ACC Middle East Conference 2016

Valvular Heart Disease 2016: Challenges and Future Prospects

Robert O. Bonow, MD, MS

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Editor-in-Chief, JAMA Cardiology

No Relationships to Disclose

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PRACTICE GUIDELINE

2008 Focused Update Incorporated Into the ACC/AHA 2006 Guidelines for the Management of Patients With Valvular Heart Disease

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease)

Endorsed by the Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons

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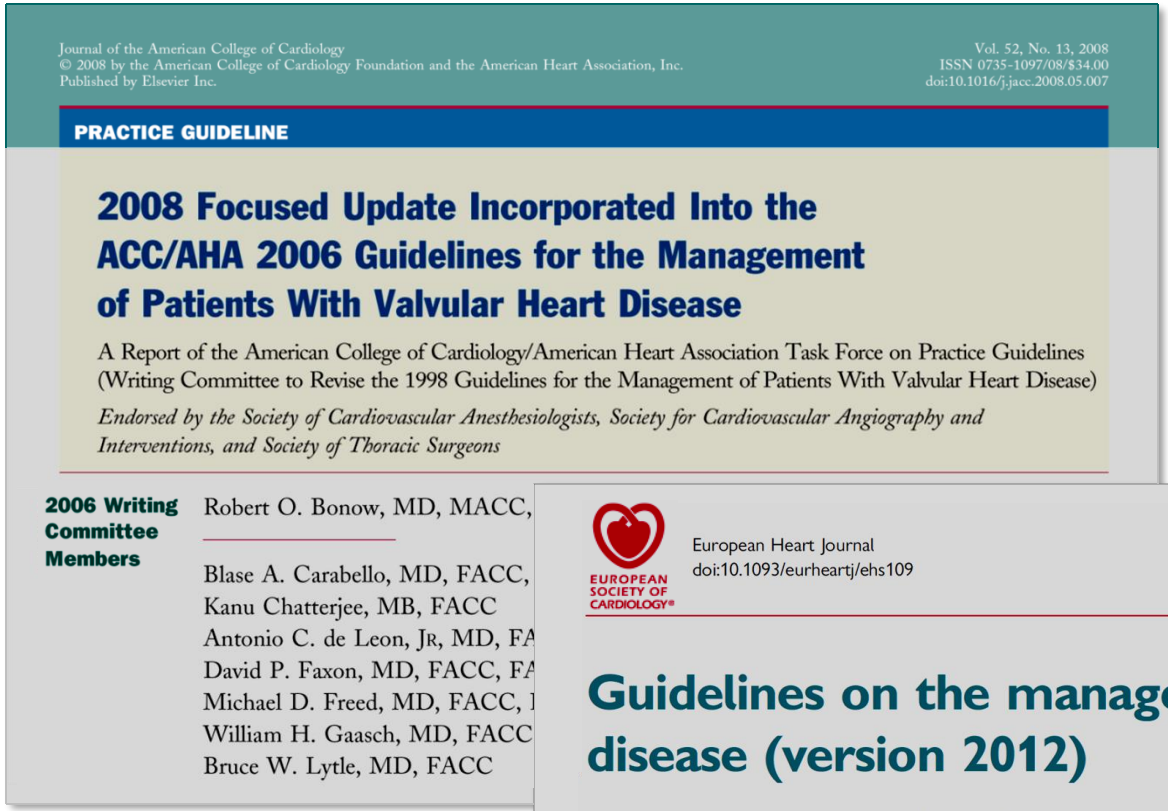

The evidence base is limited by an inadequate number of randomized clinical trials

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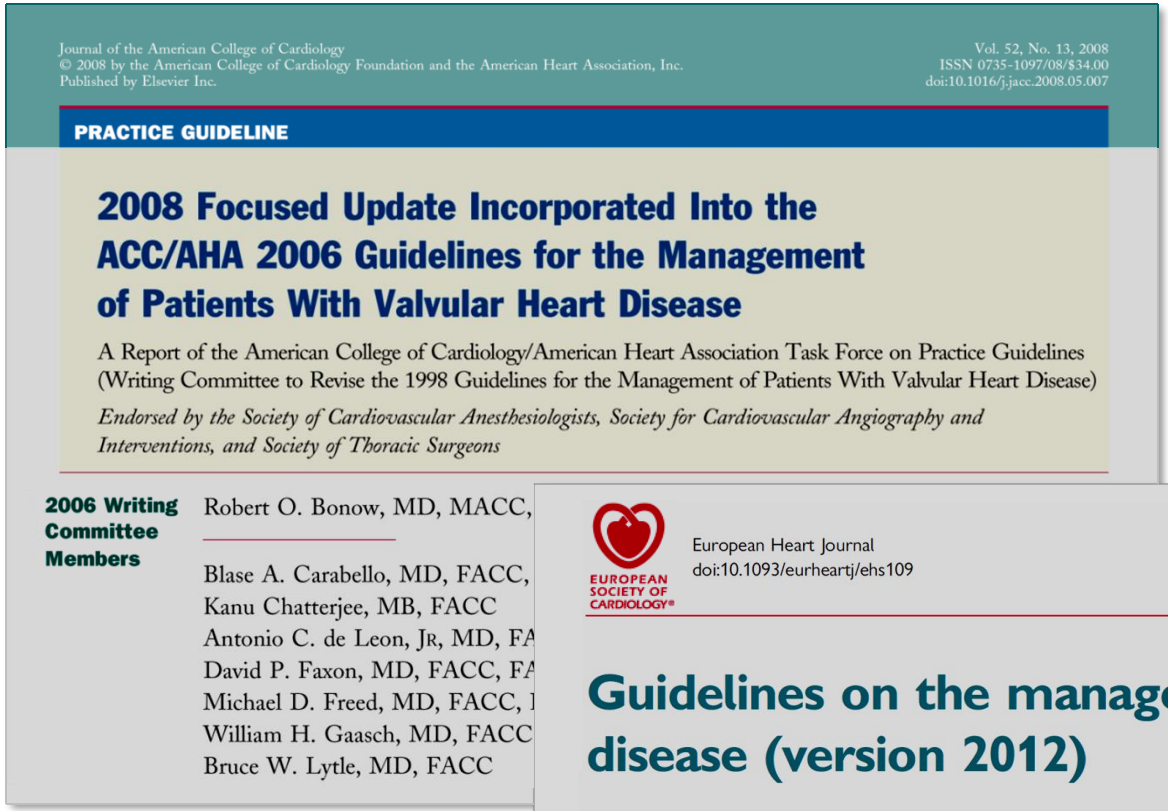
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European Heart Journal
doi:10.1093/eurheartj/ehs109

ESC/EACTS GUIDELINES

Guidelines on the management of valvular heart disease (version 2012)

Authors/Task Force Members: Alec Vahanian (Chairperson) (France)*, Ottavio Alfieri (Chairperson)* (Italy), Felicita Andreotti (Italy), Manuel J. Antunes (Portugal), Gonzalo Barón-Esquivias (Spain), Helmut Baumgartner (Germany), Michael Andrew Borger (Germany), Thierry P. Carrel (Switzerland), Michele De Bonis (Italy), Arturo Evangelista (Spain), Volkmar Falk (Switzerland), Bernard Iung (France), Patrizio Lancellotti (Belgium), Luc Pierard (Belgium), Susanna Price (UK), ny), Gerhard Schuler (Germany), Janina Stepinska en), Johanna Takkenberg (The Netherlands), tephan Windecker (Switzerland), Jose Luis Zamorano d)

Hence, virtually all of the recommendations are based on expert consensus (Level C)

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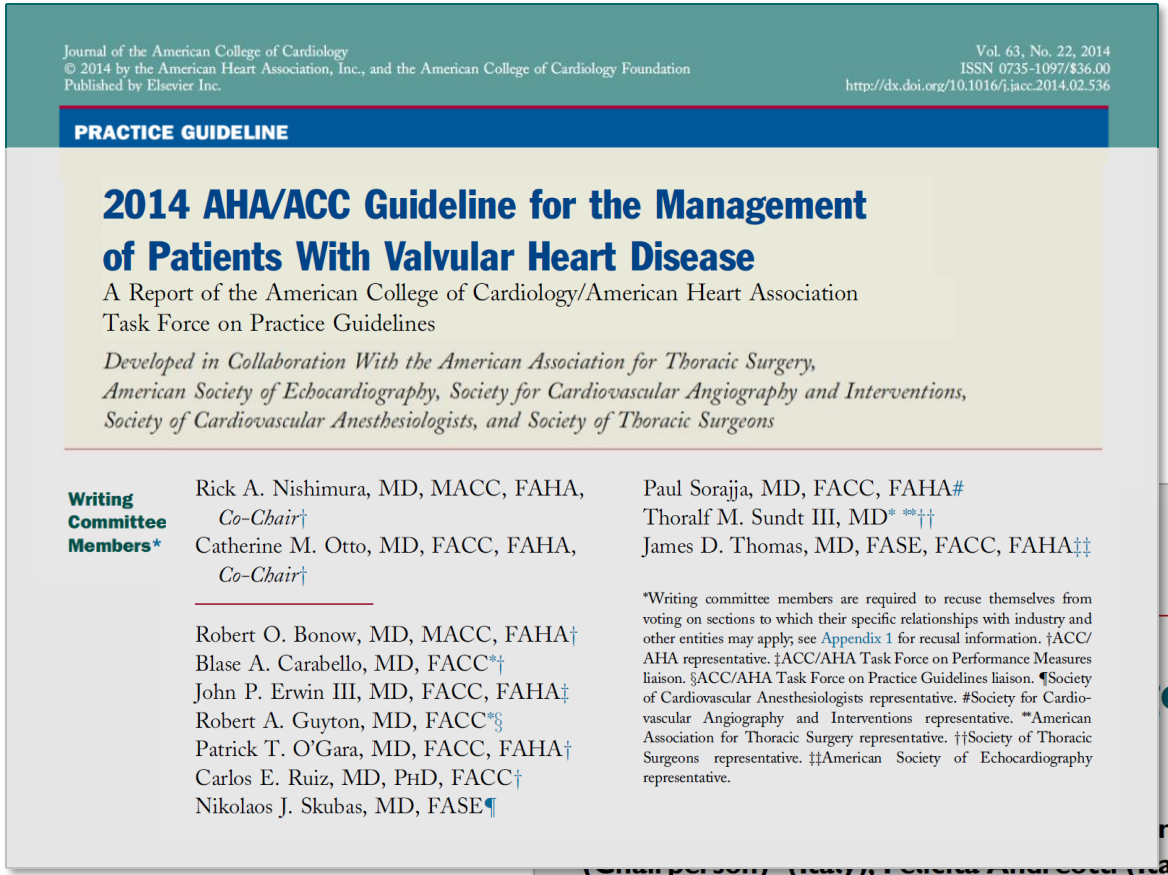

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2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the American Association for Thoracic Surgery, American Society of Echocardiography, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

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ESC/EACTS GUIDELINES

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Stages of Valvular Heart Disease

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Stage	Definition
A	Risk of valve disease → RHD, BAV, MVP, HF, CVD risk
B	Mild - moderate asymptomatic disease
C	Severe valve disease but asymptomatic C1: Normal LV function C2: Depressed LV function
D	Severe, symptomatic valve disease

Mitral regurgitation

Degenerative MR: primary valve disease

Functional MR: primary myocardial disease

Mitral regurgitation

Degenerative MR: primary valve disease

Functional MR: primary myocardial disease

Mitral regurgitation

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American Heart Association.

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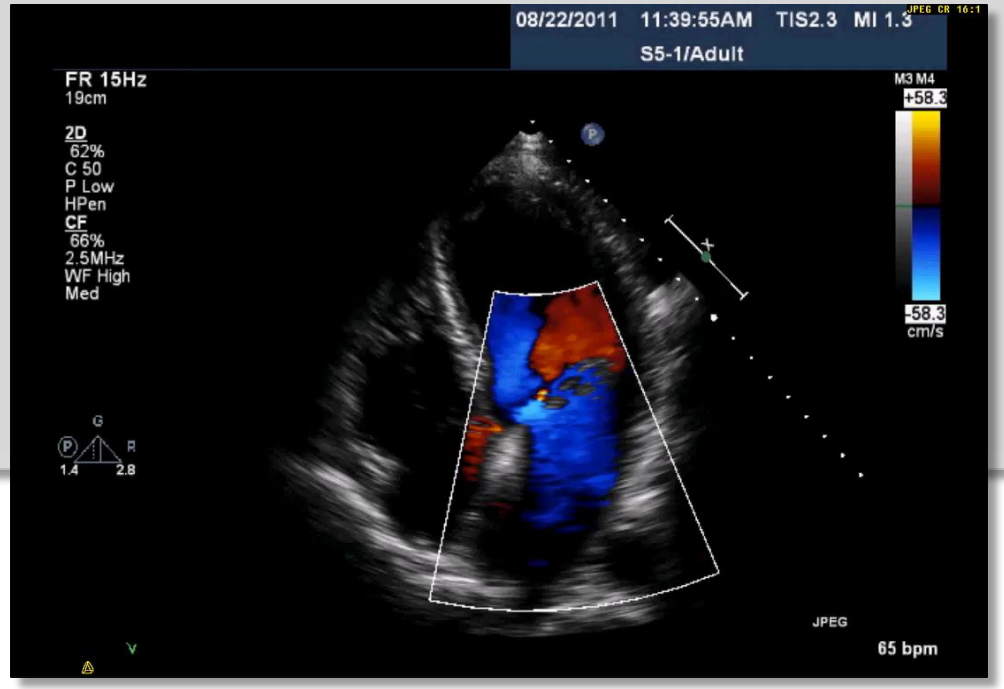
Indications for mitral valve surgery for degenerative MR?



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Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- Symptomatic patients — **class I**

Mitral regurgitation

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American Heart Association

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients** — **class I**
  - LV systolic dysfunction

Mitral regurgitation

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EACTS

Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients** — **class I**
  - LV systolic dysfunction
    - LVEF <60%

Mitral regurgitation

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EACTS

Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients** — **class I**
  - LV systolic dysfunction
    - LVEF <60%
    - LVSD >40mm

Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients** — **class I**
  - LV systolic dysfunction
  - Pulmonary hypertension — **class IIa**

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Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients**
  - LV systolic dysfunction — **class I**
  - Pulmonary hypertension — **class IIa**

PASP >50 mmHg at rest

Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients** — **class I**
  - LV systolic dysfunction — **class IIa**
  - Pulmonary hypertension — **class IIa**
  - Atrial fibrillation

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Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients**
  - LV systolic dysfunction — **class I**
  - Pulmonary hypertension — **class IIa**
  - Atrial fibrillation — **class IIa**
  - ***Normal LV function, repair feasible?*** — **?**

Mitral regurgitation

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  - Pulmonary hypertension — **class IIa**
  - Atrial fibrillation — **class IIa**
  - ***Normal LV function, repair feasible?*** — **?**

MV repair to improve survival?

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Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

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- **Asymptomatic patients**
  - LV systolic dysfunction — **class I**
  - Pulmonary hypertension — **class IIa**
  - Atrial fibrillation — **class IIa**
  - ***Normal LV function, repair feasible?*** — **?**

MV repair to improve survival?
What is the natural history?

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Mitral regurgitation

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Indications for mitral valve surgery for degenerative MR?

- **Symptomatic patients** — **class I**
- **Asymptomatic patients**
  - LV systolic dysfunction — **class I**
  - Pulmonary hypertension — **class IIa**
  - Atrial fibrillation — **class IIa**
  - ***Normal LV function, repair***

Asymptomatic severe degenerative MR:

- **66% come to surgery in 5 years because of symptoms, LV dysfunction, pulmonary hypertension or AF**
- **Long-term postoperative survival is worse if surgery is performed after patients become symptomatic**

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Medicin

Surgery for Acquired Cardiovascular Disease

Late outcomes of mitral valve repair for floppy valves: Implications for asymptomatic patients

Tirone E. David, MD
Joan Ivanov, PhD
Susan Armstrong, MSc
Harry Rakowski, MD

J Thorac Cardiovasc Surg 2003;125:1143-1152

Surgery for Acquired Cardiovascular Disease

Late outcome
Implications f

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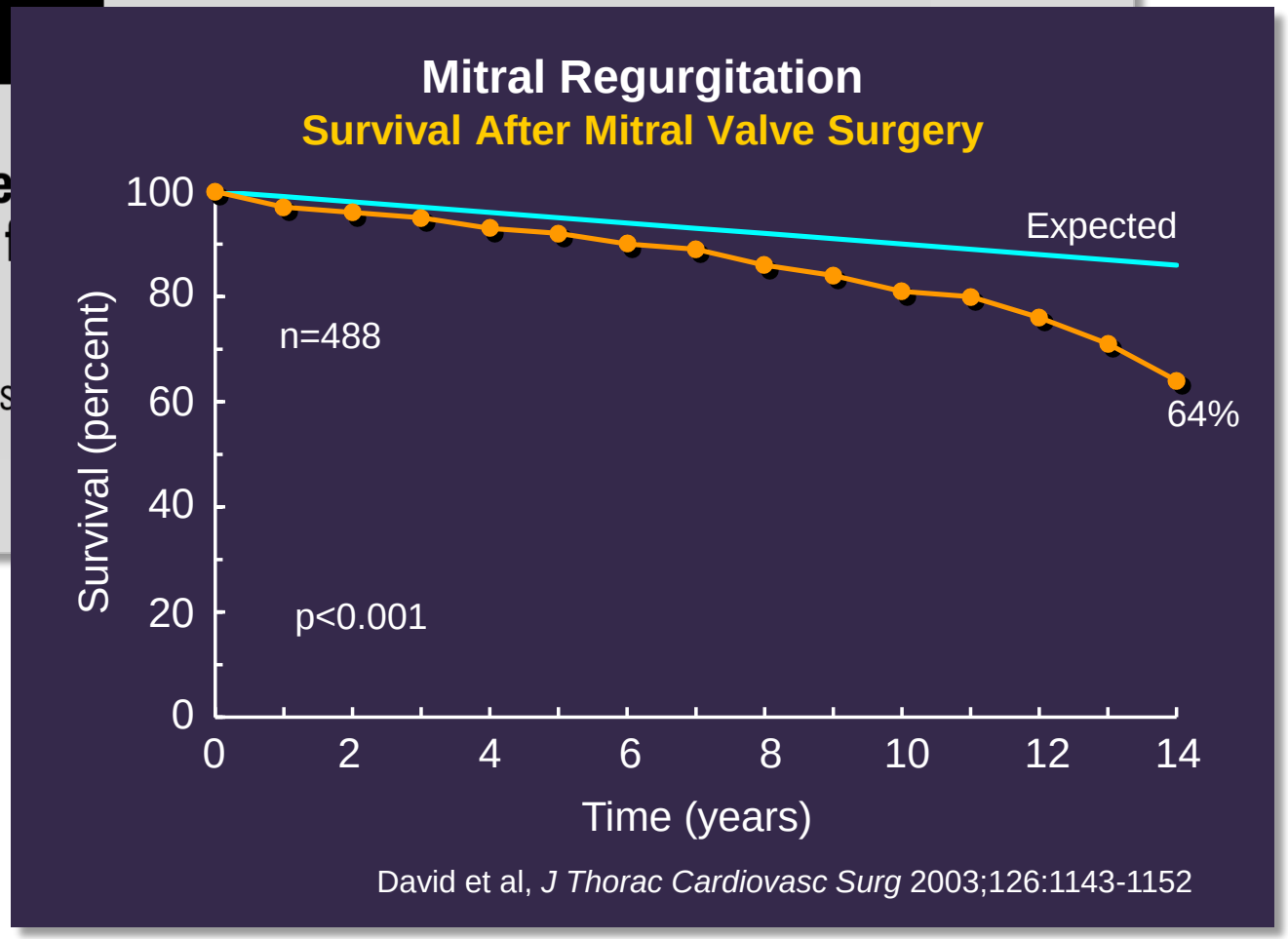

David et al, *J Thorac Cardiovasc Surg* 2003;126:1143-1152

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Implications f

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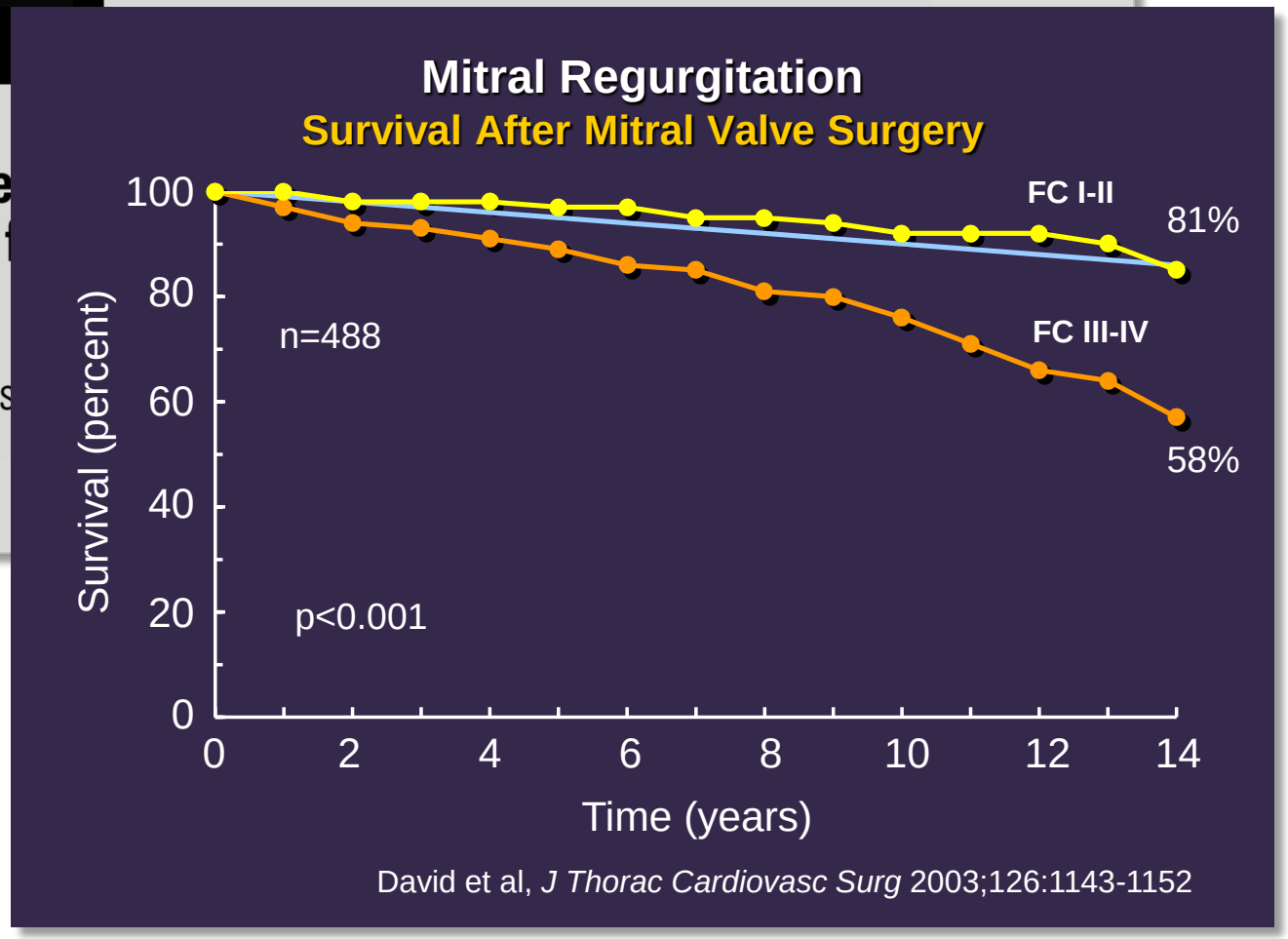

David et al, *J Thorac Cardiovasc Surg* 2003;126:1143-1152

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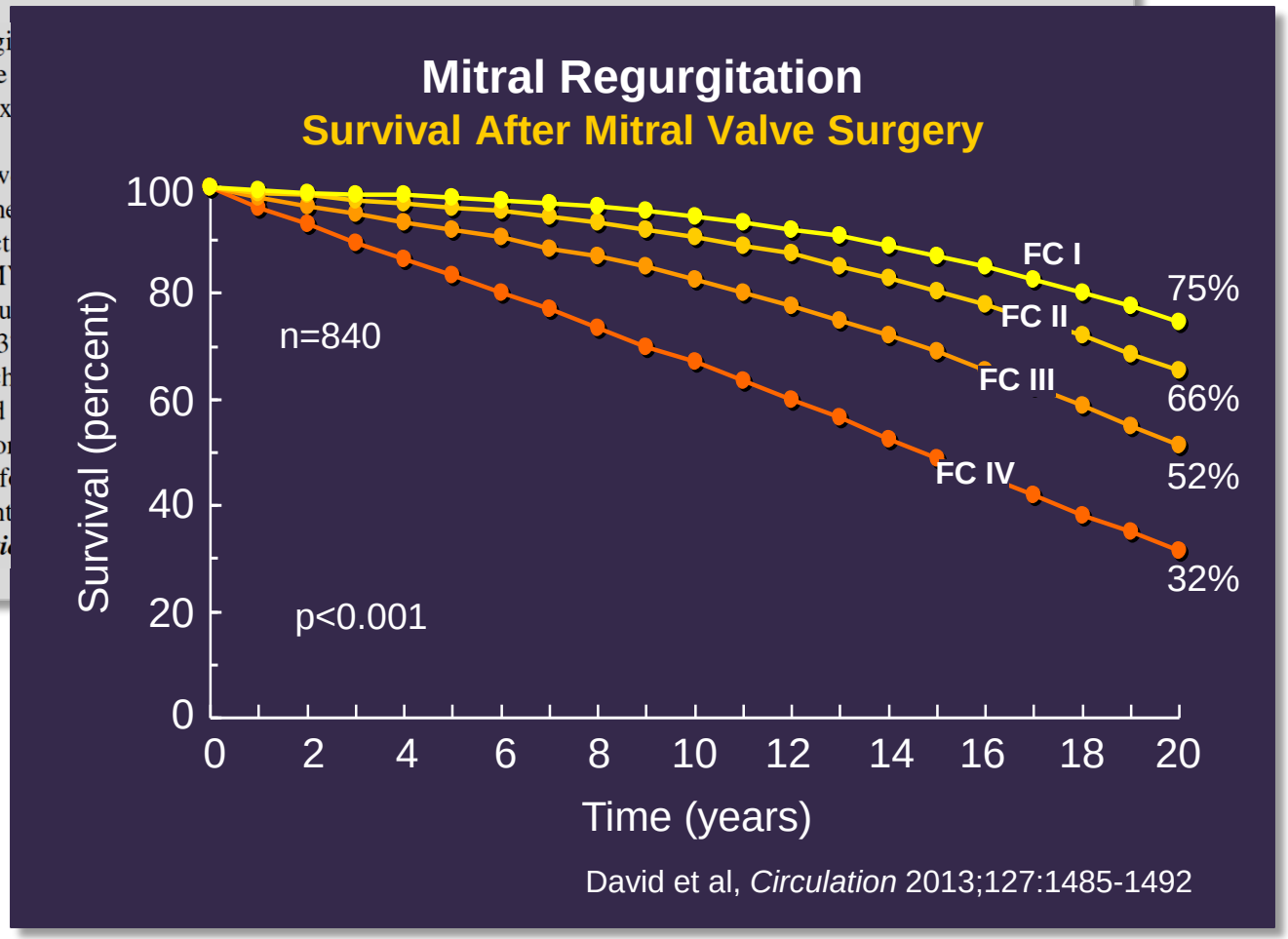
Late Outcomes of Mitral Valve Repair for Mitral Regurgitation Due to Degenerative Disease

Tirone E. David, MD; Susan Armstrong, MSc; Brian W. McCrindle MD; Cedric Manlhiot, BSc

Background—The pathologi
(MR) is broad, and there
pathologies. This study ex
Methods and Results—All
were prospectively follow
of 10.4 years. Clinical, he
Age, left ventricular eject
multivariable analysis. M
patients had repeat MV su
severe MR developed in 3
degree of myxomatous ch
associated with increased
freedom from moderate o
Conclusions—MV repair f
rest and impaired left vent
recurrent MR. (*Circulati*



David et al, *Circulation* 2013;127:1485-1492

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Mitral regurgitation

Indications for MV repair for asymptomatic primary MR:

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American Heart Association.

- Chronic severe MR
- Preserved LV function
- Experienced surgical center
- Likelihood of durable repair without residual MR > 95%

class IIa

Mitral regurgitation

Indications for MV repair for asymptomatic primary MR:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Chronic severe MR
- Preserved LV function
- Experienced surgical center
- Likelihood of durable repair without residual MR > 95%

class IIa

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- Preserved LV function
- Likelihood of durable repair and low risk for surgery, ***and***
- LA dilatation >60 ml/m2

-- *or* --

Exercise PAP >60 mmHg

class IIb

Mitral regurgitation

Indications for MV repair for asymptomatic primary MR:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Chronic severe MR
- Preserved LV function
- Experienced surgical center
- Likelihood of durable repair without residual MR > 95%.

class IIa

!

- Repair better than mitral valve replacement
- Patients should be referred to centers experienced in repair

class I

EDITORIAL COMMENT

The Time Has Come to Define Centers of Excellence in Mitral Valve Repair

Robert O. Bonow, MD, MS, David H. Adams, MD

J Am Coll Cardiol 2016;67:499-501

Centers of Excellence in Mitral Valve Repair

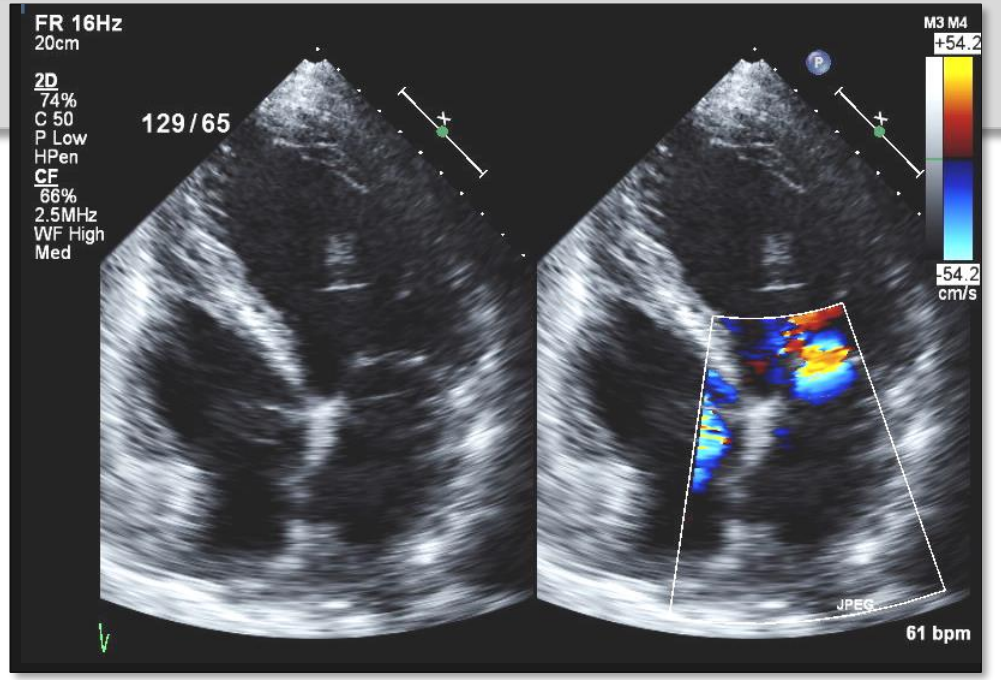
Criteria:

- **MV surgery volume requirement (center and surgeon)**
- **Expert periprocedural imaging capabilities**
- **Access to transcatheter technology**
- **Transparency regarding outcomes including: repair rates, mortality rates, stroke rates, repair durability**

Mitral regurgitation

Primary MR: primary valve disease

Secondary MR: primary myocardial disease



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Mitral regurgitation

Primary MR: primary valve disease

Secondary MR: primary myocardial disease

- Diagnostic dilemmas
- Therapeutic dilemmas

Imprecision in grading severity of secondary MR

ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2014.10.016

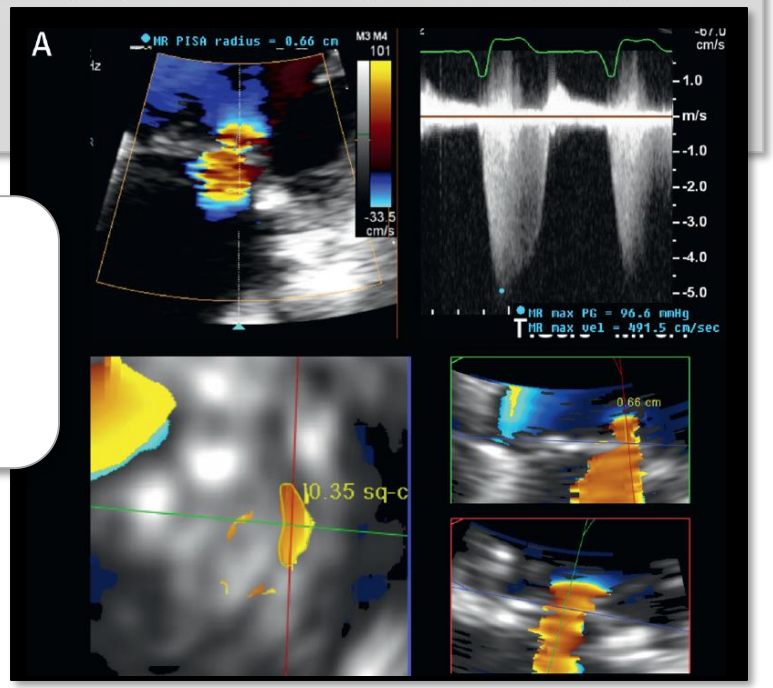
REVIEW TOPIC OF THE WEEK

Defining "Severe" Secondary Mitral Regurgitation

Emphasizing an Integrated Approach

Paul A. Grayburn, MD,*† Blasé Carabello, MD,‡ Judy Hung, MD,§ Linda D. Gillam, MD,‖ David Liang, MD,¶
Michael J. Mack, MD,# Patrick M. McCarthy, MD,** D. Craig Miller, MD,†† Alfredo Trento, MD,‡‡ Robert J. Siegel, MD‡‡

J Am Coll Cardiol 2014;54:2792-2801



What is "severe" secondary MR?

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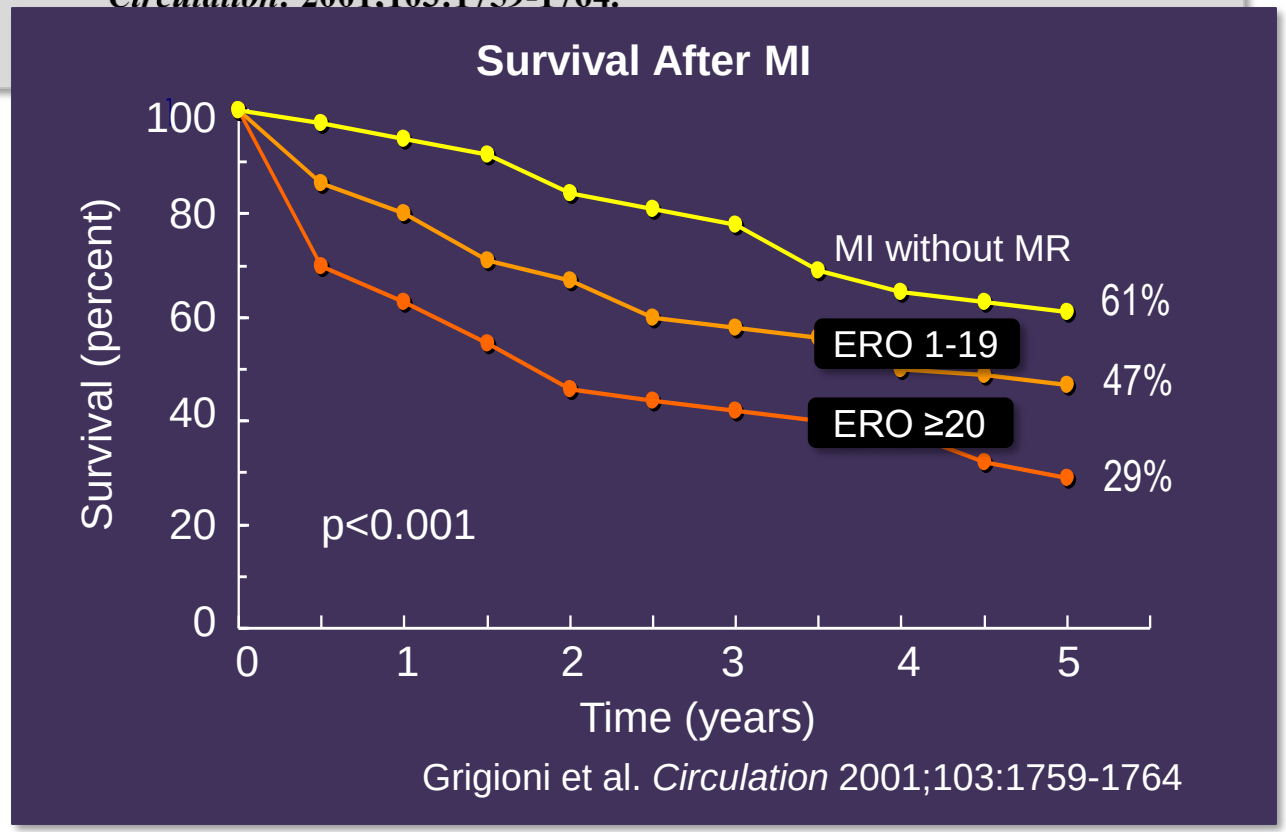
Ischemic Mitral Regurgitation

Long-Term Outcome and Prognostic Implications With Quantitative Doppler Assessment

Francesco Grigioni, MD; Maurice Enriquez-Sarano, MD; Kenton J. Zehr, MD;
Kent R. Bailey, PhD; A. Jamil Tajik, MD

Circulation. 2001;103:1759-1764.



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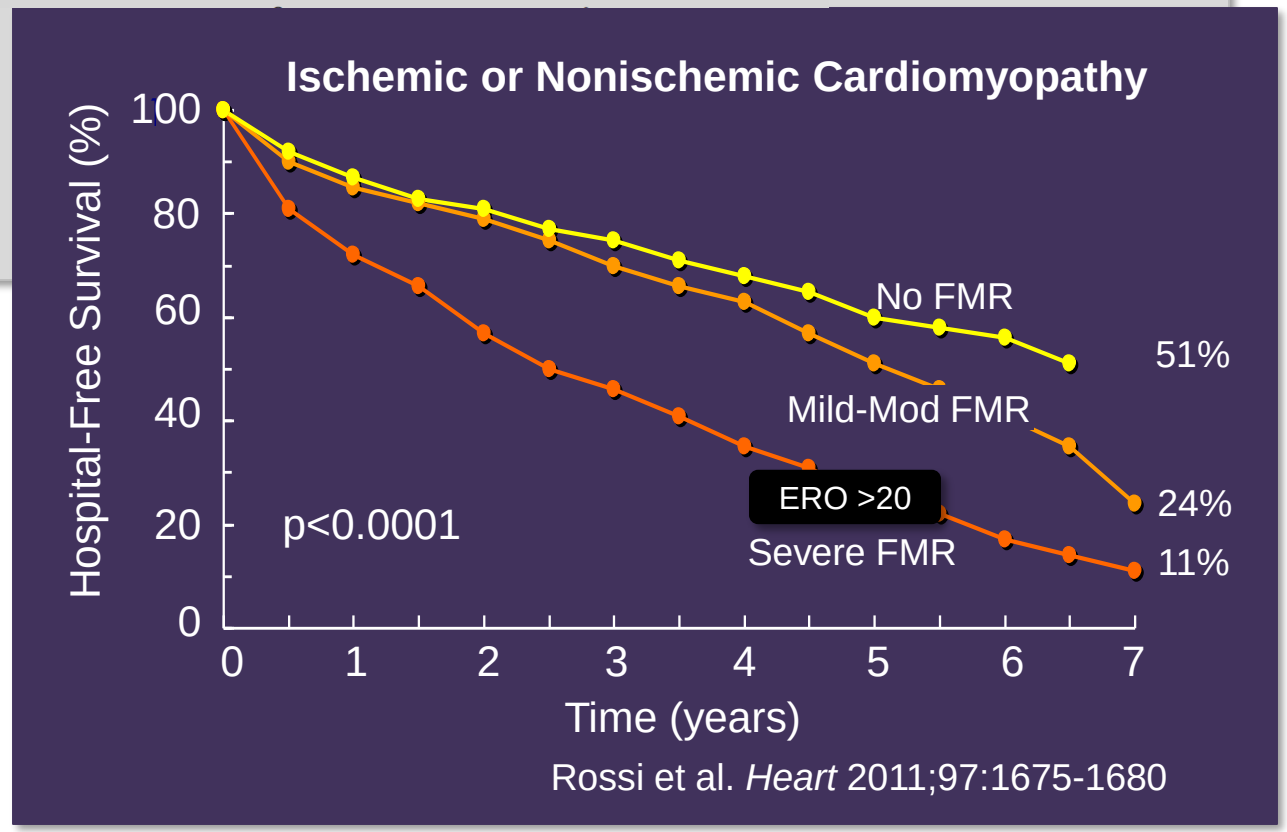
ORIGINAL ARTICLE

Independent prognostic value of functional mitral regurgitation in patients with heart failure. A quantitative analysis of 1256 patients with ischaemic and non-ischaemic dilated cardiomyopathy

Andrea Rossi,[1] Frank L Dini,[2]
Mariantonietta Cicoira,[1] Silvia
Stefano Ghio,[5] Maurice Enriqu

Heart 2011;**97**:1675–1680



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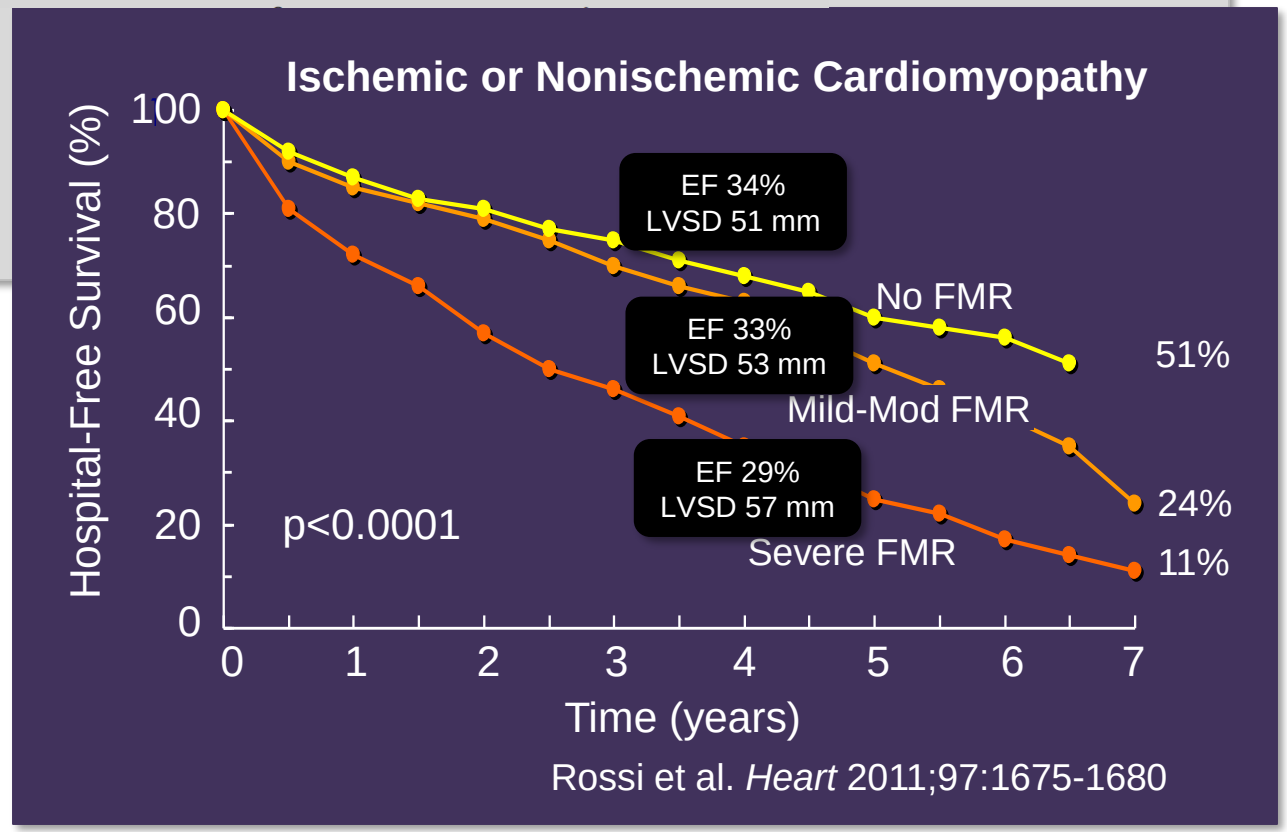

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Valvular Heart Disease

Influence of Mitral Regurgitation Repair on Survival in the Surgical Treatment for Ischemic Heart Failure Trial

Marek A. Deja, Paul A. Grayburn, Benjamin Sun, Vivek Rao, Lilin She, Michal Krejca, Anil R. Jain, Yeow Leng Chua, Richard Daly, Michele Senni, Krzysztof Mokrzycki, Lorenzo Menicanti, Jae K. Oh, Robert Michler, Krzysztof Wróbel, Andre Lamy, Eric J. Velazquez, Kerry L. Lee and Robert H. Jones

Circulation. 2012;125:2639-2648

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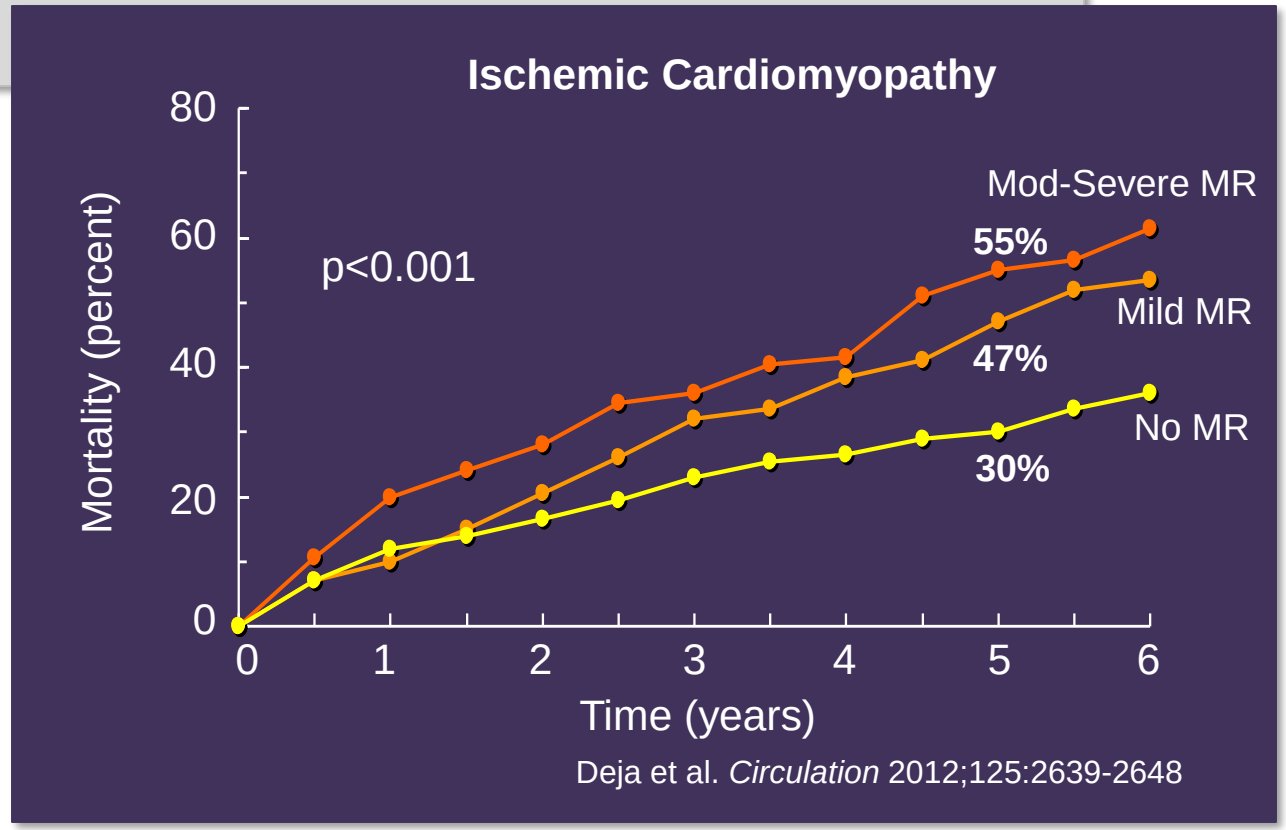

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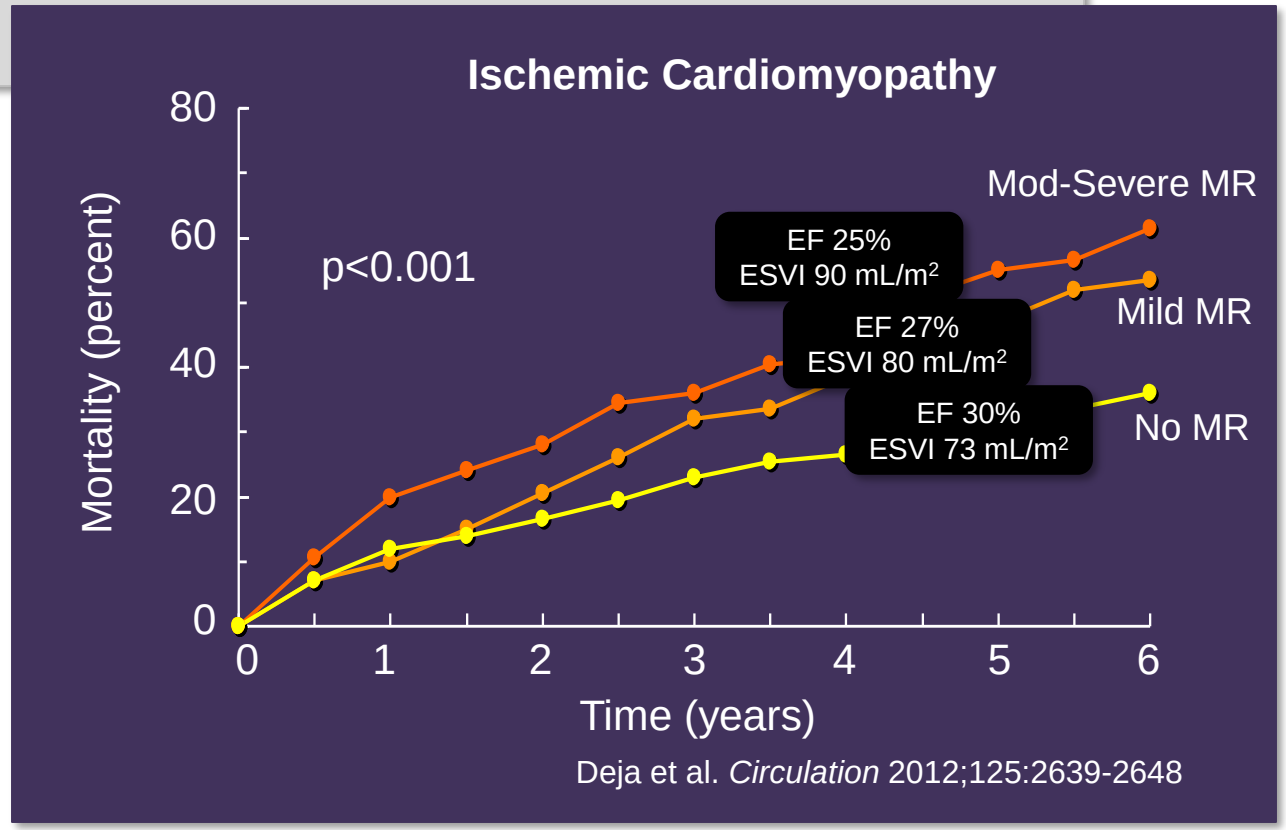

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Prevalence of MR in Patients with LV Dysfunction

		N	Prevalence MR
Yiu et al	*Circulation* 2000	128	63%
Grigioni et al	*Circulation* 2001	303	64%
Koelling et al	*Am Heart J* 2002	1436	49% *
Trichon et al	*Am J Cardiol* 2003	2057	56%
Robbins et al	*Am J Cardiol* 2003	221	59%
Cleland et al	*N Engl J Med* 2004	605	50% *
Grayburn et al	*J Am Coll Cardiol* 2005	336	77%
Bursi et al	*Circulation* 2005	303	50%
Acker et al	*J Thorac CV Surg* 2006	300	66%
Di Mauro et al	*Ann Thorac Surg* 2006	239	75%
Rossi et al	*Heart* 2011	1300	74%
Deja et al	*Circulation* 2012	599	63%
Onishi et al	*Circ Heart Fail* 2013	277	48% *

*Patients with moderate to severe MR

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Secondary mitral regurgitation:

…a marker of a sicker LV

- or -

…a contributor to a sicker LV?

Secondary mitral regurgitation:

…a marker of a sicker LV

- or -

…a therapeutic target?

Therapies that produce beneficial reverse remodeling also reduce severity of functional MR

Secondary mitral regurgitation

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Guideline-directed medical therapy for heart failure, including CRT

class I

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Secondary mitral regurgitation

Guideline-directed medical therapy for heart failure, including CRT — **class I**

Indications for mitral valve surgery:

- **Patients with severe MR undergoing CABG or AVR** — **class IIa**

Secondary mitral regurgitation

Guideline-directed medical therapy for heart failure, including CRT — **class I**

Indications for mitral valve surgery:

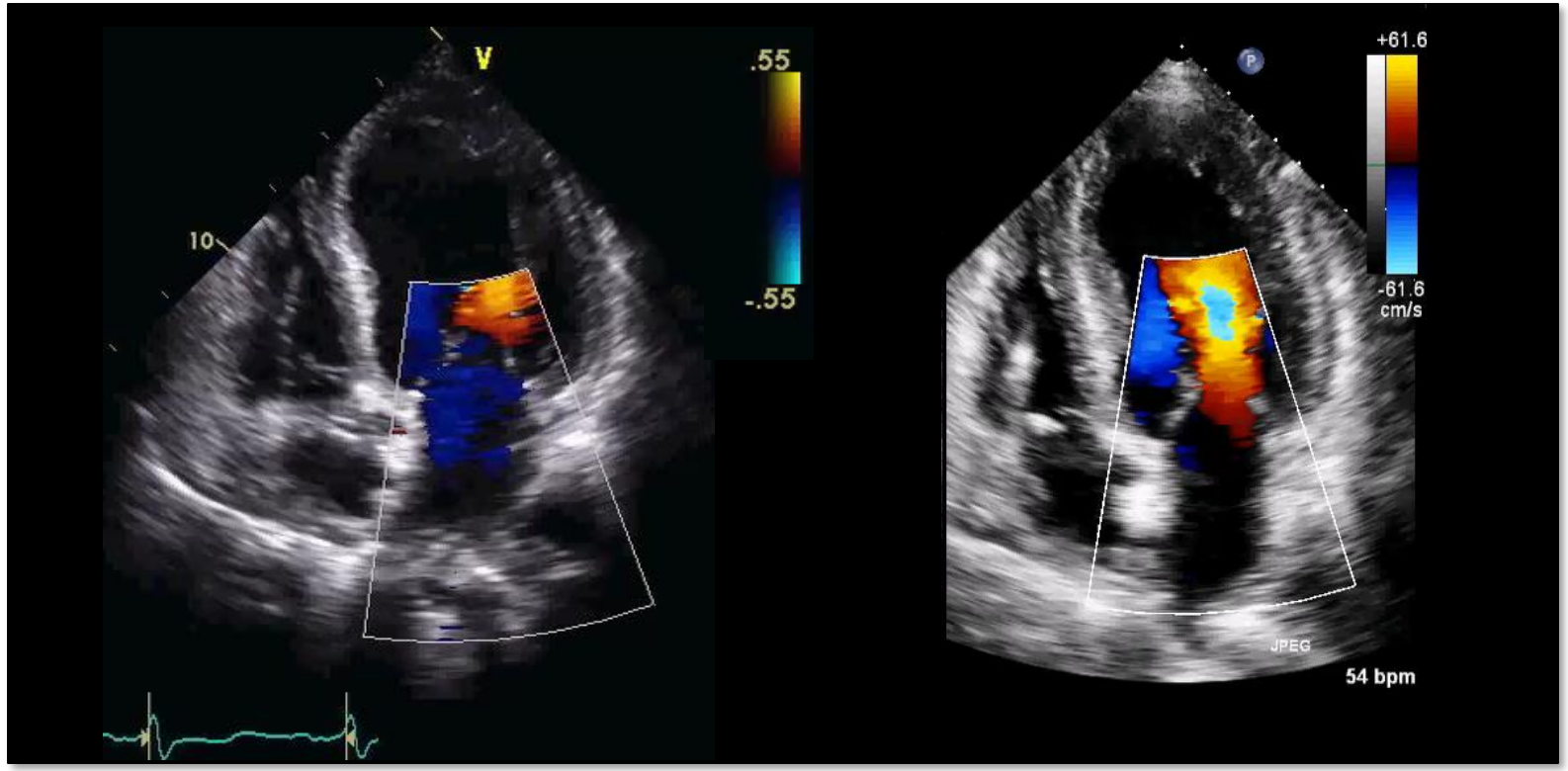
- **Patients with severe MR undergoing CABG or AVR** — **class IIa**
- **Severe MR, persistent symptoms despite optimal medical therapy, including CRT** — **class IIb**

Secondary mitral regurgitation

Guideline-directed medical therapy for heart failure, including CRT — **class I**

Indications for mitral valve surgery:

- **Patients with severe MR undergoing CABG or AVR** — **class IIa**
- **Severe MR, persistent symptoms despite optimal medical therapy, including CRT** — **class IIb**
- **Patients with moderate MR undergoing CABG or AVR** — **class IIb**



Baseline

Optimized Medical Therapy and Biventricular Pacing

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doi:10.1016/j.jacc.2011.06.061

FOCUS ISSUE: STRUCTURAL HEART DISEASE

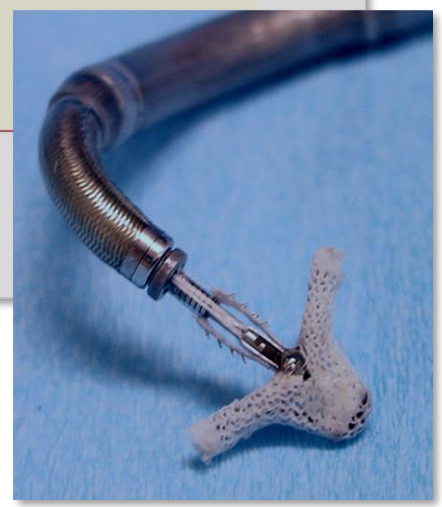
Clinical Research

Correction of Mitral Regurgitation in Nonresponders to Cardiac Resynchronization Therapy by MitraClip Improves Symptoms and Promotes Reverse Remodeling

Angelo Auricchio, MD, PHD,* Wolfgang Schillinger, MD,† Sven Meyer, MD,‡
Francesco Maisano, MD,§ Rainer Hoffmann, MD,‖ Gian Paolo Ussia, MD,¶
Giovanni B. Pedrazzini, MD,* Jan van der Heyden, MD,# Simona Fratini, MD, PHD,**
Catherine Klersy, MD, MSC,†† Jan Komtebedde, DVM,* Olaf Franzen, MD,‡
on behalf of the PERMIT-CARE Investigators

Lugano, Switzerland; Göttingen, Hamburg, and Aachen, Germany;
Milan, Catania, L'Aquila, and Pavia, Italy; and Nieuwegein, the Netherlands

J Am Coll Cardiol 2011;58:2183–9

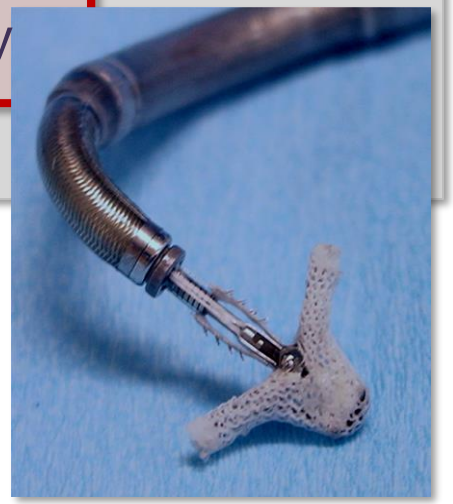


Secondary mitral regurgitation

Indications for transcatheter MV repair for severe secondary MR:

- Severe secondary MR
- Severely symptomatic
- Prohibited or high surgical risk
- Reasonable life expectancy

class IIb



Prevalence of MR in Patients with LV Dysfunction

		N	Prevalence MR
Yiu et al	*Circulation* 2000	128	63%
Grigioni et al	*Circulation* 2001	303	64%
Koelling et al	*Am Heart J* 2002	1436	49% *
Trichon et al	*Am J Cardiol* 2003	2057	56%
Robbins et al	*Am J Cardiol* 2003	221	59%
Cleland et al	*N Engl J Med* 2004	605	50% *
Grayburn et al	*J Am Coll Cardiol* 2005	336	77%
Bursi et al	*Circulation* 2005	303	50%
Acker et al	*J Thorac CV Surg* 2006	300	66%
Di Mauro et al	*Ann Thorac Surg* 2006	239	75%
Rossi et al	*Heart* 2011	1300	74%
Deja et al	*Circulation* 2012	599	63%
Onishi et al	*Circ Heart Fail* 2013	277	48% *

*Patients with moderate to severe MR

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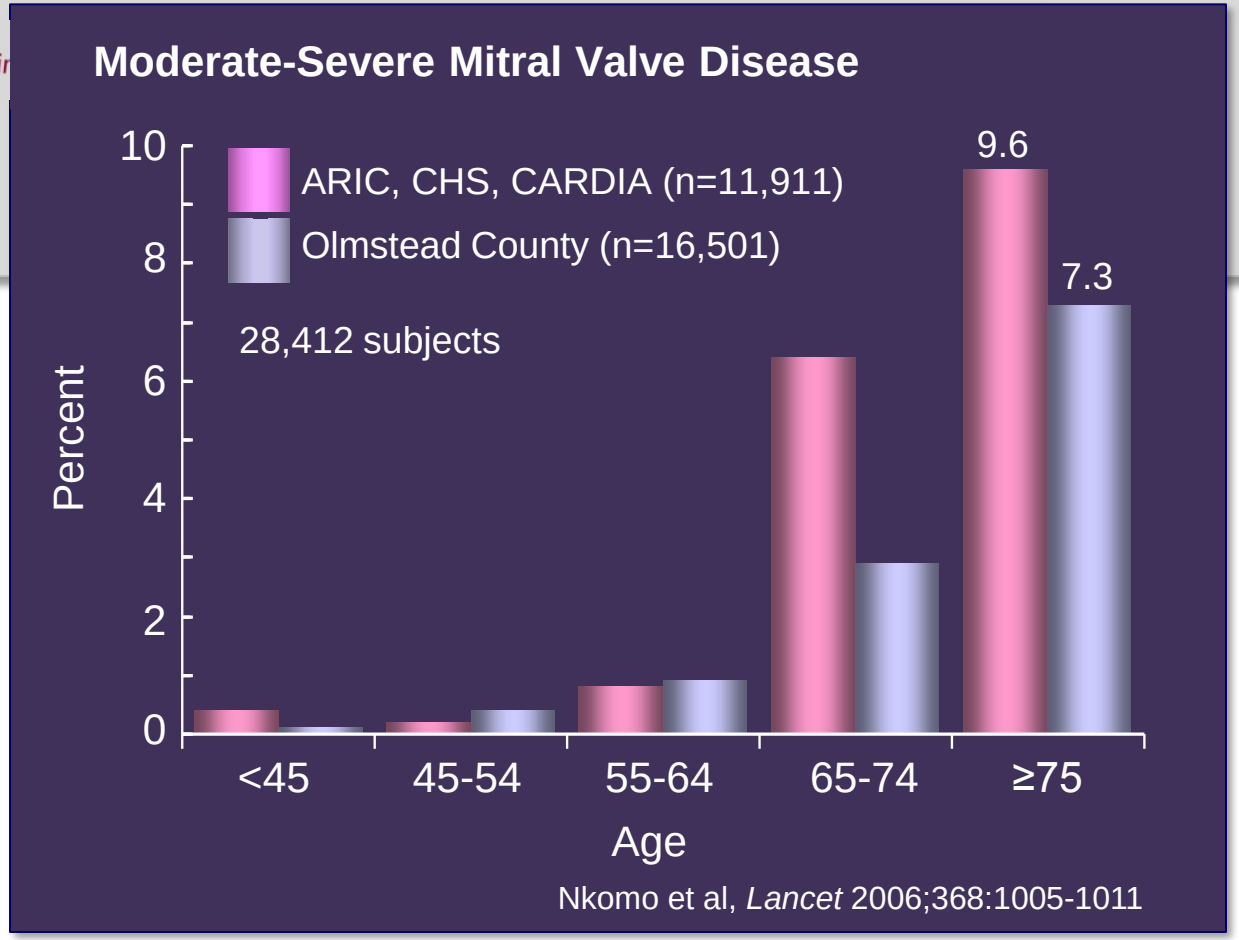
Burden of valvular heart diseases: a population-based study

Vuyisile T Nkomo, Julius M Gardin



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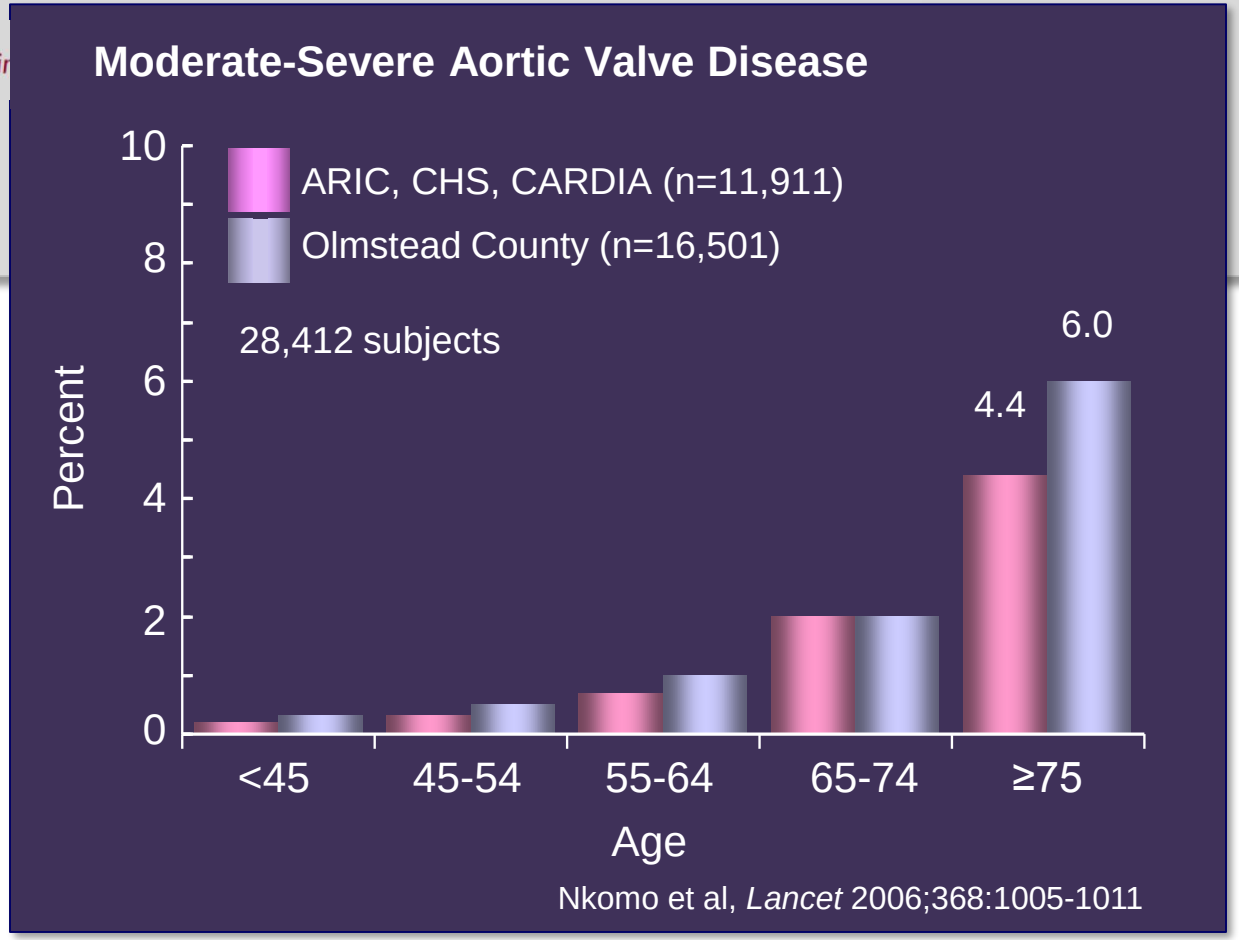
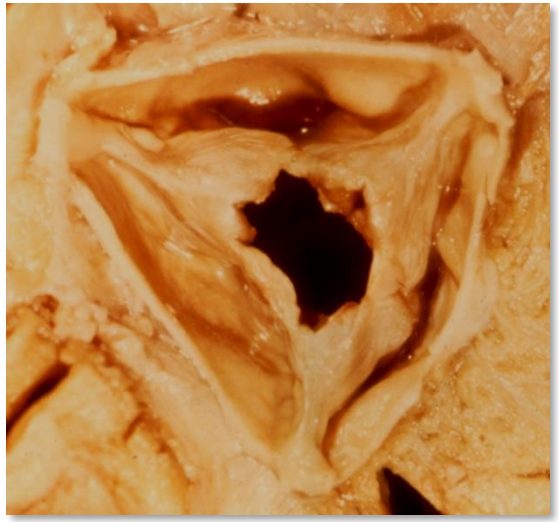


Aortic Stenosis



Rheumatic AS

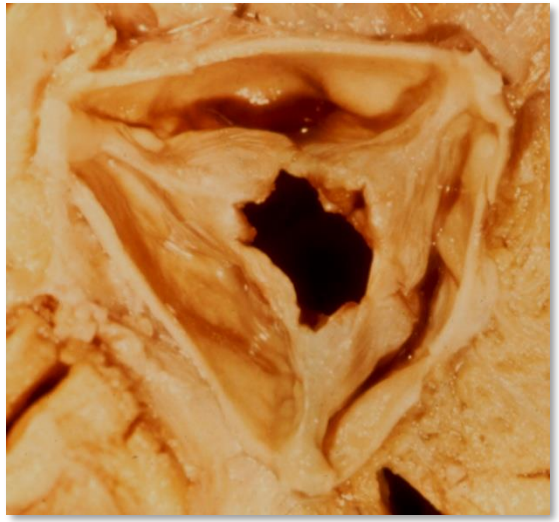
Congenital AS

Calcific AS

Northwestern Medicine

from Bonow and Braunwald, Valvular Heart Disease
Braunwald's Heart Disease, 7th ed, 2004

Aortic Stenosis



Rheumatic AS

Congenital AS

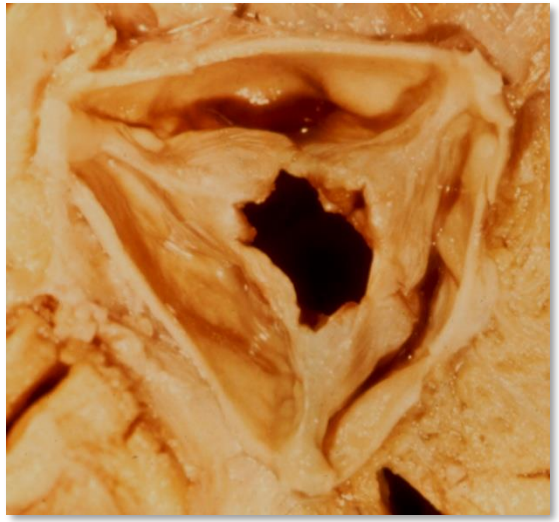
Calcific AS

Age >60	
All patients	47%
Men	51%

Roberts and Ko, *Circulation* 2005;111:920-925

from Bonow and Braunwald, Valvular Heart Disease
Braunwald's Heart Disease, 7th ed, 2004

Aortic Stenosis



Rheumatic AS

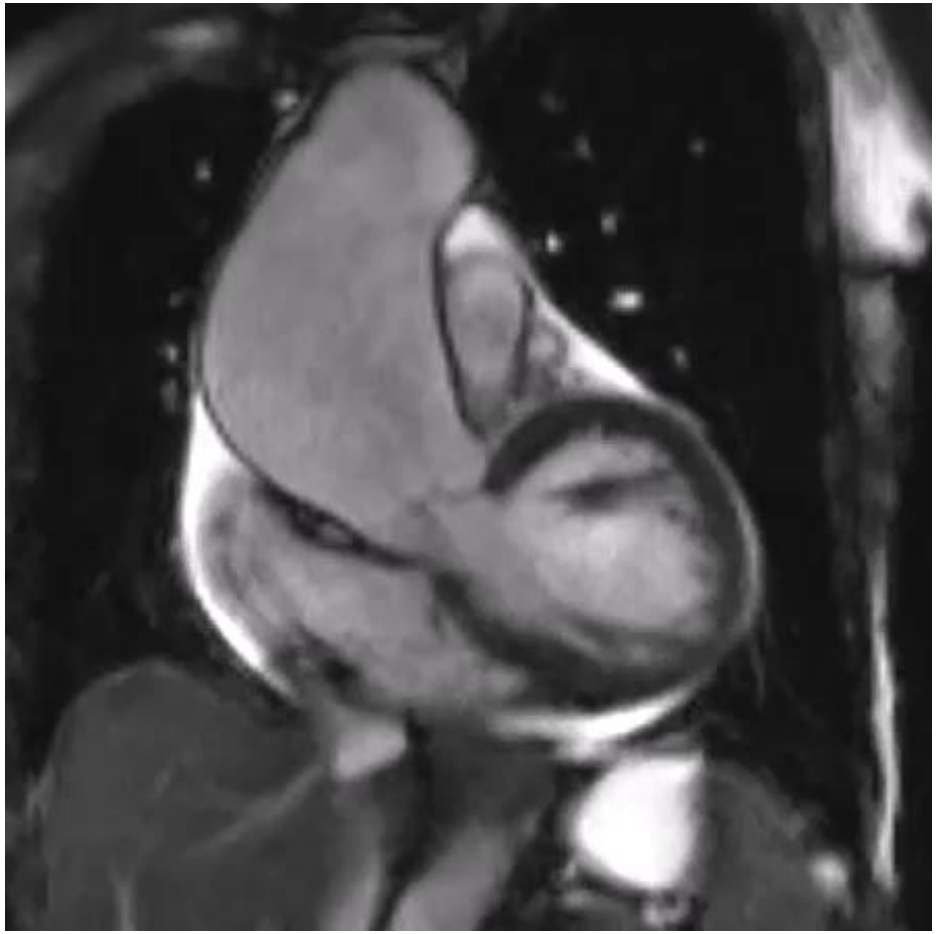
Congenital AS

Calcific AS

Age >80	
All patients	28%
Men	32%

Roberts and Ko, *Circulation* 2005;111:920-925

from Bonow and Braunwald, Valvular Heart Disease
Braunwald's Heart Disease, 7th ed, 2004



The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

John A. Jarcho, M.D., *Editor*

Aortic-Valve Stenosis — From Patients at Risk to Severe Valve Obstruction

Catherine M. Otto, M.D., and Bernard Prendergast, D.M.

N Engl J Med 2014;371:744-56.

Aortic Stenosis

By JOHN ROSS, JR., M.D. AND EUGENE BRAUNWALD, M.D.

THE ADVENT of corrective operations for various forms of heart disease has placed increasing emphasis upon the need for accurate information concerning the natural history of patients with potentially correctible lesions. An understanding of the natural course assumes particular importance in the case of aortic stenosis because of the significant incidence of sudden death associated with this disease and the grave prognosis that appears to accompany the onset of certain symptoms, patients with isolated valvular aortic stenosis of rheumatic etiology and patients without a history of rheumatic fever who have isolated calcific aortic stenosis; many of the latter patients are now considered to have developed calcification and stenosis of a congenitally bicuspid valve.[1] The review will focus primarily on the prognostic significance of three major symptoms—angina pectoris, syncope, and symptoms related to left ventricular failure

From the Cardiology Branch, National Heart Institute, Bethesda, Maryland.

Supplement V to Circulation, Vols. XXXVII and XXXVIII, July 1968

Ross and Braunwald, *Am J Circulation* 1968;38:V-61

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… the grave prognosis that appears to accompany the onset of certain symptoms

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From the Cardiology Branch, National He stitute, Bethesda, Maryland.

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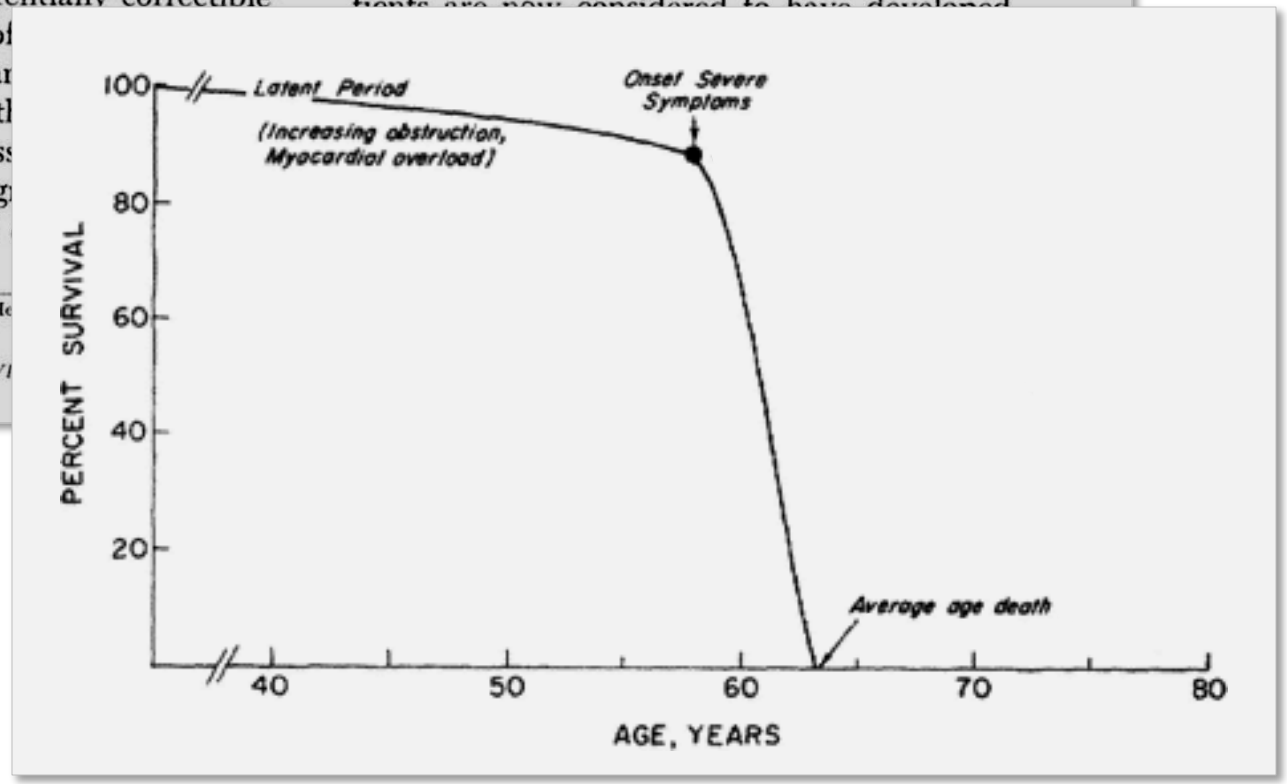

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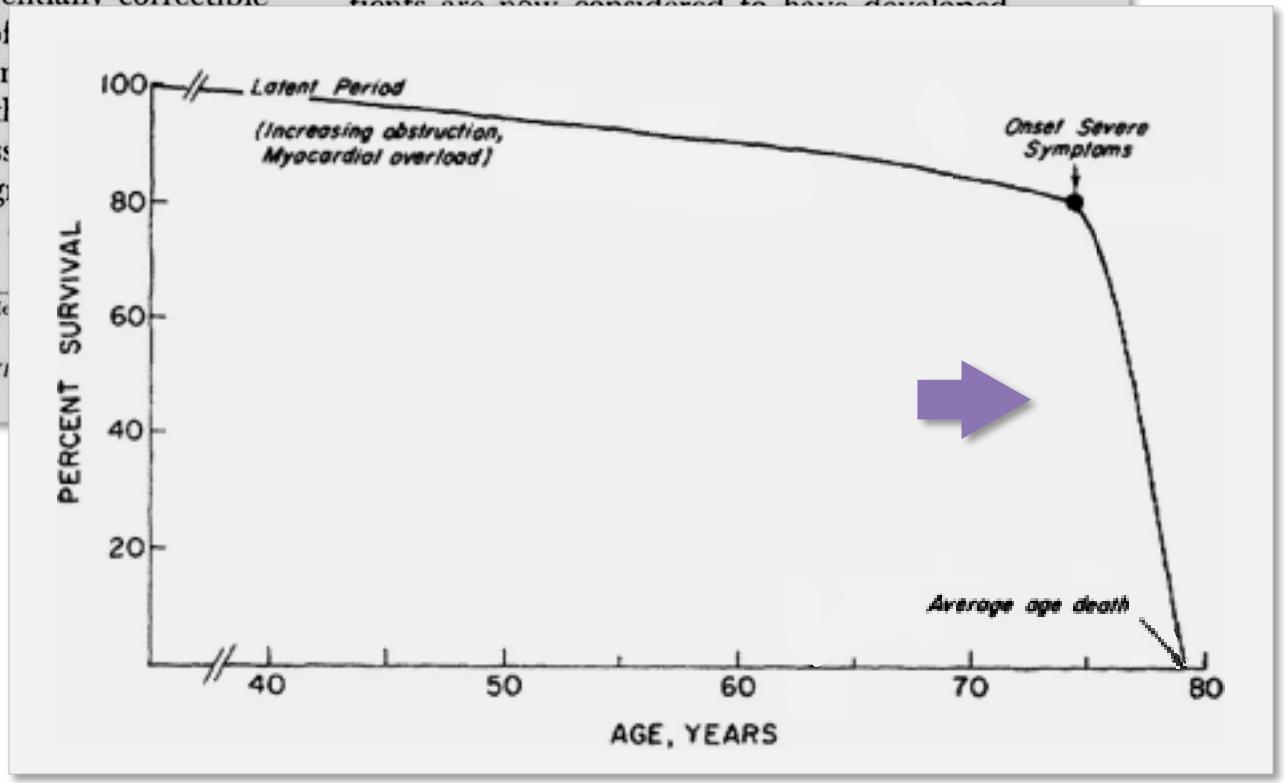
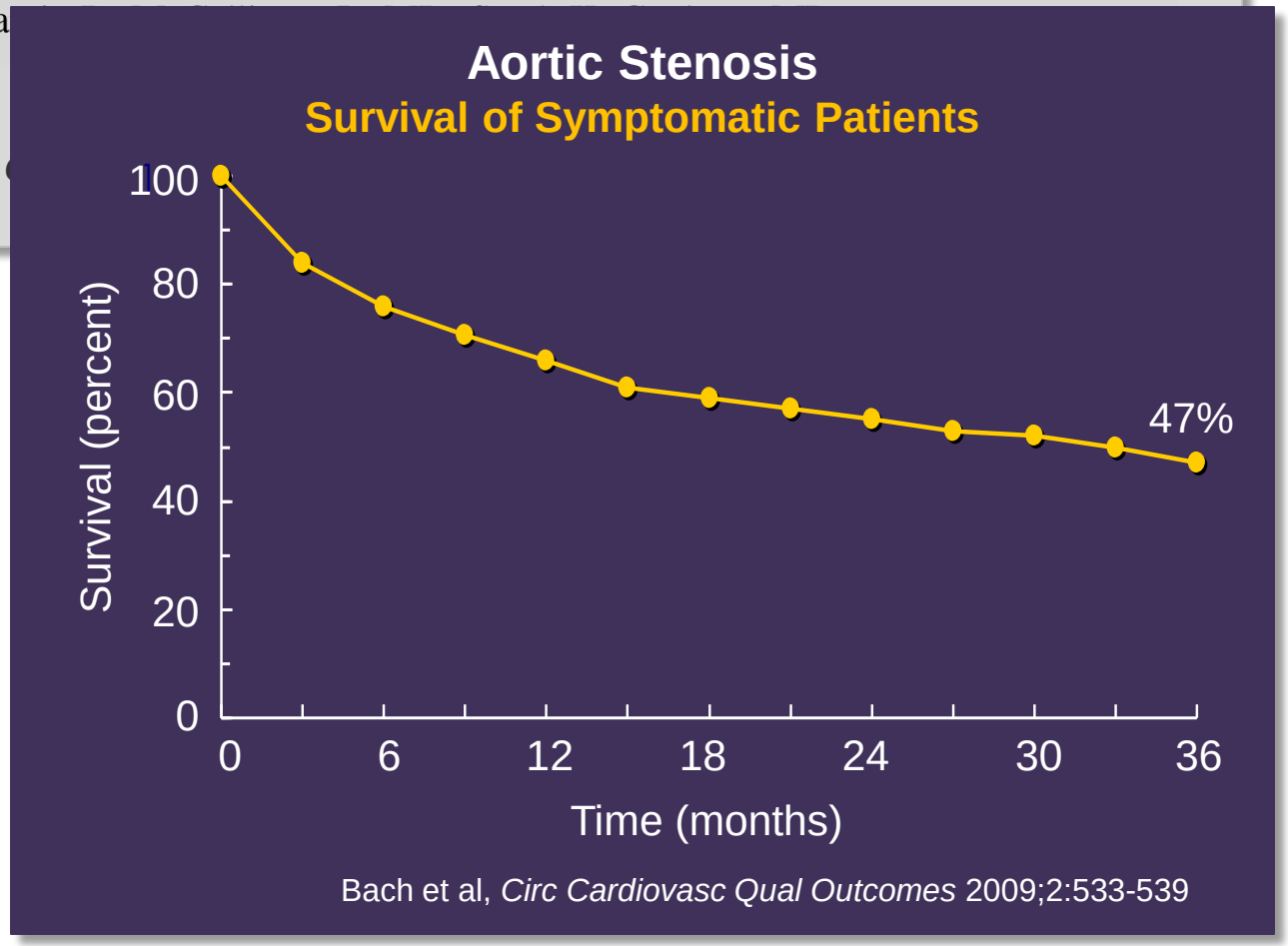


Ross and Braunwald, *Am J Circulation* 1968;38:V-61

Evaluation of Patients With Severe Symptomatic Aortic Stenosis Who Do Not Undergo Aortic Valve Replacement

The Potential Role of Subjectively Overestimated Operative Risk

David S. Bach, MD; Derrick Siao, MD; Steven E. Girard, MD, PhD; Claire Duvernoy, MD;
Benja



Bach et al, *Circ Cardiovasc Qual Outcomes* 2009;2:533-539

Northwestern Medicine

Aortic Stenosis

Indications for AVR

- **Symptomatic patients with severe AS**

class I

…if it is likely that the symptoms are cardiac in origin

Aortic Stenosis

Management challenges:

- **The asymptomatic patient with severe AS**
- **Low-flow, low gradient severe AS**
- **Indications for TAVR**

Aortic Stenosis

Management challenges:

- **The asymptomatic patient with severe AS**
- **Low-flow, low gradient severe AS**
- **Indications for TAVR**

Aortic Stenosis

Management challenges:

- **The asymptomatic patient with severe AS**
- **Low-flow, low gradient severe AS**

Are asymptomatic patients with severe AS *really* asymptomatic?

Aortic stenosis

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

Indications for valve replacement

Exercise test results:

- Symptoms — **class I**
- Hypotension — **class IIa**

How are *symptoms* determined?
- Everyone has symptoms on stress test
- Are the symptoms cardiac in origin?
- What level of exercise?

How is *hypotension* defined?
- Less than 20 mmHg increase (?)

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Aortic stenosis

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

Indications for valve replacement

Exercise test results:

- Symptoms — **class I**
- Hypotension — **class IIa**

Should *asymptomatic* patients with severe AS undergo AVR?

…when they are *really* asymptomatic?

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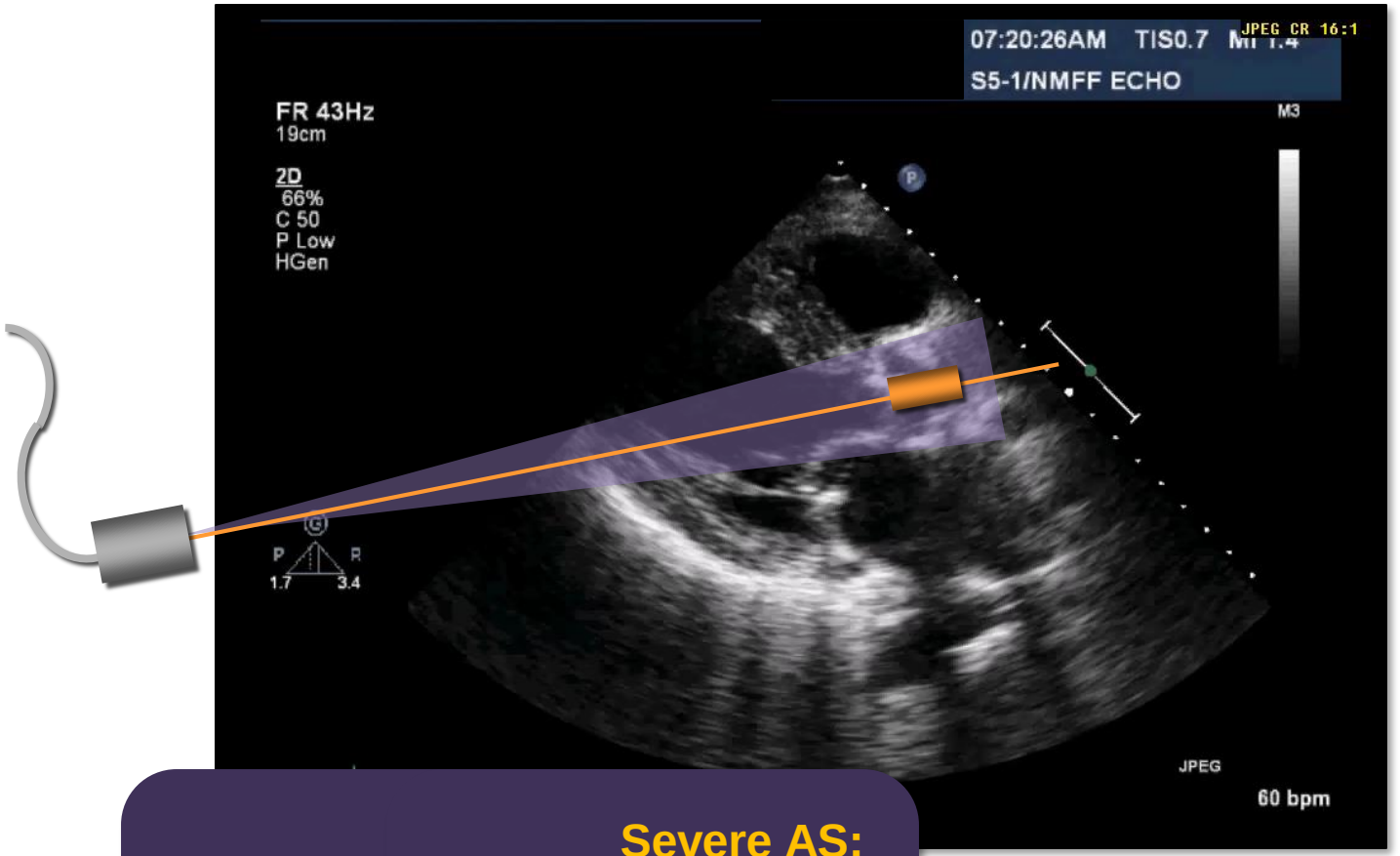

		Severe AS:
Vmax:	4.6 m/s	>4.0 m/s
Mean Δ:	52 mmHg	>40 mmHg
AVA:	0.7 sq cm	<1.0 sq cm

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Aortic Stenosis

84 year old man with severe AS

- Watchful waiting?*
- More data (more testing)?
- Aortic valve replacement?

*Wait until he develops symptoms in 5-6 years and then recommend TAVR?

Aortic Stenosis

84 year old man with severe AS

- Watchful waiting?*
- More data (more testing)?
- Aortic valve replacement?

*What is the risk of death while waiting for symptoms to trigger valve replacement?

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Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s

class IIa

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Very severe AS:
  Vmax >5.5 m/s — **class IIa**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Very severe AS:
  Vmax >5.5 m/s — **class IIa**
- Severe valve calcification and rate of progression ≥0.3 m/s / year — **class IIa**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS: Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Very severe AS: Vmax >5.5 m/s — **class IIa**
- Severe valve calcification and rate of progression ≥0.3 m/s / year — **class IIa**
- Markedly elevated BNP
- Increase in gradient with exercise >20 mmHg
- Excessive LVH

— **class IIb**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

The ACC/AHA and ESC/EACTS guidelines have lowered the threshold for surgery in asymptomatic patients with AS

- **Severity of AS**
- **Severity of calcification**
- **Left ventricular function**
- **Exercise response**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

The ACC/AHA and ESC/EACTS guidelines have lowered the threshold for surgery in asymptomatic patients with AS

- Severity of AS
- Severity of calcification
- Left ventricular function
- Exercise response
- BNP?

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http://dx.doi.org/10.1016/j.jacc.2014.02.581

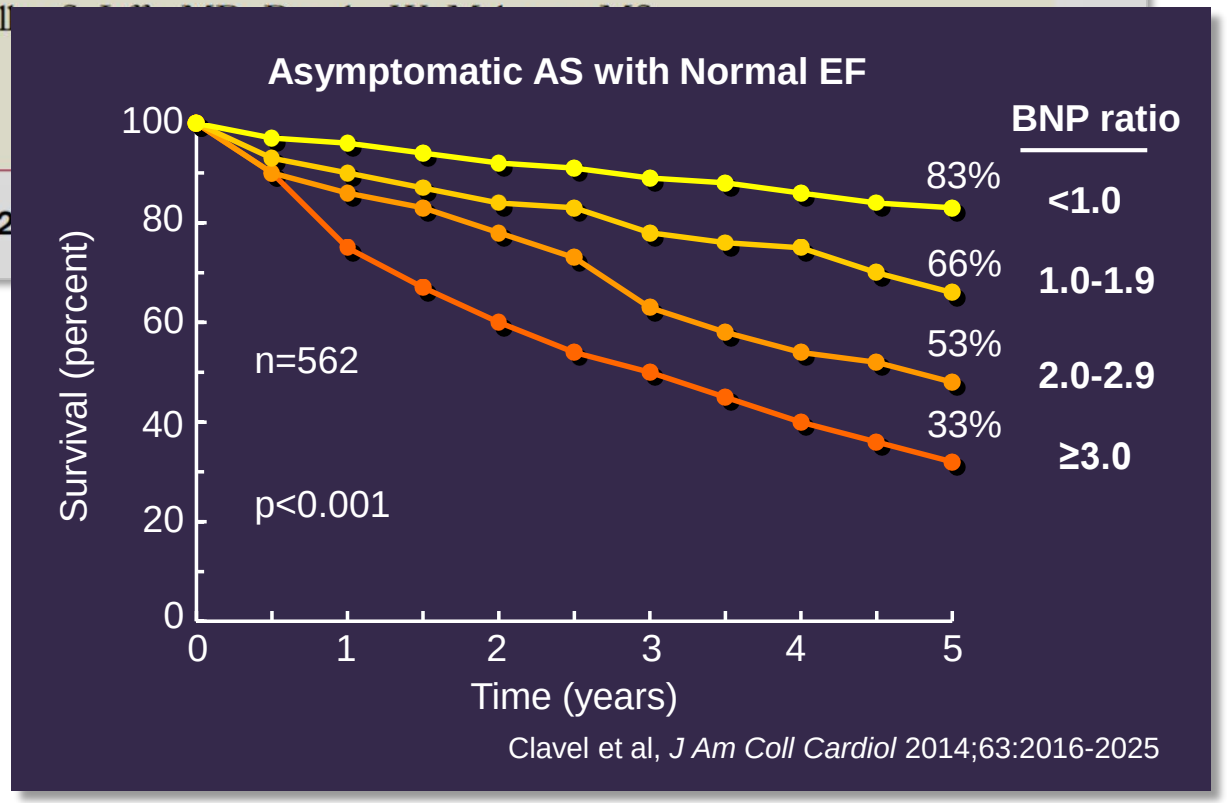
Heart Valve Disease

B-Type Natriuretic Peptide Clinical Activation in Aortic Stenosis

Impact on Long-Term Survival

Marie-Annick Clavel, DVM, PhD, Joseph Malouf, MD, Hector I. Michelena, MD,
Rakesh M. Suri, MD, DPhil, Al
Maurice Enriquez-Sarano, MD
Rochester, Minnesota

J Am Coll Cardiol 2014;63:2016–2



Clavel et al, *J Am Coll Cardiol* 2014;63:2016-2025

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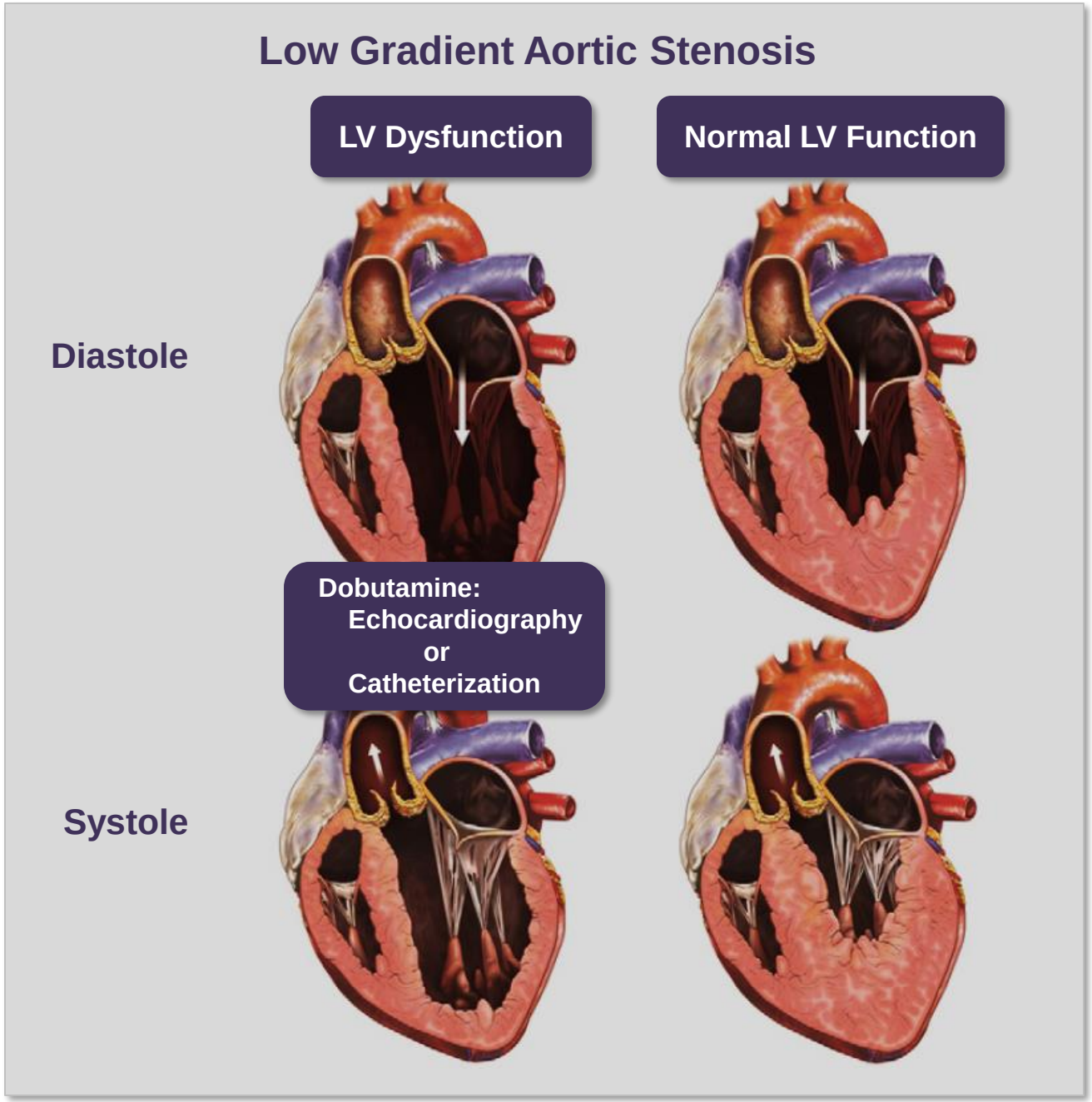
Aortic stenosis

Management challenges:

- The asymptomatic patient with severe AS
- **Low-flow, low gradient severe AS**
- Indications for TAVR

Low Gradient Aortic Stenosis



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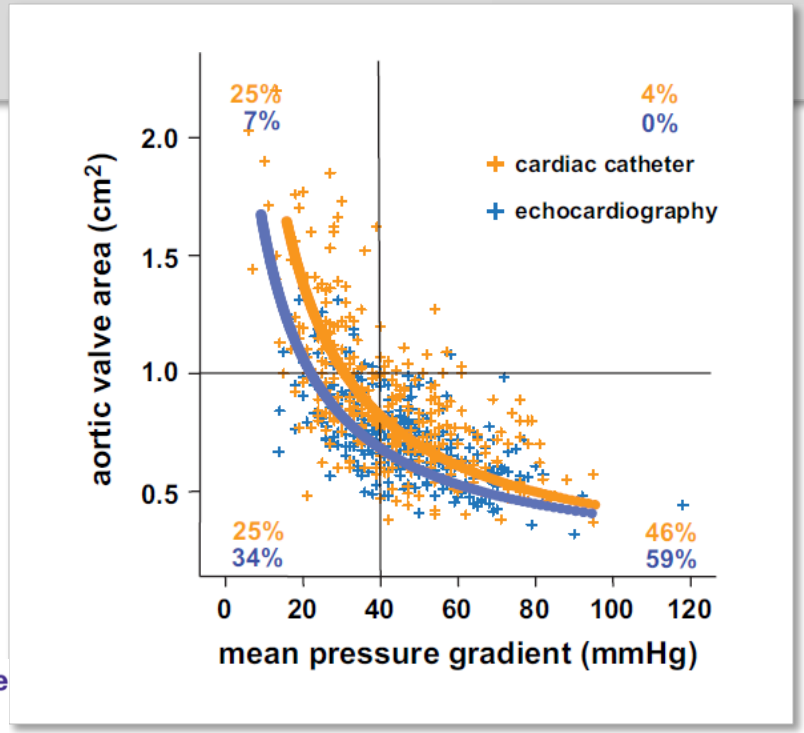
from Pibarot and Dumesnill, *J Am Coll Cardiol* 2012:60:1845-1853

Inconsistent grading of aortic valve stenosis by current guidelines: haemodynamic studies in patients with apparently normal left ventricular function

Jan Minners, Martin Allgeier, Christa Gohlke-Baerwolf, Rolf-Peter Kienzle, Franz-Josef Neumann, Nikolaus Jander

Heart 2010;**96**:1463–1468



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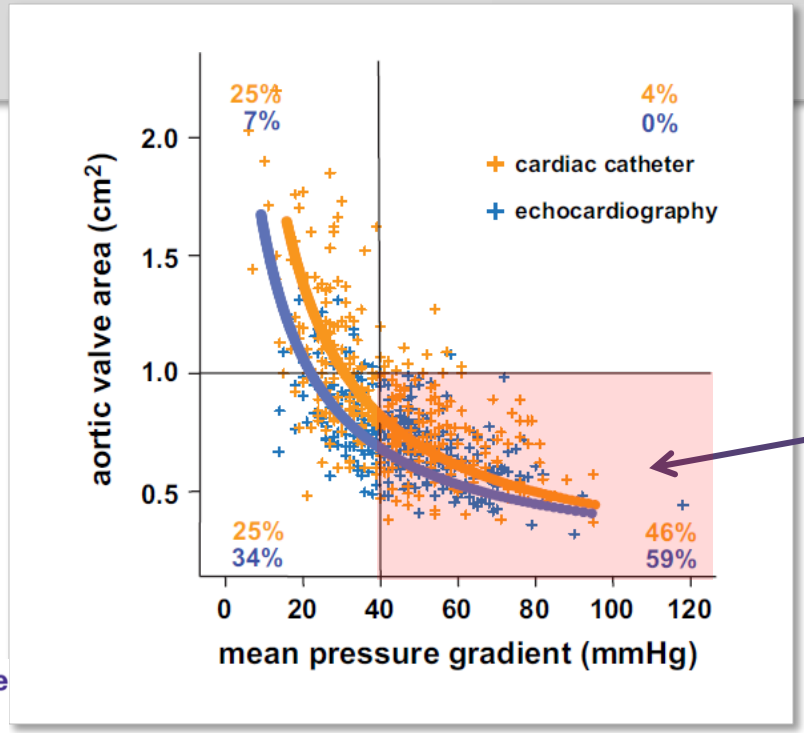

Severe AS

Inconsistent grading of aortic valve stenosis by current guidelines: haemodynamic studies in patients with apparently normal left ventricular function

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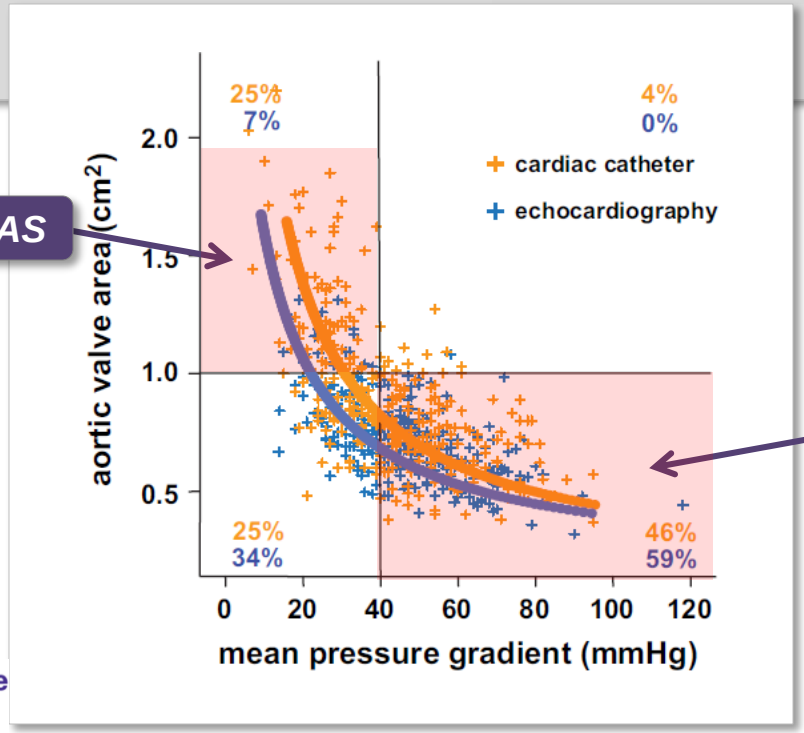

Not severe AS

Severe AS

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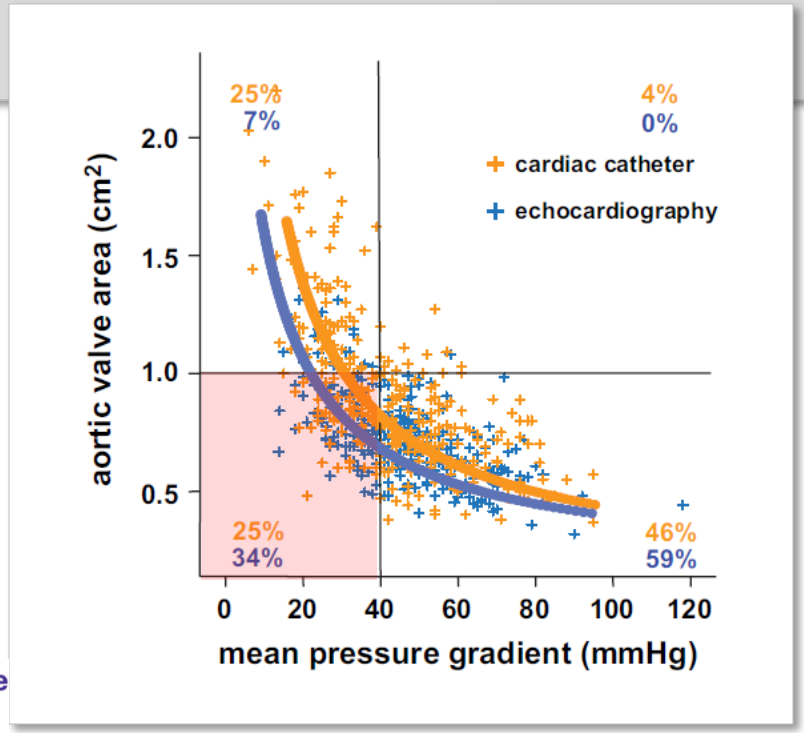

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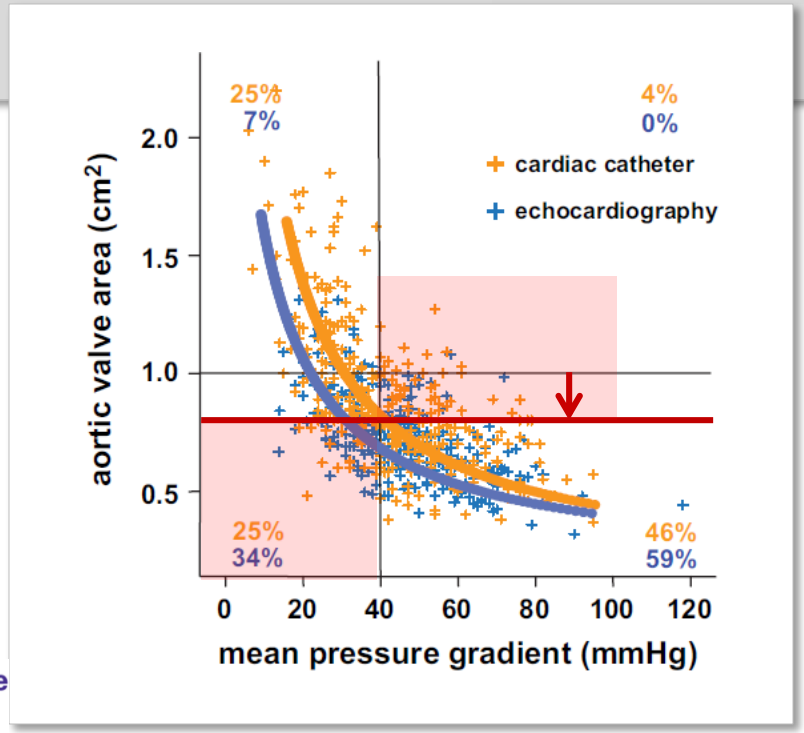

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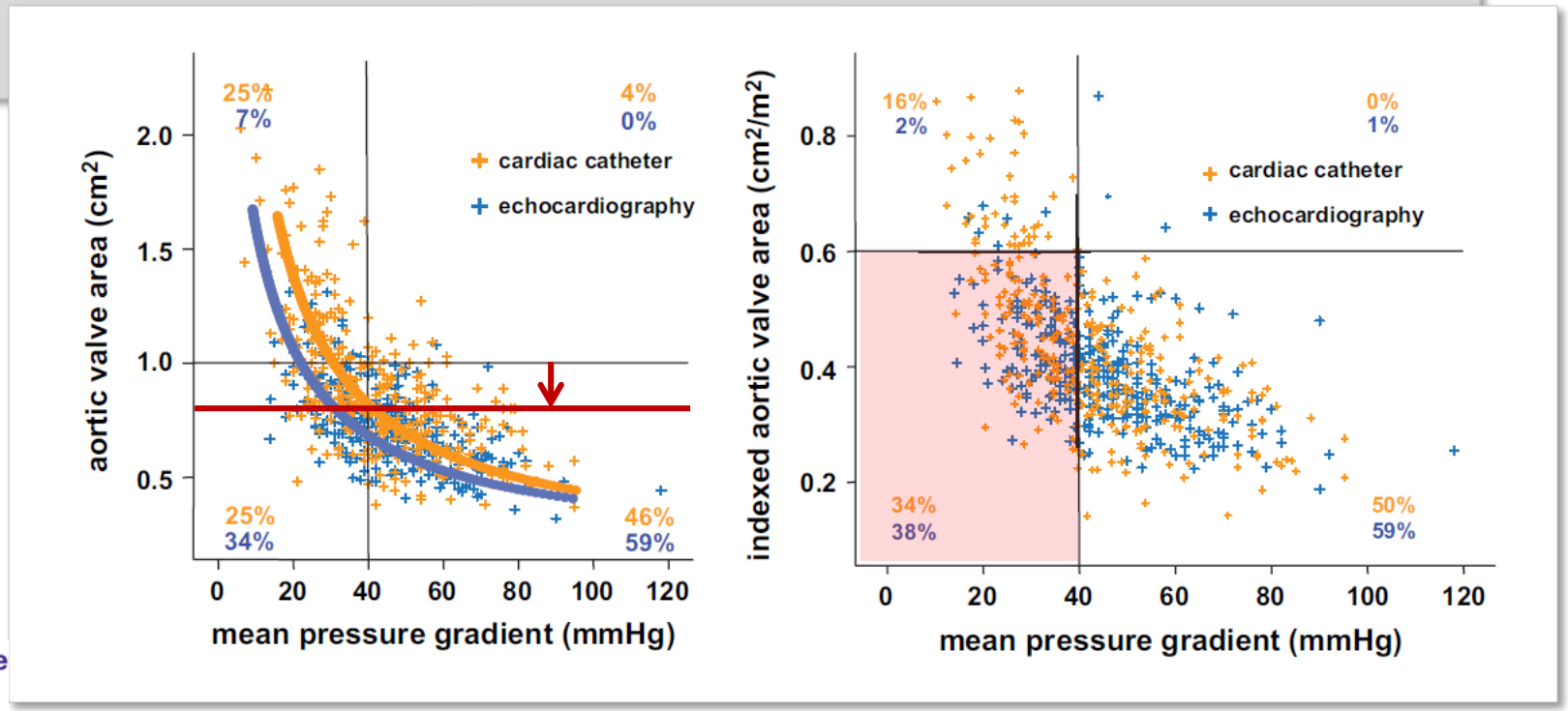

Low Flow
Low Gradient
Normal LV Function

Diastole

Systole

- Treat hypertension
- Catheterization
- Valve calcification
- Advanced imaging
- **Clinical skills**

Northwestern Medicine

from Pibarot and Dumesnill, *J Am Coll Cardiol* 2012:60:1845-1853

Low Flow, Low Gradient Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

Reduced EF:

- Dobutamine study showing:
  - Vmax >4 m/s or
  - Mean Δ >40 mmHg or
  - AVA ≤1 sq cm

class IIa

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

Reduced EF:

- With contractile reserve

class IIa

Northwestern Medicine®

Low Flow, Low Gradient Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

Reduced EF:
- Dobutamine study showing:
  - Vmax >4 m/s or
  - Mean Δ >40 mmHg or
  - AVA ≤1 sq cm

class IIa

Normal EF:
- Only if clinical, anatomic and hemodynamic data support severe AS

class IIa

Reduced EF:
- With contractile reserve

class IIa

Northwestern Medicine

Low Flow, Low Gradient Aortic Stenosis

Indications for valve replacement:

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American Heart Association.

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  - AVA ≤1 sq cm

class IIa

Normal EF:

- Only if clinical, anatomic and hemodynamic data support severe AS

class IIa

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

Reduced EF:

- With contractile reserve

class IIa

Normal EF:

- Only after thorough confirmation of severe AS

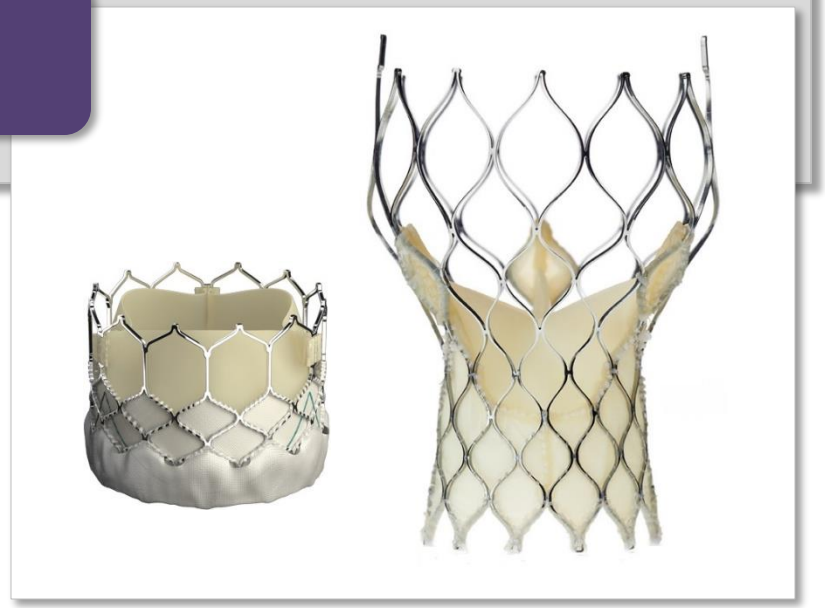
class IIa

Northwestern Medicine

Aortic stenosis

Management challenges:

- The asymptomatic patient with severe AS
- Low-flow, low gradient severe AS
- Indications for TAVR



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Intervention for Severe AS

Indications for TAVR vs surgical AVR:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Evaluation by a Heart Team — **class I**

Intervention for Severe AS

Indications for TAVR vs surgical AVR:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Evaluation by a Heart Team — **class I**
- Surgical AVR for patients at low or intermediate risk — **class I**

Intervention for Severe AS

Indications for TAVR vs surgical AVR:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

• Evaluation by a Heart Team	class I
• Surgical AVR for patients at low or intermediate risk	class I
• TAVR for patients with prohibitive surgical risk and life expectancy >12 months	class I

Intervention for Severe AS

Indications for TAVR vs surgical AVR:

- Evaluation by a Heart Team — **class I**

? Surgical AVR for patients at low or intermediate risk — **class I**

TAVR as alternative?

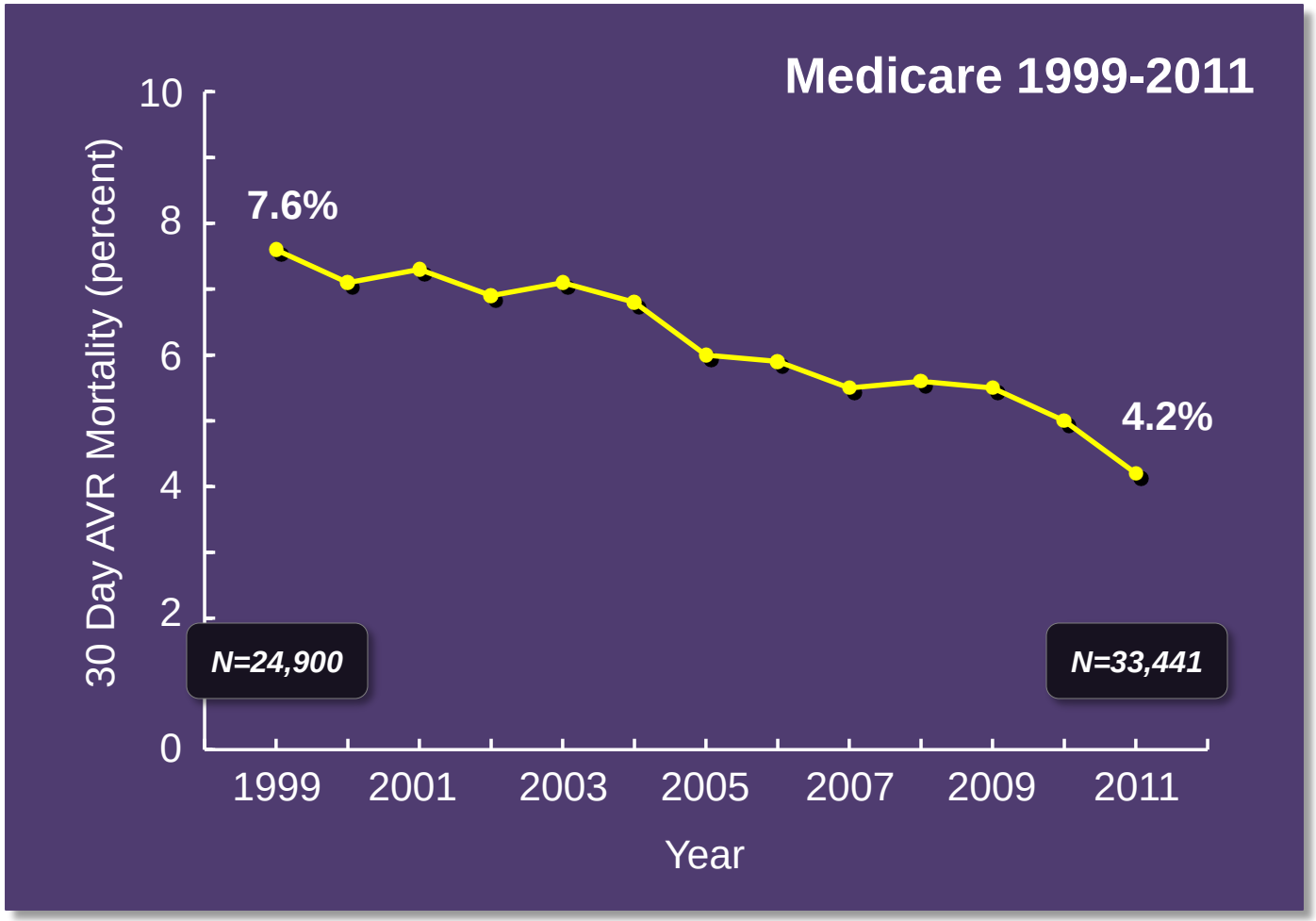
- TAVR for patients with prohibitive surgical risk and life expectancy >12 months — **class I**

? TAVR alternative for patients at high surgical risk — **class IIa**

class I?

Aortic Valve Replacement

Hospital Mortality

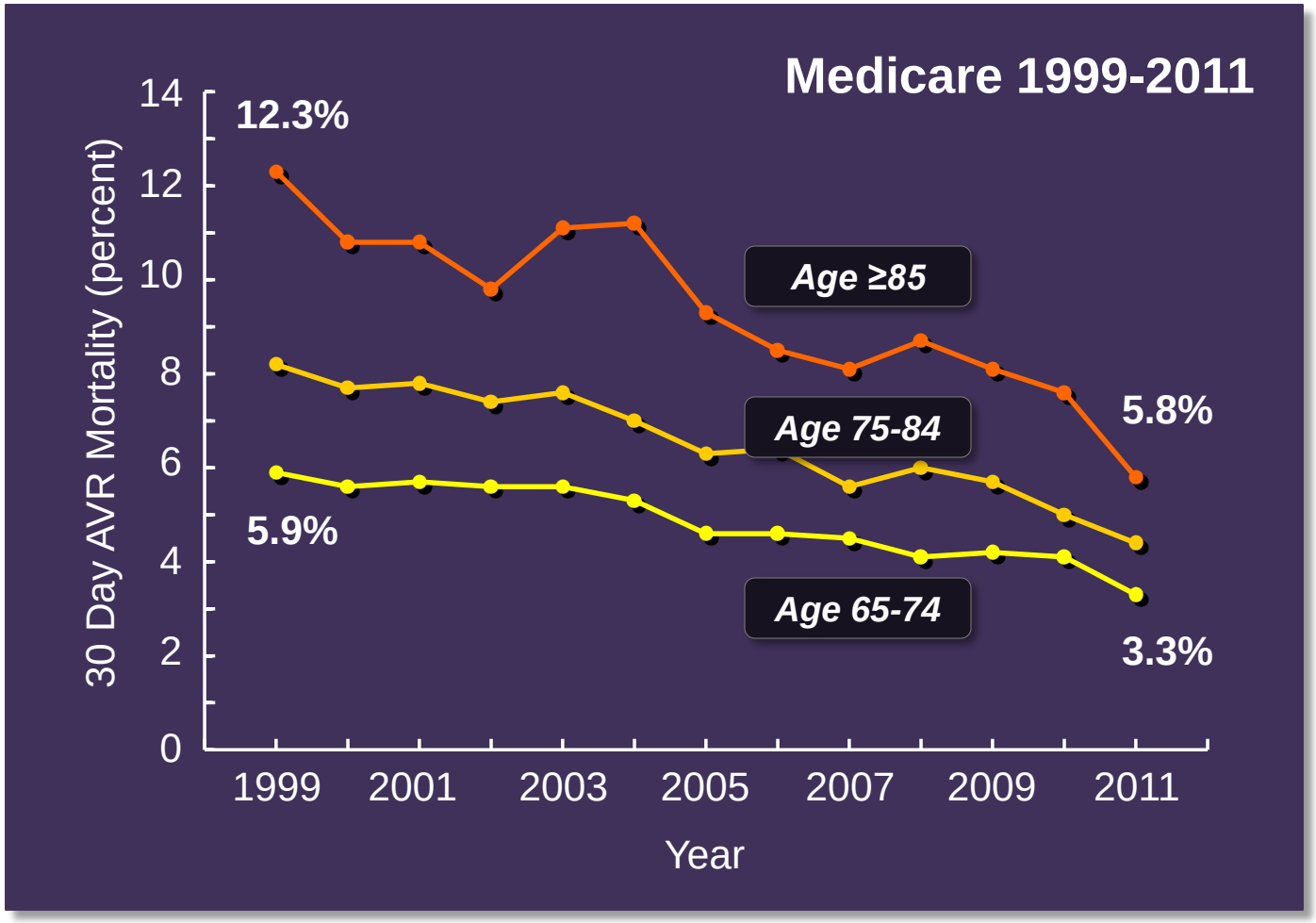


Barreto-Filho et al, *JAMA* 2013;210:2078-2085

Northwestern Medicine

Aortic Valve Replacement

Hospital Mortality



Barreto-Filho et al, *JAMA* 2013;210:2078-2085

Series

Valvular heart disease 1

Management strategies and future challenges for aortic valve disease

Robert O Bonow, Martin B Leon, Darshan Doshi, Neil Moat

Lancet 2016; 387: 1312–23

TAVR Now

- TAVR has been truly transformative
- Surgical AVR remains the standard with proven durability and safety for most patients
- TAVR provides treatment options for patients who previously had no options other than a predictably very poor short term outcome
- TAVR is an alternative to SAVR in patients at high or intermediate surgical risk
- The threshold for TAVR is declining in clinical trials, registries and clinical practice
- All patients want this
- Determining when to withhold TAVR is difficult

TAVR in the Future

- Guidelines will need to adapt to the rapidly evolving TAVR evidence base
  - TAVR in intermediate and low risk surgical patients
- Availability of TAVR is likely to inform new indications for valve replacement
  - Moderate AS in primary cardiomyopathy
  - Asymptomatic severe AS?
- Judgment of the Heart Team remains essential in patient selection for TAVR
- Appropriate use criteria and performance measures are needed to define quality

Clinical Studies

Aortic Stenosis*

PAUL WOOD, O.B.E., M.D., F.R.C.P.

London, England

AORTIC stenosis is a simple mechanical fault, which, if severe enough, imposes a heavy burden on the left ventricle and sooner or later overcomes it. An obstructive lesion of this sort present
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definition of severe stenosis is one with sufficient hypertrophy of the left ventricle to cause inversion of the T wave of the electrocardiogram in left ventricular surface leads or their

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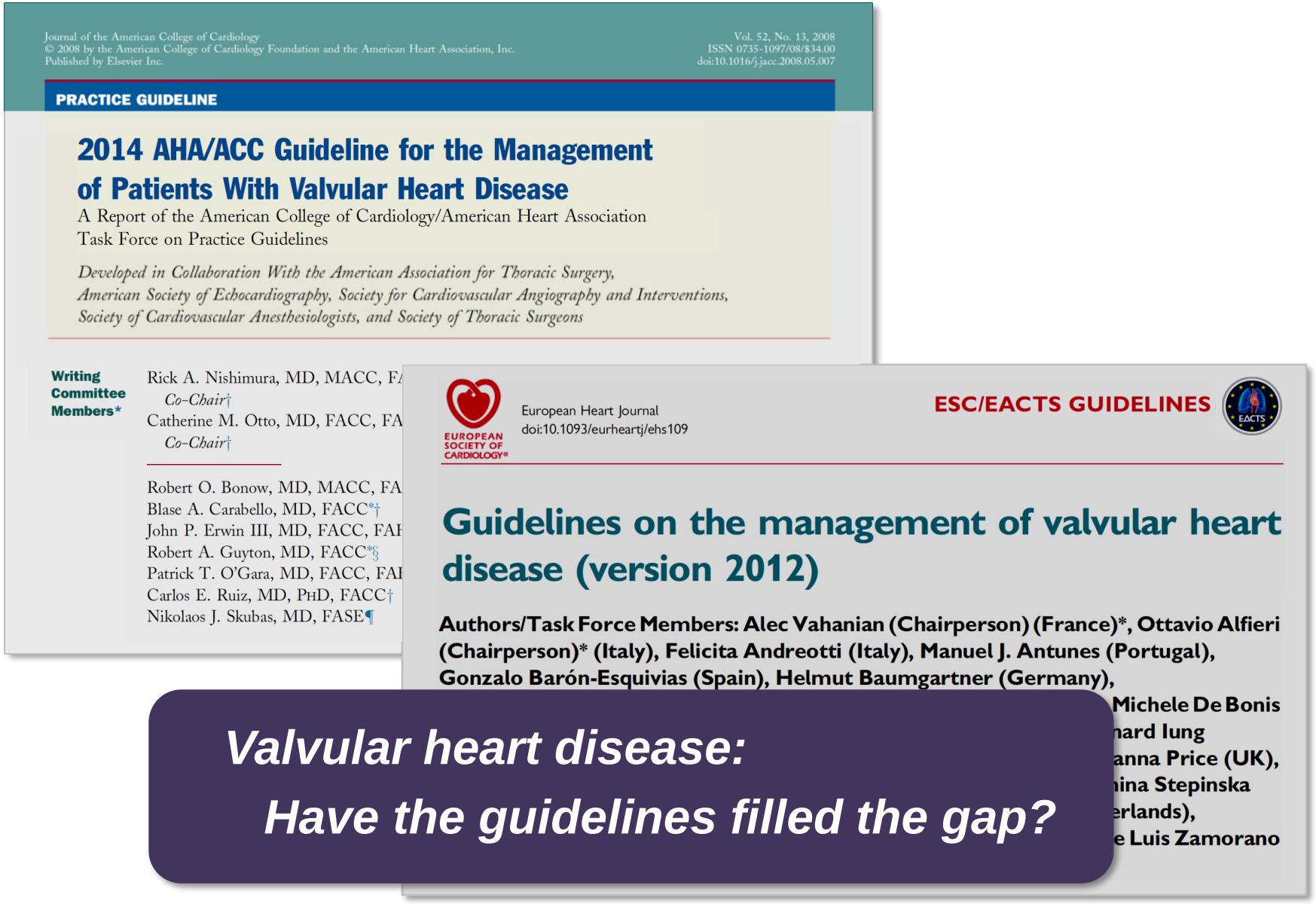
Aortic stenosis is a simple mechanical fault which, if severe enough, imposes a heavy burden on the left ventricle and sooner or later overcomes it.

The 1958 Morris H. Nathanson Lecture, University of Southern California, Los Angeles.

…it's not simple any more

Northwestern Medicine

Wood P, *Am J Cardiol* 1958;1:553-571



Valvular heart disease: Have the guidelines filled the gap?

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