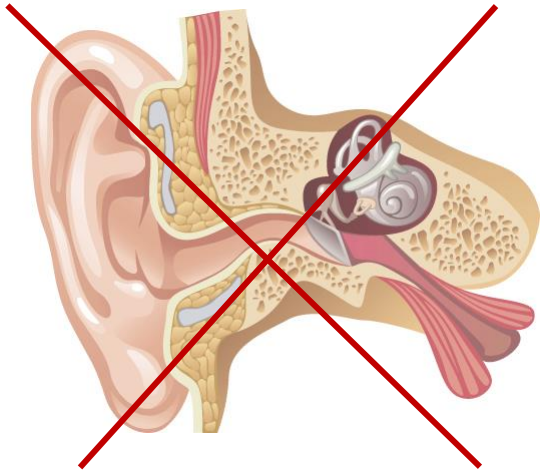
„Der schwindlige Patient“

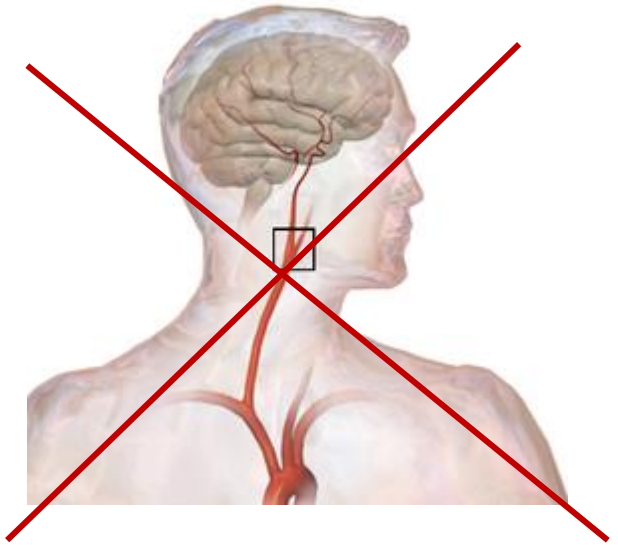
Andrea Amegah-Sakotnik

Herzanästhesie Graz

No conflicts

…Schwindel hat viele Ursachen

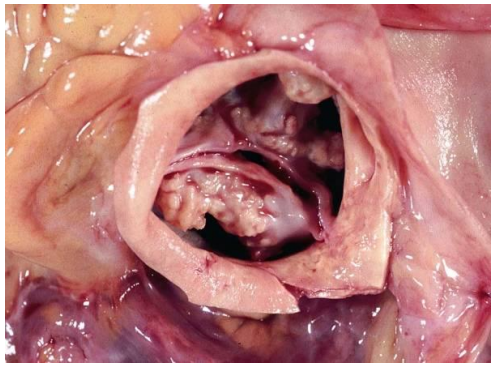




… darum geht es aber heute nicht…

..sondern:

Die Aortenstenose (AS) im nicht-kardiochirurgischen Umfeld



	Mild	Moderat	Schwer
Max. Geschwindigkeit (m/s)	2,6 - 2,9	3.0 - 4,0	≥ 4,0
Mittlerer Gradient (mmHg)	< 20	20 - 40	≥ 40
AÖF (cm²)	> 1,5	1.0 - 1,5	< 1,0
AÖF Index (cm²/m²)	> 0,85	0,60 - 0,85	< 0,6
Velocity Ratio	> 0,50	0,25 - 0,50	< 0,25

ESC European Society of Cardiology

European Heart Journal (2022) **43**, 561–632
https://doi.org/10.1093/eurheartj/ehab395

ESC/EACTS GUIDELINES

2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

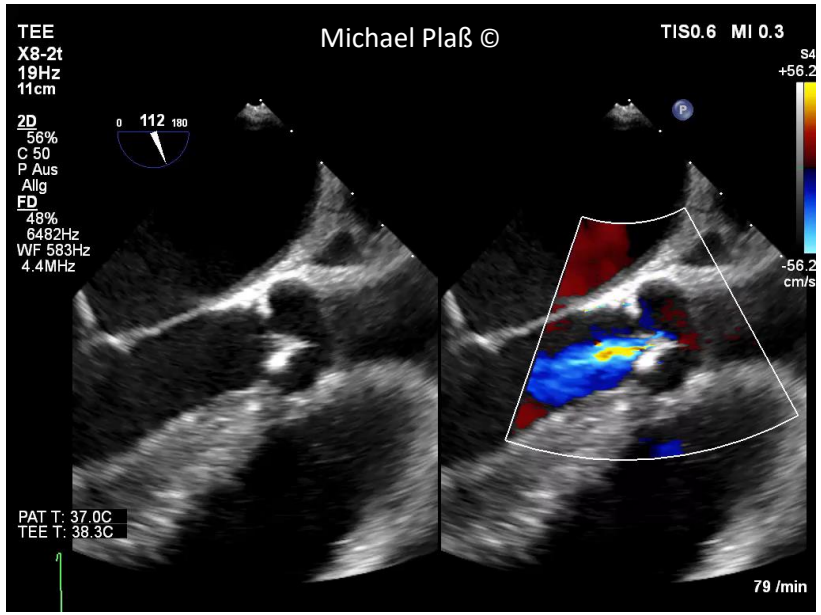
Circulation
Volume 143, Issue 5, 2 February 2021; Pages e35-e71
https://doi.org/10.1161/CIR.0000000000000932

American Heart Association.

ACC/AHA CLINICAL PRACTICE GUIDELINE

2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Evaluierung der AS

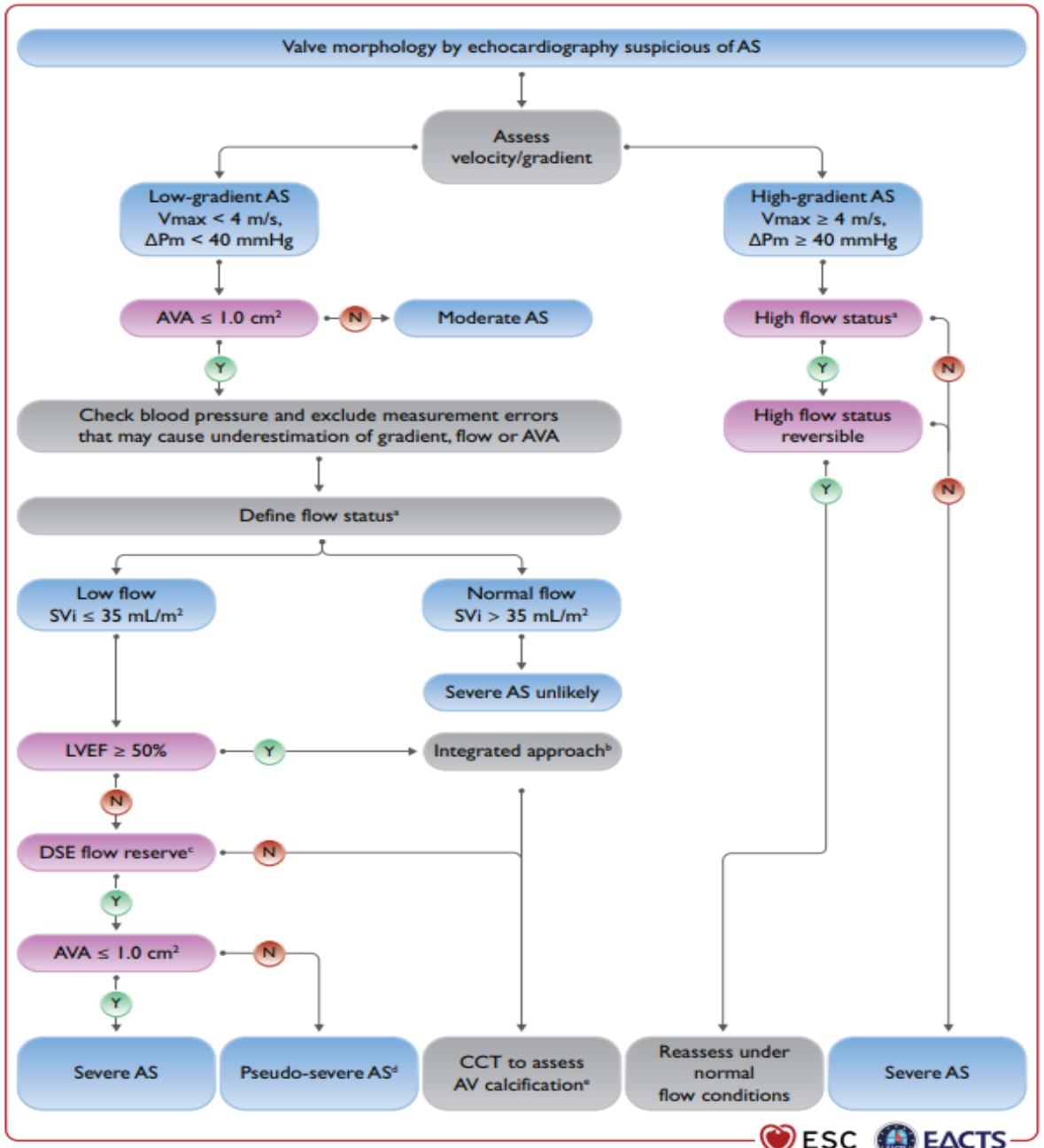


ESC European Society of Cardiology
European Heart Journal (2022) 43, 561–632
https://doi.org/10.1093/eurheartj/ehab395

ESC/EACTS GUIDELINES

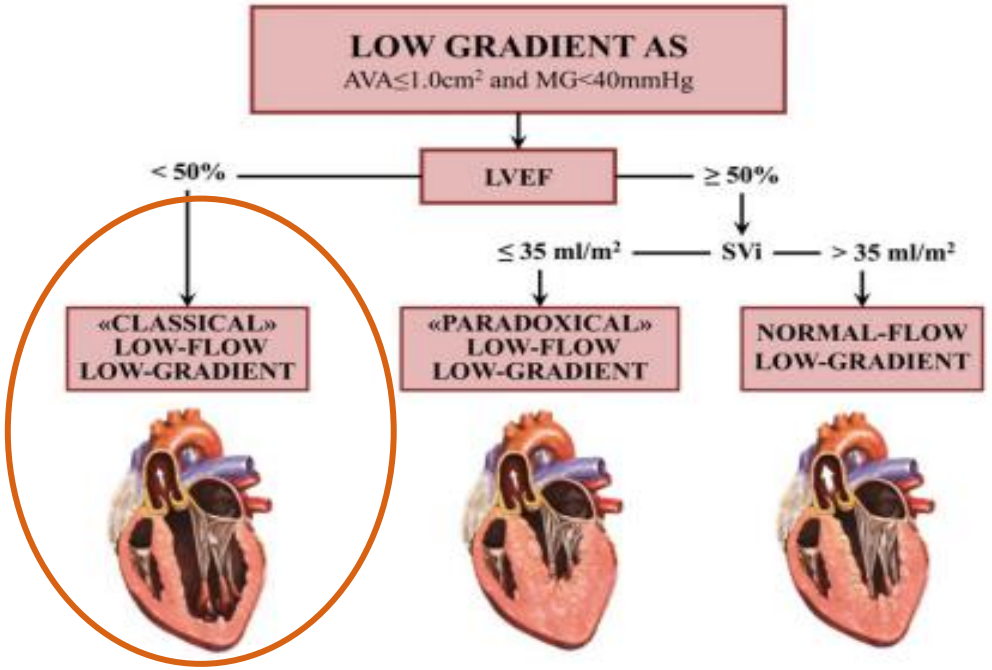
2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)



Hochgradige AS, AVA < 1 cm 2, Differenzierung

High Gradient (HG) (MG ≥ 40 mm Hg)	Low Gradient (LG) (MG < 40 mm Hg)
NF/Very HG Normal Flow (SVI ≥ 35 ml/m2), MG > 60 mm Hg	LF/LG with reduced LVEF Low Flow (SVI < 35 ml/m2), LVEF < 50%
NF/HG Normal Flow (SVI ≥ 35 ml/m2)	LF/LG with preserved LVEF Low Flow (SVI < 35 ml/m2), LVEF ≥ 50%
LF/HG Low Flow (SVI < 35 ml/m2)	NF/LG Normal Flow (SVI ≥ 35 ml/m2)



European Heart Journal (2016) **37**, 2645–2657
doi:10.1093/eurheartj/ehw096

REVIEW

Clinical update

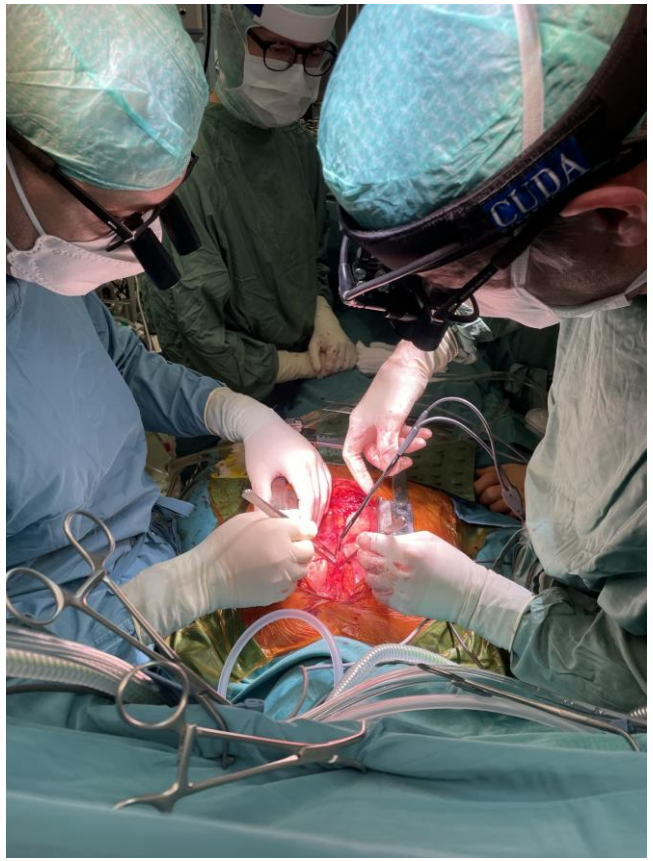
Low-gradient aortic stenosis

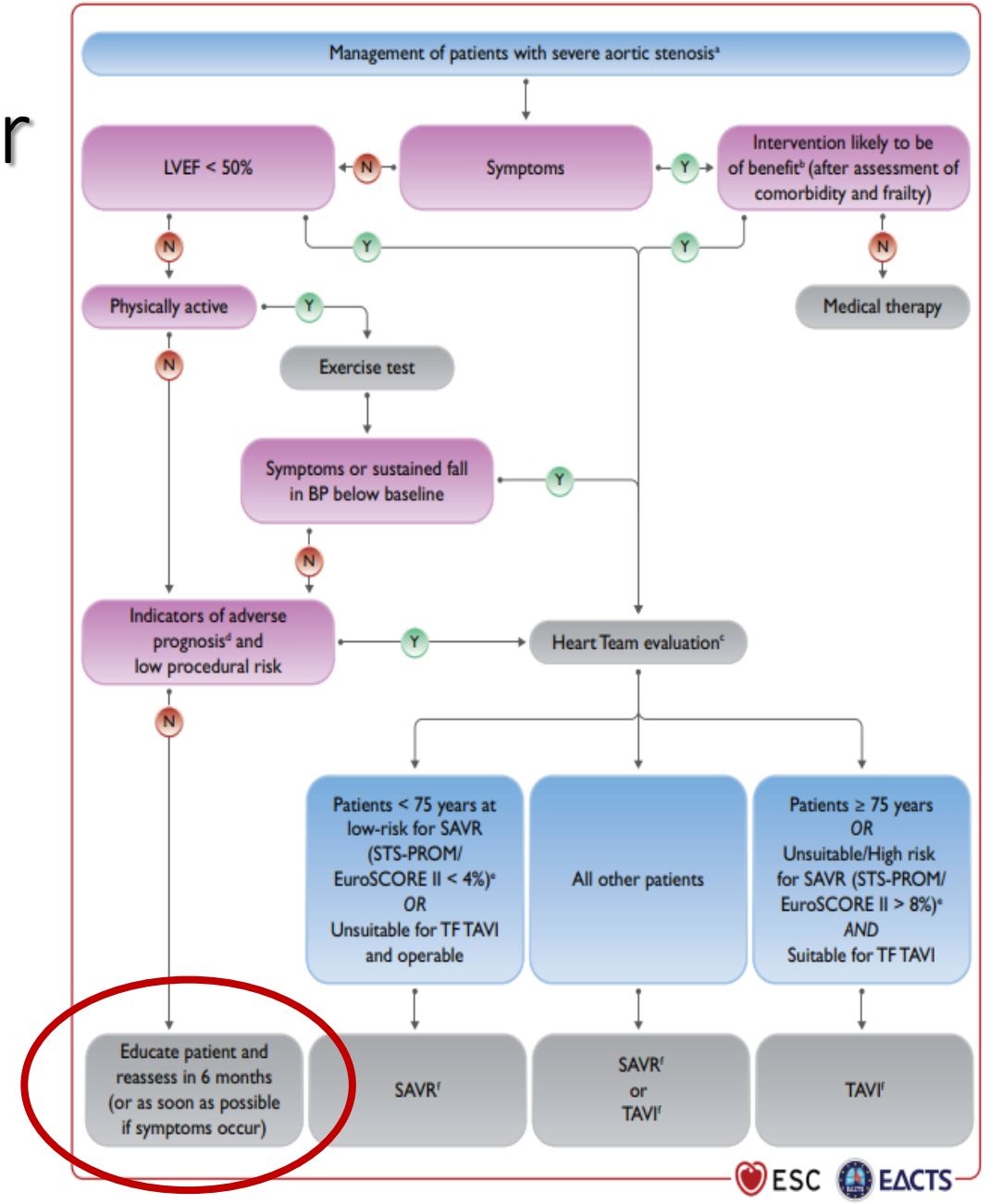
Marie-Annick Clavel[1], Julien Magne[2], and Philippe Pibarot[1]*

[1]Québec Heart and Lung Institute/Institut Universitaire de Cardiologie et de Pneumologie de Québec, Université Laval, 2725 Chemin Sainte Foy, #A-2075, QC, Canada G1V4G5; and [2]CHU Limoges, Hôpital Dupuytren, Faculté de médecine de Limoges, Limoge, France

Received 6 October 2015; revised 22 January 2016; accepted 20 February 2016; online publish-ahead-of-print 31 March 2016

Therapie/Korrektur der Aortenstenose





Aortenstenose relevant für die Anästhesie?

…Severe aortic stenosis constitutes a well-established risk factor for perioperative mortality and myocardial infarction…

European Heart Journal (2014) **35**, 2383–2431
doi:10.1093/eurheartj/ehu282

ESC/ESA GUIDELINES

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

Fall 1

65-jähriger Patient

- Zuweisung in die präop. Ambulanz bei geplanter Carotis TEA links und rezentem Insult mit Hemiparese rechter Unterarm
- Bei der Auskultation: Systolikum 2. ICR rechts parasternal -> Herzecho: Diagnose: hochgradige AST, AVA 0,8 cm^2 , MG 50 mm Hg, konzentrische Hypertrophie, normale LVEF
- MET 5, keine AP-Symptomatik

Was sollen wir tun?

Fall 1

- Gespräch mit dem zuständigen Gefäßchirurgen:

  Hochgradige Carotisstenose mit Plaque im Bereich d. Carotisgabel -> dringliche OP
- Interdisziplinäre Entscheidung zur gefäßchirurg. OP unter intensiviertem Monitoring

Circulation
Volume 143, Issue 5, 2 February 2021; Pages e35-e71
https://doi.org/10.1161/CIR.0000000000000932

ACC/AHA CLINICAL PRACTICE GUIDELINE

15.3. Management of the Asymptomatic Patient

Recommendations for Management of the Asymptomatic Patient With VHD Undergoing Noncardiac Surgery
Referenced studies that support the recommendations are summarized in Online Data Supplement 47.

COR	LOE	Recommendations
2a	B-R	1. In asymptomatic patients with moderate or greater degrees of AS and normal LV systolic function, it is reasonable to perform elective noncardiac surgery.[798–800]

European Heart Journal (2014) 35, 2383–2431 doi:10.1093/eurheartj/ehu282

ESC/ESA GUIDELINES

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

…In the case of **urgent non-cardiac surgery** in patients with severe aortic stenosis, such procedures should be performed under more invasive haemodynamic monitoring, avoiding rapid changes in volume status and heart rhythm as far as possible...

Was ist überhaupt das Problem?

Pathophysiologie der Aortenstenose

- Graduelles Geschehen, über Jahre fortschreitend
- Linksherzhypertrophie, Fibrose,
  -> LV Compliance reduziert,
  diastolische Funktionsstörung
- Myokardiale Ischämie
- Periphere Vasodilatation

Patrick J. Lynch, medical illustrator

Aortenstenose: Narkoseführung „non-cardiac surgery“

Präoperativ: Stress – Prämedikation!
Normovolämie vor der Einleitung
Perfektes PBM – Ery-Konzentrate?

Monitoring: invasiver RR, ZVK, Harnkatheter (Temperatur)

Intraoperativ: RR-Abfälle (Phenylephrin, frühzeitig Noradrenalin)
Vermeide: Tachykardie! Rhythmusverlust!
Volumsverschiebungen

Postoperativ: Verlängertes Monitoring

ELSEVIER
Journal of the American College of Cardiology
Volume 65, Issue 3, 27 January 2015, Pages 295-302

The Present and Future
Review Topic of the Week
Aortic Stenosis and Perioperative Risk With Noncardiac Surgery

Aortenstenose: Narkoseführung „non-cardiac surgery“

…In conclusion, low- to intermediate risk noncardiac surgery for patients with severe, asymptomatic AS can be performed relatively safely. Intraoperative hypotension was frequent and required prompt and aggressive treatment…

The American Journal of Cardiology
Volume 105, Issue 8, 15 April 2010, Pages 1159-1163

Valvular heart disease

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], Hari P. Chaliki MD [a]

The American Journal of Cardiology
Volume 117, Issue 3, 1 February 2016, Pages 486-488

Readers' Comments

Asymptomatic Severe Aortic Stenosis and Noncardiac Surgery

Giuseppe Tarantini MD, PhD, Luca Nai Fovino MD, Paola Tellaroli MSc, Tommaso Fabris MD, Sabino Iliceto MD

European Heart Journal (2014) 35, 2383–2431
doi:10.1093/eurheartj/ehu282

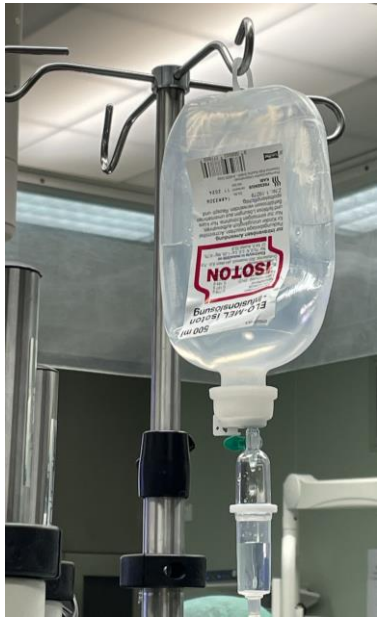
ESC/ESA GUIDELINES

European Society of Anaesthesiology ESA

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

…In the absence of symptoms, severe AS does not seem to increase the perioperative risk for noncardiac surgery…



Fall 2

75-jähriger männlicher Patient der Urologie

- Vorstellung in der präop. Ambulanz
  (Expertise der Herzanästhesie erwünscht)

- Hämaturie, geplante OP: TURP/TURB?

- Bekannte hochgradige AST: LVEF 55%, MG > 65 mm Hg,
  SVI 53 ml/m^2 , AVA 0,6 cm^2

Fall 2

75-jähriger männlicher Patient der Urologie

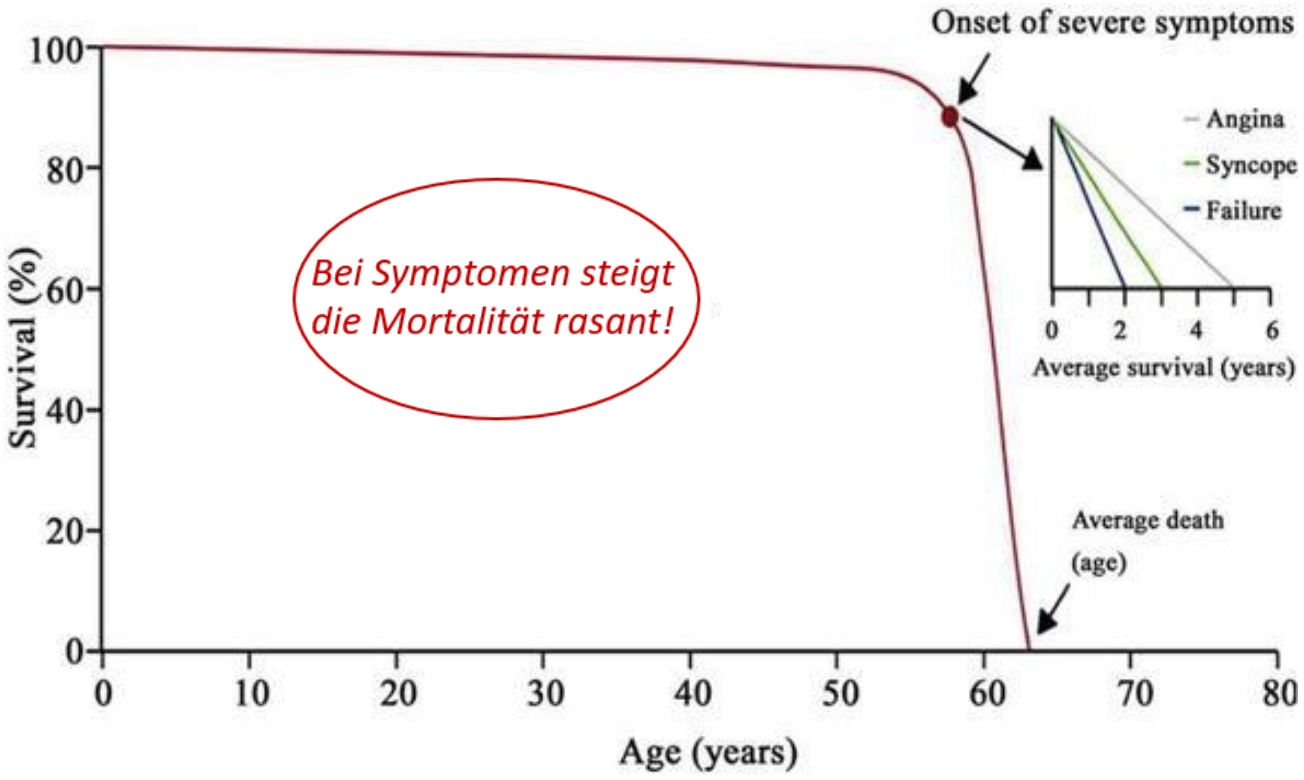
- Aortenstenose (in Observanz), bislang asymptomatisch, jedoch auf der Station 1 x synkopiert, seit kurzem Schwindel

- klagt über starke krampfartige Schmerzen in der Harnblase

Was sollen wir tun?

Symptome der hochgradigen AST

- Schwindel
- Angina pectoris
- Synkope
- Dyspnoe
- Herzversagen



Ross J Jr, Braunwald E. Circulation 1968;38 (SupplV): 61

Interdisziplinäre Abwägung:
AVR oder TAVI oder BAV präoperativ ?

Med Uni Graz

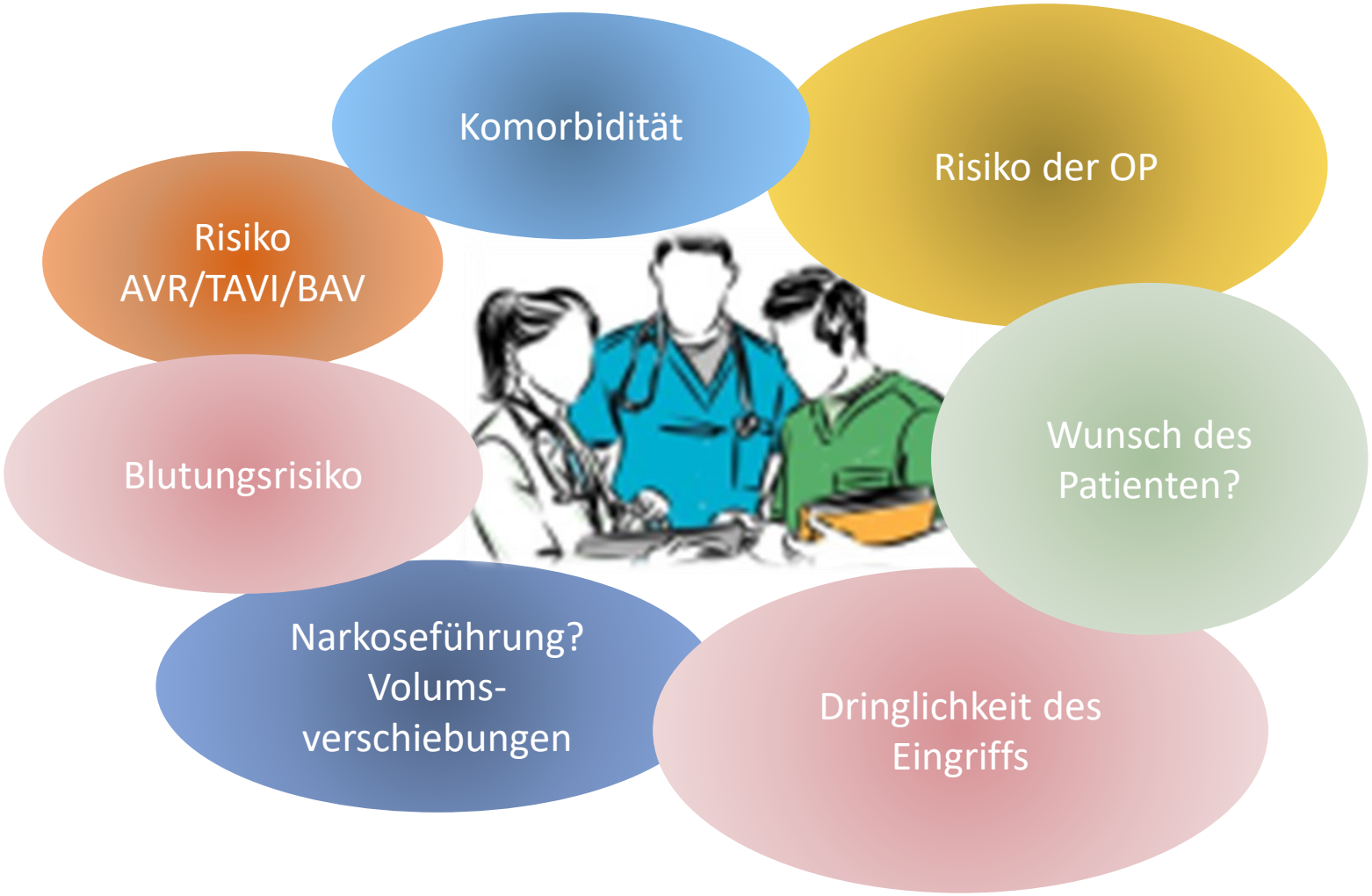


Table 3 Surgical risk estimate according to type of surgery or intervention[a,b]

Low-risk: < 1%	Intermediate-risk: 1–5%	High-risk: > 5%
• Superficial surgery • Breast • Dental • Endocrine: thyroid • Eye • Reconstructive • Carotid asymptomatic (CEA or CAS) • Gynaecology: minor • Orthopaedic: minor (meniscectomy) • Urological: minor (transurethral resection of the prostate)	• Intraperitoneal: splenectomy, hiatal hernia repair, cholecystectomy • Carotid symptomatic (CEA or CAS) • Peripheral arterial angioplasty • Endovascular aneurysm repair • Head and neck surgery • Neurological or orthopaedic: major (hip and spine surgery) • Urological or gynaecological: major • Renal transplant • Intra-thoracic: non-major	• Aortic and major vascular surgery • Open lower limb revascularization or amputation or thromboembolectomy • Duodeno-pancreatic surgery • Liver resection, bile duct surgery • Oesophagectomy • Repair of perforated bowel • Adrenal resection • Total cystectomy • Pneumonectomy • Pulmonary or liver transplant

ESC/ESA GUIDELINES

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

Intervention (AVR oder TAVI oder BAV) präoperativ ?

…in the case of elective non-cardiac surgery, the presence of symptoms is essential for decision-making…

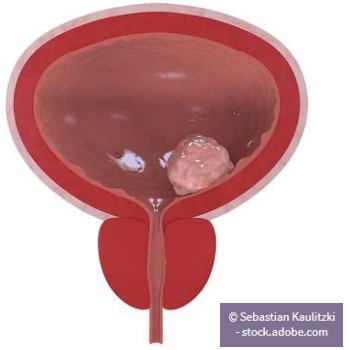
…in symptomatic patients, aortic valve replacement should be considered before elective surgery…

European Heart Journal (2014) 35, 2383–2431 ESC/ESA GUIDELINES
doi:10.1093/eurheartj/ehu282

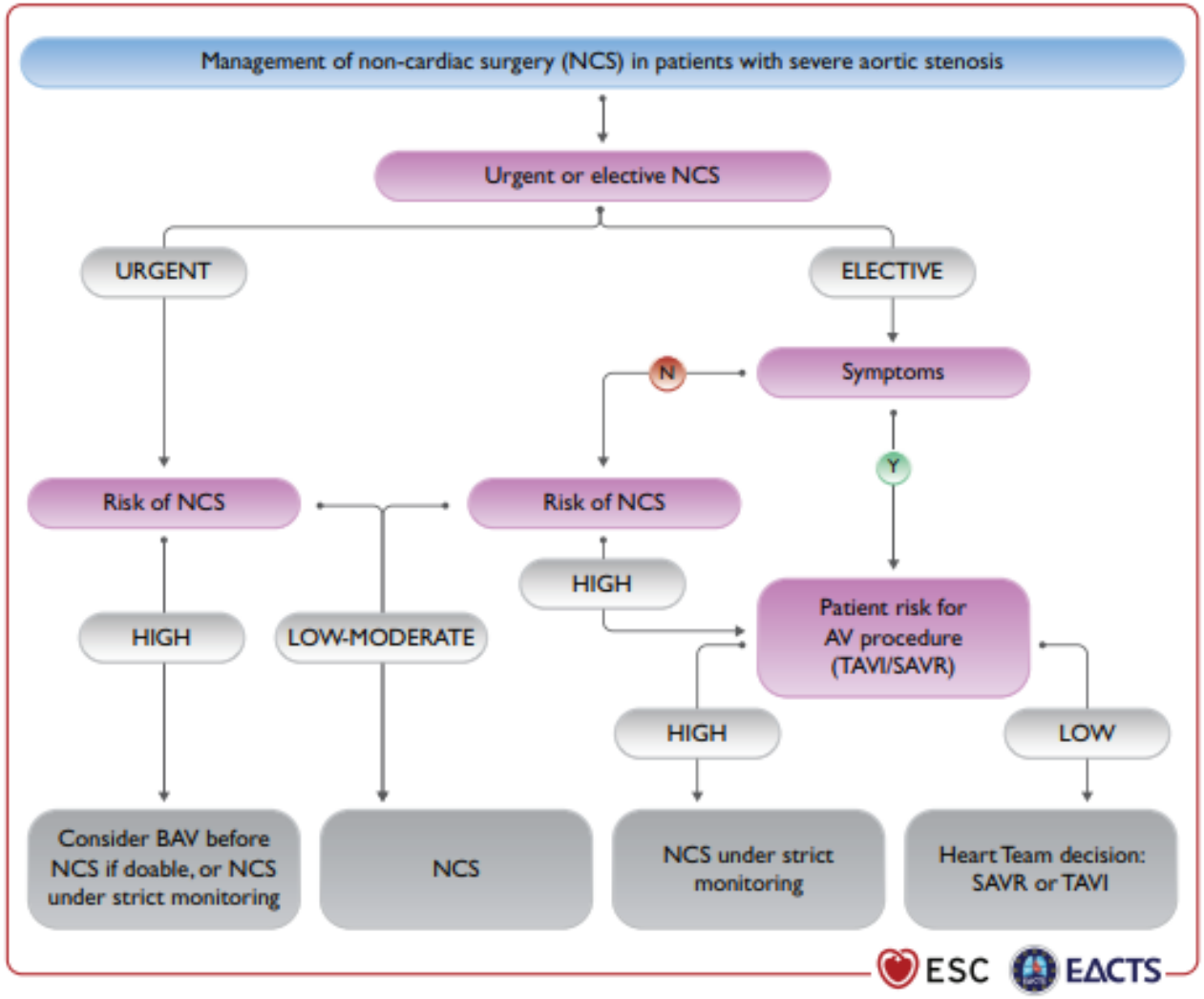
2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

…aber: dringliche OP!



Empfehlungen ESC/EACTS



ESC European Society of Cardiology
European Heart Journal (2022) **43**, 561–632
https://doi.org/10.1093/eurheartj/ehab395

ESC/EACTS GUIDELINES

2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Fall 2

75-jähriger männlicher Patient der Urologie

- Entscheidung zur OP in Allgemeinnarkose unter exzessivem hämodynamischen Monitoring
- Initial problemloser Verlauf
- Postop. Tag 3: Akute kardiale Dekompensation mit Kammerflimmern, CPR kein ROSC erreichbar. Patient ist leider verstorben.
- Anämie als (Mit-)Ursache?!

AS und Spinalanästhesie?

Dan Med J 64/9 | September 2017 | DANISH MEDICAL JOURNAL | 1

Central regional anaesthesia in patients with aortic stenosis – a systematic review

Sofia Johansson & Morten Nikolaj Lind

Journal of Cardiothoracic and Vascular Anesthesia 34 (2020) 1586–1587

Contents lists available at ScienceDirect

Journal of Cardiothoracic and Vascular Anesthesia

journal homepage: www.jcvaonline.com

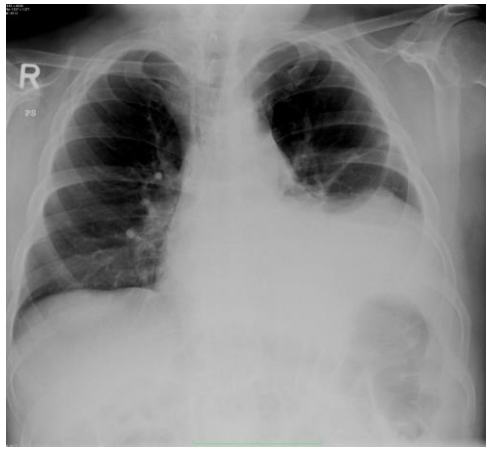
Case Report

Spinal Anesthesia for Transcatheter Aortic Valve Implantation (TAVI)

Vincent Lecluyse, MD, FRCPC[1]

Department of Anesthesia, Hôpital du Sacré-Coeur de Montréal, Université de Montréal, Montréal, Québec, Canada

Fall 3



70-jährige Patientin der Thoraxchirurgie

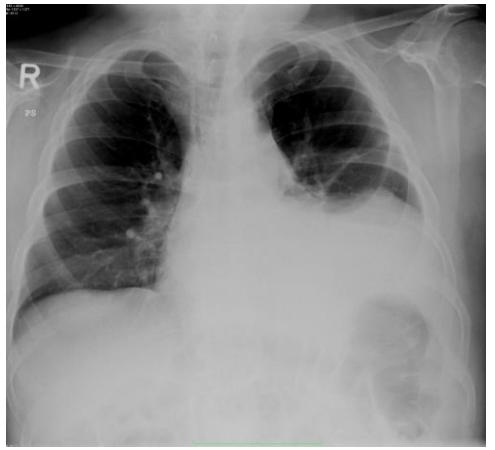
- Stationäre Aufnahme wegen eines Pleuraempyems links
- st.p. Serienrippenfraktur und TSD
- Sturz im Rahmen von Schwindel bei bekannter hochgradiger AS

TTE vor 1 Monat: AVA 0,7 cm^2

MG 37 mmHg, SVI 30 ml/ m^2, LVEF 60%

Fall 3

70-jährige Patientin der Thoraxchirurgie



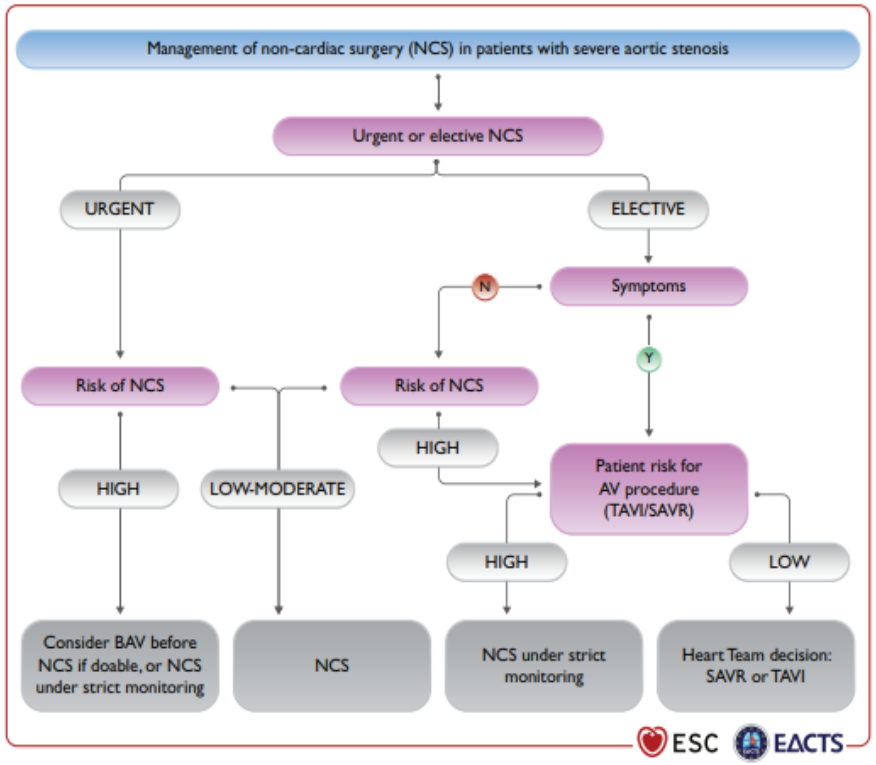
- Dringliche OP!
- Einlungenventilation
- zumindest mittleres OP-Risiko

Circulation
Volume 143, Issue 5, 2 February 2021; Pages e35-e71
https://doi.org/10.1161/CIR.0000000000000932

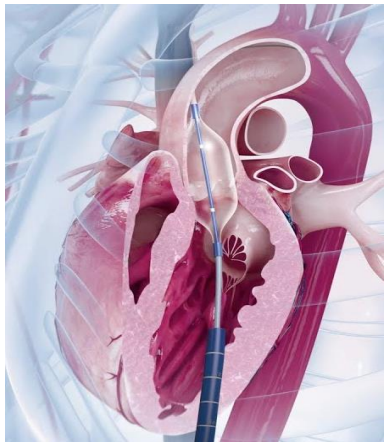
ACC/AHA CLINICAL PRACTICE GUIDELINE

15.2. Management of the Symptomatic Patient

Recommendation for Management of the Symptomatic Patient With VHD Undergoing Noncardiac Surgery		
COR	**LOE**	**Recommendation**
1	C-EO	1. In patients who meet standard indications for intervention for VHD (replacement and repair) on the basis of symptoms and disease severity, intervention should be performed before elective noncardiac surgery to reduce perioperative risk if possible, depending on the urgency and risk of the noncardiac procedure.[797]



Fall 3



70-jährige Patientin der Thoraxchirurgie

Interdisziplinäre Entscheidung: Präoperative Ballonvalvuloplastie (BAV)

Circulation

Three-year outcome after balloon aortic valvuloplasty. Insights into prognosis of valvular aortic stenosis.

C M Otto, M C Mickel, J W Kennedy, E L Alderman, T M Bashore, P C Block, J A Brinker, D Diver, J Ferguson and D R HolmesJr

Originally published 1 Feb 1994 | https://doi.org/10.1161/01.CIR.89.2.642 | Circulation. 1994;89:642–650

…Long-term survival after balloon aortic valvuloplasty is poor with 1- and 3-year. Although survivors report fewer symptoms, early restenosis and recurrent hospitalization are common…

JACC Interventions

JACC: CARDIOVASCULAR INTERVENTIONS

PUBLISHED BY ELSEVIER INC.

Complications and Outcome of Balloon Aortic Valvuloplasty in High-Risk or Inoperable Patients

Itsik Ben-Dor, MD, Augusto D. Pichard, MD, Lowell F. Satler, MD, Steven A. Goldstein, MD, Asmir I. Syed, MD, Michael A. Gaglia Jr, MD, MSc, Gaby Weissman, MD, Gabriel Maluenda, MD, Manuel A. Gonzalez, MD, MPH, Kohei Wakabayashi, MD, Sara D. Collins, MD, Rebecca Torguson, MPH, Petros Okubagzi, MD, Zhenyi Xue, MS, Kenneth M. Kent, MD, PhD, Joseph Lindsay, MD, Ron Waksman, MD

…Long-term survival is poor after BAV alone. BAV as a bridge to percutaneous or surgical aortic valve replacement is feasible, safe, and associated with better outcome than BAV alone…

Fall 4

78-jährige Patientin der Gefäßchirurgie

- Wegen Schwindel beim niedergelassenen Neurologen – ACI Stenose rechts 85% - ad Gefäßchirurgie zur elektiven Carotis TEA
- Präoperativen Ambulanz: laut Patientin gute Belastbarkeit (??)

Pulmonalvenöse Stauung im Thoraxröntgen; Systolikum

-> Herzecho:

Hochgradige AS, low-flow, low-gradient; MG 34 mm Hg, AVA 0,7 cm^2,
SVI 30 ml, LVEF 40%

Fall 4

78-jährige Patientin der Gefäßchirurgie

- Wiedervorstellung mit Befund v. Herzecho:

  Patientin meint, dass sie doch kaum belastbar sei und bei geringer Belastung unter Dyspnoe leide

Schwindel tatsächlich von der ACI-Stenose?

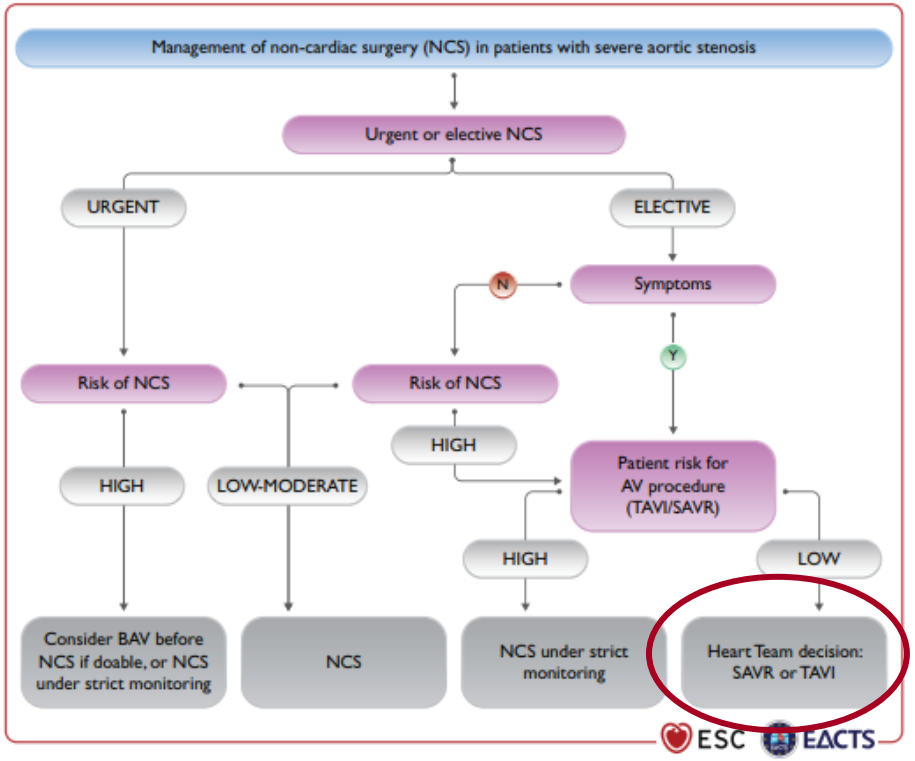
Fall 4

78-jährige Patientin der Gefäßchirurgie

Heart-Team & Gefäßchirurgie:

Herzkatheter:

KHK I – LAD Stenose



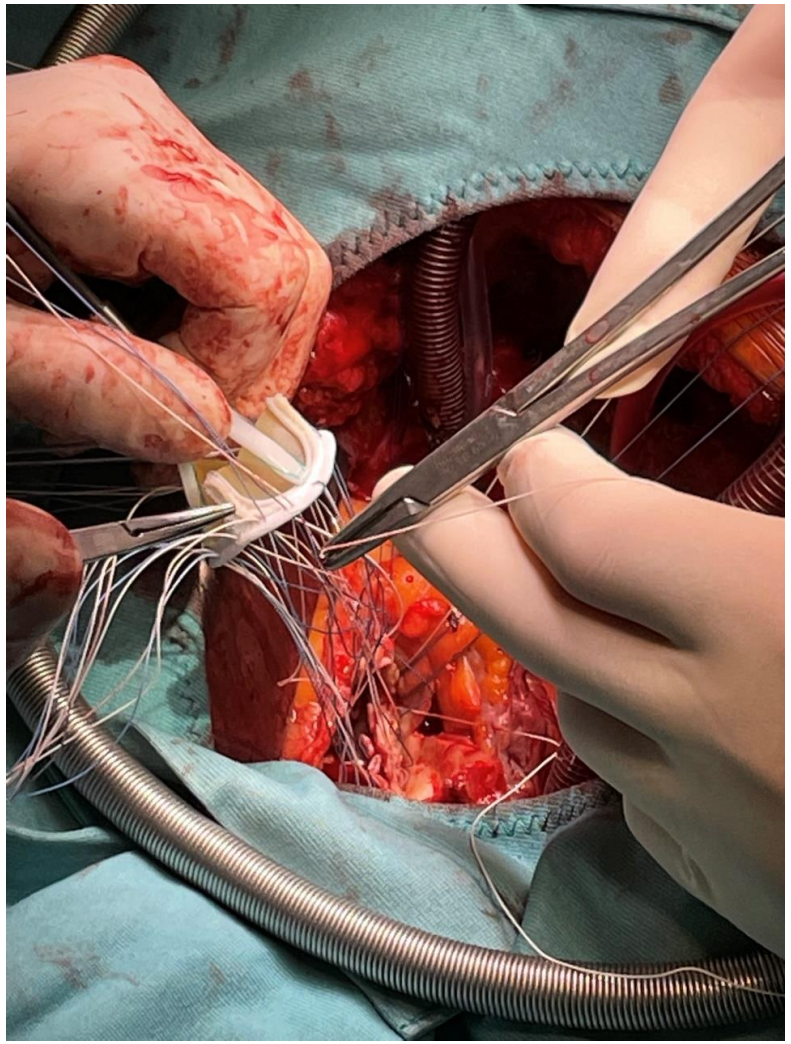
Fall 4

78-jährige Patientin der Gefäßchirurgie

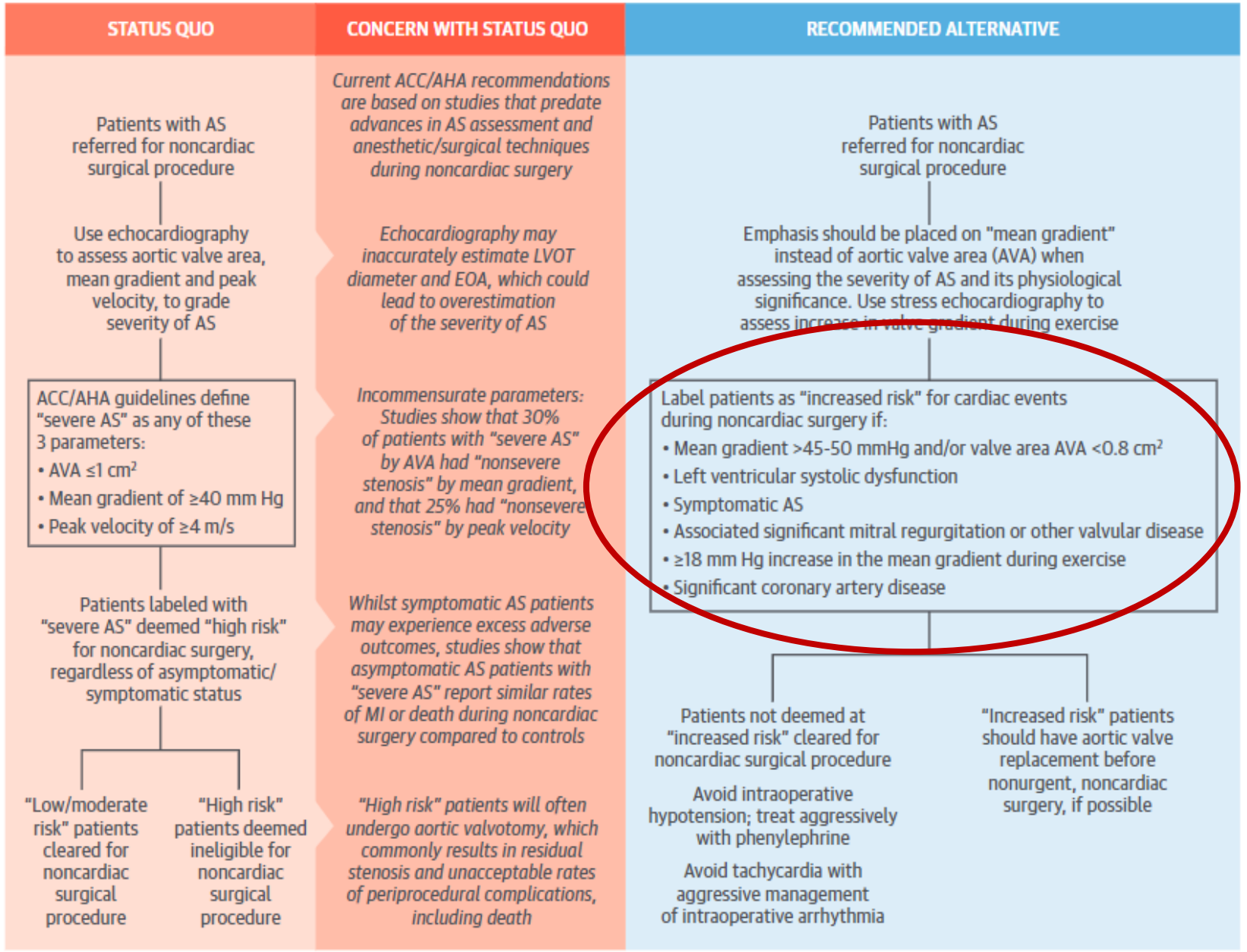
Heart-Team & Gefäßchirurgie:

3 Tage später: AVR, CABG elektiv

3 Monate später: Carotis TEA im Intervall



CENTRAL ILLUSTRATION **Concerns With Current Noncardiac Surgical Risk Assessments in Patients With Aortic Stenosis**



ELSEVIER

Journal of the American College of Cardiology

Volume 65, Issue 3, 27 January 2015, Pages 295-302

The Present and Future

Review Topic of the Week

Aortic Stenosis and Perioperative Risk With Noncardiac Surgery

Padmaraj Samarendra MD *, †, ⁂, Michael P. Mangione MD ‡, §

…low-flow AS…

…BNP?

BNP – prognostischer Faktor bei AS?

…In this large cohort of patients with moderate or severe AS, BNP clinical activation…was a powerful predictor of long-term mortality, incrementally and independently of all baseline characteristics...

…Moreover BNP was a quantitative marker of outcome, whereby higher activation predicted higher mortality…

…identify those with high-risk asymptomatic aortic stenosis who may benefit from early intervention…

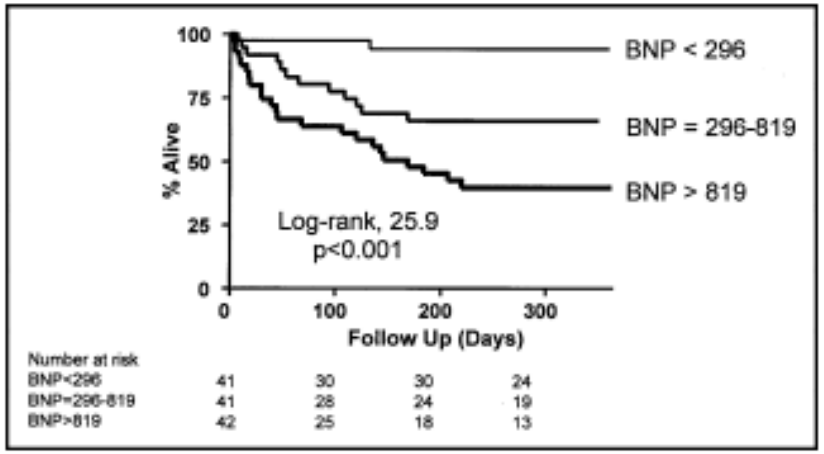


Figure 3. The effect of BNP levels on survival in AS. Patients with BNP levels from 296 to 819 pg/ml and >819 pg/ml had progressively reduced survival.

Journal of the American College of Cardiology
Volume 63, Issue 19, 20 May 2014, Pages 2016-2025

Clinical Research
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, Allan S. Jaffe MD, Douglas W. Mahoney MS, Maurice Enriquez-Sarano MD

The American Journal of Cardiology
Volume 96, Issue 10, 15 November 2005, Pages 1445-1448

Valvular heart disease

Usefulness of an Elevated B-Type Natriuretic Peptide in Predicting Survival in Patients With Aortic Stenosis Treated Without Surgery

Matthew G. Nessmith MD, Hidekatsu Fukuta MD, Steffen Brucks MD, William C. Little MD

Take home message

- Die hochgradige AS ist eine outcome-relevante Erkrankung wenn Symptome bestehen bzw. ein großer chirurgischer Eingriff geplant ist
- Präoperative Evaluierung (Auskultation!), niederschwelliger Zugang zum Herzecho, Klassifizierung, CAVE: low-flow status; BNP?
- Interdisziplinäre Besprechung des Vorgehens
- Intensiviertes Patient Blood Management!

Med Uni Graz

Take home message

Intraoperativ: erweitertes hämodynamisches Monitoring

Vermeide:

- Stress
- RR-Abfälle
- Tachykardie
- Hypovolämie

} *Normo…!*

Med Uni Graz

Vielen Dank für die Aufmerksamkeit!