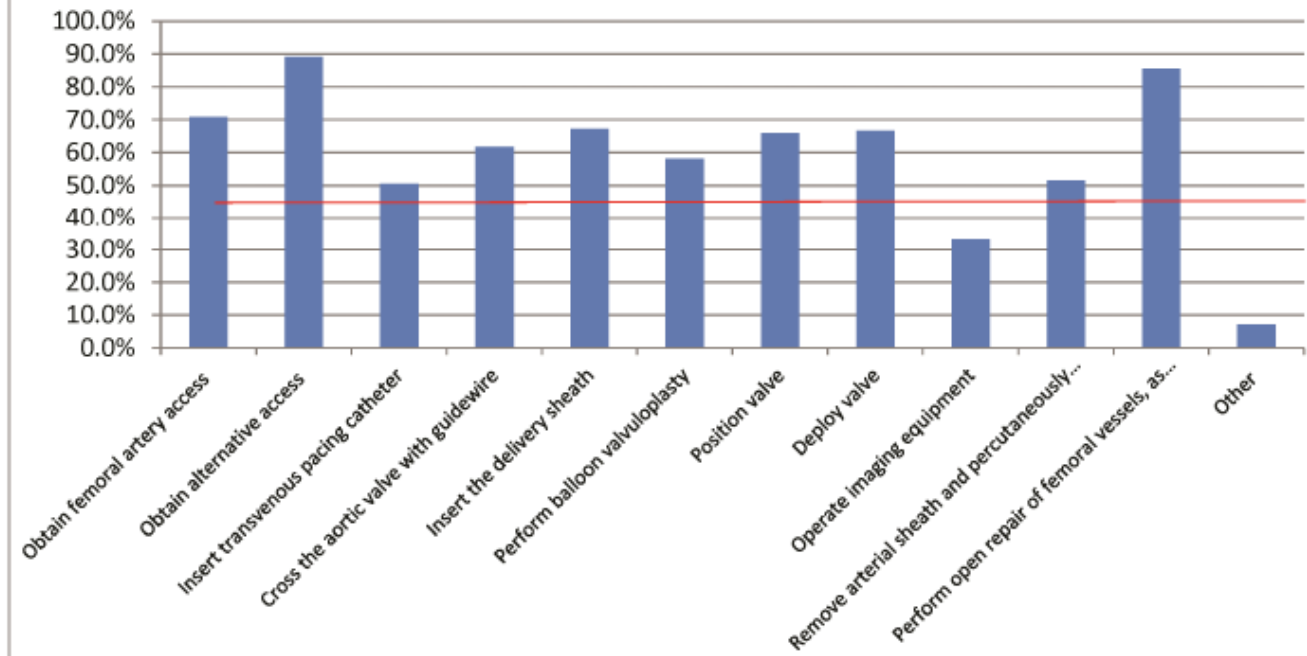
CRUIPT



TAVR Program Administration



Intraoperative Technical Aspects of TAVR



American Board of Thoracic Surgery Operative Case Index Requirements

For 5/2 or 5/3 residents starting thoracic training on or after July 1, 2017

For I-6 residents starting PGY 5 on or after July 1, 2017

For 4/3 residents starting thoracic training on or after July 1, 2017

Cardiac Focused		Requirements	General Thoracic Focused	
Total	Subtotal		Subtotal	Total
		CONGENITAL HEART DISEASE		
	5	Primary surgeon		
	15	First assistant	10	
20		Subtotal Congenital Heart Disease		10
		ADULT CARDIAC		
60		Acquired Valvular Heart Disease		30
	25	Aortic Valve Repair/Replacement	15	
	15	Mitral Valve Repair/Replacement	5	
	5	Tricuspid Valve Repair/Replacement, Annuloplasty	5	
	5	TAVR as primary		
	10	TAVR as assistant	5	
80		Myocardial Revascularization		35
	15	Re-Do Sternotomy**	5	
		**Can be double-counted with any Cardiac procedure		
15		Interventional Wire-based Procedures		5
	5	Left Heart Catheterization, PCI, TEVAR, Mitral Clip		
	10	Intra-aortic Balloon Pump	5	

Cosa ci riserverà il futuro?



[Communications](#) ▶ [Computers](#) ▶ [Science](#) ▶ [Technology](#) ▶ [Gadgets](#) ▶ [Innovation](#) ▶ [Resources](#) ▶ [Humour](#)

🏠 > [Computers](#) > [Small, Mini, Micro... Nano](#)

Small, Mini, Micro...

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Structural Heart Disease,
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CARDIOCHIRURGIA MICROINVASIVA



Gino Gerosa

Presidente

Società Italiana di Cardiocirurgia

*Al cuore dell'Active Ageing
Milano, 18 Settembre 2019*