Facultat de Medicina
Campus Clínic
Universitat de Barcelona
Barcelona
29 y 30 Septiembre 2017

VI Congreso SEICAV
Sociedad Española de Infecciones Cardiovasculares

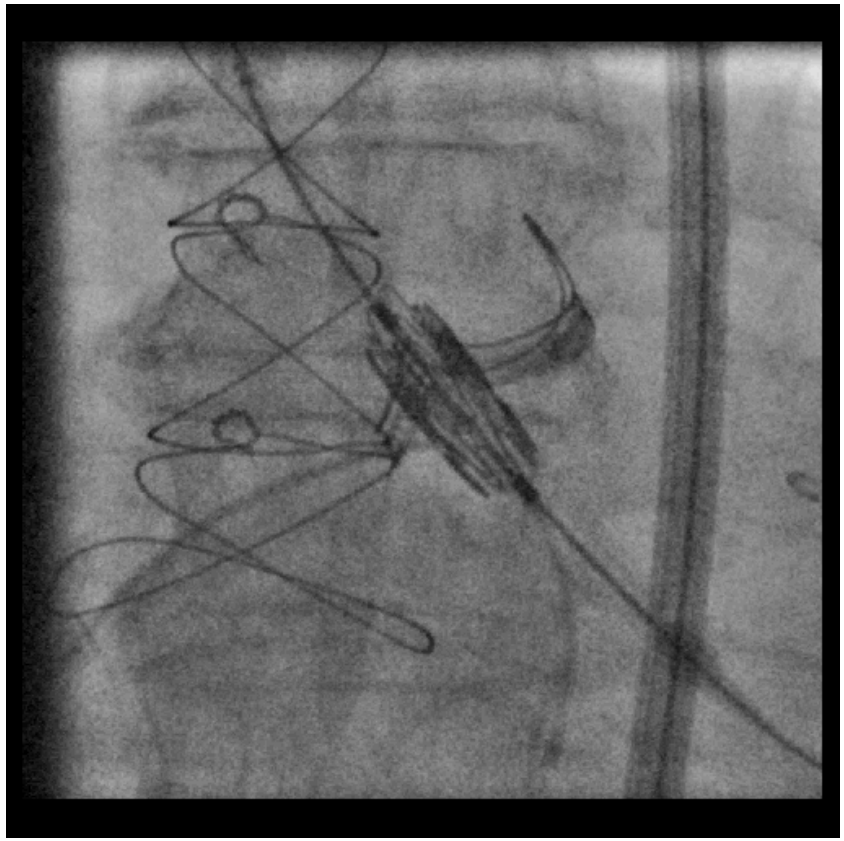
Endocarditis sobre TAVI
¿Qué hemos aprendido y hacia donde vamos?

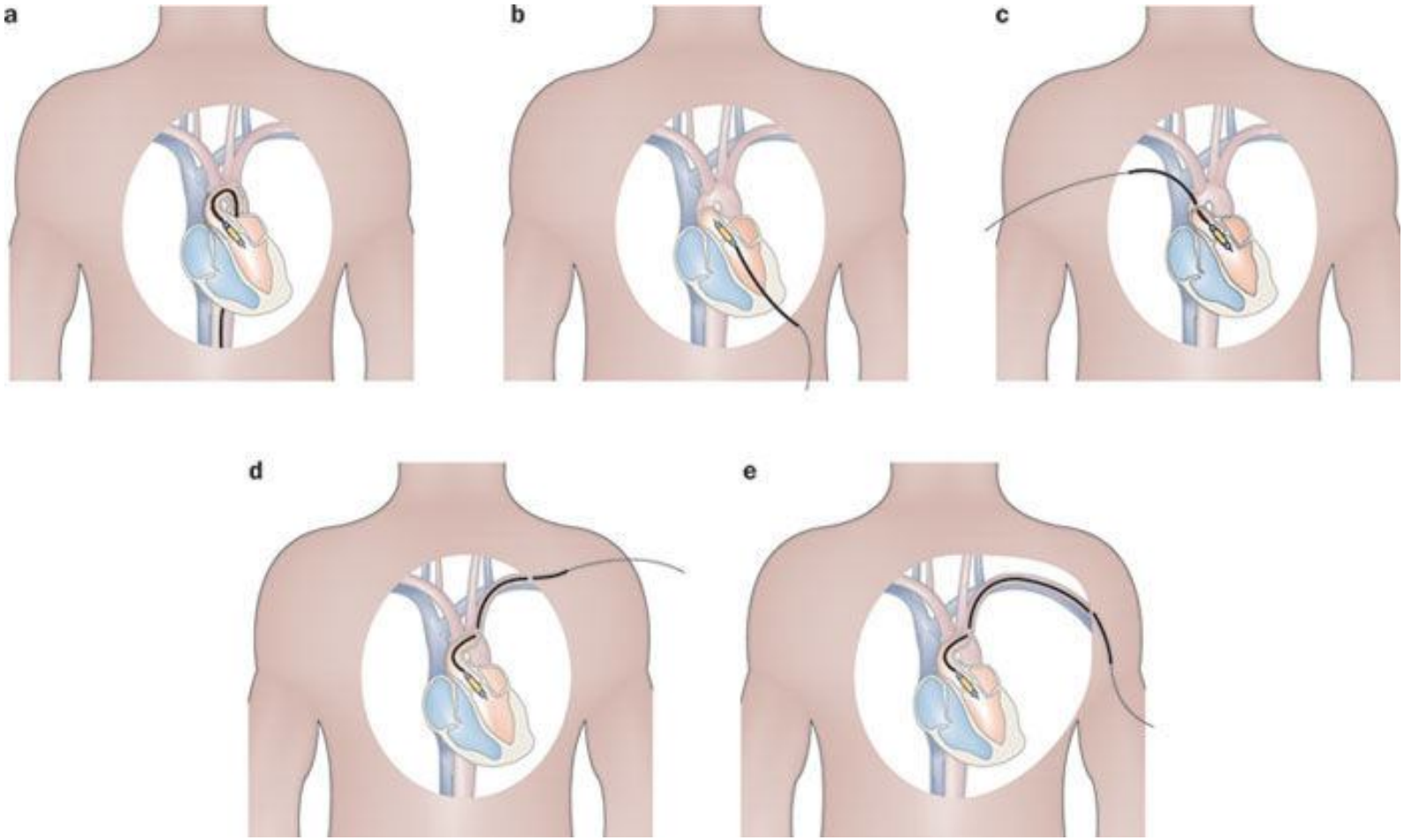
Ander Regueiro, MD, FESC
Cardiología Intervencionista
Hospital Clínic de Barcelona
Universidad de Barcelona

INSTITUT UNIVERSITAIRE DE CARDIOLOGIE ET DE PNEUMOLOGIE DE QUÉBEC
AFFILIÉ À UNIVERSITÉ LAVAL

CLÍNIC BARCELONA Hospital Universitari

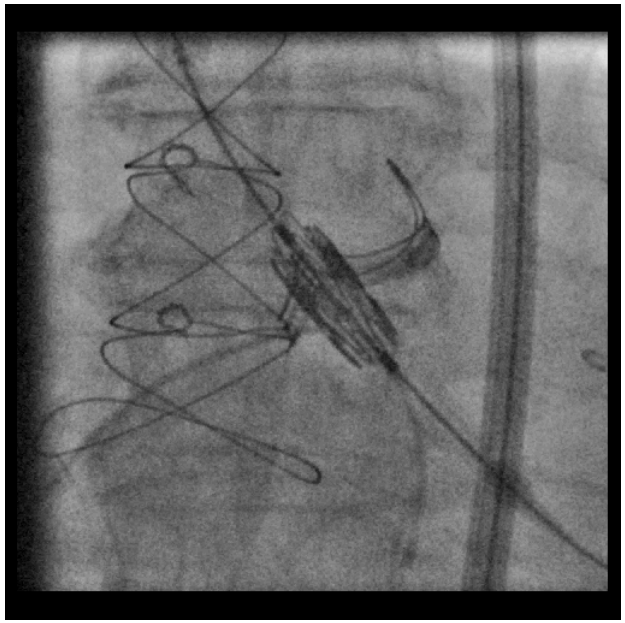
Transcatheter aortic valve implantation
TAVI



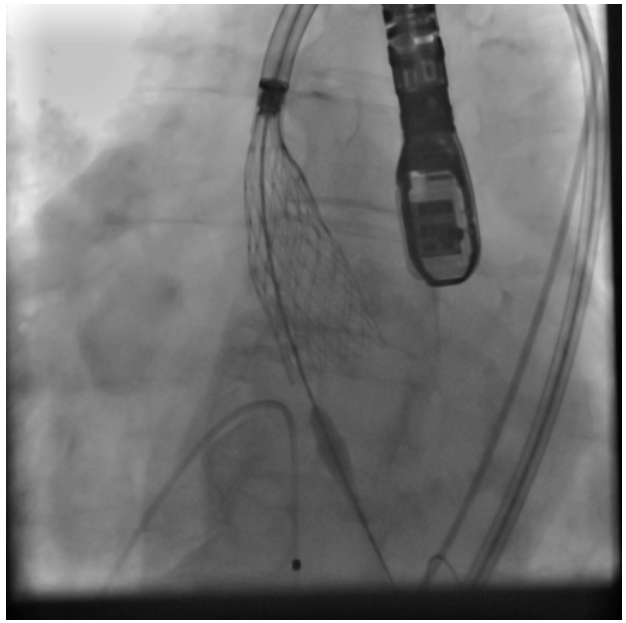


Nature Reviews Cardiology **9**, 15-29 (January 2012)

Expandible con balón
(Sapien)



Autoexpandible
(CoreValve, Portico…)



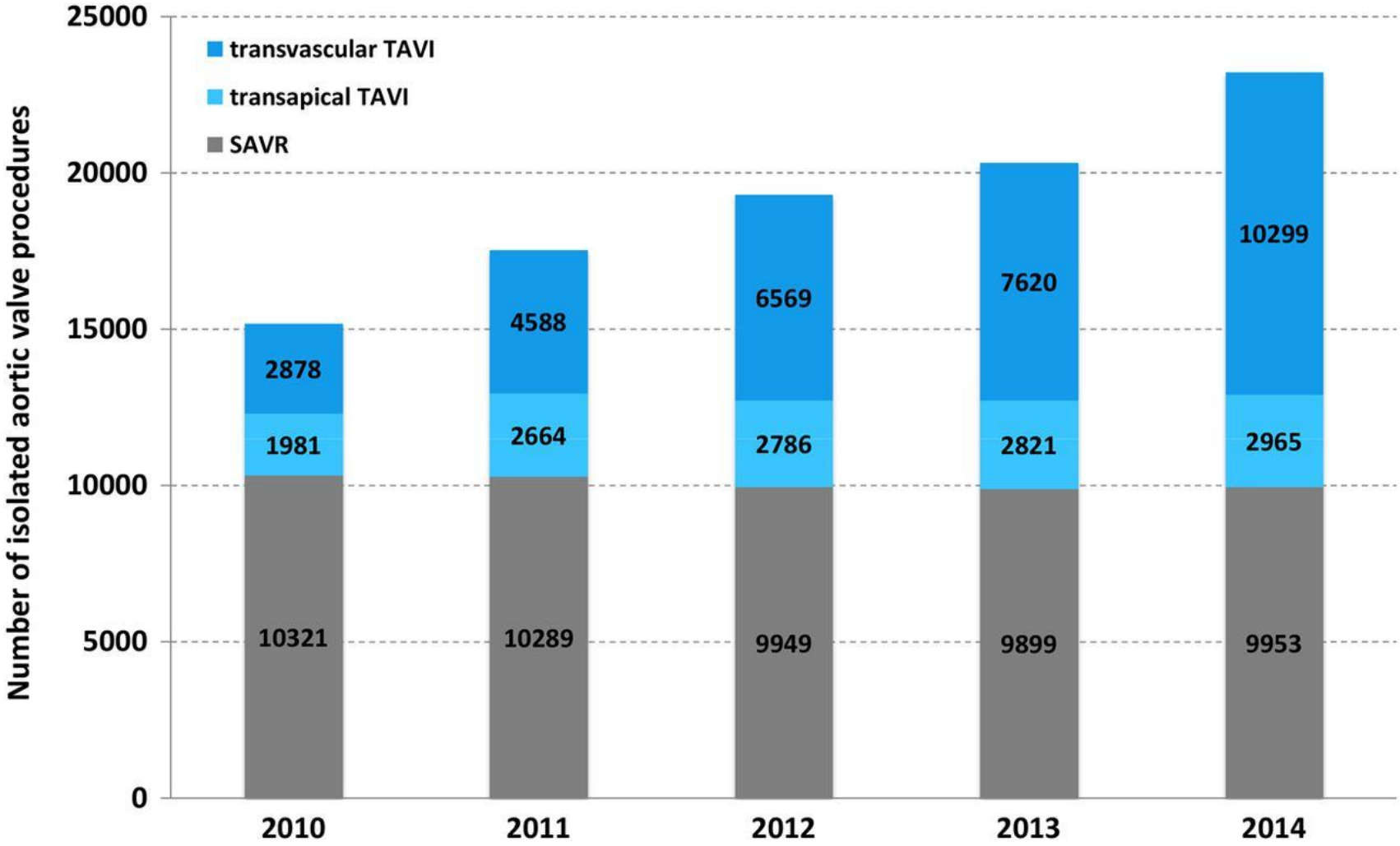
Special Report

Percutaneous Transcatheter Implantation of an Aortic Valve Prosthesis for Calcific Aortic Stenosis

First Human Case Description

Alain Cribier, MD; Helene Eltchaninoff, MD; Assaf Bash, PhD; Nicolas Borenstein, MD; Christophe Tron, MD; Fabrice Bauer, MD; Genevieve Derumeaux, MD; Frederic Anselme, MD; François Laborde, MD; Martin B. Leon, MD

Circulation. 2002;106:3006-3008



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EHJ. 2016;37(10):803-801

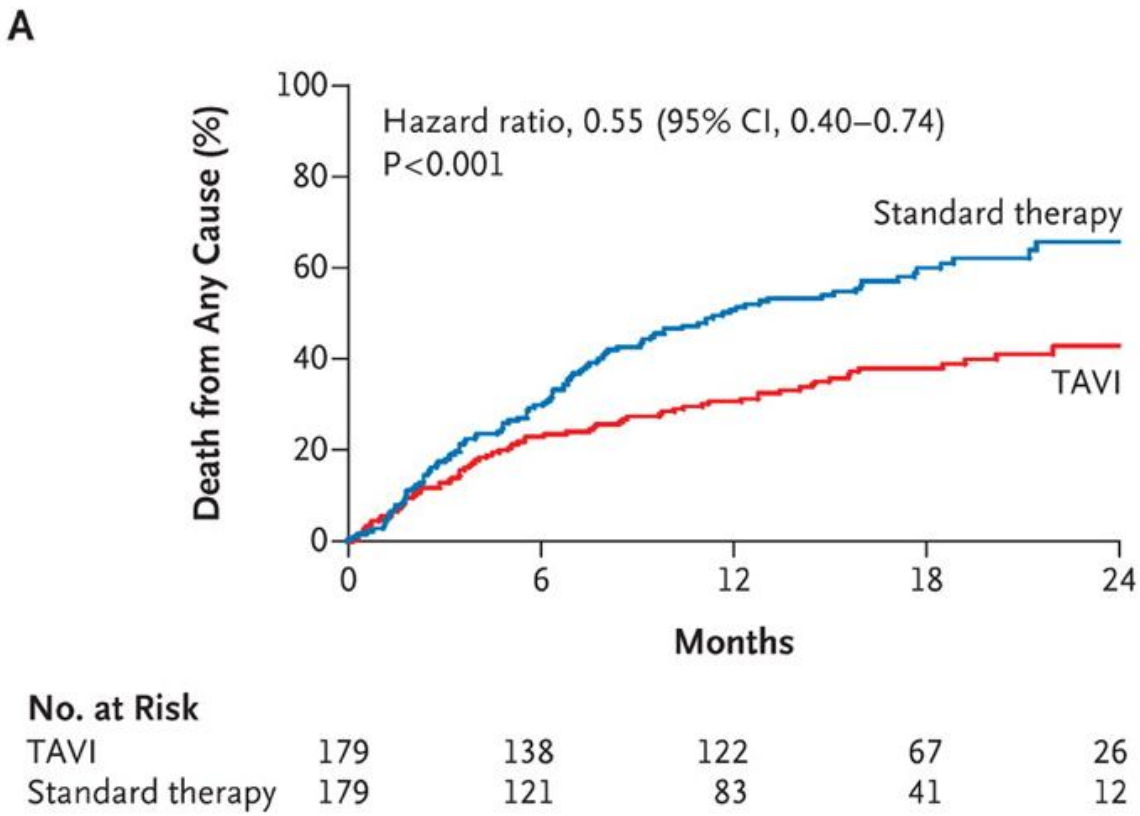
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 OCTOBER 21, 2010 VOL. 363 NO. 17

Transcatheter Aortic-Valve Implantation for Aortic Stenosis in Patients Who Cannot Undergo Surgery

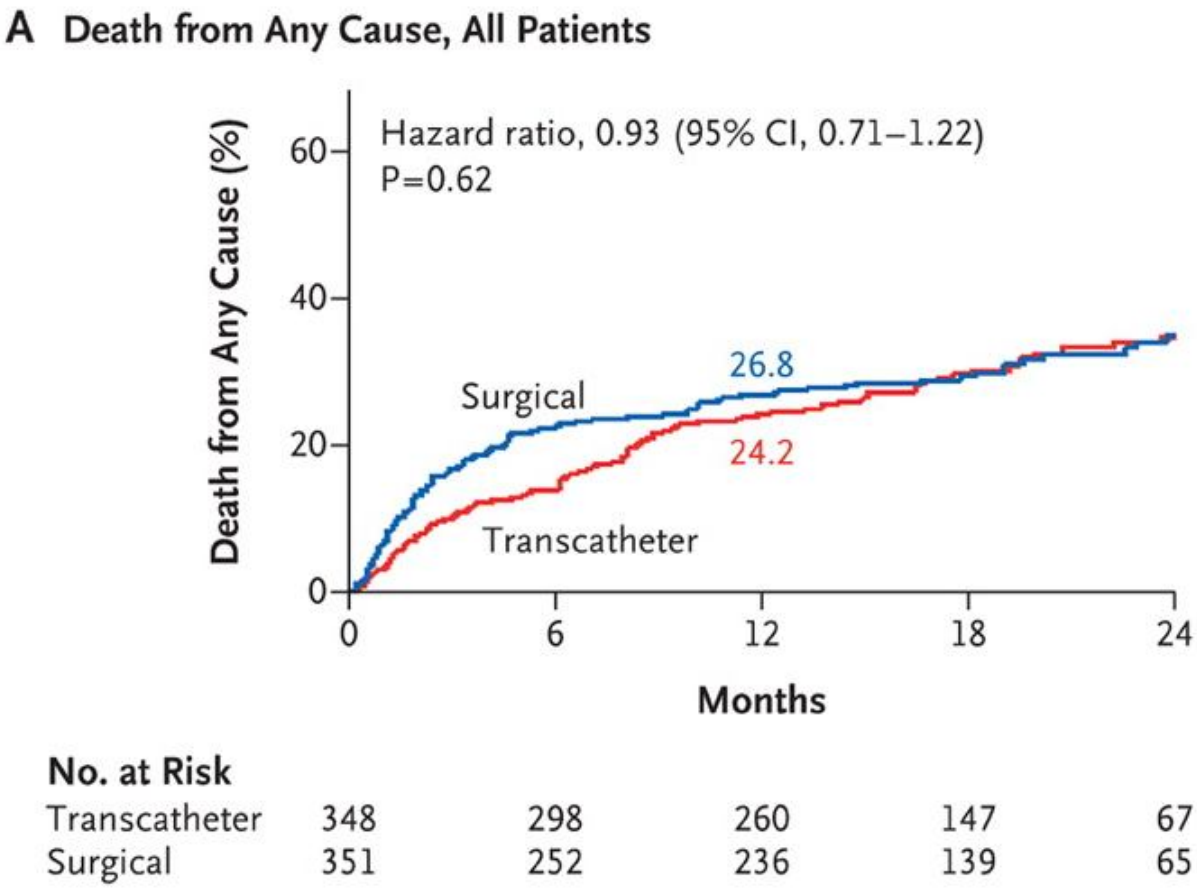
Martin B. Leon, M.D., Craig R. Smith, M.D., Michael Mack, M.D., D. Craig Miller, M.D., Jeffrey W. Moses, M.D., Lars G. Svensson, M.D., Ph.D., E. Murat Tuzcu, M.D., John G. Webb, M.D., Gregory P. Fontana, M.D., Raj R. Makkar, M.D., David L. Brown, M.D., Peter C. Block, M.D., Robert A. Guyton, M.D., Augusto D. Pichard, M.D., Joseph E. Bavaria, M.D., Howard C. Herrmann, M.D., Pamela S. Douglas, M.D., John L. Petersen, M.D., Jodi J. Akin, M.S., William N. Anderson, Ph.D., Duolao Wang, Ph.D., and Stuart Pocock, Ph.D., for the PARTNER Trial Investigators*

TAVI vs. Tratamiento médico
PARTNER Cohorte B



N Eng J Med 2010; 363:1597-1607

TAVI vs. SVAo
PARTNER Cohorte A



N Eng J Med 2011; 364:2187-2198

Guías valvulopatías, ESC
Estenosis aórtica

Recommendations	Class	Level
The choice for intervention must be based on careful individual evaluation of technical suitability and weighing of risks and benefits of each modality (aspects to be considered are listed in the according table). In addition, the local expertise and outcomes data for the given intervention must be taken into account.	I	C
SAVR is recommended in patients at low surgical risk (STS or EuroSCORE II <4% or logistic EuroSCORE I <10% and no other risk factors not included in these scores, such as frailty, porcelain aorta, sequelae of chest radiation).	I	B
TAVI is recommended in patients who are not suitable for SAVR as assessed by the Heart Team.	I	B

Eur Heart J 2017; doi:10.1093/eurheartj/ehx391

doi:10.1510/icvts.2010.239517

INTERACTIVE CARDIOVASCULAR AND THORACIC SURGERY

Interactive CardioVascular and Thoracic Surgery 11 (2010) 252–253

www.icvts.org

Proposal for bail-out procedures - Valves

Transapical aortic valve prosthetic endocarditis

Manuel Carnero-Alcázar*, Luis Carlos Maroto Castellanos, Javier Cobiella Carnicer, José Enrique Rodríguez Hernández

Department of Cardiac Surgery, Hospital Clinico San Carlos, Madrid, Spain

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Journal of Infection (2015) 70, 565–576

www.elsevierhealth.com/journals/jinf

Infective endocarditis in patients with an implanted transcatheter aortic valve: Clinical characteristics and outcome of a new entity☆

Juan M. Pericas [a,**], Jaume Llopis [b], Carlos Cervera [a], Emilio Sacanella [c], Carlos Falces [d], Rut Andrea [d], Cristina Garcia de la Maria [a], Salvador Ninot [e], Bàrbara Vidal [d], Manel Almela [f], Juan C. Paré [d], Manel Sabaté [d], Asunción Moreno [a], Francesc Marco [g], Carlos A. Mestres [e], Jose M. Miro [a,*], the Hospital Clinic Endocarditis Study Group [h]

Incidence and clinical impact of infective endocarditis after transcatheter aortic valve implantation

Manuel Martínez-Sellés[1,2]*, MD, PhD; Emilio Bouza[1], MD, PhD;
Pablo Díez-Villanueva[1], MD, PhD; Maricela Valerio[1], MD; María Carmen Fariñas[3], MD, PhD;
Antonio J. Muñoz-García[4], MD, PhD; Josefa Ruiz-Morales[4], MD; Juan Gálvez-Acebal[5], MD;
Isabel Antorrena[5], MD; Jesús María de la Hera Galarza[7], MD; Enrique Navas[8], MD, PhD;
Patricia Muñoz[1], MD, PhD; on behalf of the GAMES study group

1. Hospital General Universitario Gregorio Marañón, Madrid, Spain; 2. Universidad Europea, Madrid, Spain; 3. Hospital Universitario Marqués de Valdecilla, Santander, Spain; 4. Hospital Clínico Universitario Virgen de la Victoria, Málaga, Spain; 5. Hospital Universitario Virgen Macarena, Seville, Spain; 6. Hospital Universitario la Paz, Madrid, Spain; 7. Hospital Central de Asturias, Oviedo, Spain; 8. Hospital Universitario Ramón y Cajal, Madrid, Spain

ORIGINAL CONTRIBUTION

CLINICIAN'S CORNER

Contemporary Clinical Profile and Outcome of Prosthetic Valve Endocarditis

JAMA. **2007**;297(12):1354-1361

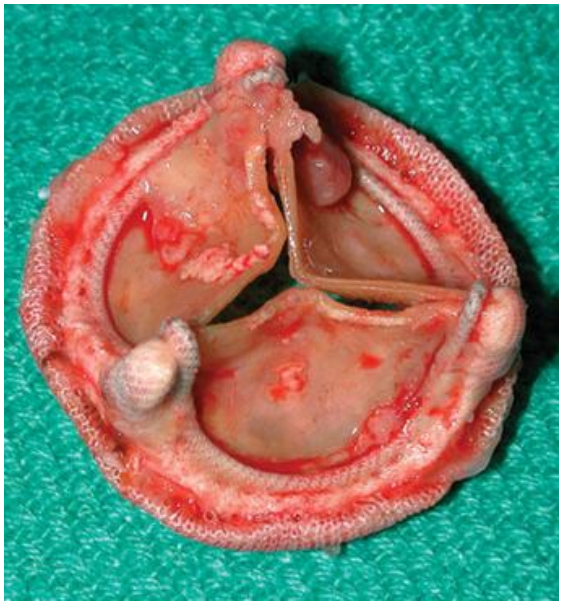
TAVI ≠ SVAo
Paciente

THE PARTNER 3 TRIAL

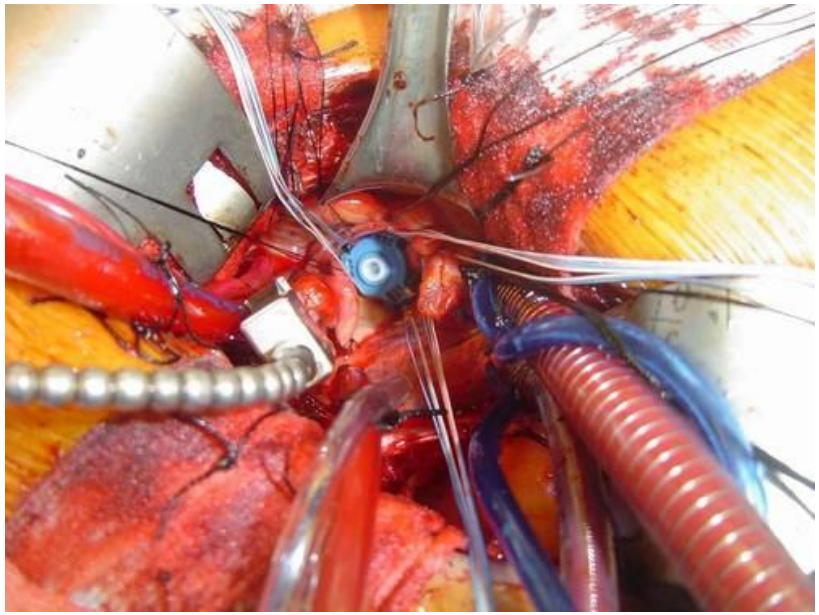
PATIENT INFORMATION GUIDE

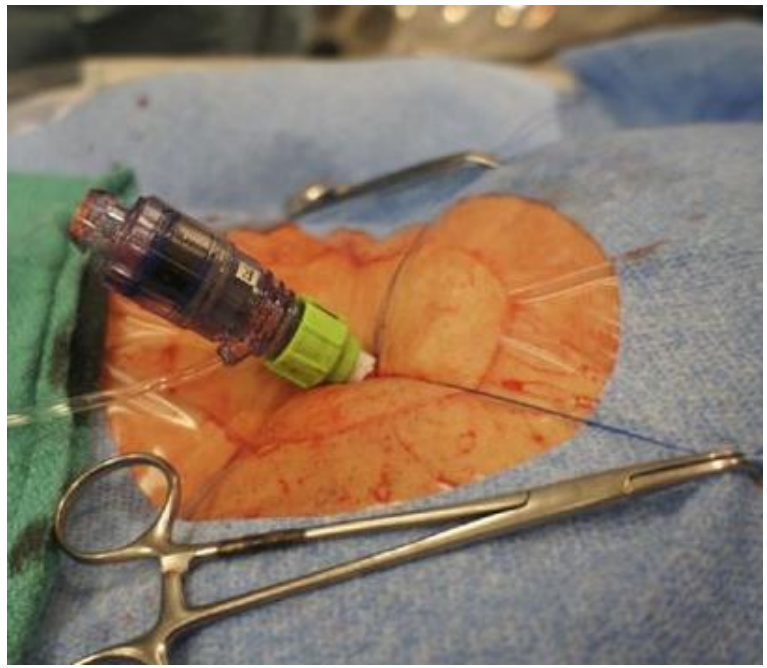
TAVI ≠ SVAo
Prótesis

TAVI ≠ SVAo
Prótesis



TAVI ≠ SVAo
Procedimiento





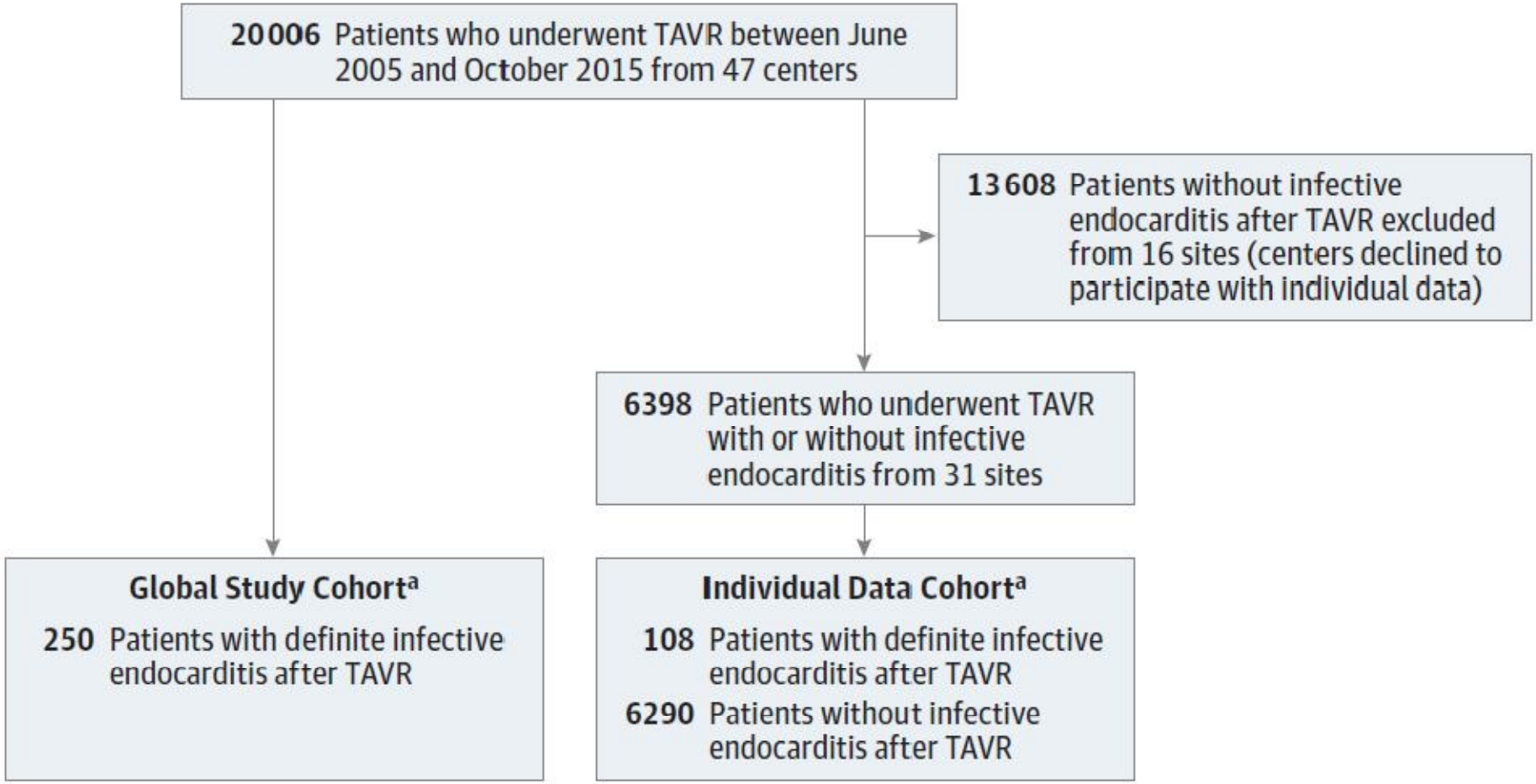
JAMA | Original Investigation

Association Between Transcatheter Aortic Valve Replacement and Subsequent Infective Endocarditis and In-Hospital Death

Regueiro A, Linke A, Latib A, et al. *JAMA*. 2016;316(10):1083-1092

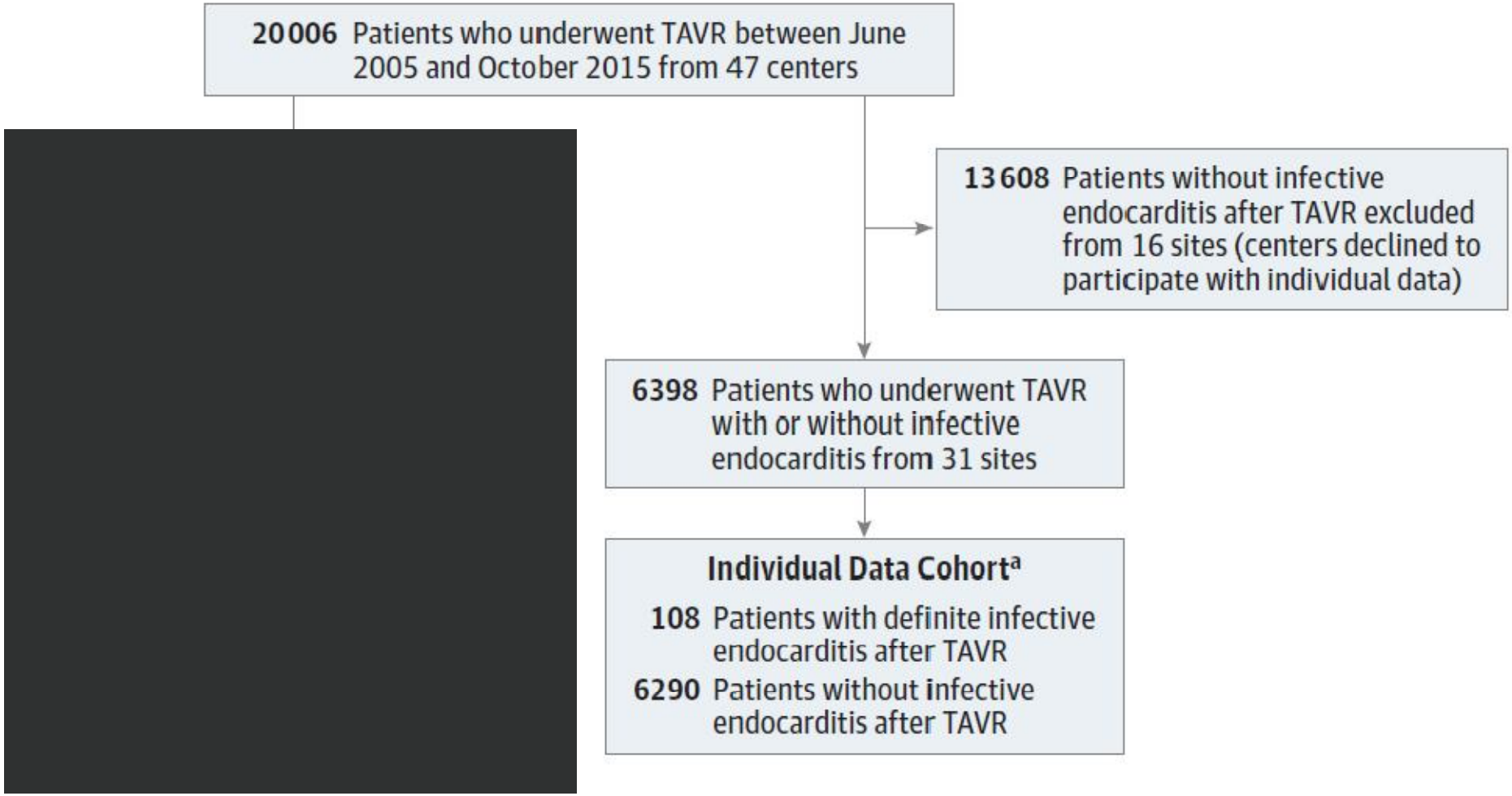
Objetivo

- Describir las características clínicas y la evolución de los pacientes que presentan una endocarditis infecciosa tras un remplazo valvular aórtico transcatéter (TAVI)



JAMA. 2016;316(10):1083-1092

Cohorte de datos individuales



JAMA. 2016;316(10):1083-1092

Cohorte global

20 006 Patients who underwent TAVR between June 2005 and October 2015 from 47 centers

Global Study Cohort[a]

250 Patients with definite infective endocarditis after TAVR

[redacted]

JAMA. 2016;316(10):1083-1092

Metodología

Análisis estadístico

- **Cohorte global (250 pt con EI post-TAVI)**
  - Características episodio EI
  - Factores asociados con mortalidad intrahospitalaria tras EI post-TAVI
- **Cohorte individual (108 EI tras 6398 TAVI)**
  - Factores asociados con el desarrollo de EI tras TAVI
- **Datos perdidos:** Imputación múltiple

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global

- Incidencia: 1.1% persona-año (IC 95% 1.1%-1.4%)
- Mediana 5.3 meses (IQR 1.5-13.4) entre TAVI y primer síntoma EI
- Endocarditis temprana en 178 pacientes (71.2%)
- Endocarditis <2 meses post TAVI en 72 pacientes (28.8%)
- Asociada a cuidados sanitarios en 132 pacientes (52.8%)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características basales

	No. (%) of Patients (N = 250)
Baseline characteristics	
Age, median (IQR), y	80 (59-91)
Men	159 (63.6)
Diabetes mellitus	97 (38.8)
Chronic renal failure	117 (46.8)
COPD	78 (31.2)
Atrial fibrillation	97 (38.8)
Previous stroke	31 (12.4)
Previous infectious endocarditis	3 (1.2)
Previous valve surgery	29 (11.7)
Logistic EuroSCORE, median (IQR), %[a,b]	17.9 (10-28)
Mean transaortic gradient, mean (SD), mm Hg	45 (17)
Left ventricular ejection fraction, mean (SD), %	53 (13.9)
Aortic valve area, mean (SD), cm^2	0.72 (0.22)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características TAVI

	No. (%) of Patients (N = 250)
Procedural characteristics	
Antibiotic prophylaxis	236 (94.4)
β-Lactam alone	195 (78.0)
Vancomycin alone	15 (6.0)
Valve implant site	
Catheterization laboratory	107 (42.8)
Operating or hybrid operating room	143 (57.2)
Type of valve	
Self-expandable valve[c]	119 (47.6)
Balloon-expandable valve[d]	131 (52.4)
Approach	
Transfemoral	208 (83.2)
Transapical	31 (12.4)
Transaortic	8 (3.2)
Other	3 (1.2)
Orotracheal intubation	137 (54.8)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características TAVI

	No. (%) of Patients (N = 250)
In-hospital (TAVR) outcomes	
Device success[e]	204 (81.6)
Mean residual transaortic gradient, mean (SD), mm Hg	12 (7)
Aortic regurgitation (≥moderate)	39 (15.2)
Stroke	12 (4.8)
Major vascular complication	25 (10.0)
Major or life-threatening bleeding	29 (11.6)
Acute kidney injury	33 (13.2)
Permanent pacemaker implant	53 (21.2)
Length of hospital stay, median (IQR), d	9 (7-15)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características EI

	No. (%) of Patients (N = 250)
Exposure to sources of bacteremia before infective endocarditis	
Unknown	174 (69.6)
Presumed intravascular source/ Soft tissue infection	26 (10.4)
Gastrointestinal	17 (6.8)
Urologic	16 (6.4)
Odonatological	9 (3.6)
Pacemaker implant	8 (3.2)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características EI

	No. (%) of Patients (N = 250)
Causative organism[c]	
Enterococcus species	57/232 (24.6)
Staphylococcus aureus	54/232 (23.3)
Coagulase-negative *Staphylococcus*	41/232 (16.8)
Viridans streptococci	16/232 (6.9)
Culture negative	12/232 (5.2)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Características EI

	No. (%) of Patients (N = 250)
Echocardiographic findings, No./total (%)[d]	
Vegetations	165/244 (67.6)
Transcatheter aortic valve leaflets	79/165 (47.9)
Transcatheter aortic valve stent	30/165 (18.2)
Mitral	41/165 (24.8)
Pacemaker lead	7/165 (4.8)
Tricuspid	7/165 (4.8)
Periannular complication	44/244 (18.0)
New aortic regurgitation	24/244 (9.8)
New mitral regurgitation	34/244 (13.9)

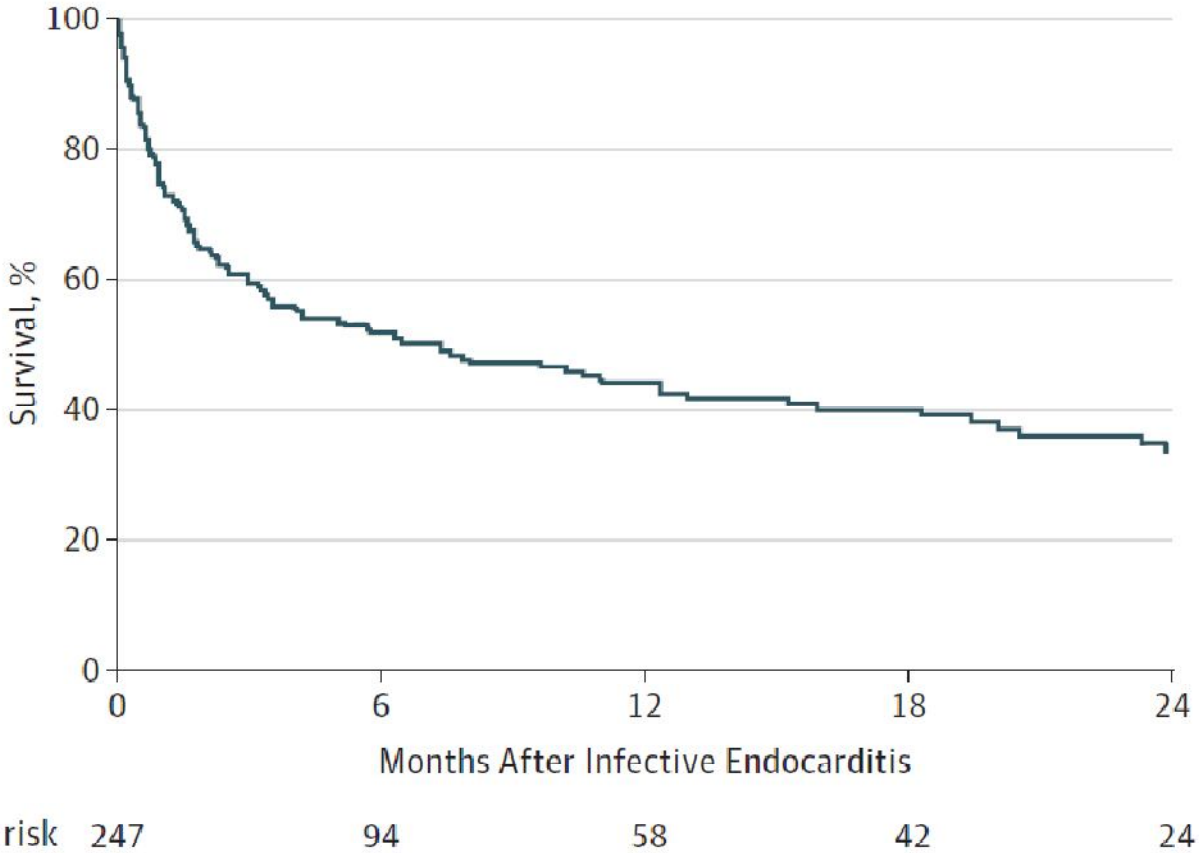
JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global

	No. (%) of Patients (N = 250)
Management and in-hospital outcomes	
Surgery during infective endocarditis hospitalization	37 (14.8)
Surgical transcatheter valve explantation	27 (10.8)
Surgical treatment without valve explantation	10 (4.0)
Transcatheter valve-in-valve procedure	3 (1.2)
Isolated pacemaker extraction	7 (2.8)
In-hospital death	90 (36.0)
Follow-up outcomes[e]	
Follow-up time after infective endocarditis, median (IQR), mo	10.5 (3.0-20.8)
Total person-years	171.5
Recurrent infective endocarditis, No./total (%)	15/160 (9.4)
Death at follow-up, No./total (%)	50/160 (31.5)
2-y mortality rate, (95% CI), %[e]	66.7 (59.0 to 74.2)

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Mortalidad (2 años)



JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Global. Mortalidad intrahospitalaria

	No In-Hospital Death (n = 160)	In-Hospital Death (n = 90)	Adjusted Odds Ratio (95% CI)[a,b]	*P* value
Logistic EuroSCORE[c]	18.6 (12.2)	23.1 (14.1)		
Per 1% increase			1.03 (1.00-1.05)	.02
Stroke during infective endocarditis hospitalization				
No	141	72	1 [Reference]	.10
Yes	11	14	2.29 (0.85-6.16)	
Heart failure during infective endocarditis hospitalization				
No	116	35	1 [Reference]	<.001
Yes	36	51	3.36 (1.74-6.45)	
Renal failure during infective endocarditis hospitalization				
No	104	28	1 [Reference]	.002
Yes	48	58	2.70 (1.42-5.11)	
Staphylococcus aureus endocarditis				
No	117	54	1 [Reference]	.10
Yes	31	30	1.76 (0.90-3.44)	

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Individual. Factores asociados EI

	EI (N=108)	No EI (N=6290)	*P* Valor	HR Ajustada (IC 95%)	*P* valor
Edad, mediana (IQR)	**80 (74-83)**	**83 (78-87)**	**<0.001**	**0.97 (0.94-0.99)**	**.001**
Varón	**67 (62.0)**	**3016/6070 (49.7)**	**.01**	**1.69 (1.13-2.52)**	**.01**
Diabetes mellitus	**45 (41.7)**	**1577/5252 (30.2)**	**.009**	**1.52 (1.02-2.29)**	**.04**
EPOC	39 (36.1)	1439/5709 (25.2)	.01	1.35 (0.89-2.04)	.16
IOT	64 (59.2)	2347/4874 (48.2)	.02	1.28 (0.68-1.93)	.22
IAo residual (≥Moderada)	**22/98 (22.4)**	**770/5254 (14.6)**	**.03**	**2.05 (1.28-3.28)**	**.003**

JAMA. 2016;316(10):1083-1092

Resultados
Cohorte Individual
Factores NO asociados a EI post TAVI

- Válvula autoexpandible
  - EI 38.9% vs. No EI 43.5%; P=.34

- Sala hemodinámica
  - EI 80.6% vs. No EI 83.2%; P=.47

JAMA. 2016;316(10):1083-1092

- Los pacientes que desarrollaron EI post TAVI (Incidencia 1.1% paciente-año) tuvieron una mortalidad intrahospitalaria elevada (36%) con una tasa baja de cirugía (10.8%)

- Una menor edad, el sexo masculino, la diabetes mellitus y la insuficiencia aórtica residual moderada o severa se asociaron a un mayor riesgo de EI post TAVI

JAMA. 2016;316(10):1083-1092

TAVI vs. SVAo

- Incidencia: Similar
- Etiología: Enterococo/S. Aureus
- Pronóstico: Mayor mortalidad en TAVI
- Profilaxis: Sin recomendaciones específicas

¿Hacia donde vamos?
Población TAVI

- Alto riesgo quirúrgico + riesgo intermedio y bajo (**similar a la quirúrgica estándar)**

¿Hacia donde vamos?

Población TAVI. Bajo riesgo quirúrgico

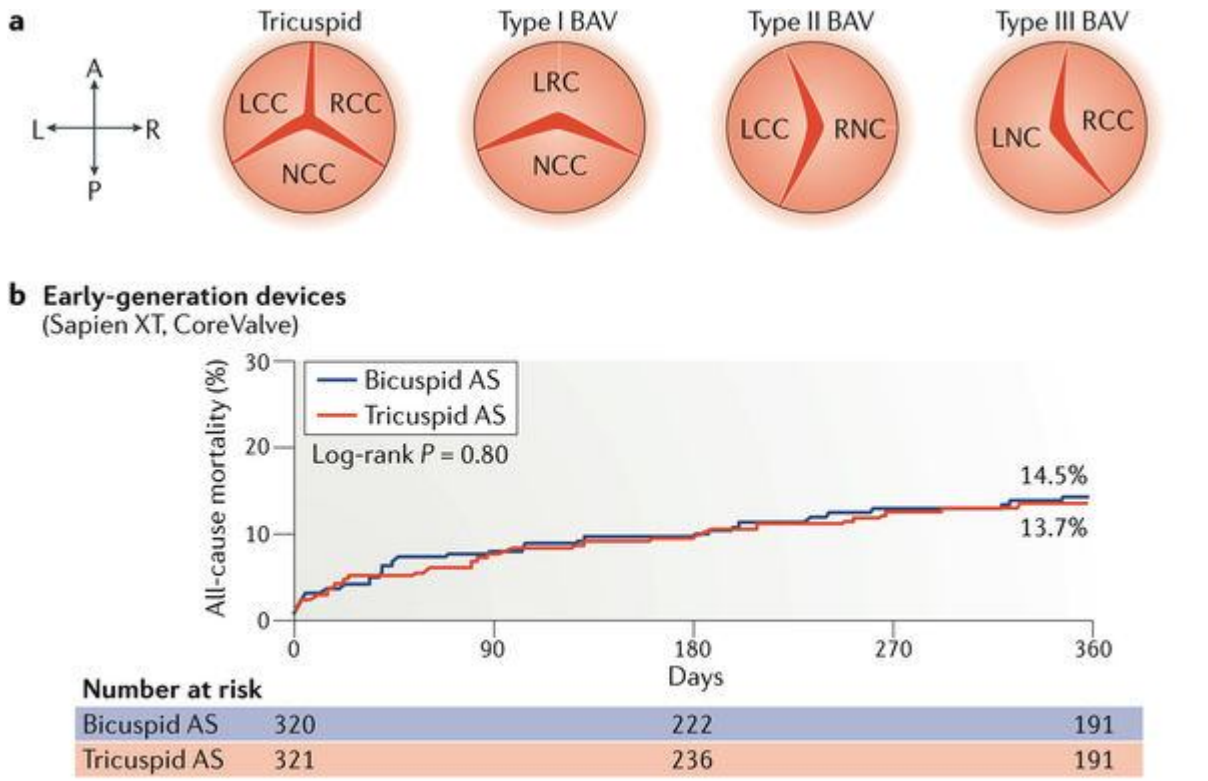
¿Hacia donde vamos?

TAVI en pacientes con estenosis aórtica moderada e insuficiencia cardiaca

Rationale and design of the Transcatheter Aortic Valve Replacement to UNload the Left ventricle in patients with ADvanced heart failure (TAVR UNLOAD) trial

Ernest Spitzer, MD,[a,b] Nicolas M. Van Mieghem, MD, PhD,[a] Philippe Pibarot, DVM,[c] Rebecca T. Hahn, MD,[d,e] Susheel Kodali, MD,[d,e] Mathew S. Maurer, MD,[d] Tamim M. Nazif, MD,[d,e] Josep Rodés-Cabau, MD,[c] Jean-Michel Paradis, MD,[c] Arie-Pieter Kappetein, MD, PhD,[a] Ori Ben-Yehuda, MD,[e] Gerrit-Anne van Es, PhD,[f] Faouzi Kallel, PhD,[g] William N. Anderson, PhD,[h] Jan Tijssen, PhD,[f] and Martin B. Leon, MD[d,e] *Rotterdam, The Netherlands; Québec, Canada; Irvine and Lake Forest, CA*

¿Hacia donde vamos?
TAVI en pacientes con válvula bicúspide



Nature Reviews | Cardiology

¿Hacia donde vamos?
Mitral, tricúspide…

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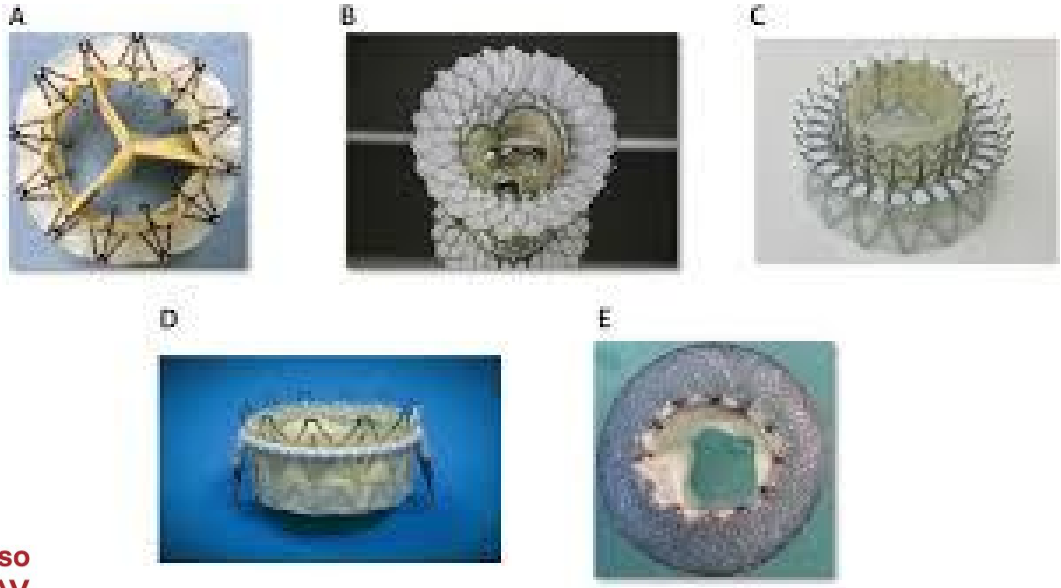
THE PRESENT AND FUTURE

STATE-OF-THE-ART REVIEW

Transcatheter Mitral Valve Replacement

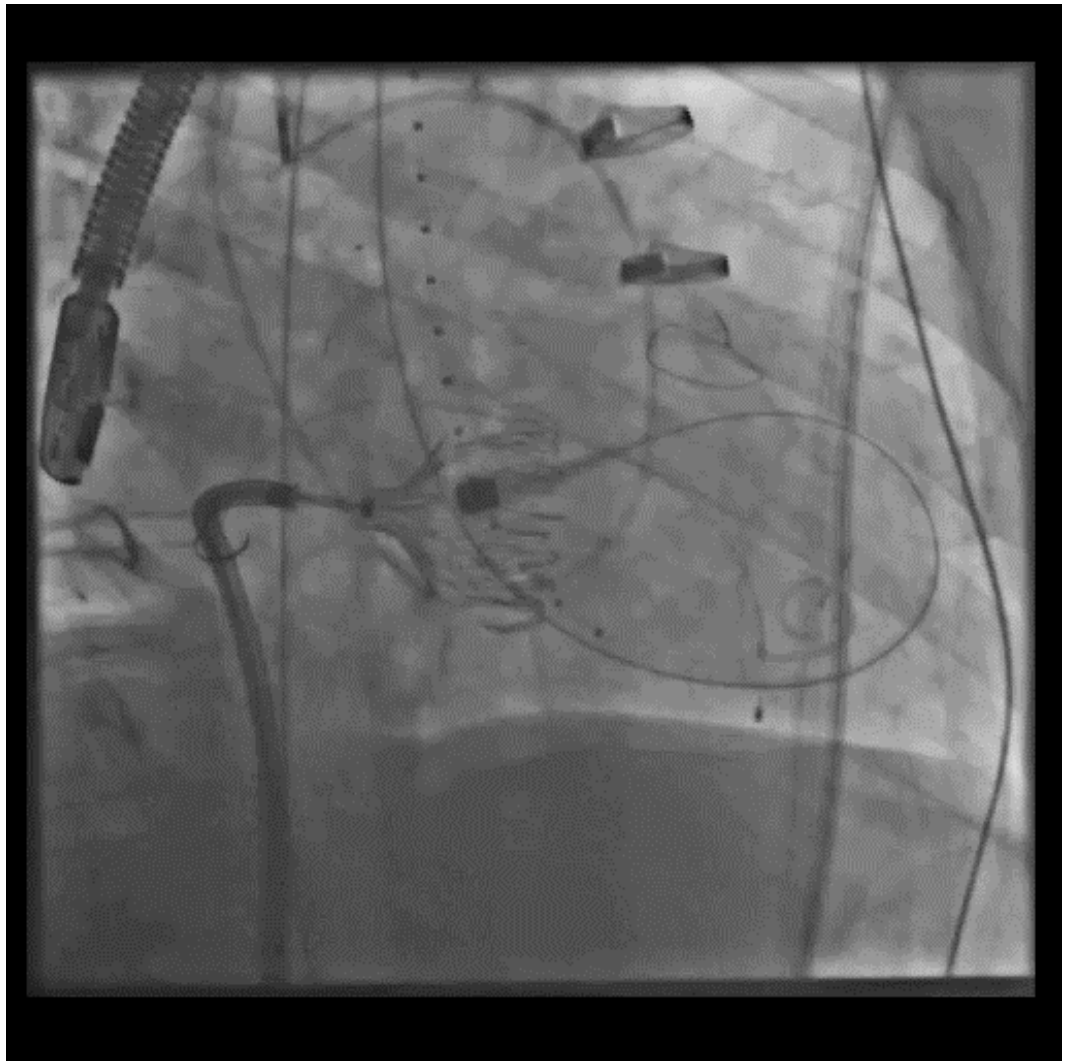
Insights From Early Clinical Experience and Future Challenges

Ander Regueiro, MD,[a] Juan F. Granada, MD,[b] François Dagenais, MD,[a] Josep Rodés-Cabau, MD[a]



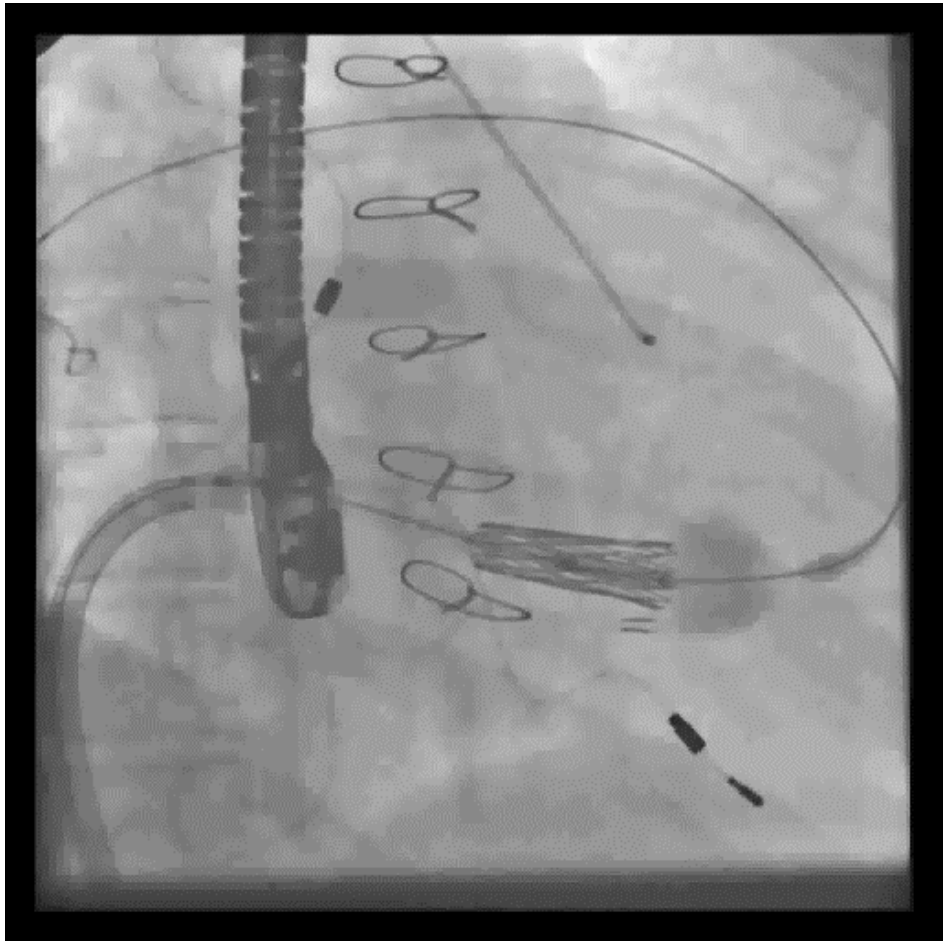
¿Hacia donde vamos?

Mitral

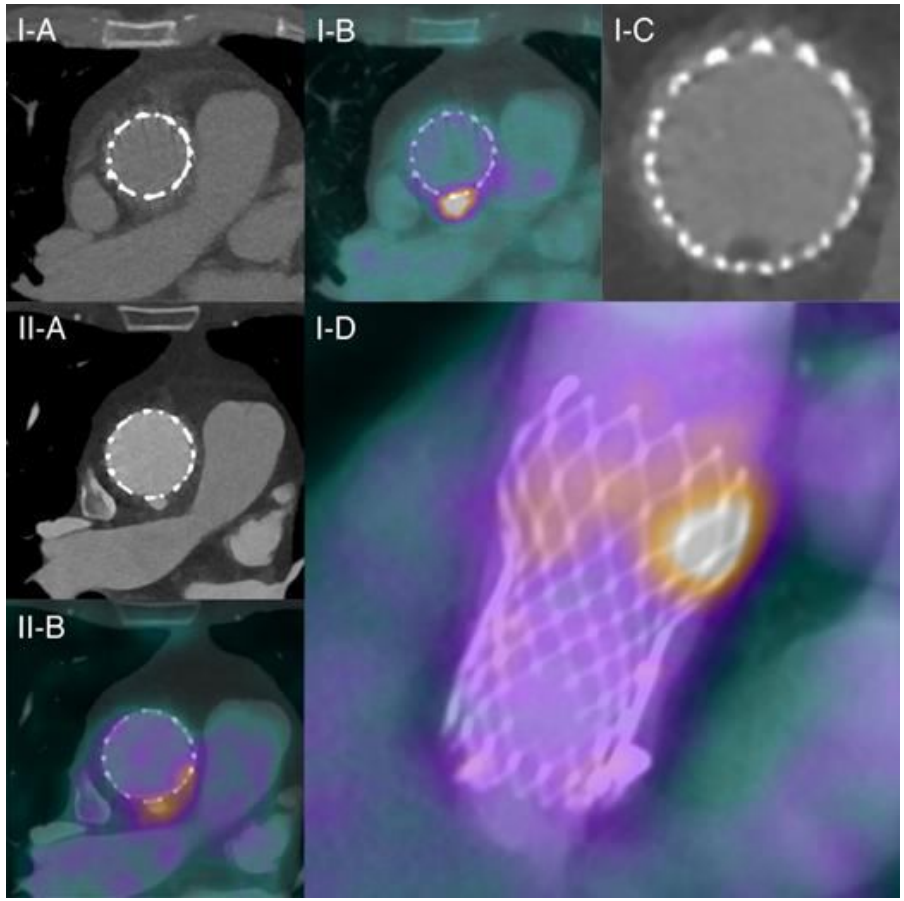


¿Hacia donde vamos?

Tricúspide



¿Hacia donde vamos?
Diagnóstico



EHJ. 2016;37(39):3059

¿Hacia donde vamos?
Proxilaxis

- No hay recomendaciones específicas basadas en evidencia

- Profilaxis pre-procedimiento
  - 80% B-lactámicos

- Profilaxis EI intervenciones
  - Igual que prótesis aórticas quirúrgicas

Endocarditis post TAVI
Conclusiones

- En pacientes con EAo y alto riesgo quirúrgico o no operables, la incidencia de EI post TAVI es del 1.1% pacientes-año. La mortalidad intrahospitalaria es elevada y la tasa de cirugía baja.

- La EI por enterococo seguida del S. aureus es la más frecuente tras el implante de TAVI

- La población que recibirá una TAVI será de menor riesgo quirúrgico

- No hay evidencia robusta para recomendar una profilaxis para EI post TAVI diferente a la recomendada en las guías para la SVAo quirúrgica