VHD in non-cardiac surgery: perioperative strategies

Simona Sperlongano, MD, PhD, FISC

Division of Cardiology, Department of Traslational Medical Sciences,
University of Campania Luigi Vanvitelli, Naples, Italy

Email: simona.sperlongano@unicampania.it

In patients with valvular heart disease (VHD) who undergo non-cardiac surgery (NCS), the risk of peri-operative cardiovascular complications is increased.

The risk’ s magnitude depends on:

- Type and severity of VHD (the risk is increased in patients with obstructive valve disease);
- the type of NCS (low, intermediate or high-risk surgery, and urgent vs non-urgent surgery).

ESC European Society of Cardiology
European Heart Journal (2022) **43**, 3826–3924
https://doi.org/10.1093/eurheartj/ehac270

ESC GUIDELINES

2022 ESC Guidelines on cardiovascular assessment and management of patients undergoing non-cardiac surgery

ESC European Society of Cardiology
European Heart Journal (2025) **00**, 1–102
https://doi.org/10.1093/eurheartj/ehaf194

ESC GUIDELINES

2025 ESC/EACTS Guidelines for the management of valvular heart disease

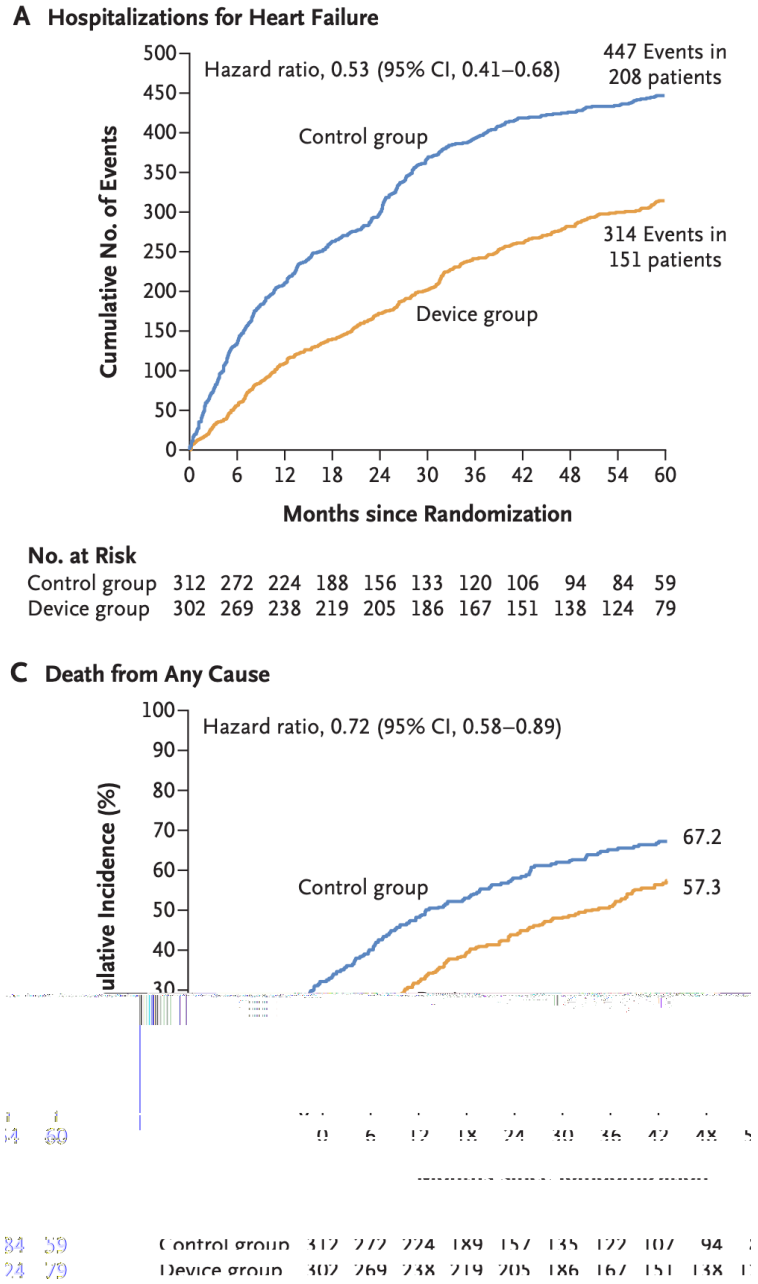
Developed by the task force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Clinical and echocardiographic evaluation is recommended in ALL PATIENTS with **KNOWN OR SUSPECTED VHD** who are scheduled for **ELECTIVE INTERMEDIATE- OR HIGH-RISK NCS**.

MITRAL VALVE REGURGITATION

Mitral valve regurgitation		
In patients with symptomatic severe primary MR or asymptomatic severe primary MR with LV dysfunction (LVESD ≥40 mm and/or LVEF ≤60%), valve intervention (surgical or transcatheter) should be considered prior to intermediate- or high-risk NCS, if time allows.	**IIa**	**C**
In patients with severe secondary MR who remain symptomatic despite guideline-directed medical therapy (including CRT if indicated), valve intervention (transcatheter or surgical) should be considered before NCS, in eligible patients with an acceptable procedural risk.	**IIa**	**C**

Non-cardiac surgery can usually be performed safely in asymptomatic patients with severe MR or AR and preserved LV function. If NCS is urgent, patients should undergo surgery under strict haemodynamic monitoring, regardless of symptom status. In cases of elective (non-urgent) NCS in patients with severe ventricular SMR, medical therapy should be optimized. If symptoms persist and NCS is intermediate or high risk, TEER should be considered after Heart Team discussion based on clinical and anatomical selection criteria.[194,584] Valve treatment should be performed for patients with AR meeting the criteria for valve intervention before any elective intermediate- or high-risk NCS.[966,967]



NCS can be performed safely in **ASYMPTOMATIC** patients with severe MR **PRESERVED LVEF** (NCS is usually well-tolerated in these patients).

If NCS is **URGENT**, patients with severe MR should undergo surgery under strict haemodynamic monitoring, regardless of symptom status.

Peri-operative haemodynamic goals

1) Normal-high heart rate

A higher heart rate will shorten systolic time and, consequently, regurgitant volume (MR occurs during systole).

2) Sinus rhythm

Mantaining sinus rhythm will preserve the atrial contribution to cardiac output.

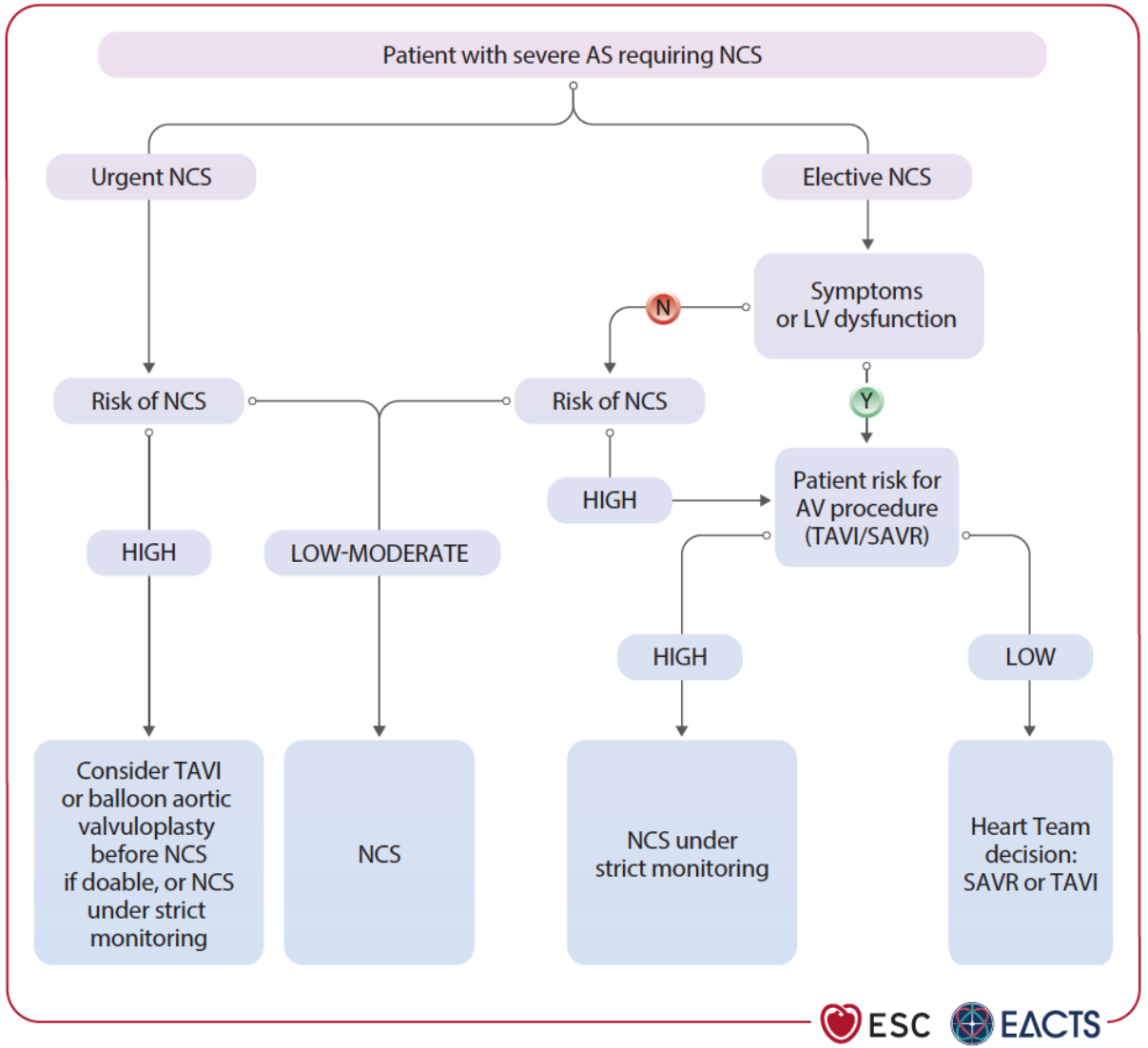
3) Mild preload increase

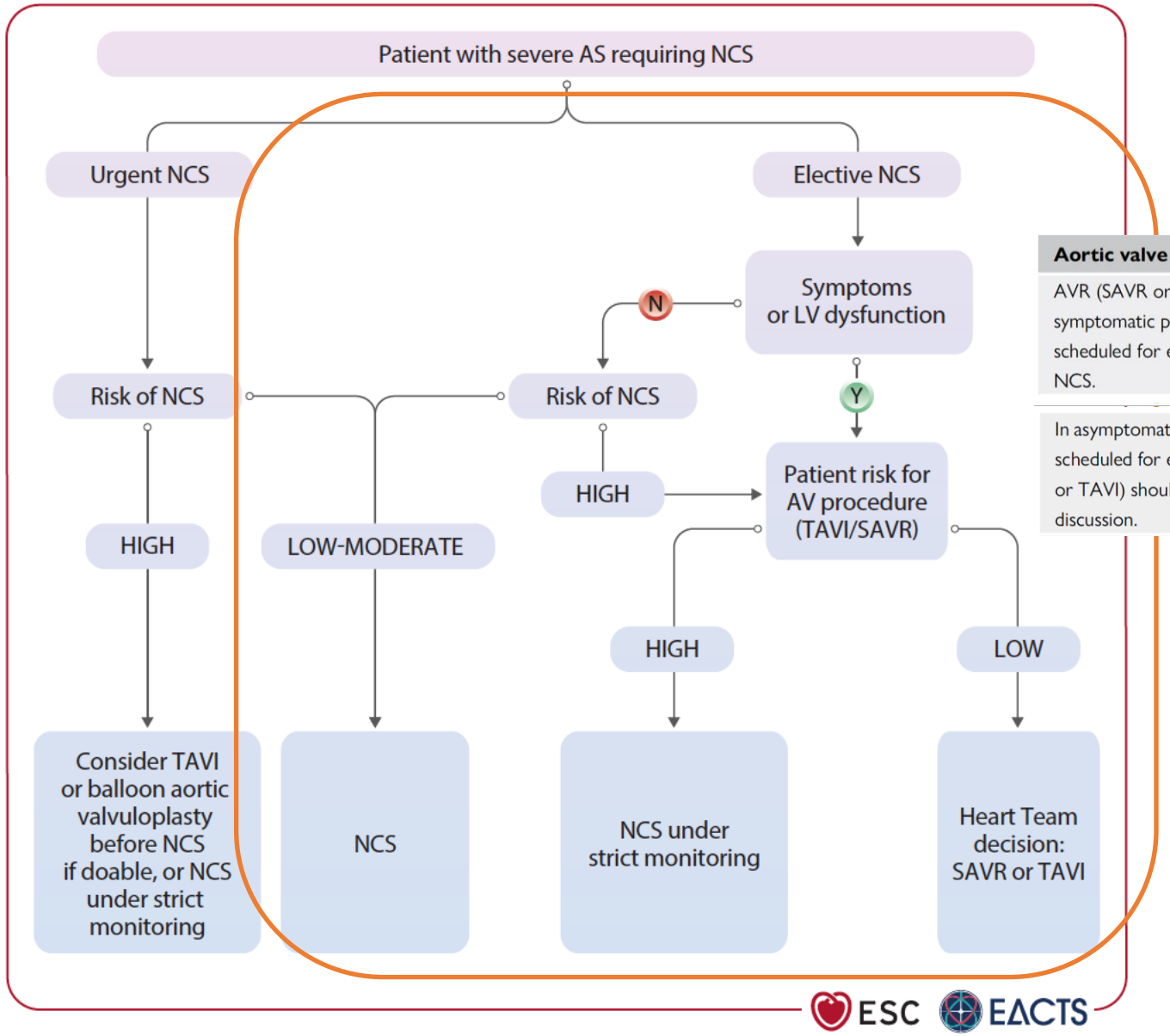
Mild preload augmentation and mainteinance will ensure adequate forward flow.

4) Afterload reduction

A decreased afterload will promote a reduction in regurgitant volume and increase in forward systemic flow.

AORTIC VALVE STENOSIS



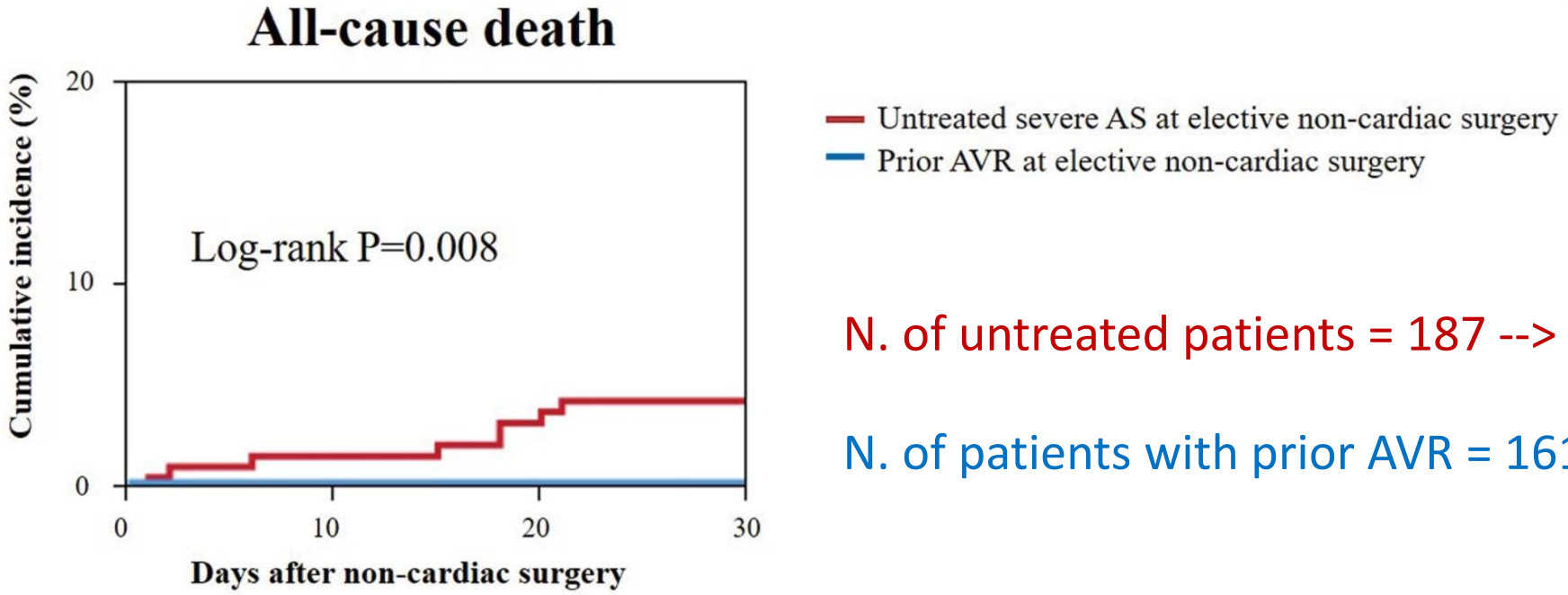


Aortic valve stenosis		
AVR (SAVR or TAVI) is recommended in symptomatic patients with severe AS who are scheduled for elective intermediate- or high-risk NCS.	I	C
In asymptomatic patients with severe AS who are scheduled for elective high-risk NCS, AVR (SAVR or TAVI) should be considered after Heart Team discussion.	IIa	C

CURRENT AS registry

(3815 patients with symptomatic and asymptomatic severe AS,

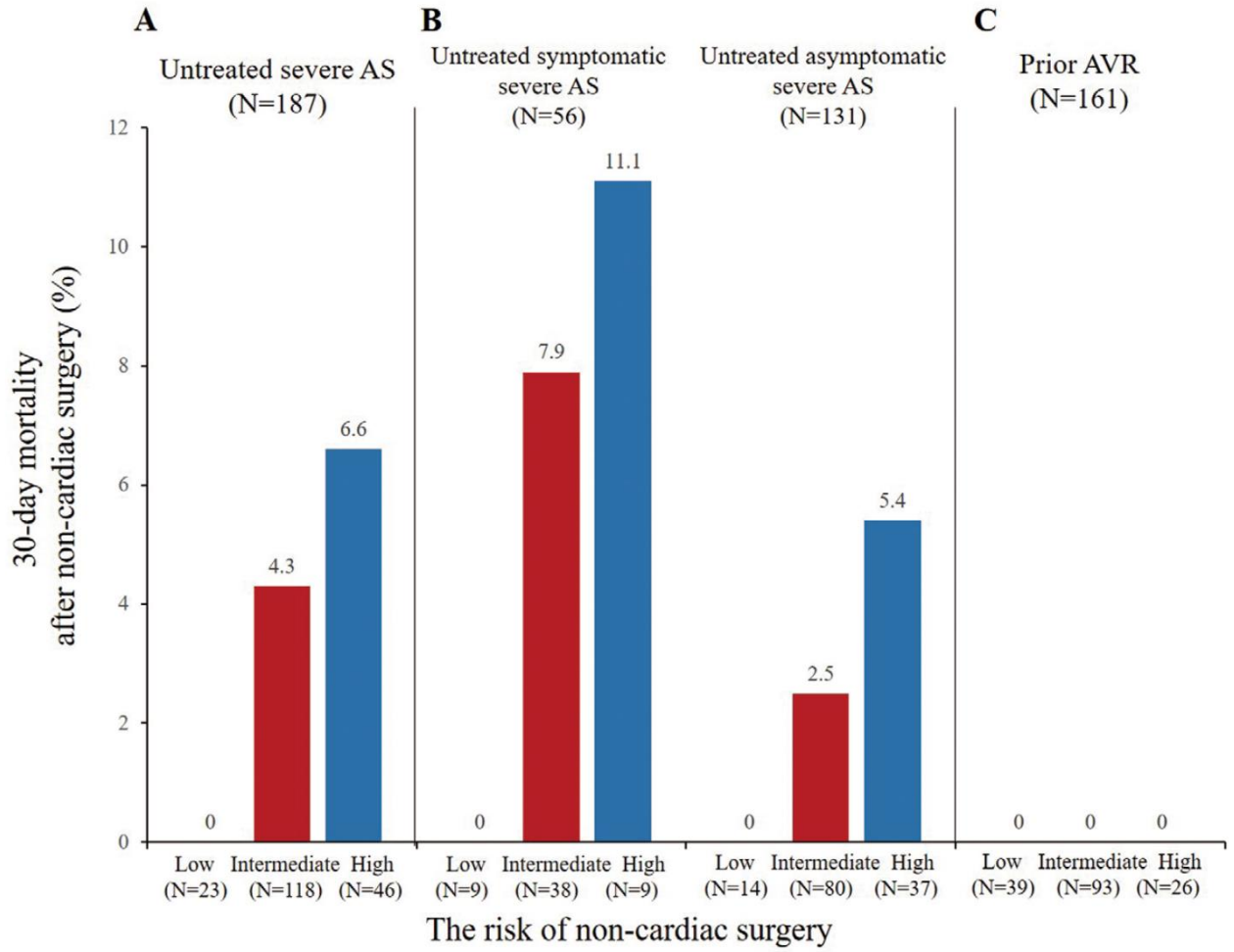
Jan 2003 – Dec 2011, 27 centers in Japan)



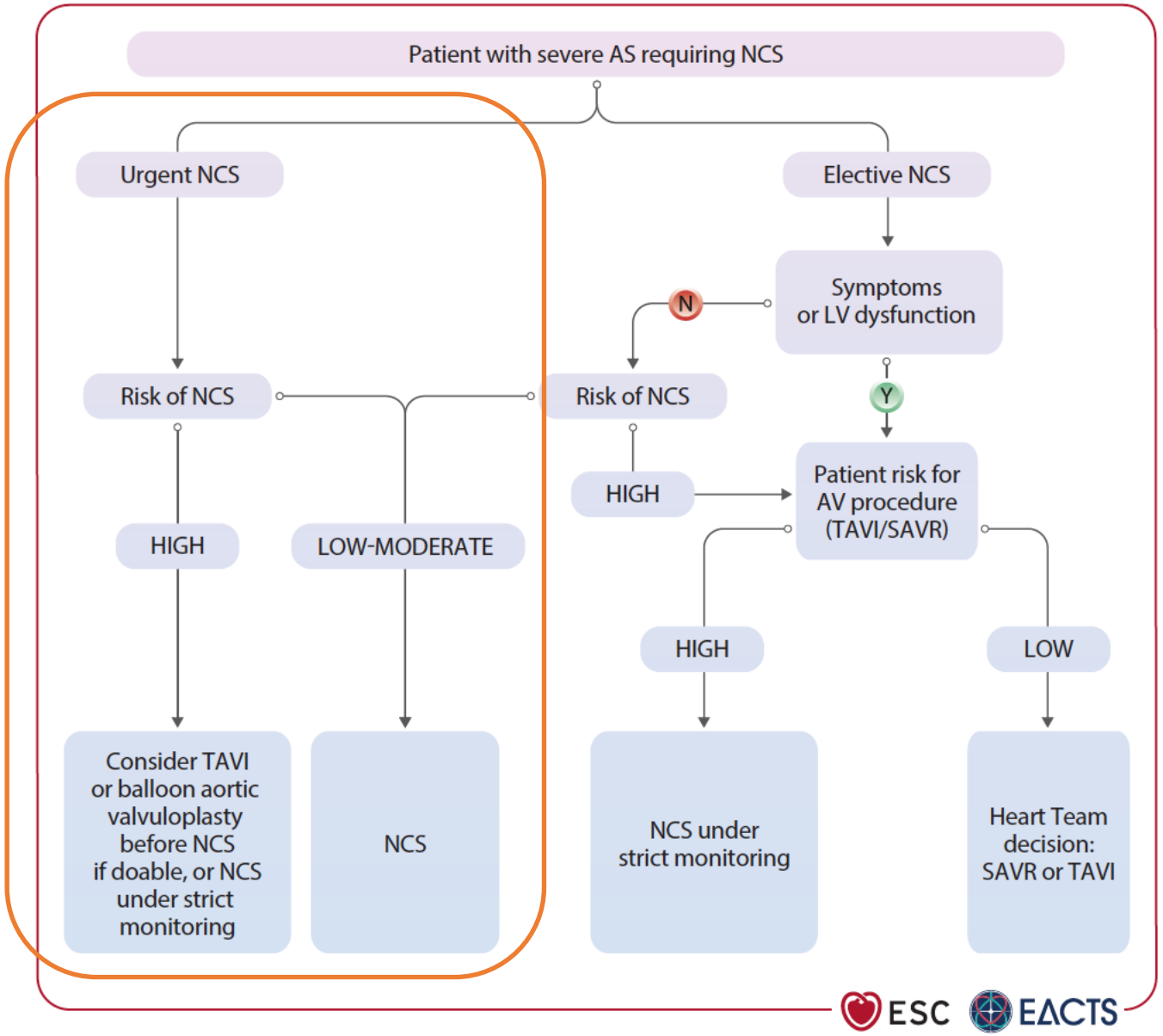
N. of untreated patients = 187 --> 8 (4.3%) died at 30 days

N. of patients with prior AVR = 161 --> no died at 30 days

Symptomatic and **asymptomatic** severe AS is associated with higher risk of 30-day mortality if untreated before elective **intermediate**- and **high-risk** NCS.



Among untreated patients with severe AS, mortality at 30 days is higher in **high-** than intermediate-risk surgery, and in **symptomatic** than asymptomatic patients.


Patient with severe AS requiring NCS
Urgent NCS
Elective NCS
Symptoms or LV dysfunction
N
Y
Risk of NCS
Risk of NCS
HIGH
LOW-MODERATE
HIGH
Patient risk for AV procedure (TAVI/SAVR)
HIGH
LOW
Consider TAVI or balloon aortic valvuloplasty before NCS if doable, or NCS under strict monitoring
NCS
NCS under strict monitoring
Heart Team decision: SAVR or TAVI
ESC
EACTS

Peri-operative haemodynamic goals

1) Normal-slow heart rate

Tachycardia should be avoided to ensure adequate diastolic filling and, consequently, adequate stroke volume.

Adequate LV diastolic filling also allows for greater coronary perfusion (in patients affected by AS left ventricle is sensitive to ischaemia).

Excessive bradycardia should also be avoided because cardiac output may become extremely low due to the fixed aortic orifice.

2) Sinus rhythm

Atrial contribution should be preserved since, in patients with AS, it accounts for ~ 40% of the total stroke volume, due to left ventricular diastolic dysfunction.

Since arrhythmias are poorly tolerated, defibrillator and beta-blockers should be ready.

3) Adequate preload

Preload should be mainteined to ensure adequate LV filling and stroke volume.

4) Normal/increased afterload

Afterload should be manteined since a reduction in systemic vascular resistence can’t be adequately compensated for by an increase in stroke volume, due to the narrowed and fixed aortic orifice.

Intra-operative hypotension should be treated immediately and aggressively with a direct α-adrenergic agonist.

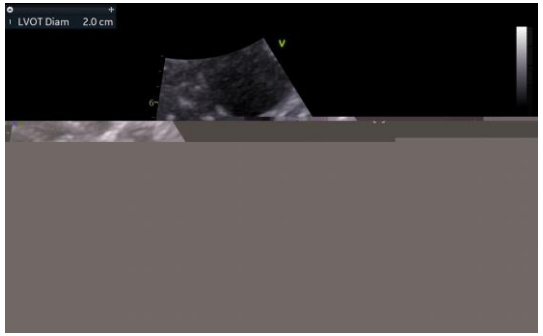
CASE REPORT

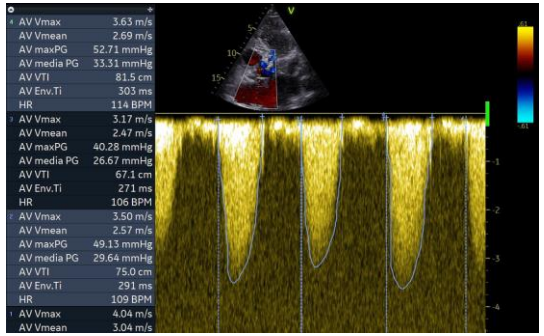
- Vittorio, 86 year-old man;
- Systemic arterial hypertension;
- Permanent atrial fibrillation treated with **edoxaban 30 mg** once daily (according to renal function).

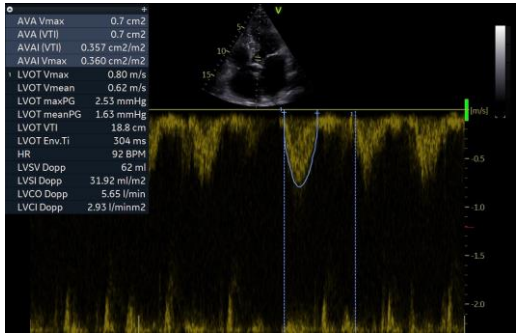
On **29 March 2025**, the patient was admitted to the geriatric ward of our hospital for anaemia requiring blood transfusions.

Edoxaban was discontinued and replaced with **Enoxaparin 6000 U every 12 hours**, according to age, body weight, and renal function.

ECHOCARDIOGRAPHY (the patient reported to be **symptomatic for dyspnea during moderate efforts** for several months).





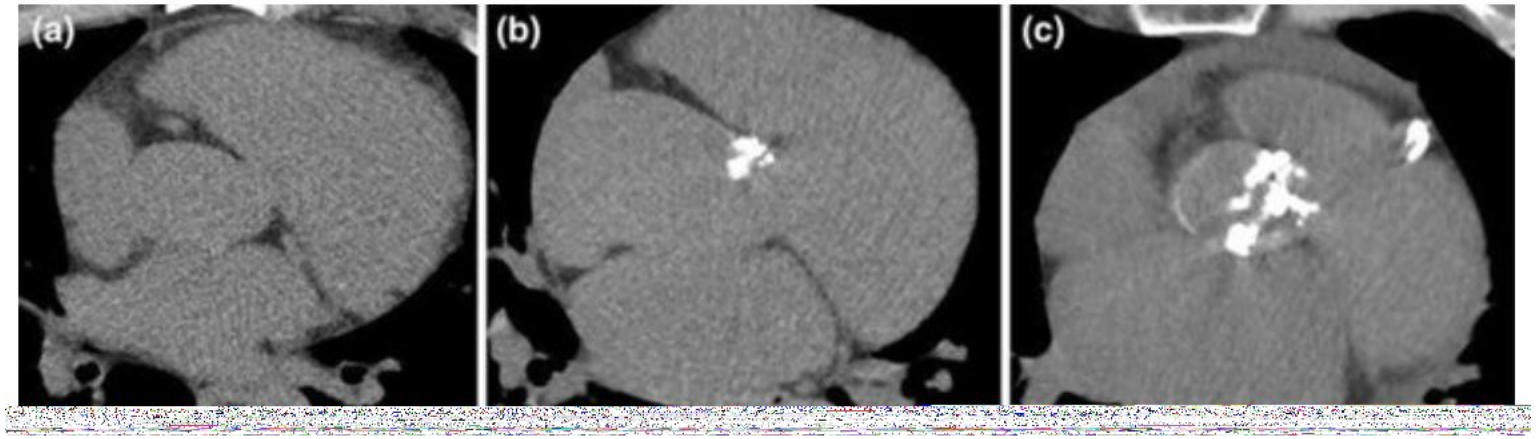


→PARADOXICAL LOW FLOW - LOW GRADIENT AORTIC STENOSIS:

- AVA = 0.7 cm^2 (AVAi = 0.38 cm^2/m^2);
- Mean gradient = 34 mmHg;
- SVi = 32 ml/m^2;
- LVEF = 55% with Simpson biplane method

CARDIAC MULTIDETECTOR COMPUTED TOMOGRAPHY

→**SEVERE AORTIC STENOSIS** (≥ 2000 Agatston Units)



Int J Cardiovasc Imaging
DOI 10.1007/s10554-015-0783-y

COLONSCOPY

→Lesion in the ascending colon: 5 cm, heteroplastic, vegetative, bleeding spontaneously

→Biopsy

→**RIGHT COLON ADENOCARCINOMA** WITH *MUSCULARIS MUCOSAE* INFILTRATION

→Indication for **COLON RESECTION SURGERY (INTERMEDIATE-/HIGH-CARDIOVASCULAR RISK NCS)**

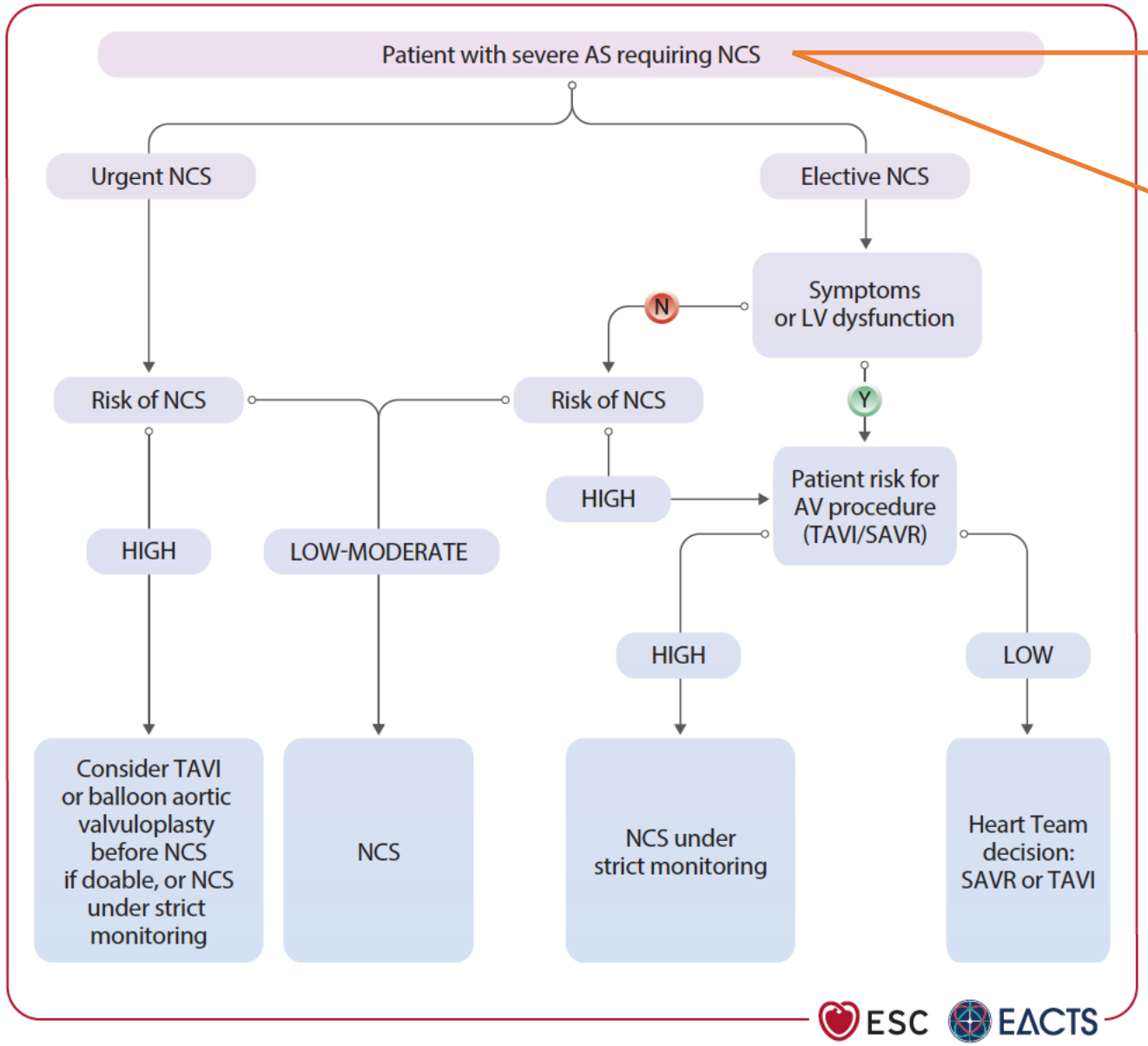
URETHROCYSTOSCOPY FOR EPISODE OF HAEMATURIA

→Three bladder polyps and other small exophytic formations

→**STRONG SUSPICION OF MALIGNANCY**

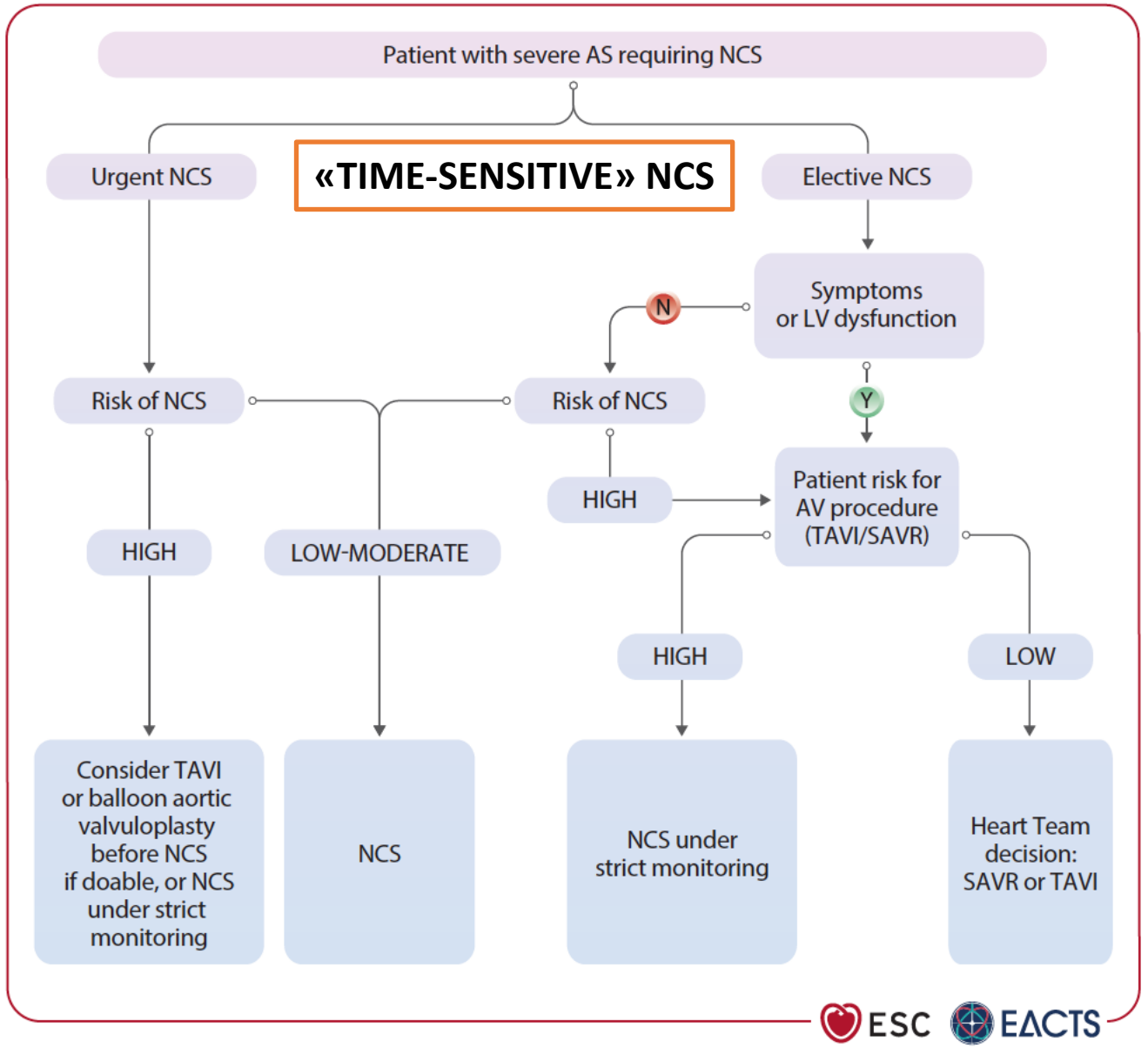
→Indication for **TURB (LOW CARDIOVASCULAR RISK NCS/HIGH BLEEDING RISK)**

URGENT OR ELECTIVE?



COLON SURGERY

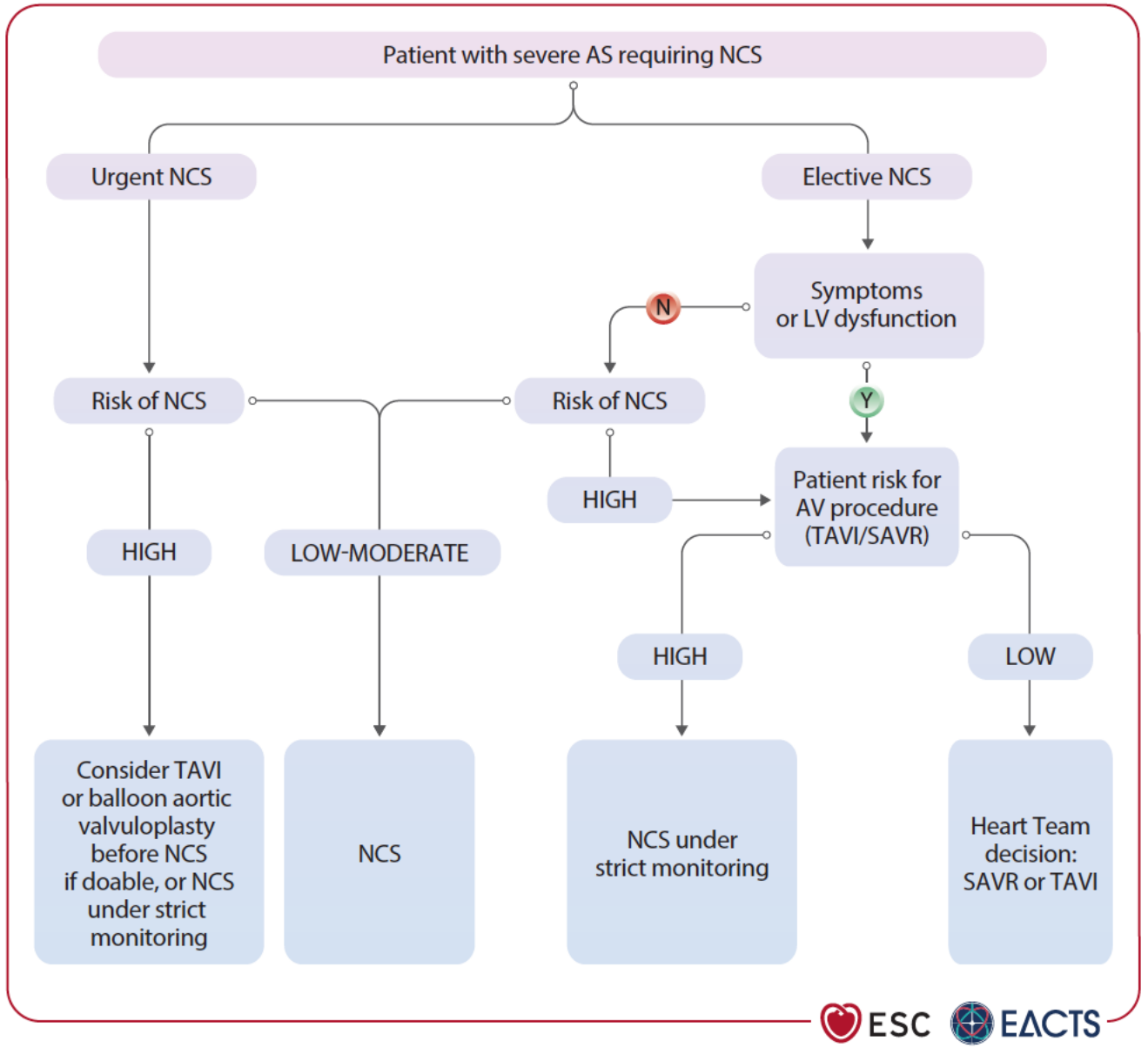
TURB



Cancer surgery is a «time-sensitive» NCS, and it should be performed as soon as possible.

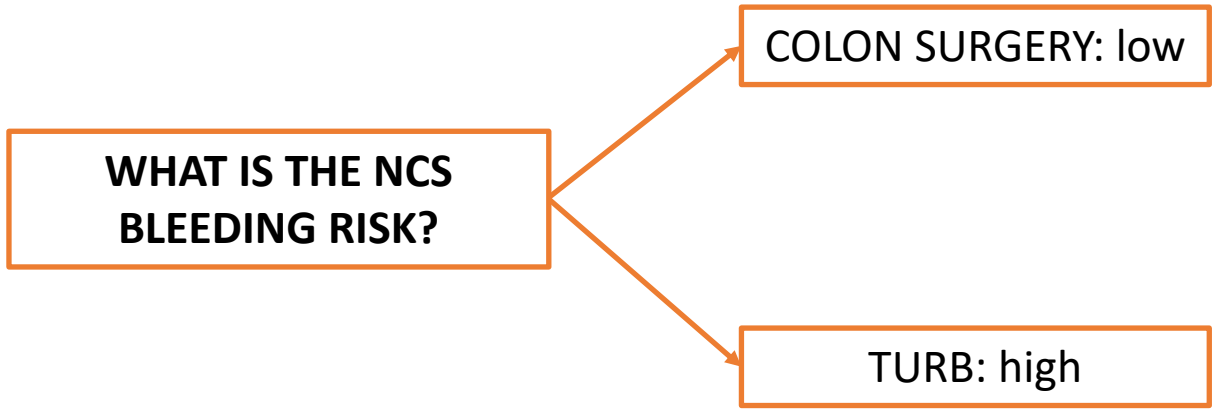
The time window varies from case to case.

TAVI complications may significantly delay NCS.



SYMPTOMATIC OR ASYMPTOMATIC?

Dyspnoea during moderate exertion may be due to anaemia rather than aortic stenosis.



If the bleeding risk of NCS is high, anti-thrombotic therapy has to be discontinuated (e.g. cardioaspirin should be stopped 7 days before NCS).

Discontinuation of antithrombotic therapy can be not safe if the patient has just undergone TAVI.

What should we do?

Anesthesiologists refused to perform NCS.

The patient first underwent TAVI (Abbott Navitor 29 mm).

Peri-operative management of antithrombotic therapy was straightforward, since the patient was receiving enoxaparin therapy, which was suspended on the morning of NCSs.

TURB and colon resection were performed after TAVI (within a month).

TAKE-HOME MESSAGES

1) When a patient with significant VHD is scheduled for NCS, check wheter NCS is urgent or elective:

-URGENT: consider NCS prior to valve intervention;

-ELECTIVE: consider valve intervention prior to NCS, in particular if patient is symptomatic and the cardiovascular risk of NCS is intermediate or high;

-«*TIME-SENSITIVE*»: consider the time window (how long can we wait before performing NCS?) and possible complications of valve procedures that could delay NCS.

Thank you

Simona Sperlongano, MD, PhD, FISC

Division of Cardiology, Department of Traslational Medical Sciences,
University of Campania Luigi Vanvitelli, Naples, Italy

Email: simona.sperlongano@unicampania.it