Mladý pacient s aortální vadou: myslíme dostatečně dlouhodobě?

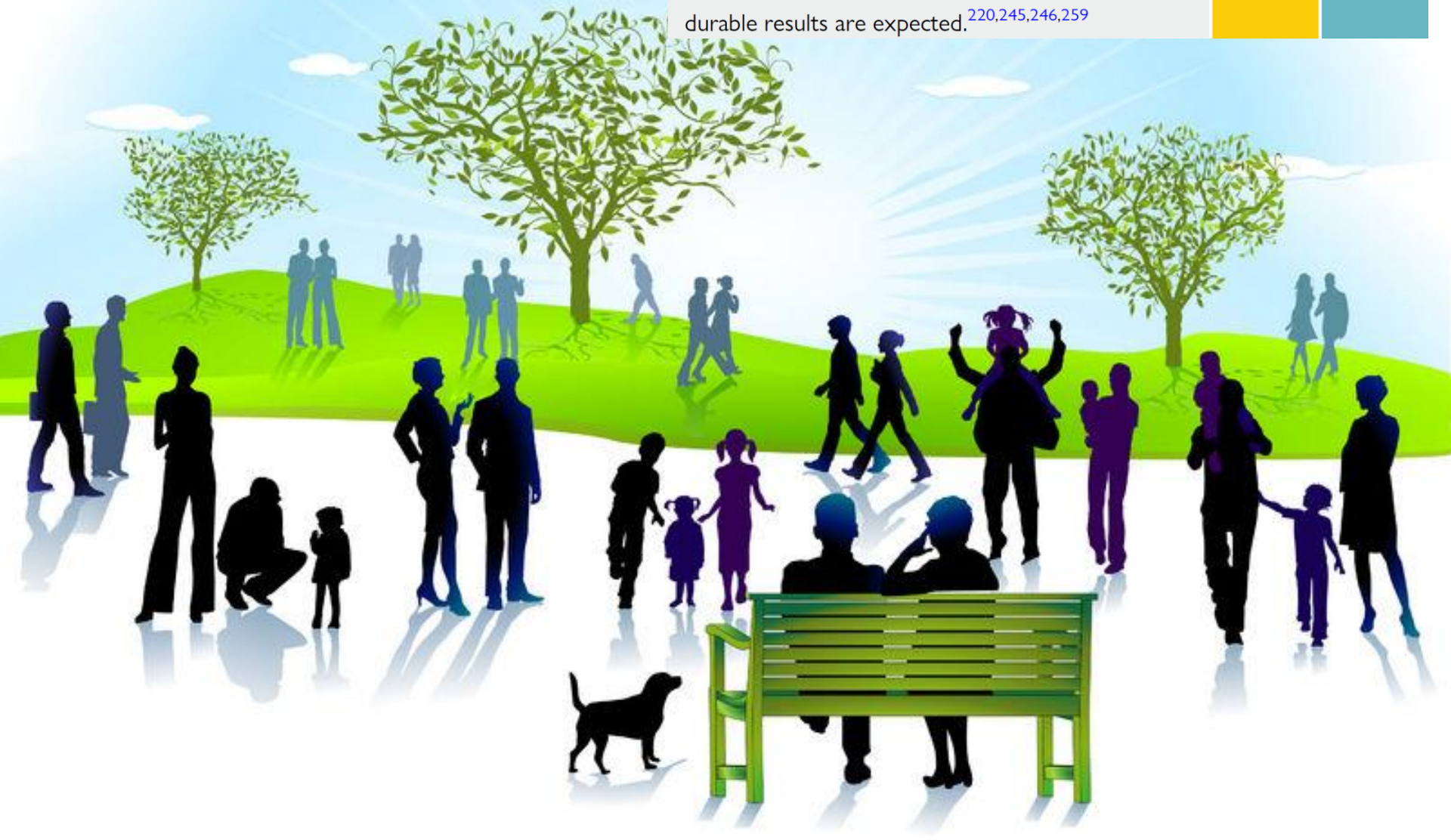
XXXV. WORSKSHOP ČAIK

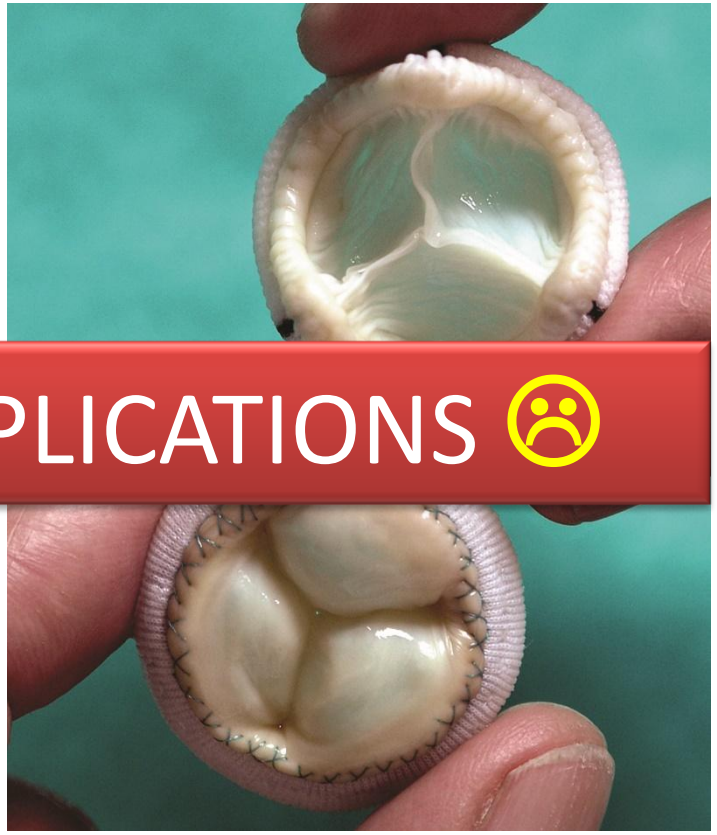
Jan Vojáček

Kardiochirurgická klinika

LF a FN Hradec Králové

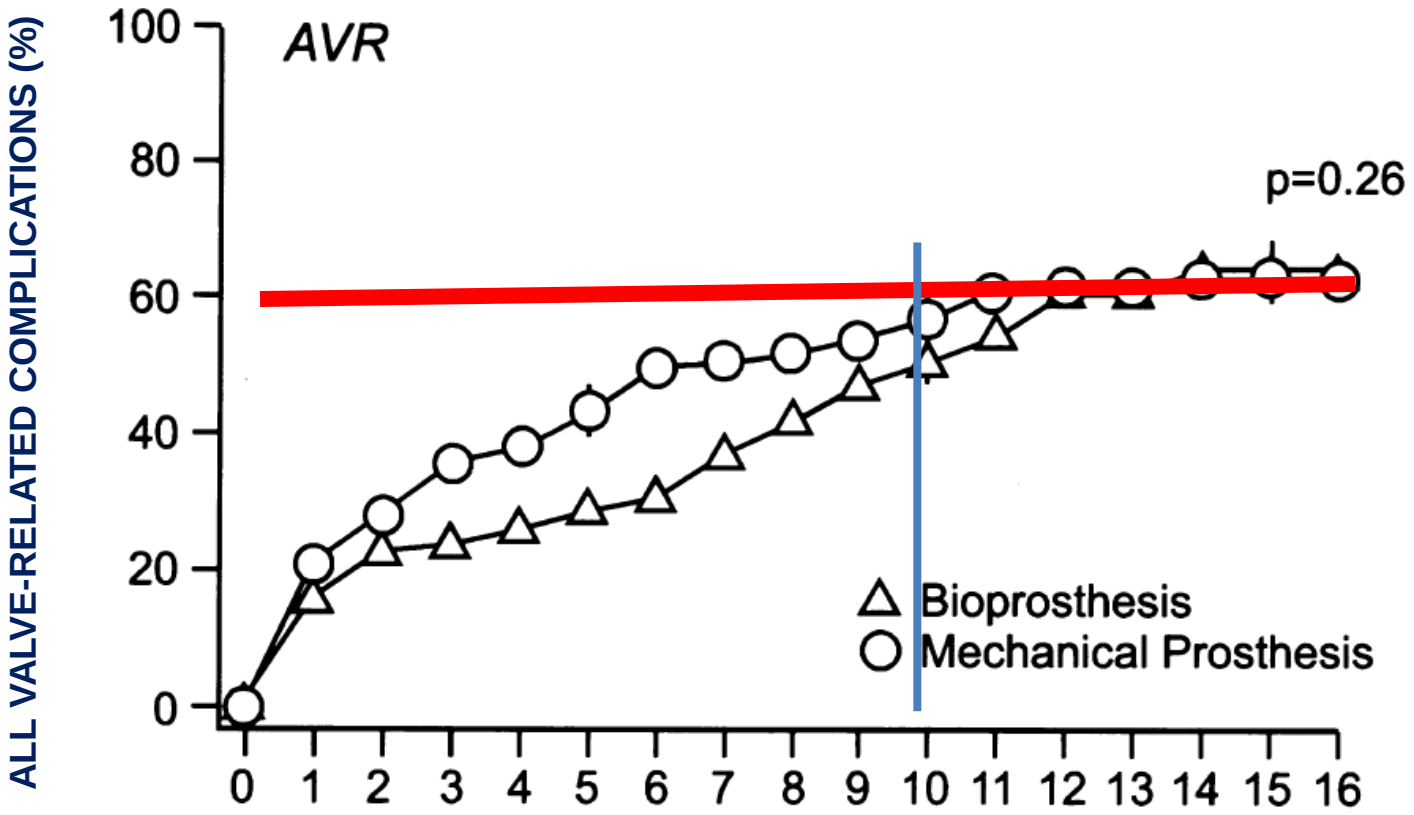
Valve-sparing aortic root replacement is recommended in young patients with aortic root dilatation at experienced centres, when durable results are expected.[247,250–253,255]	I	B
AV repair should be considered in selected patients with severe AR at experienced centres, when durable results are expected.[220,245,246,259]	IIa	B





VALVE RELATED COMPLICATIONS ☹

The long-term results of mechanical and bioprosthetic AVR



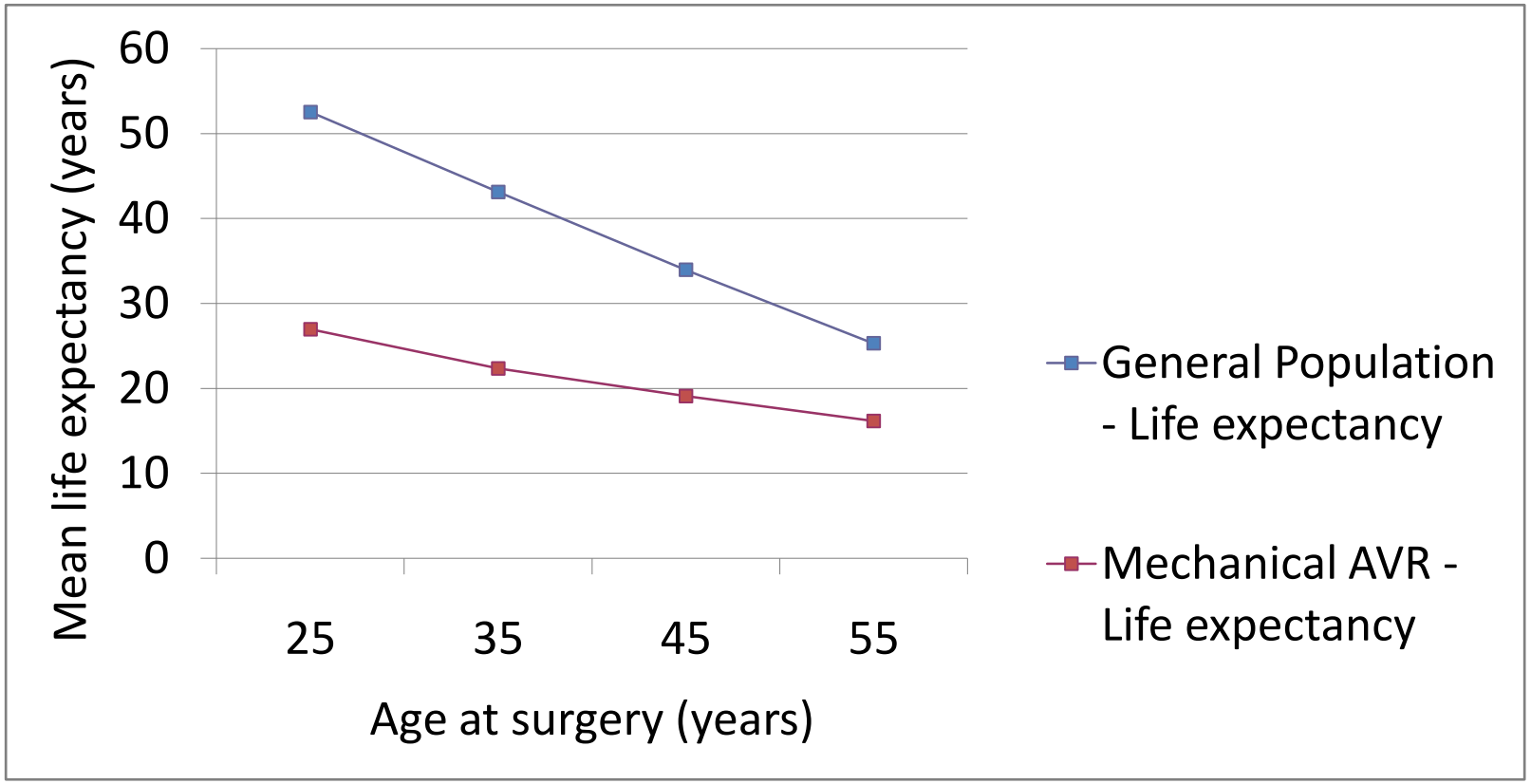
Hammermeister et al. Outcomes 15 years after valve replacement with a mechanical versus a bioprosthetic valve: final report of the Veterans Affairs randomized trial. J Am Coll Cardiol. 2000 Oct;36(4):1152-8.

Mechanical aortic valve replacement in non-elderly adults: meta-analysis and microsimulation

- 1995 – 2015
- Age: 18 – 55 (mean age: 48 years)
- 5728 patients from 29 publications
- Life expentancy and lifetime event risk

Korteland NM et al. Mechanical aortic valve replacement in non-elderly adults: meta-analysis and microsimulation. Eur Heart J. 2017 Dec 1;38(45):3370-3377

Life expectancy after mechanical AVR??



Korteland NM et al. Mechanical aortic valve replacement in non-elderly adults: meta-analysis and microsimulation. Eur Heart J. 2017 Dec 1;38(45):3370-3377

45 years

Life expectancy: 34 years

Life expectancy = 19 years (instead of 34 years)

Lifetime risk of:

TEC	18%
Bleeding	15%
ReDo	10%

Loss in Life Expectancy After Surgical Aortic Valve Replacement

JACC 2019

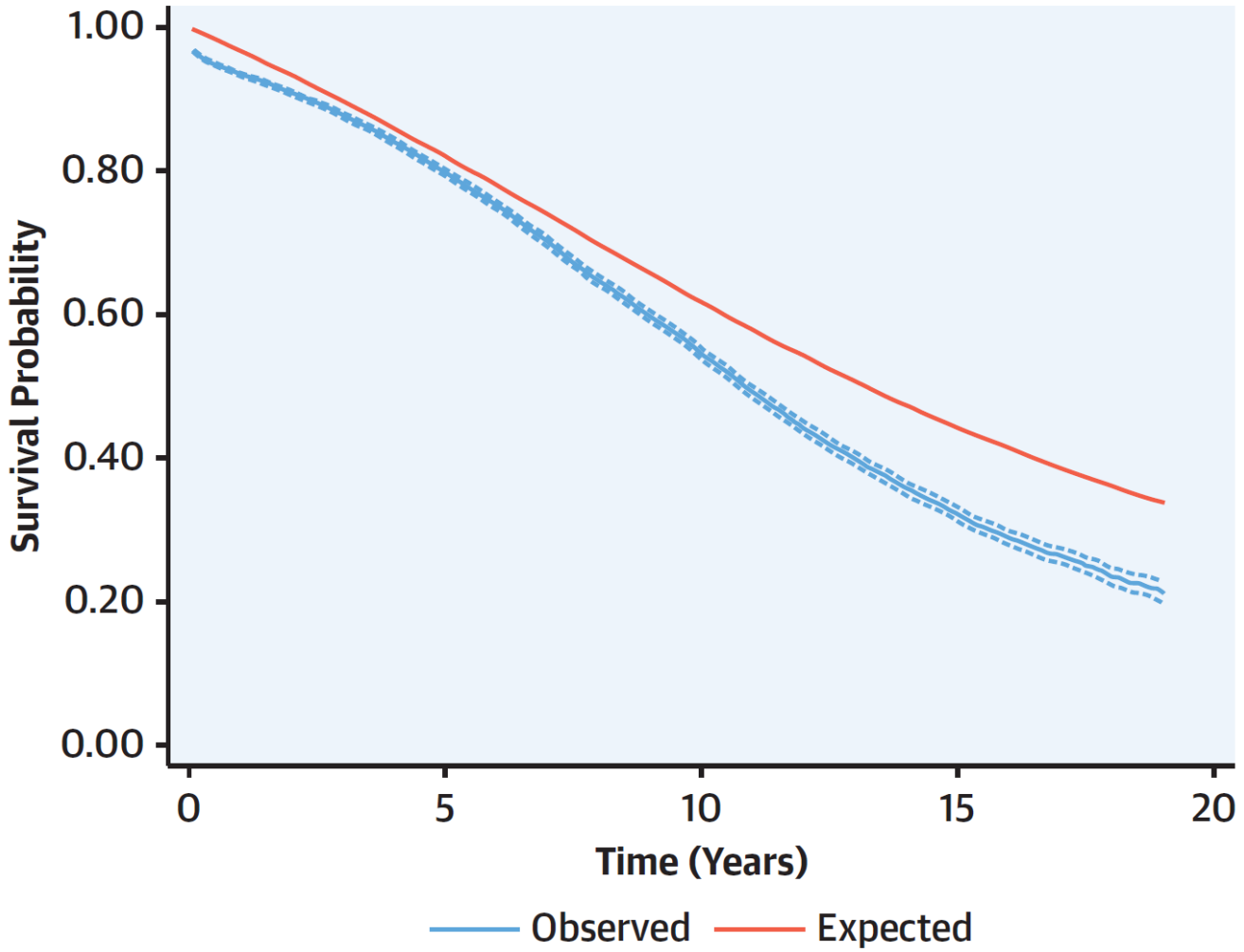
SWEDEHEART Study

23 528 patients after AVR

Loss in Life Expectancy After Surgical Aortic Valve Replacement

JACC 2019

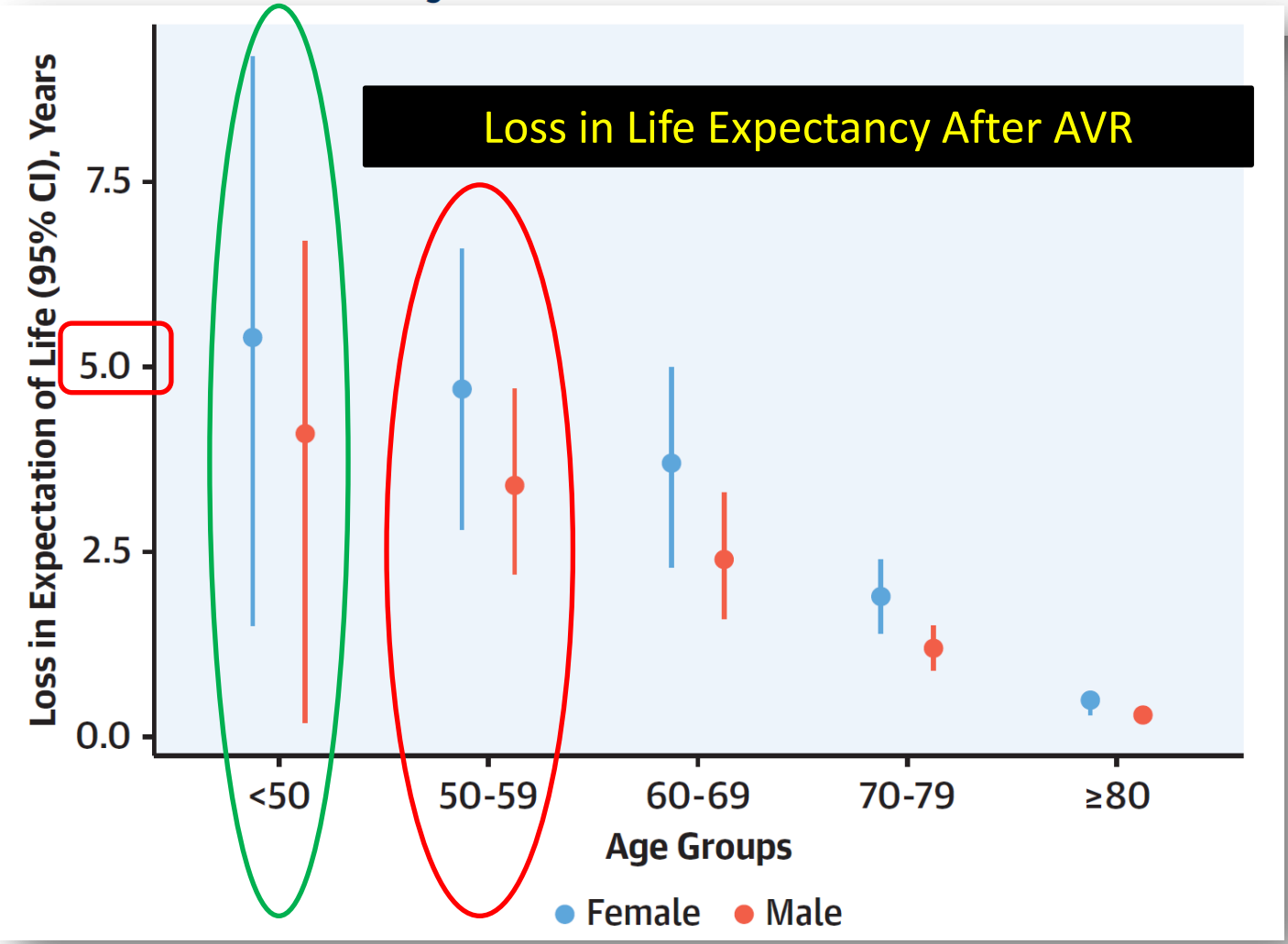
SWEDEHEART Study



Loss in Life Expectancy After Surgical Aortic Valve Replacement

JACC 2019

SWEDEHEART Study



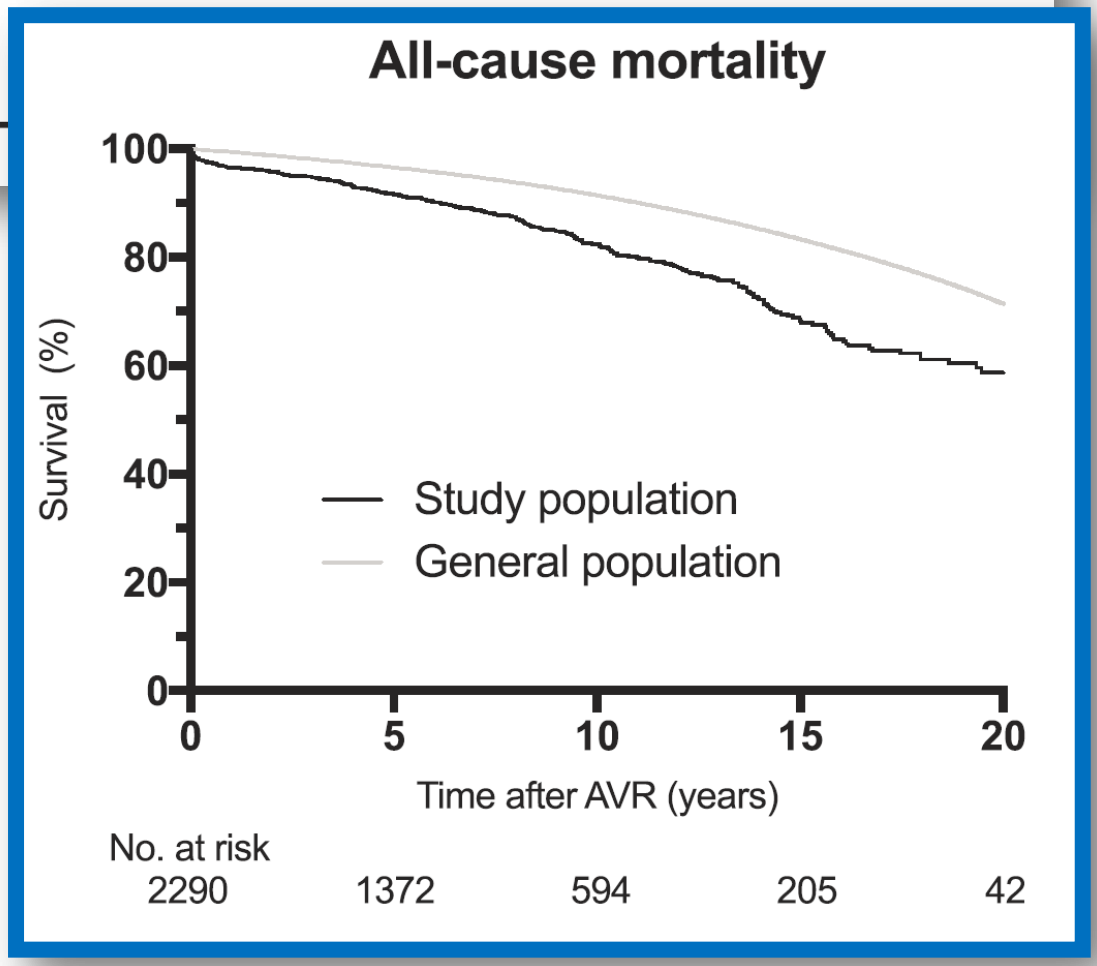
Circulation: Cardiovascular Quality and Outcomes

Circ Cardiovasc Qual Outcomes. 2019

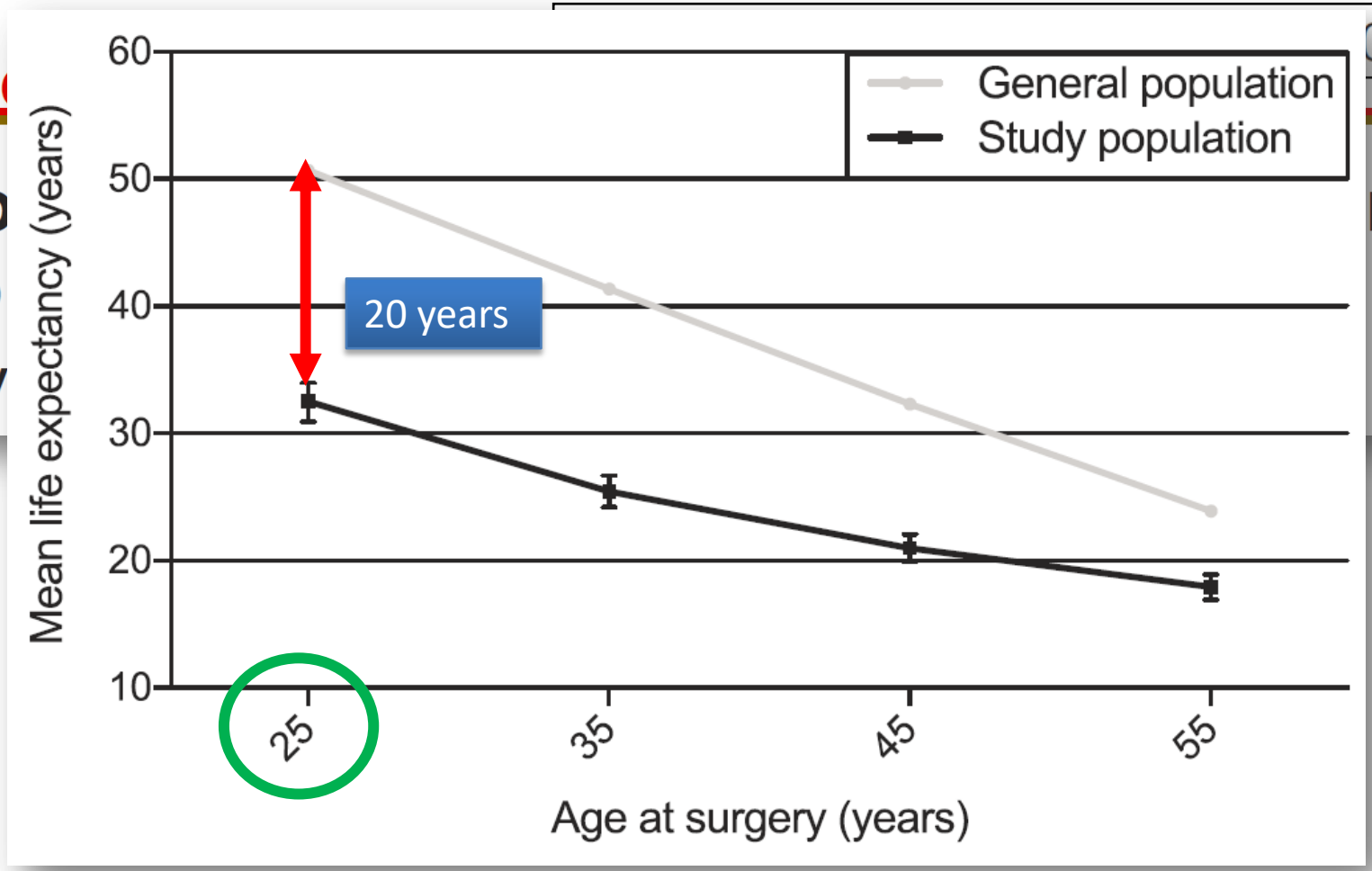
ORIGINAL ARTICLE

Bioprosthetic Aortic Valve Replacement in Nonelderly Adults

A Systematic Review, Meta-



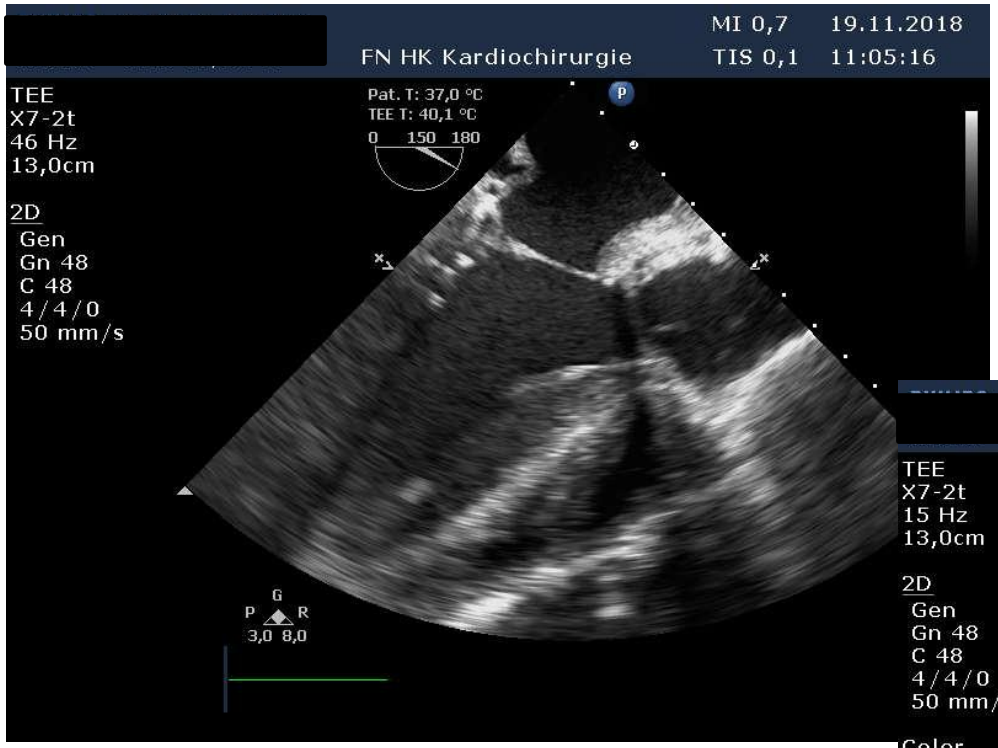
Circulation: Cardiovascular Quality and Outcomes

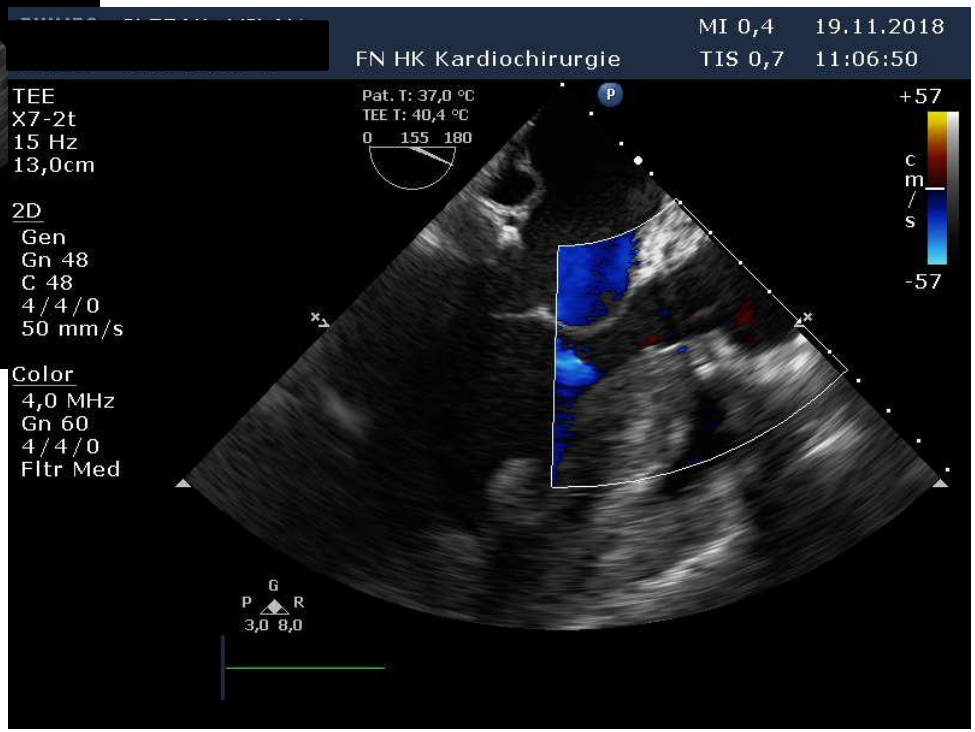


Microsimulation-based age-specific **mean life expectancy after bioAVR** compared with the age- and sex-matched general population

The Ross procedure

Perioperative TEE





Improved Survival After the Ross Procedure Compared With Mechanical Aortic Valve Re

When is the Ross operation a good

Tirone E. David, MD; Anna W

2010

Long-Term Outcomes of Patients Undergoing the Ross Procedure

JACC 2021

German Ross Registry

s of the Ross Procedure
anical Aortic Valve Replacement

Matched Cohort Study

Aug 14;

T. DAVID, Circulation, August 2016

homograft aortic root

trial. Lancet. 2010

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
VOL. 79, NO. 8, 2022
© 2022 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION
PUBLISHED BY ELSEVIER

Propensity-Matched Comparison of the Ross Procedure and Prosthetic

CENTRAL ILLUSTRATION Long-Term Outcomes After the Ross Procedure vs Prosthetic Aortic Valve Replacement in Adults

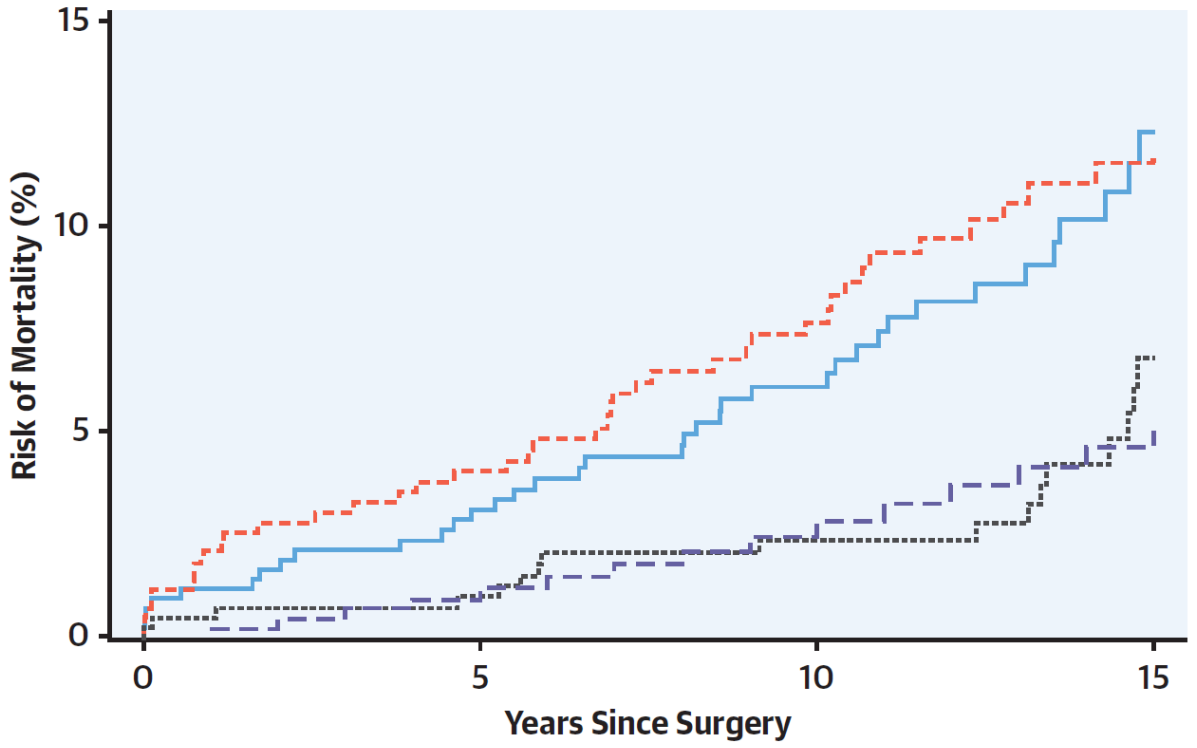
Ross vs Biological vs Mechanical AVR

- New York and California Statewide Data (1997-2014)
- Adults needing elective isolated AVR (18-50 years old)
- Exclusions: Concomitant procedures, reoperations, IV drug use, dialysis, endocarditis, history of cancer, connective tissue disorders
- 1:1:1 propensity matching (Ross: Biological: Mechanical)
- N = 434 patients per cohort
- Median follow-up: 12.5 years

El-Hamamsy: Propensity-Matched Comparison of the Ross Procedure and Prosthetic Aortic Valve Replacement in Adults

JACC 2022

Long-Term Cumulative Incidence of All Cause Mortality Compared with the Matched U.S. General Population



Number at Risk				
Bioprosthetic	434	386	290	113
Mechanical	434	369	287	131
Ross	434	376	298	129

Bioprosthetic Mechanical Ross General Population

European Journal of Cardio-Thoracic Surgery 00 (2022) 1–9
https://doi.org/10.1093/ejcts/ezac013

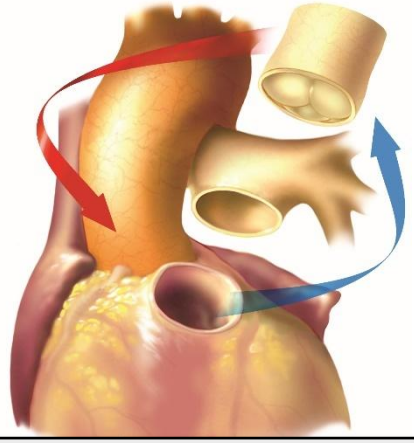
ORIGINAL ARTICLE

Cite this article as: Gofus J, Fila P, Drabkova S, Zacek P, Ondrasek J, Nemec P *et al.* Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis. Eur J Cardiothorac Surg 2022; doi:10.1093/ejcts/ezac013.

Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis

Jan Gofus [a], Petr Fila [b,*], Svetlana Drabkova[c], Pavel Zacek [a], Jiri Ondrasek[b], Petr Nemec [b], Jan Sterba[b], Martin Tuna[a], Jiri Jarkovsky[c] and Jan Vojacek[a]

[a] Department of Cardiac Surgery, Charles University, Faculty of Medicine and University Hospital in Hradec Kralove, Hradec Kralove, Czech Republic
[b] Department of Cardiac Surgery, Centre of Cardiovascular Surgery and Transplantation, Brno, Czech Republic
[c] Institute of Health Information and Statistics of the Czech Republic, Prague, Czech Republic



Dept. of Cardiac Surg, UH HK; CKTCH, Brno

296 Ross adult patients

All cardiac centers in Czech Republic

5120 mechanical AVR

European Journal of Cardio-Thoracic Surgery 00 (2022) 1–9
https://doi.org/10.1093/ejcts/ezac013

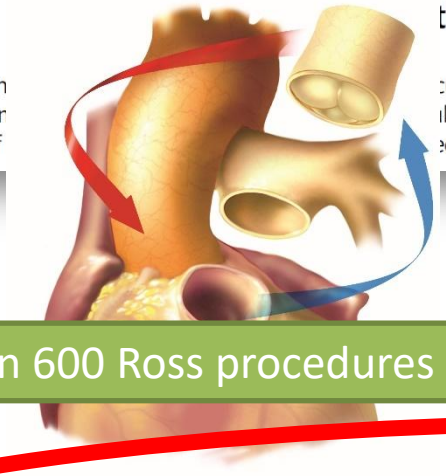
ORIGINAL ARTICLE

Cite this article as: Gofus J, Fila P, Drabkova S, Zacek P, Ondrasek J, Nemec P *et al.* Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis. Eur J Cardiothorac Surg 2022; doi:10.1093/ejcts/ezac013.

Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis

Jan Gofus [a], Petr Fila [b,*], Svetlana Drabkova[c], Pavel Zacek [a], Jiri Ondrasek[b], Petr Nemec [b], Jan Sterba[b], ...tin Tuna[a], Jiri Jarkovsky[c] and Jan Vojacek[a]

[a] Departmen... culty of Medicine and University Hospital in Hr... ...ublic
[b] Departmer... ...lar Surgery and Transplantation, Brno, Czech R...
[c] Institute of ...ech Republic, Prague, Czech Republic



More than 600 Ross procedures

291 Ross adult patients

291 mechanical AVR

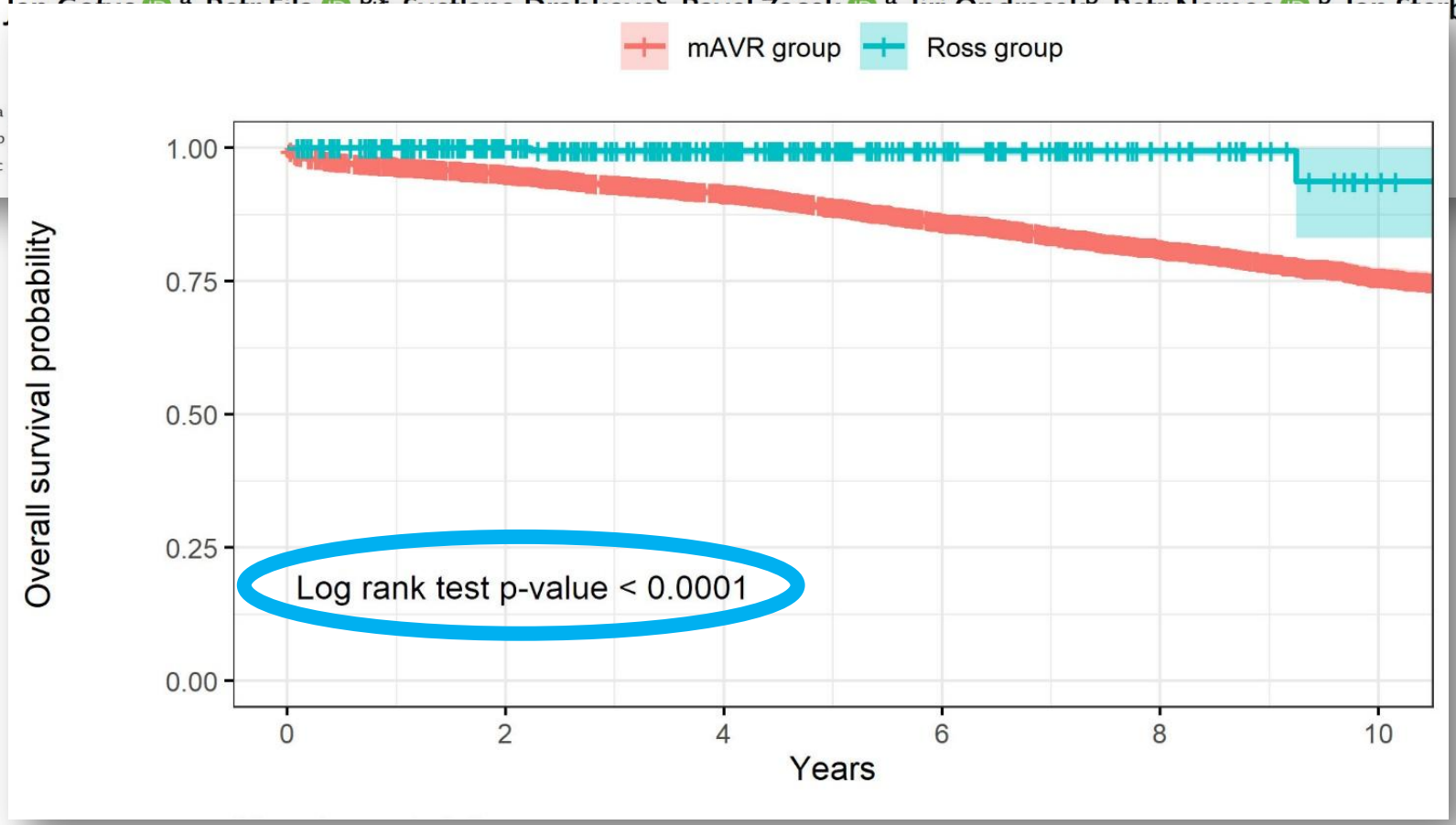
0% In-hospital mortality

European Journal of Cardio-Thoracic Surgery 00 (2022) 1–9
https://doi.org/10.1093/ejcts/ezac013

ORIGINAL ARTICLE

Cite this article as: Gofus J, Fila P, Drabkova S, Zacek P, Ondrasek J, Nemec P *et al.* Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis. Eur J Cardiothorac Surg 2022; doi:10.1093/ejcts/ezac013.

Ross procedure provides survival benefit over mechanical valve in adults: a propensity-matched nationwide analysis



European Journal of Cardio-Thoracic Surgery 2025, 67(9), ezaf295
https://doi.org/10.1093/ejcts/ezaf295

CONSENSUS STATEMENT

Cite this article as: Vojacek J, Gofus J, Andreas M, Bavaria JE, Berdajs D, Casselman FPA *et al.* EACTS Expert Consensus Statement on the Ross Procedure in Adult Patients. Eur J Cardiothorac Surg 2025; doi:10.1093/ejcts/ezaf295.

GUIDELINES AND ADULT CARDIAC SURGERY

EACTS Expert Consensus Statement on the Ross Procedure in Adult Patients

Jan Vojacek[*,1]; Jan Gofus[1]; Martin Andreas[2]; Joseph E. Bavaria[3]; Denis Berdajs[4]; Filip P. A. Casselman[5]; Ismail El-Hamamsy[6]; Tomas Holubec[7]; Laurent de Kerchove[8]; Milan Milojevic[9,10]; Leonardo Mulinari[11]; Maral Ouzonian[12]; Peter Skillington[13]; Johanna J. M. Takkenberg[14]; Peter Verbrugghe[15]; EACTS Sciventific Document Group

26 pages and 24 Expert Statements

[4]Department of Cardiac Surgery, University Hospital of Basel, Switzerland
[5]Department of Cardiac Surgery, Heart Center Azorg, Aalst, Belgium
[6]Department of Cardiovascular Surgery.Mount Sinai Hospital and Icahn School of Medicine at Mount Sinai, New York, NY, USA
[7]Department of Cardiovascular Surgery, University Heart and Vascular Centre, University Hospital Frankfurt and Goethe University Frankfurt, Frankfurt/Main, Germany
[8]Division of Cardiothoracic and Vascular Surgery, Cliniques Universitaires Saint-Luc, Pôle de Recherche Cardiovasculaire, Institut de Recherche Expérimentale et Clinique, Université Catholique de Louvain, Brussels, Belgium
[9]Department of Cardiac Surgery and Cardiovascular Research, Dedinje Cardiovascular Institute, Belgrade, Serbia
[10]Department of Cardiac Surgery, University Hospital Zurich, University of Zurich, Zurich, Switzerland
[11]Pediatric and Congenital Cardiac Surgery, Department of Surgery, Miller School of Medicine, University of Miami, Miami, FL, USA
[12]Peter Munk Cardiac Centre, University Health Network, Department of Surgery, University of Toronto, Ontario, Canada
[13]Department of Cardiothoracic Surgery, Royal Melbourne Hospital, Epworth Hospital, Melbourne, Victoria, Australia
[14]Department of Cardio-Thoracic Surgery, Erasmus University Medical Center, Rotterdam, Netherlands
[15]Department of Cardiac Surgery, UZ Leuven, Leuven, Belgium

Ross Procedure in Adults- EACTS Expert Statement

Rationale

- Restoration of long-term life expectancy to the level of age- and sex-matched general population
- Superior hemodynamic performance compared to all prosthetic aortic valve replacement options
- Improved freedom from valve-related complications

Patient selection

- Age < 60 years and life expectancy > 15 years, minimum comorbidities
- Optimal indication is aortic valve stenosis or mixed disease with non-dilated annulus
- In pure aortic regurgitation and/or annulus dilation, surgical technique must be adjusted

Surgical technique

- Tailored free standing root replacement with stabilization of aortic annulus and sinotubular junction if necessary
- Autologous inclusion technique
- Prosthetic inclusion technique

Centralization and Ross Centres of Excellence

- Strong positive volume-outcome association for the outcomes of Ross procedure at surgeon- and centre-level
- Centres of Excellence defined by case volume, mortality, clinical and echocardiographic outcomes
- Longitudinal postoperative clinical and echocardiographic follow-up