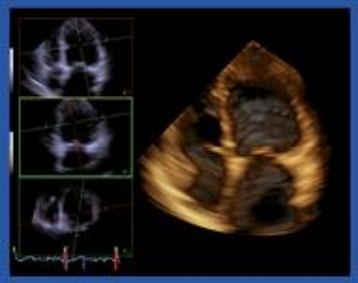

EuroValve

November 8-9, 2013

Asymptomatic severe aortic stenosis and non cardiac surgery

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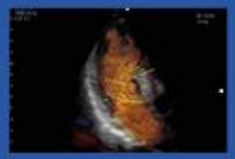
Ramón y Cajal Hospital. Madrid



EACVI

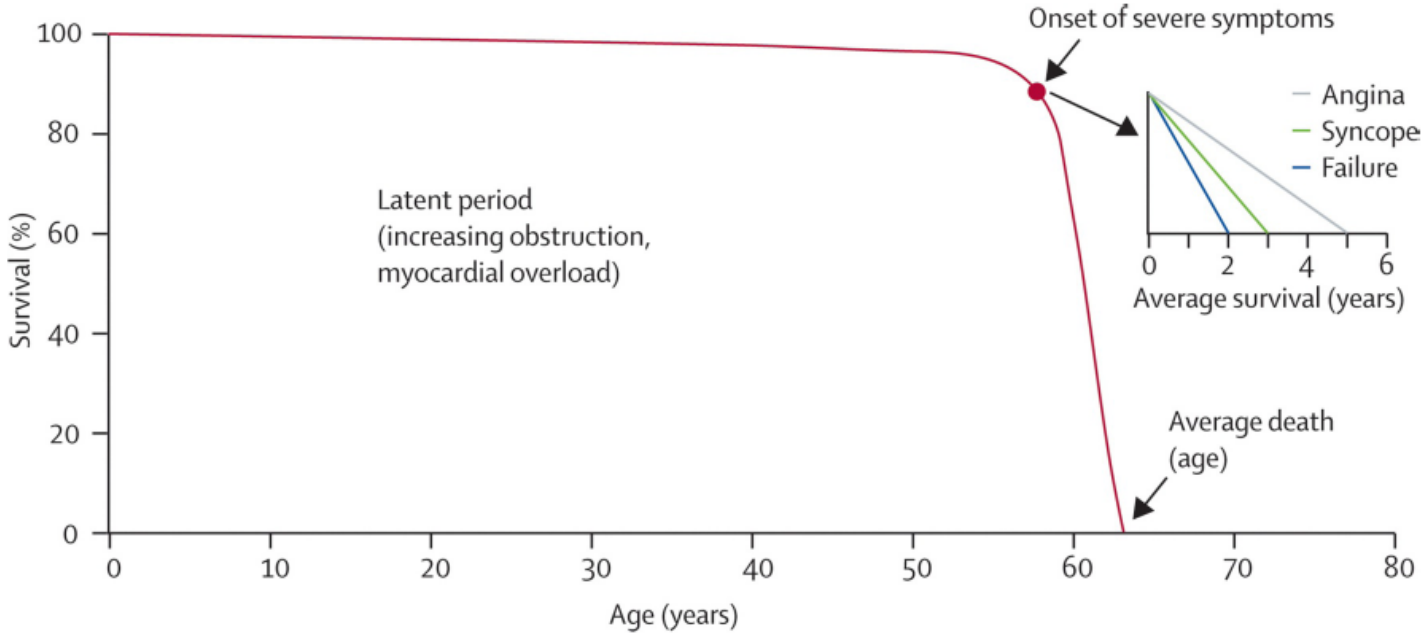
www.eurovalvecongress.com

Faculty Disclosure

Covadonga Fernández-Golfín

I have **no financial relationships** to disclose.

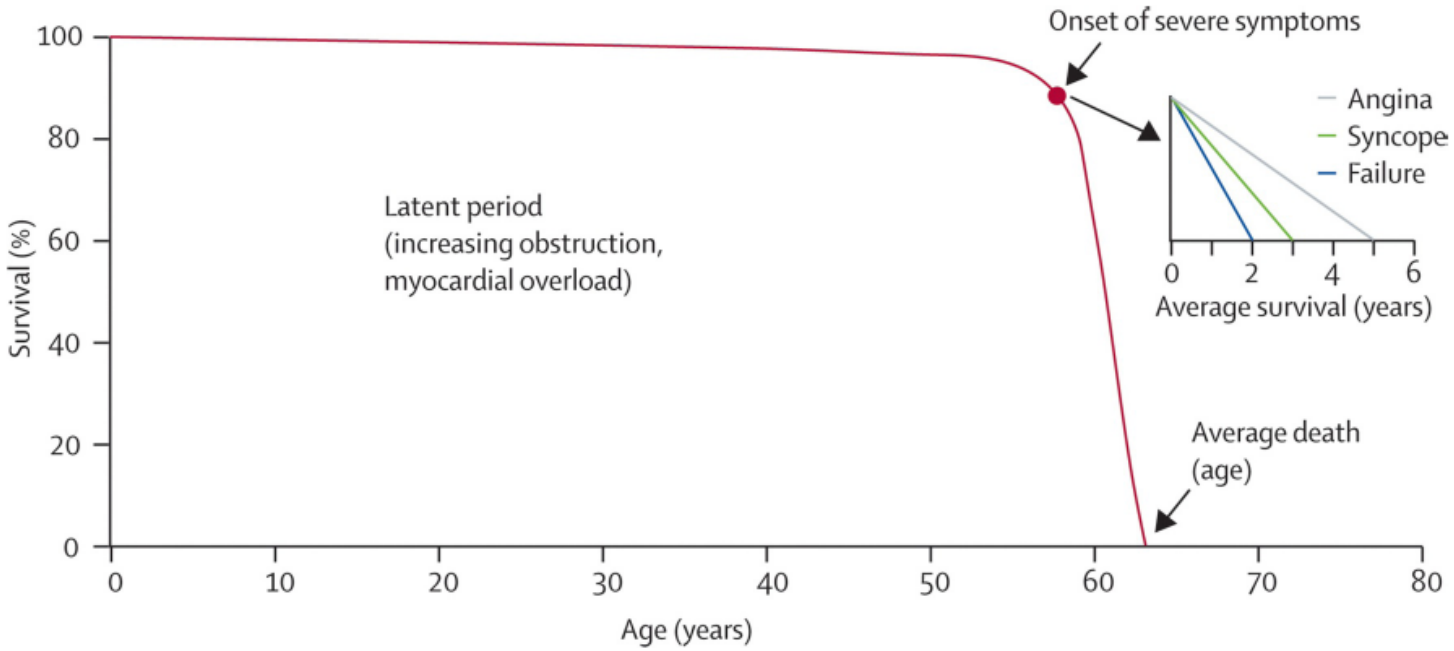
Aortic stenosis



The Lancet, 2009, 373, 9680, 13-19

Symptoms in patients with AS and normal LVSF rarely occur until the stenosis is severe as defined by **valve area <1.0 cm2, aortic jet velocity over 4.0 m/sec, and/or mean transvalvular gradient exceeds 40 mmHg .**

Aortic stenosis



Sudden cardiac death <1% per year in the truly asymptomatic AS

Average event-free survival at 2 years from 20% to > 50%

Rosenhek R, Circulation 2010;121:151–156

Pellikka PA, Circulation 2005;111: 3290–3295

Aortic stenosis

AVR is indicated in patients with severe AS and any symptoms related to AS.	I
AVR is indicated in patients with severe AS undergoing CABG, surgery of the ascending aorta or another valve.	I
AVR is indicated in asymptomatic patients with severe AS and systolic LV dysfunction (LVEF <50%) not due to another cause.	I
AVR is indicated in asymptomatic patients with severe AS and abnormal exercise test showing symptoms on exercise clearly related to AS.	I

European Heart Journal (2012) 33, 2451–2496

Risk stratification

IMAGING

Valve morphology and function
Calcification
Jet velocity
Jet velocity prog.

LV function
LV mass
LVEF
Longitudinal strain
Diastolic function
LA volume
Myocardial fibrosis

EXERCISE TESTING

Treadmill stress test
Symptoms
Abnormal blood pressure
ST depression

Exercise echocardiography
Increase gradients

BIOMARKERS

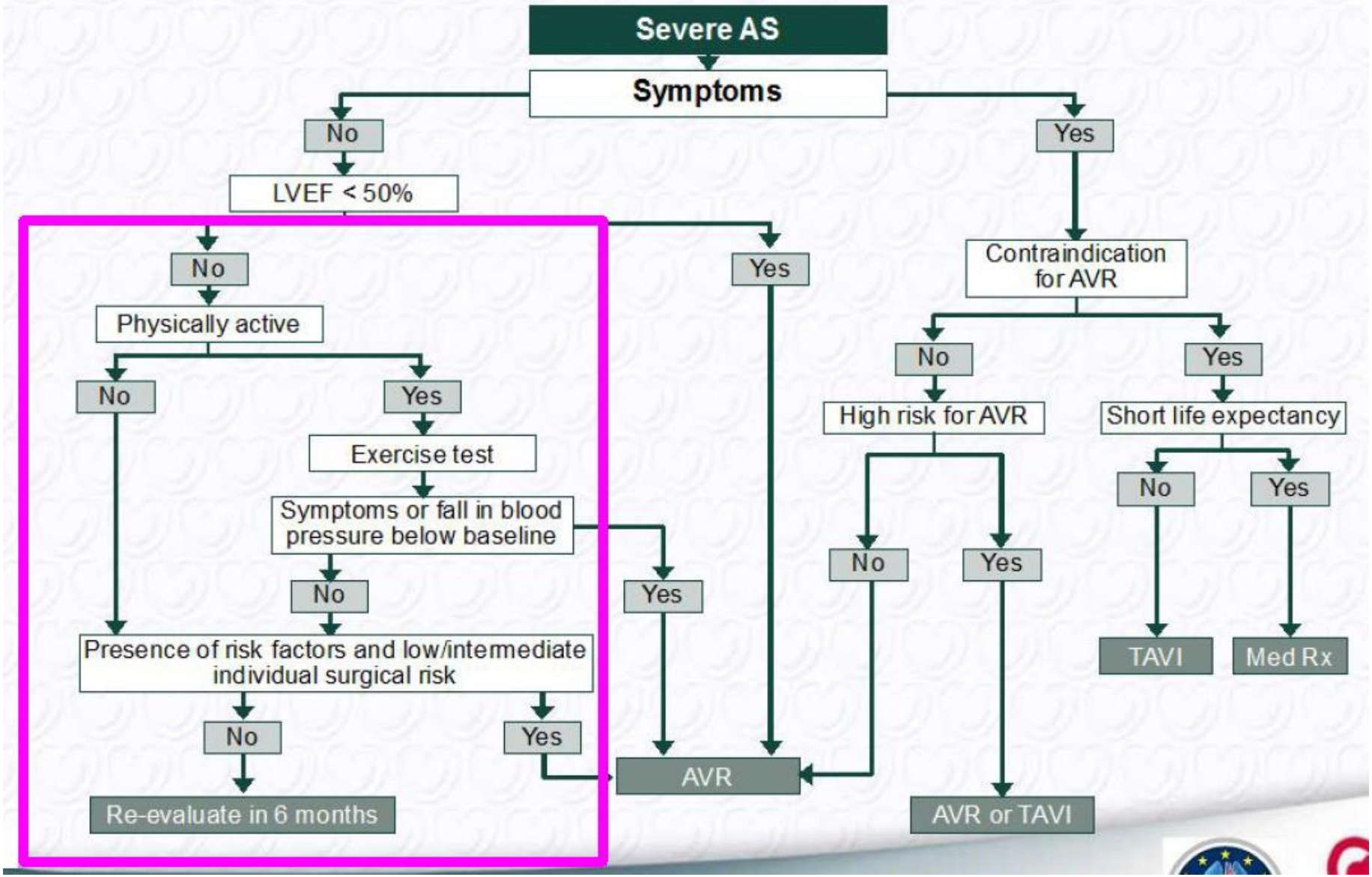
BNP

Aortic stenosis

AVR should be considered in asymptomatic patients, with normal EF and none of the above mentioned exercise test abnormalities, if the surgical risk is low, and one or more of the following findings is present: • very severe AS defined by a peak transvalvular velocity > 5.5 m/s, • severe valve calcification and a rate of peak of transvalvular velocity progression ≥ 0.3 m/s per year.	IIa	C
AVR may be considered in asymptomatic patients with severe AS, normal EF and none of the above mentioned exercise test abnormalities, if surgical risk is low, and one or more of the following findings is present: • markedly elevated natriuretic peptide levels confirmed by repeated measurements without other explanations, • increase of mean pressure gradient with exercise by > 20 mmHg, • excessive LV hypertrophy in the absence of hypertension.	IIb	C

European Heart Journal (2012) 33, 2451–2496

EuroValve



European Heart Journal (2012) 33, 2451–2496

AS and non cardiac surgery

- AS is the most common VHD in Europe
- Severe AS is a well stablished risk factor for perioperative mortality and MI
- Surgical stress and anesthesia can result in unexpected hypotension, decreased coronary perfusion and death in severe AS.

AS and non cardiac surgery

1977 Goldman
1986 Detsky

Increases life-threatening or fatal cardiac complications

1989 O'Keefe
1998 Raymer
Torsher

Low event rate of 0% to 7%

2001 Rohde
2004 Kertai

2010 Calleja

Increased peak instantaneous aortic gradients, increased cardiovascular morbidity (8%)

AS and non cardiac surgery

108 patients with moderate or severe aortic stenosis, elective non cardiac surgery (retrospective)

Control group

Stratified according to type of surgery

Perioperative death or myocardial infarction

Am J Med. 2004;116:8 –13

AS and non cardiac surgery

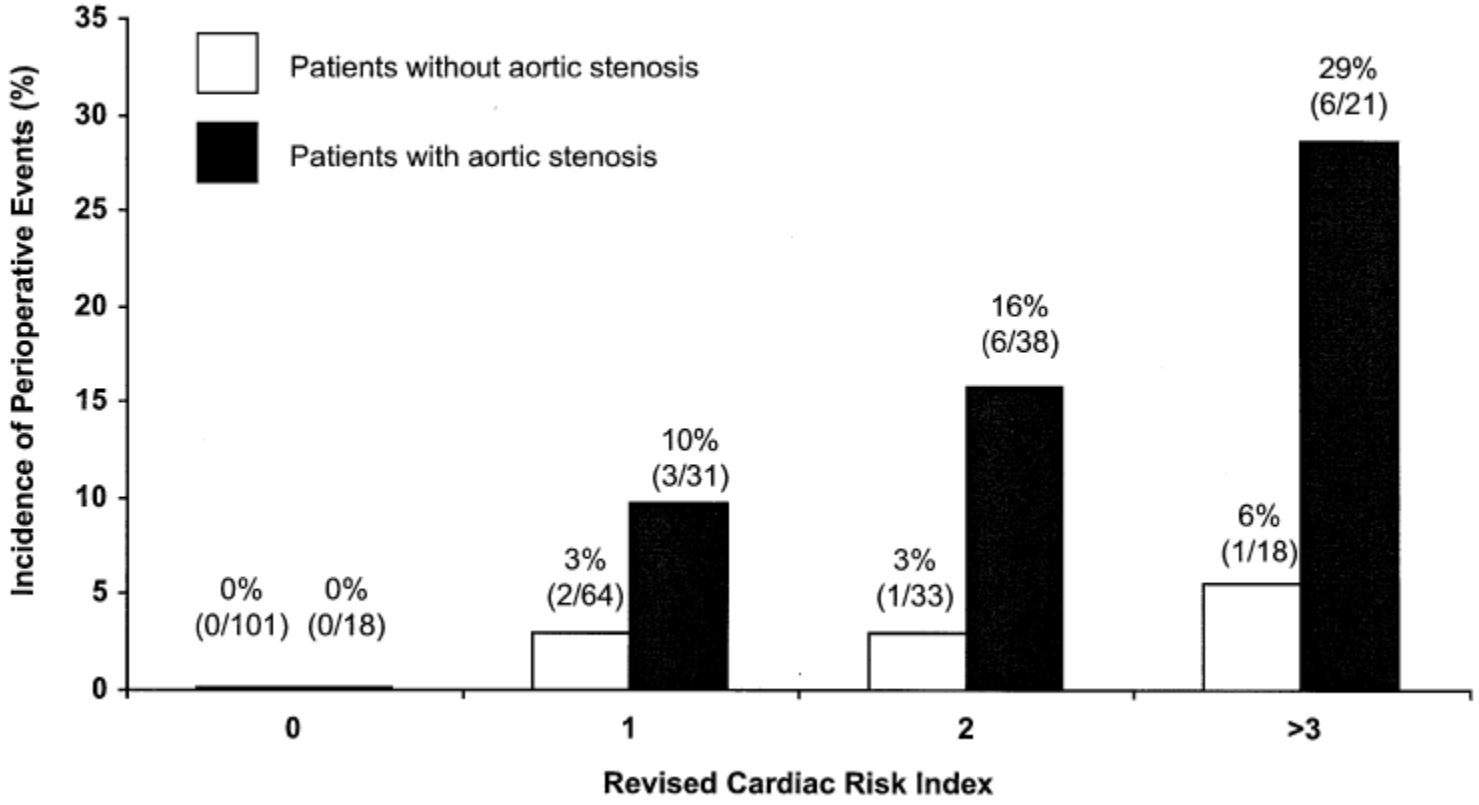
Intraoperative period			
Type of anesthesia			<0.01
Balanced or intravenous general	82 (76)	126 (58)	
Central neural blockade	7 (7)	28 (14)	
Combined technique	8 (7)	41 (19)	
Conscious sedation	11 (10)	21 (9)	
Type of surgery			1.0
Major vascular	41 (38)	82 (38)	
Other vascular	9 (8)	18 (8)	
Abdominal	13 (12)	26 (12)	
Orthopedic	23 (21)	46 (21)	
Genitourinary	7 (7)	14 (7)	
Head and neck	2 (2)	4 (2)	
Other	13 (12)	26 (12)	

6% (19 p) mortality and non fatal myocardial infarction

79% Aortic stenosis group

Am J Med. 2004;116:8 –13

AS and non cardiac surgery



Am J Med. 2004;116:8 –13

AS and non cardiac surgery

Cardiac Risk in Patients Aged >75 Years With Asymptomatic, Severe Aortic Stenosis Undergoing Noncardiac Surgery

Anna M. Calleja, MD[a], Subha Dommaraju, MD[a], Rakesh Gaddam, MD[a], Stephen Cha, MS[b], Bijoy K. Khandheria, MD[a], and Hari P. Chaliki, MD[a,*]

Asymptomatic severe AS (30 p)

Elective non cardiac surgery

Control group (60 p)

Composite of death, MI, heart failure, ventricular arrhythmias before dismissal, and intraoperative hypotension.

Am J Cardiol 2010;105: 1159 –1163)

AS and non cardiac surgery

Baseline clinical characteristics

Variable	Patients (n = 30)	Controls (n = 60)	p Value*
Age (years)	78 ± 9	76 ± 9	0.55
Men	19 (63%)	39 (65%)	0.87
Diabetes mellitus	8 (27%)	15 (25%)	0.87
Coronary artery disease	11 (37%)	24 (40%)	0.75
Hypertension	22 (73%)	41 (68%)	0.63
Cerebrovascular accident	9 (30%)	8 (13%)	0.06
Hyperlipidemia	15 (50%)	32 (53%)	0.88
Chronic obstructive pulmonary disease	5 (17%)	8 (13%)	0.68
Medications			
Aspirin	15 (50%)	27 (45%)	0.64
β blocker	9 (30%)	13 (22%)	0.39
Angiotensin-converting enzyme inhibitor	6 (20%)	11 (18%)	0.85

Am J Cardiol 2010;105: 1159 –1163)

AS and non cardiac surgery

High risk	1 (3%)	3 (5%)
Vascular surgery†		
Intermediate risk	25 (83%)	46 (77%)
Orthopedic surgery‡	9 (30%)	9 (15%)
Abdominal surgery§	3 (10%)	5 (8%)
Urologic surgery¶	4 (13%)	10 (17%)
Vascular surgery‖	4 (13%)	3 (5%)
General surgery#	2 (7%)	8 (13%)
Miscellaneous**	3 (10%)	11 (18%)
Low risk	4 (13%)	11 (18%)
Orthopedic surgery††	0 (0%)	2 (3%)
Urologic surgery (transrectal prostate biopsy)	1 (3%)	1 (2%)
Miscellaneous surgery‡‡	3 (10%)	8 (13%)

Am J Cardiol 2010;105: 1159 –1163)

AS and non cardiac surgery

No significant differences in the composite end point (33% vs 23%)

No deaths

Intraoperative hypotension requiring vasopressor use, odds ratio of 2.5 for patients (95% confidence interval 0.8 to 7.6; p = 0.11)

No differences in MI

Am J Cardiol 2010;105: 1159 –1163)

2012 ESC Guidelines

RISK STRATIFICATION

TYPE OF SURGERY

SYMPTOMS

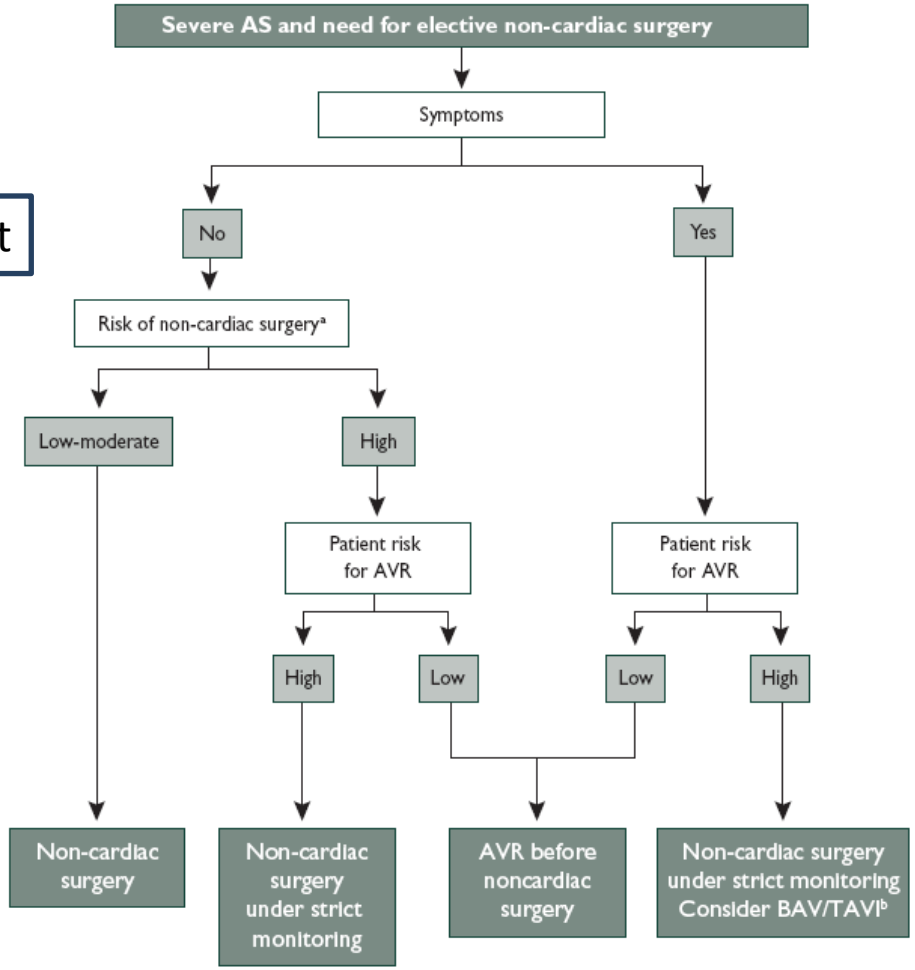
2009 ESC Guidelines

Low-risk <1%	Intermediate-risk 1–5%	High-risk >5%
▪ Breast ▪ Dental ▪ Endocrine ▪ Eye ▪ Gynaecology ▪ Reconstructive ▪ Orthopaedic—minor (knee surgery) ▪ Urologic—minor	▪ Abdominal ▪ Carotid ▪ Peripheral arterial angioplasty ▪ Endovascular aneurysm repair ▪ Head and neck surgery ▪ Neurological/ orthopaedic—major (hip and spine surgery) ▪ Pulmonary renal/ liver transplant ▪ Urologic—major	▪ Aortic and major vascular surgery ▪ Peripheral vascular surgery

European Heart Journal (2009) 30, 2769–2812

2012 ESC Guidelines

Treadmill exrecise test



European Heart Journal (2012) 33, 2451–2496

AS non cardiac surgery

Conflicting evidence regarding cardiac risk in non cardiac surgery

- Retrospective studies
- Patients profile
- Selection bias

Risk stratification

IMAGING

Valve morphology and function
Calcification
Jet velocity
Jet velocity progr.

LV function
LV mass
LVEF
Longitudinal strain
Diastolic function
LA volume
Myocardial fibrosis

EXERCISE TESTING

Treadmill stress test
Symptoms
Abnormal blood pressure
ST depression

Exercise echocardiography
Gradient increase

BIOMARKERS

BNP

Conclusions

✓Severe AS is a risk factor for cardiac mortality and MI during non cardiac surgery

✓Symptomatic patients should undergo AVR before non cardiac surgery

✓Asymptomatic patients based on type of surgery and AVR risk

✓Recommendations are based on limited data

✓Asymptomatic patients with severe AS undergoing non cardiac surgery may benefit from an individual risk stratification approach