

What is the current role of echocardiography in IE?

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Conflicts of interest

- Cardiologist



Diagnosis

Surgery?



Echocardiography



Treatment monitoring

Treatment success? Per oral? Follow-up



Diagnosis

- Anamnesis and presentation
- Blood cultures
- Echo
 - Readily and easily available
 - Quick and painless
 - TOE better than TTE (screening)
 - Only modality with a good negative predictive value = rule out

Echo

Echo

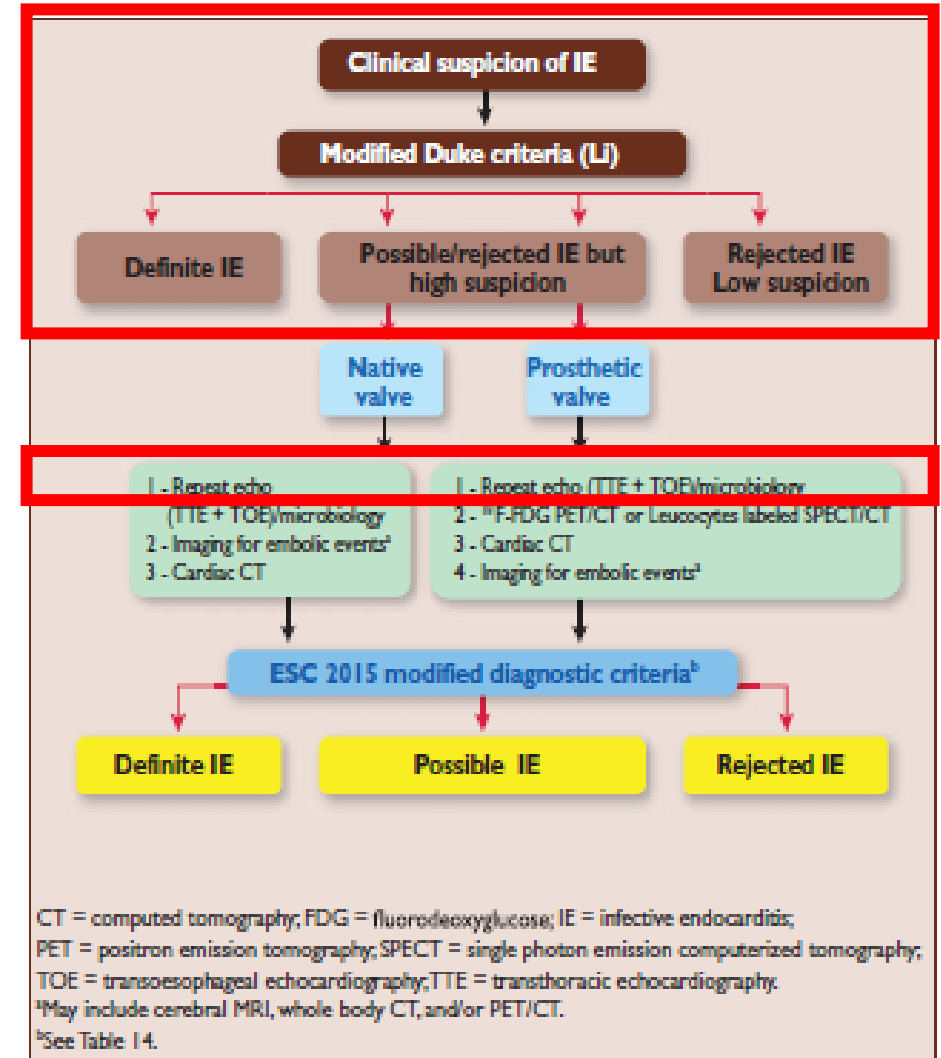


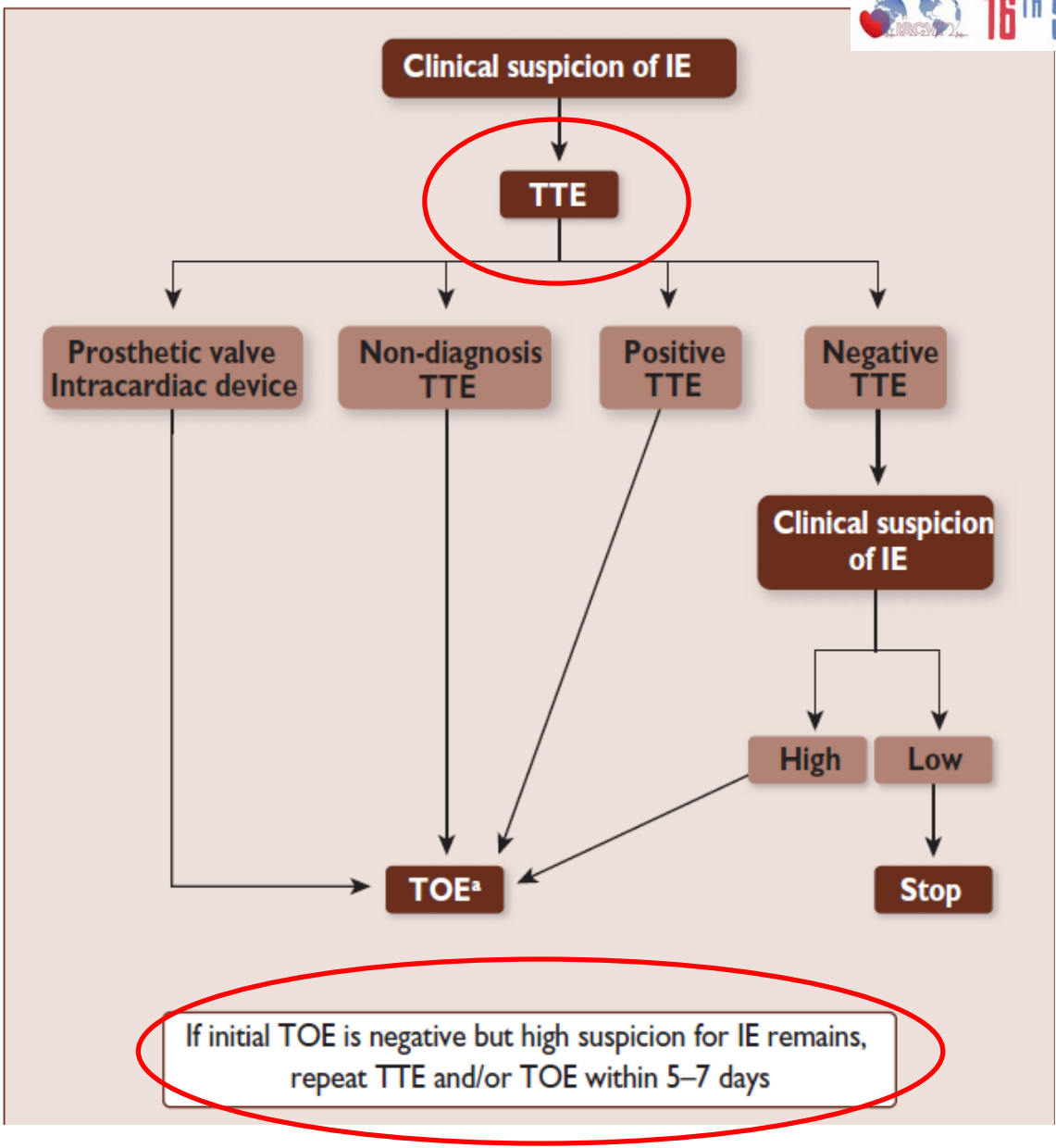
Figure 3 European Society of Cardiology 2015 algorithm diagnosis of infective endocarditis.



TTE

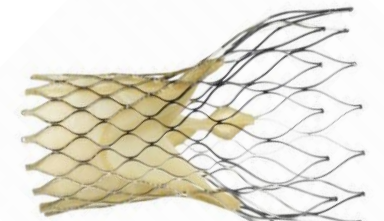
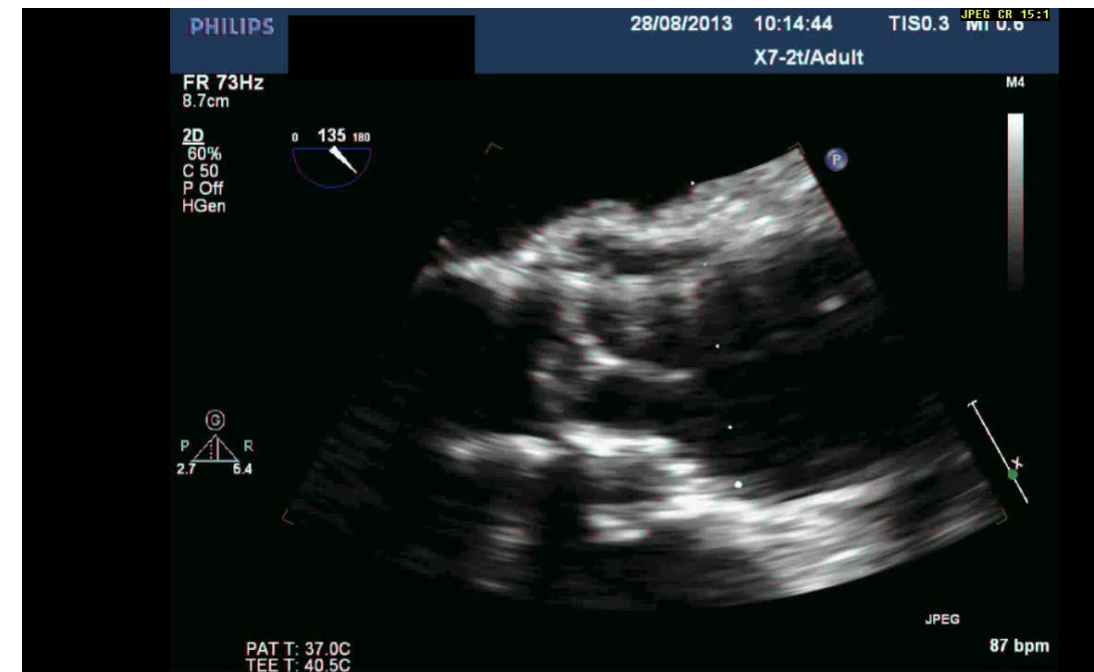
Table 10 Role of echocardiography in infective endocarditis

Recommendations	Class ^a	Level ^b	Ref. ^c
A. Diagnosis			
• TTE is recommended as the first-line imaging modality in suspected IE.	I	B	64,65
• TOE is recommended in all patients with clinical suspicion of IE and a negative or non-diagnostic TTE.	I	B	64, 68–71
• TOE is recommended in patients with clinical suspicion of IE, when a prosthetic heart valve or an intracardiac device is present.	I	B	64,71
• Repeat TTE and /or TOE within 5–7 days is recommended in case of initially negative examination when clinical suspicion of IE remains high.	I	C	



Diagnosis: prosthetic valve endocarditis

- Increasing incidence
- PVE has worse prognosis than NVE
- Diagnostic, echocardiographic challenging
- TAVI even more challenging
- Duke criteria have low sensitivity for PVE
- New diagnostics tools are needed (in addition to PET)



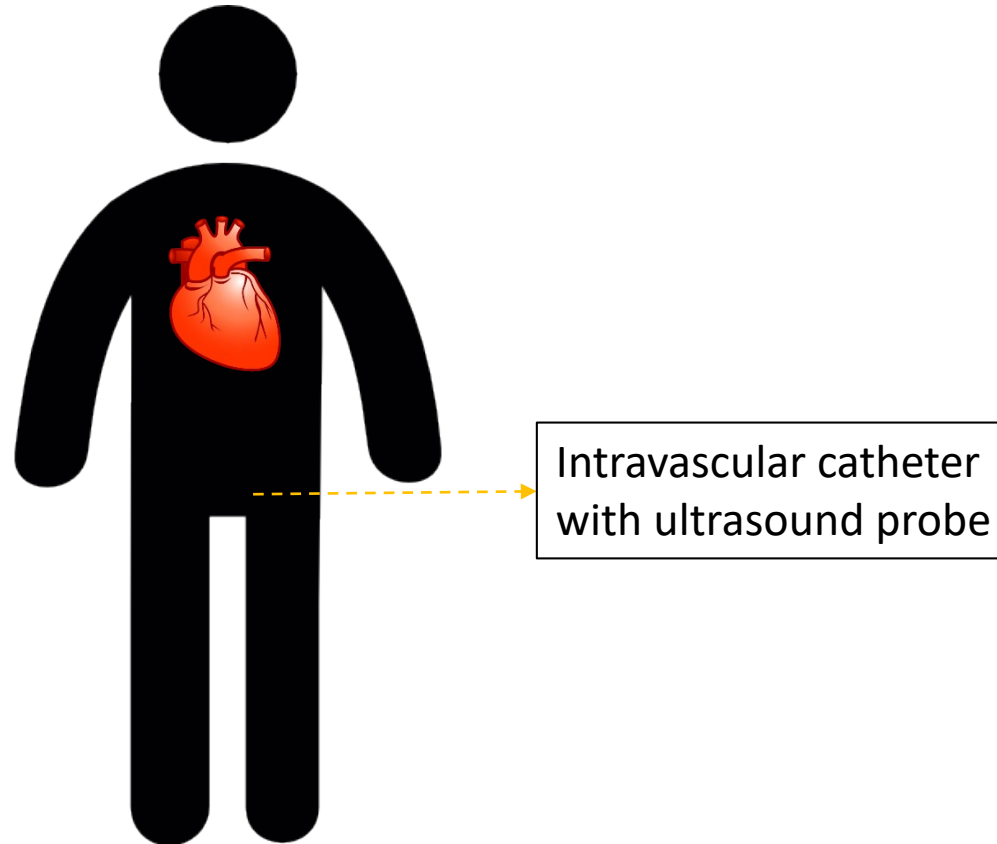
Corevalve

ICE



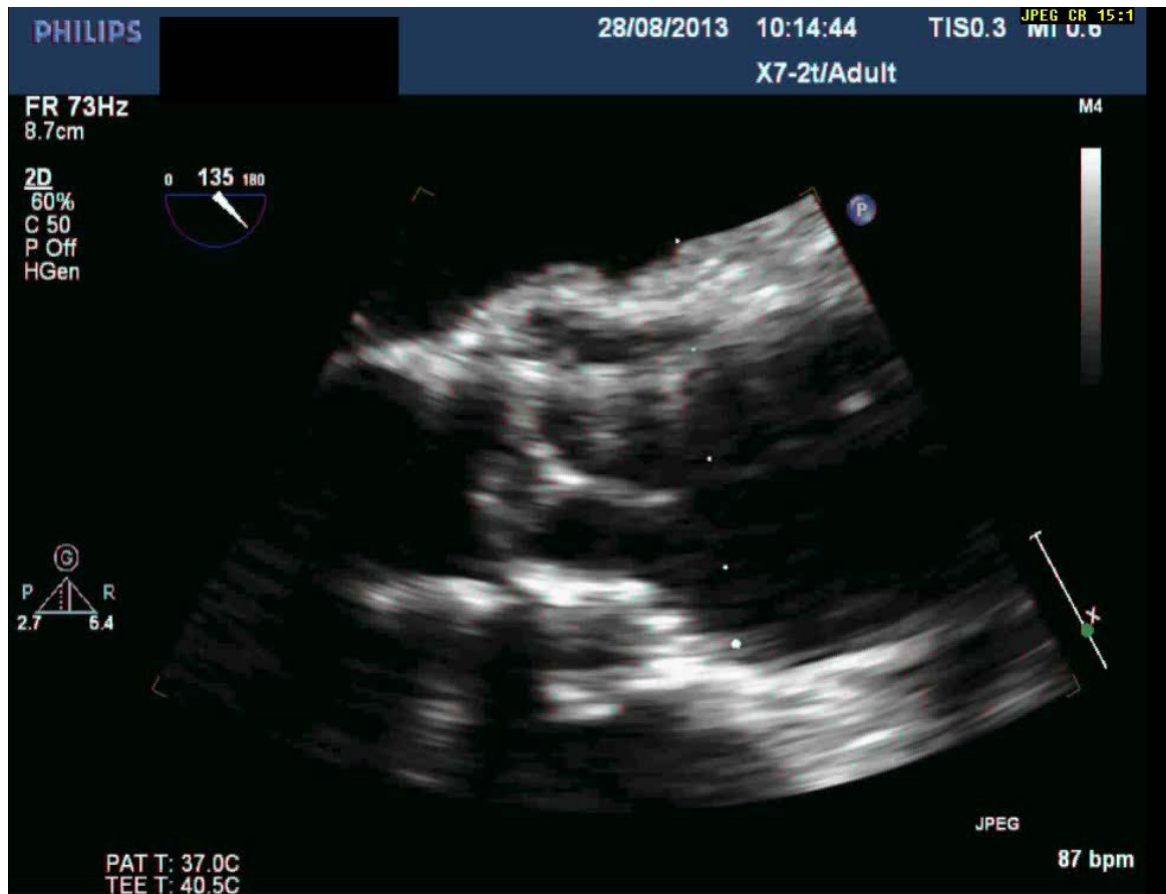
Intracardiac echocardiography (ICE)

- ICE is an invasive modality with high resolution.



Intracardiac echocardiography (ICE)

TEE

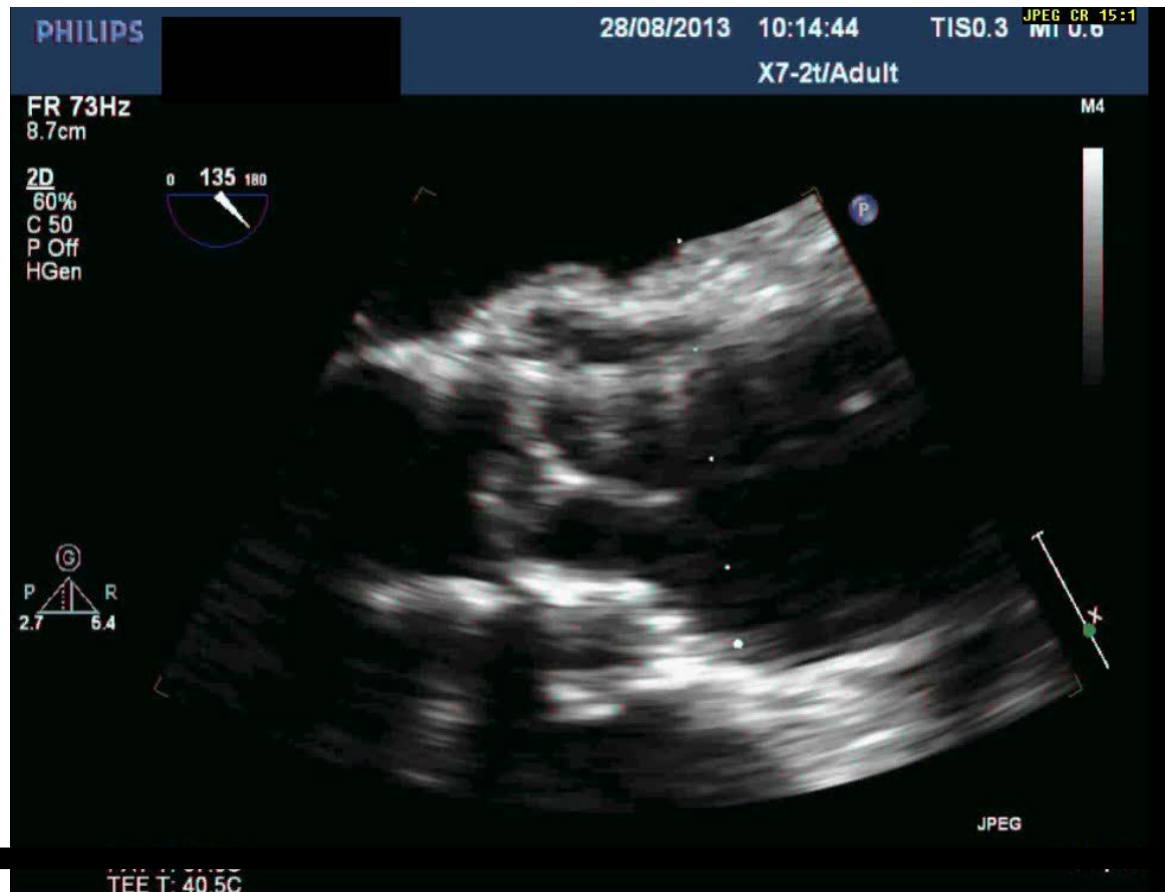


ICE

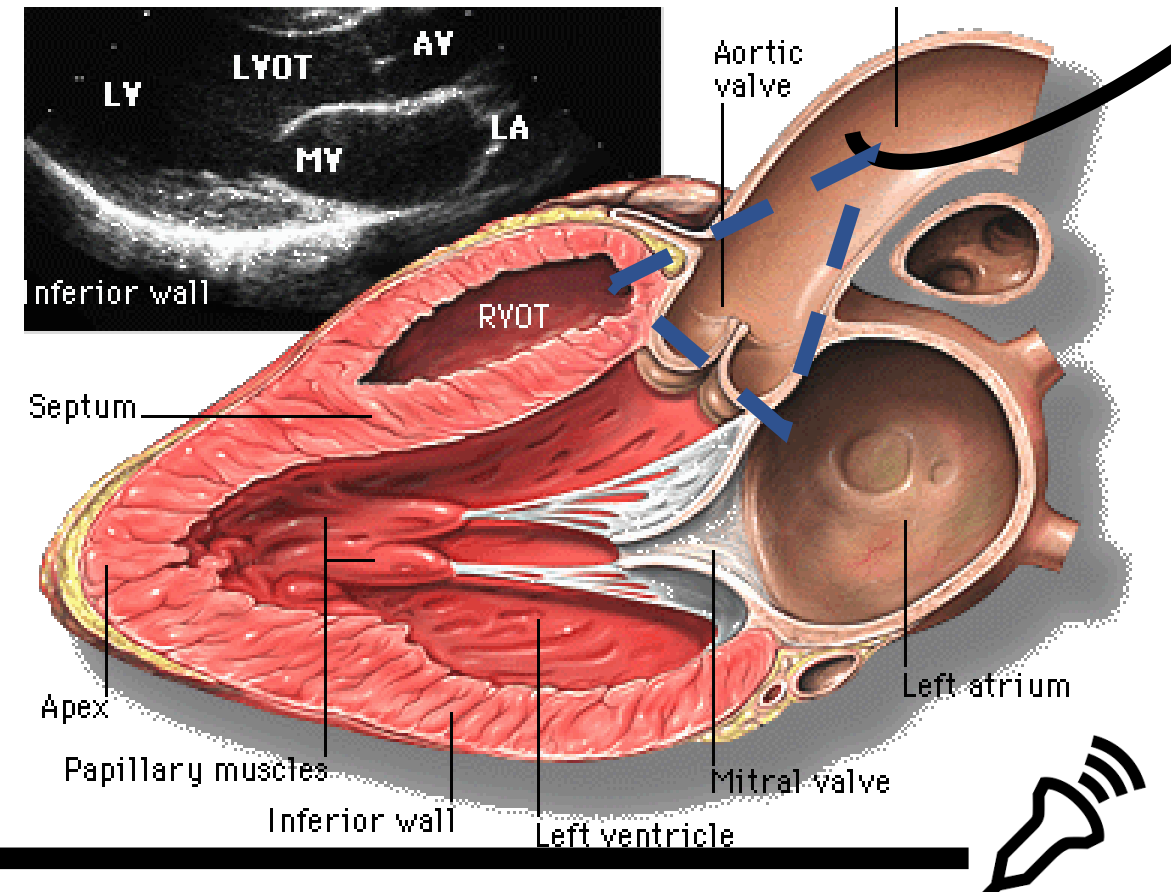


Intracardiac echocardiography (ICE)

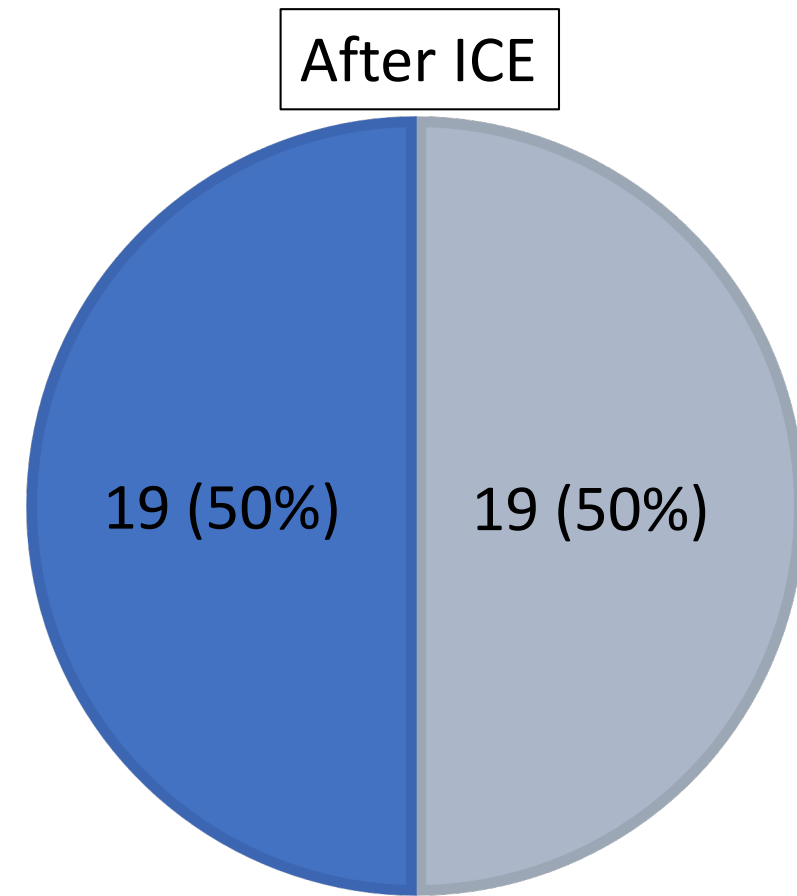
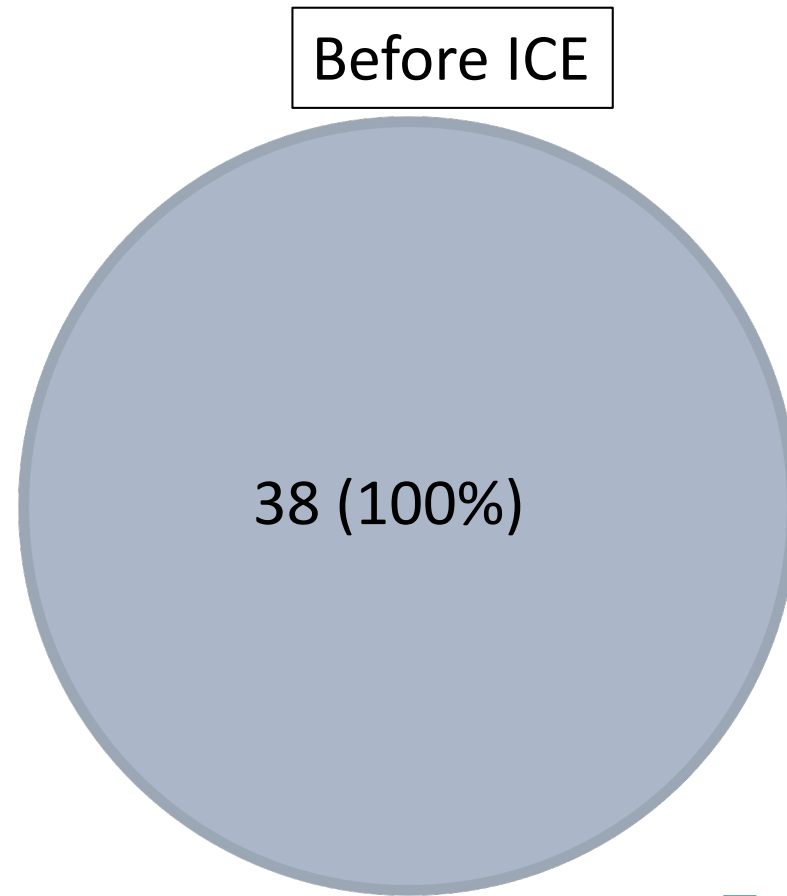
TEE



ICE



Reclassification of patients



■ Definite PVE
■ Possible PVE



Echocardiography and surgical indication



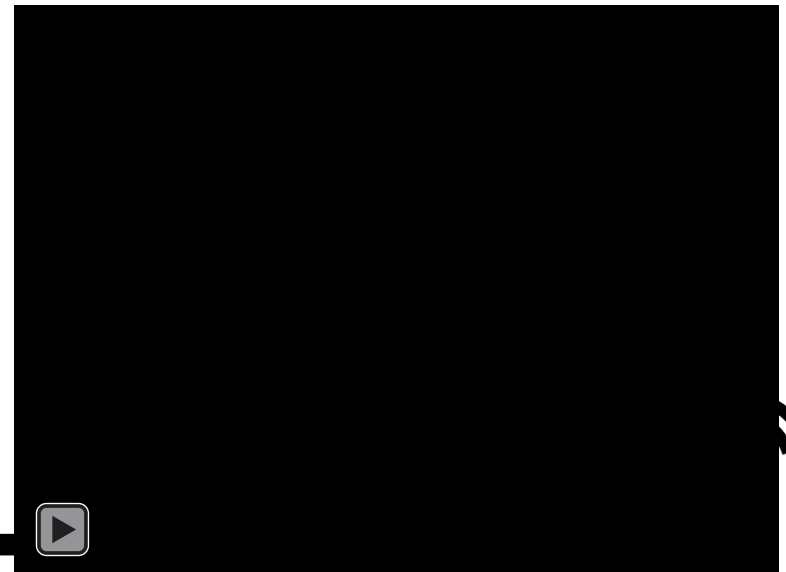
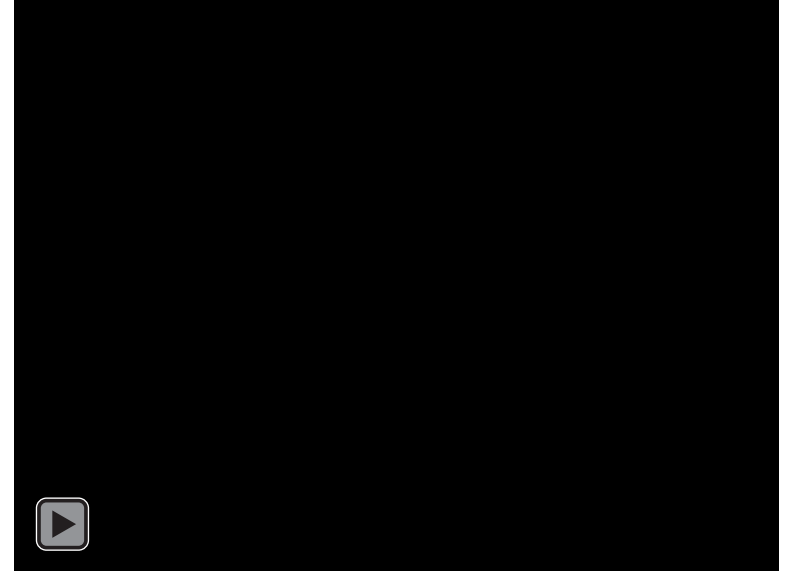
Echocardiography and surgical indication

Indications for surgery	Timing ^a	Class ^b	Level ^c	Ref. ^d
1. Heart failure				
Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B	111,115, 213,216
Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance	Urgent	I	B	37,115, 209,216, 220,221
2. Uncontrolled infection				
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B	37,209, 216
Infection caused by fungi or multiresistant organisms	Urgent/ elective	I	C	
Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci	Urgent	IIa	B	123
PVE caused by staphylococci or non-HACEK gram-negative bacteria	Urgent/ elective	IIa	C	
3. Prevention of embolism				
Aortic or mitral NVE or PVE with persistent vegetations > 10 mm after one or more embolic episode despite appropriate antibiotic therapy	Urgent	I	B	9,58,72, 113,222
Aortic or mitral NVE with vegetations > 10 mm, associated with severe valve stenosis or regurgitation, and low operative risk	Urgent	IIa	B	9
Aortic or mitral NVE or PVE with isolated very large vegetations (> 30 mm)	Urgent	IIa	B	113
Aortic or mitral NVE or PVE with isolated large vegetations (> 15 mm) and no other indication for surgery ^e	Urgent	IIIb	C	



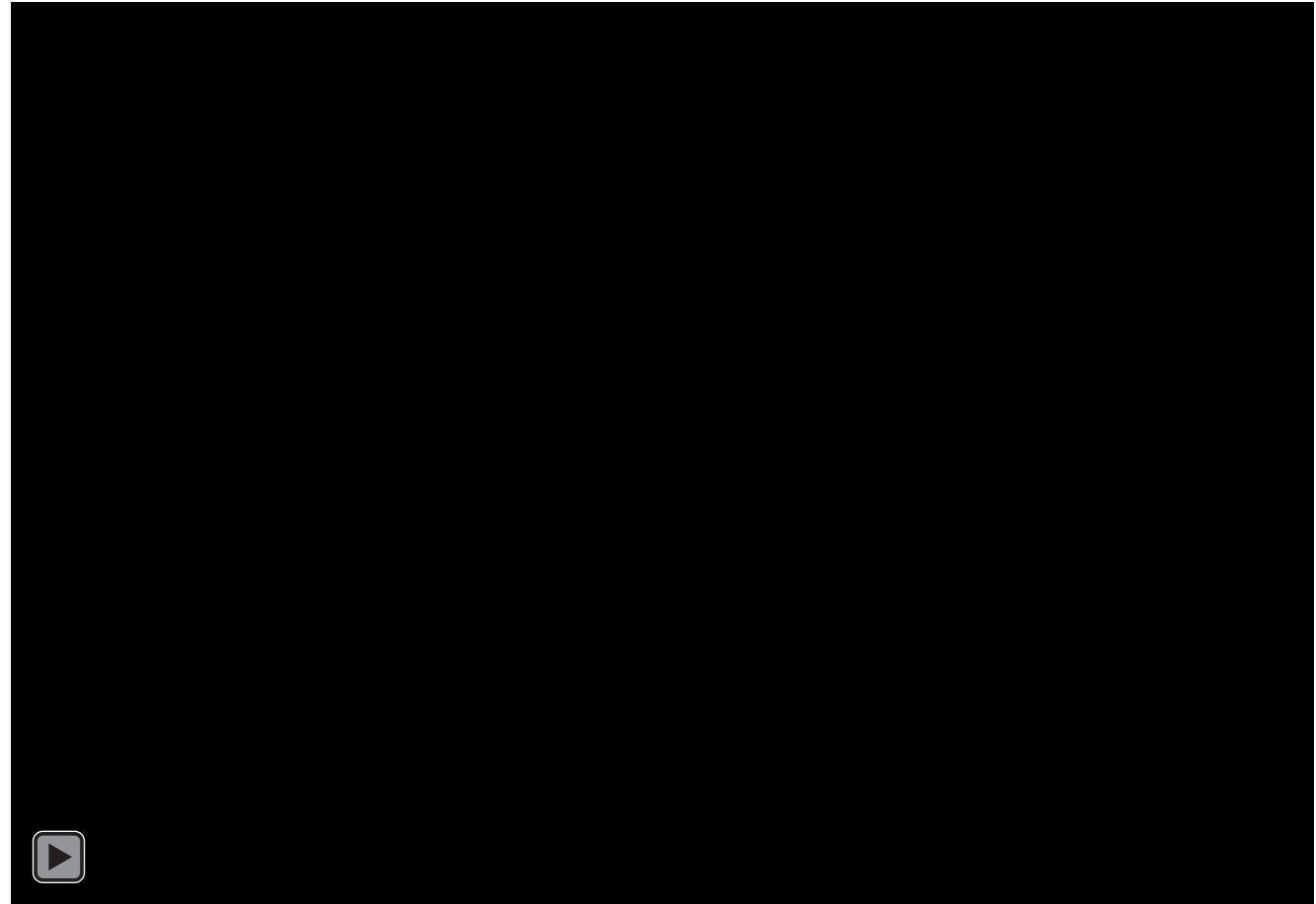
Echocardiography and surgical indication

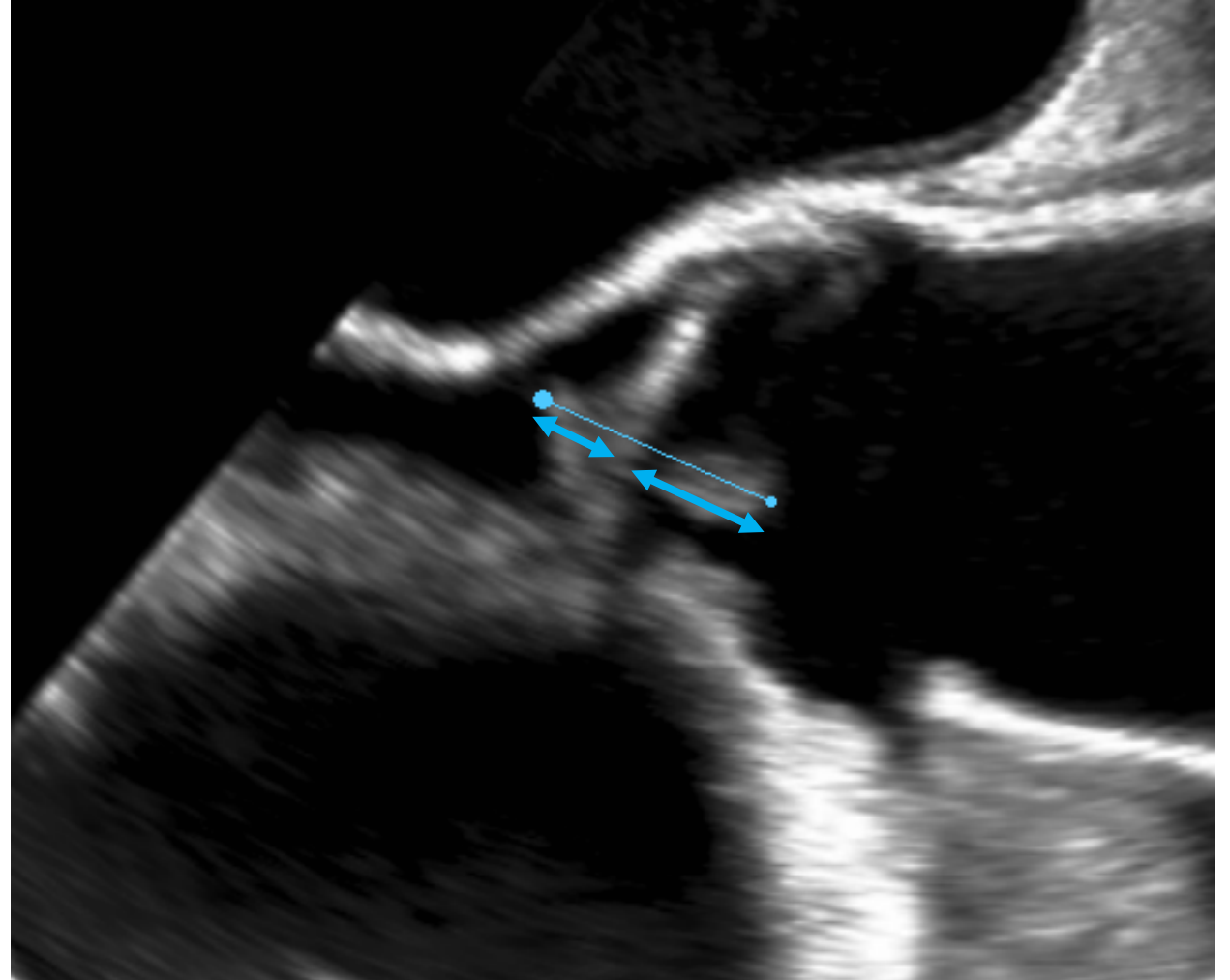
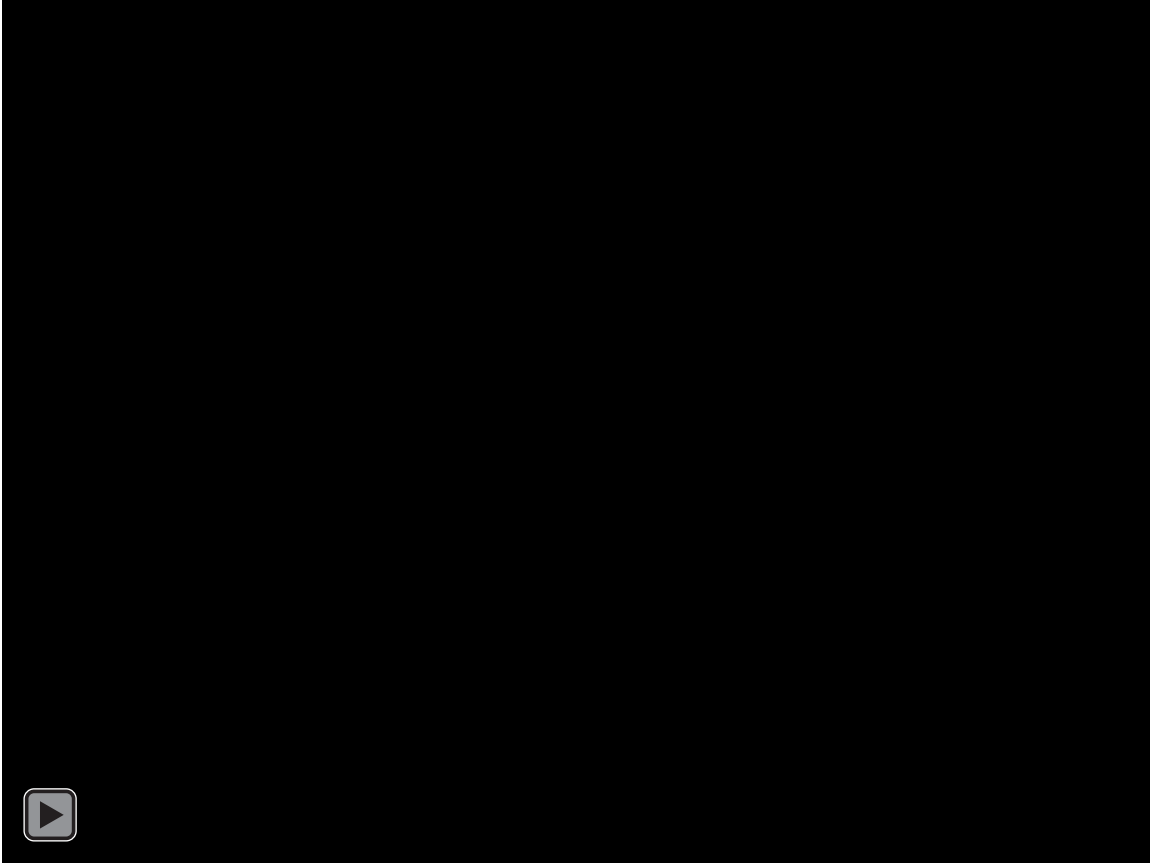
- Echocardiography guides surgery (valve dysfunction and vegetation size)
- Surgical indications are interpreted variably across centers
- Data (observational, selected, and from tertiary centers) have shown very conflicting results for surgery vs medical therapy
- Guidelines regarding surgery are based on LOE B+C



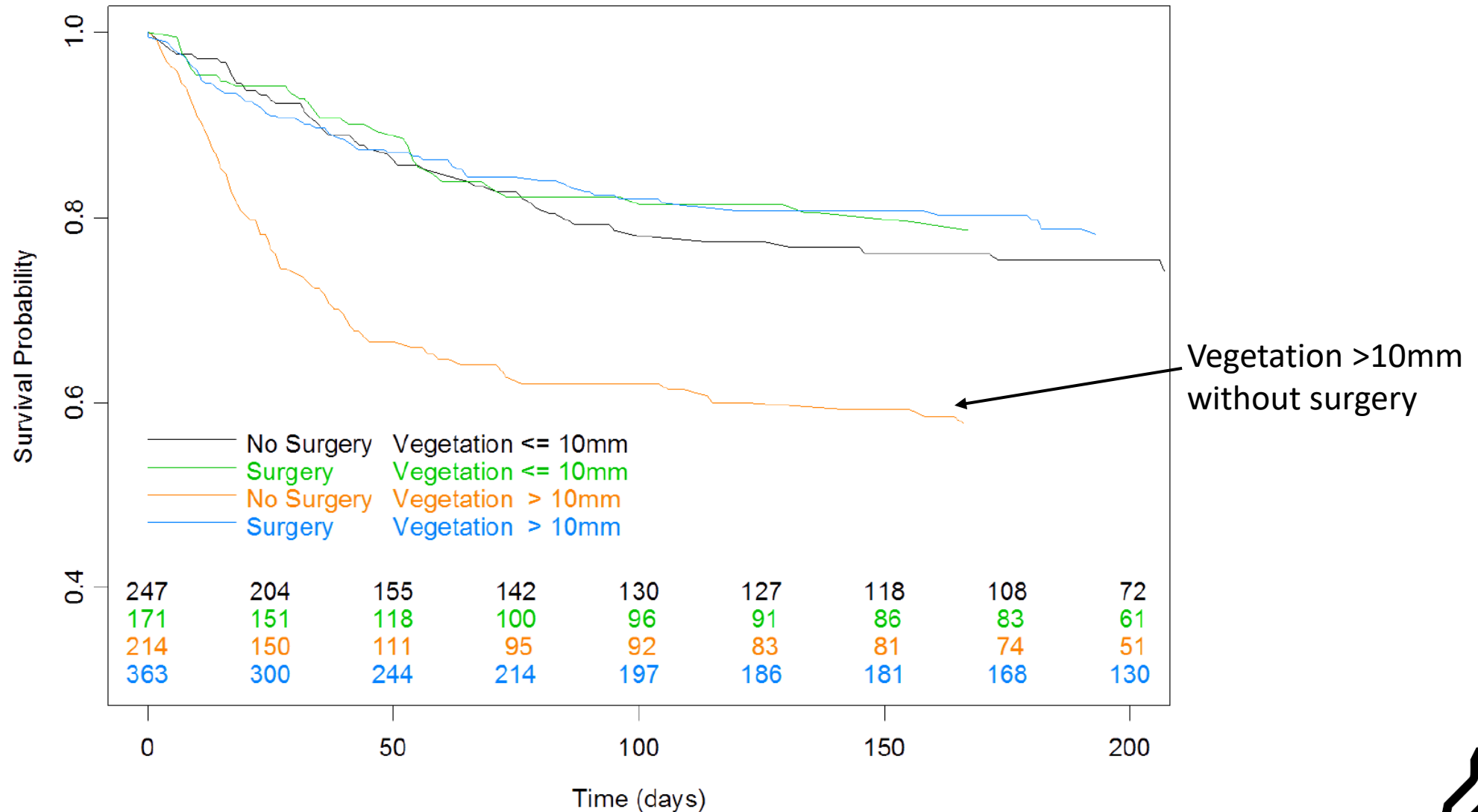
Vegetation size is difficult!

- Not well defined: max length
- Inter + intra variability
- May decide surgery





The Challenge: lack of randomized data



Vegetation size is important

- Vegetation size may decide surgery
- Vegetation size is key in an ongoing clinical trial: ASTERIx
 - Hypothesis: Surgery + antibiotics superior to antibiotics alone
 - Inclusion: Definite IE + vegetation 10-30mm
 - Exclusion: Surgical indication of heart failure or abscess etc
 - Sample size 496
 - National Danish RCT and more countries coming on
 - 24 patients randomized so far
 - Well funded PI initiated trial

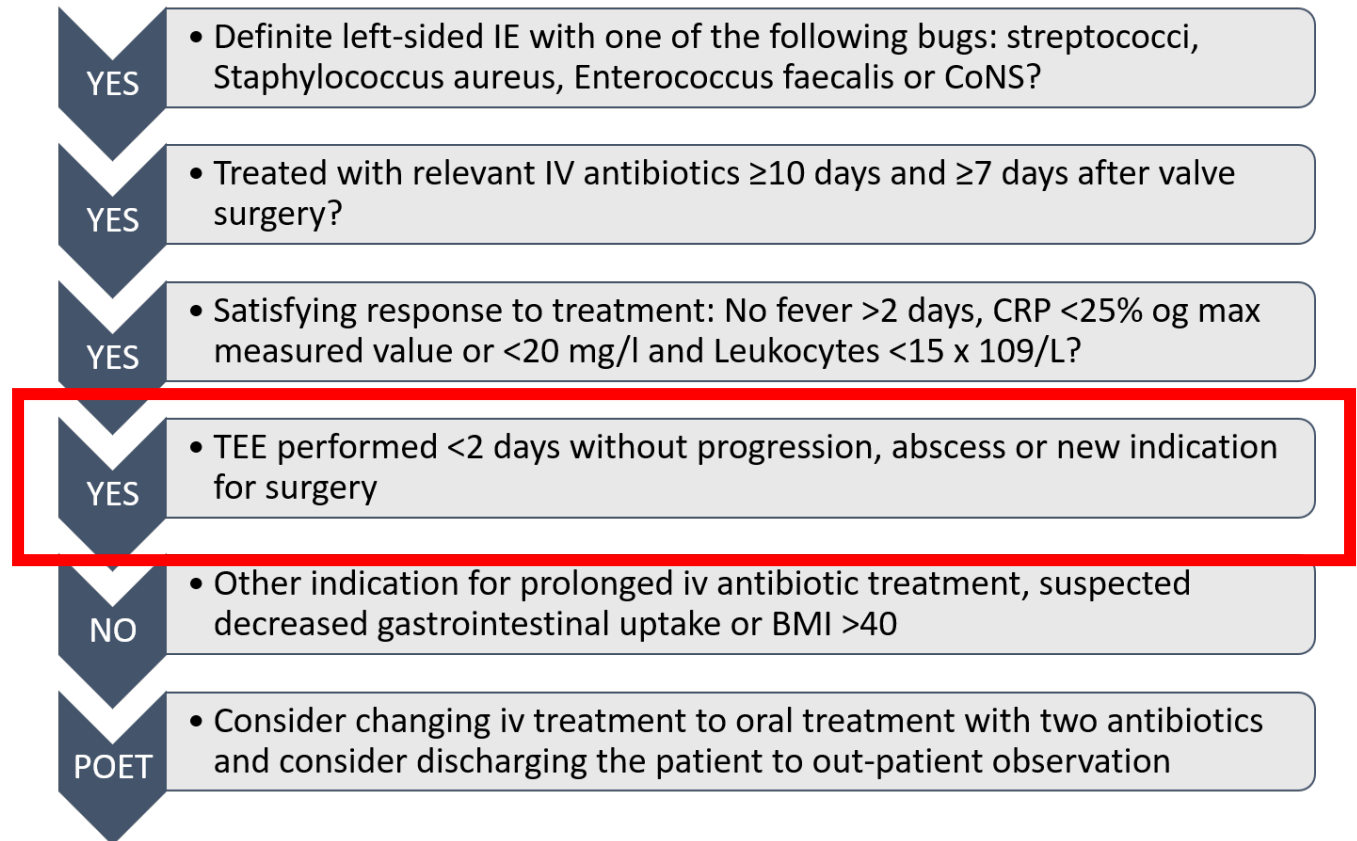


Echocardiography: Treatment success? Per oral? Follow-up



Echocardiography

- Monitoring of treatment
- Shift from iv to per oral
- At end of treatment and during follow-up



Current role of echocardiography

- Just as important as before
- Easily available
- ICE may become another modality in PVE
- No other modality is as important for all aspects of IE care (diagnosis, surgical indication, monitoring of treatment, and follow-up)



Questions?

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