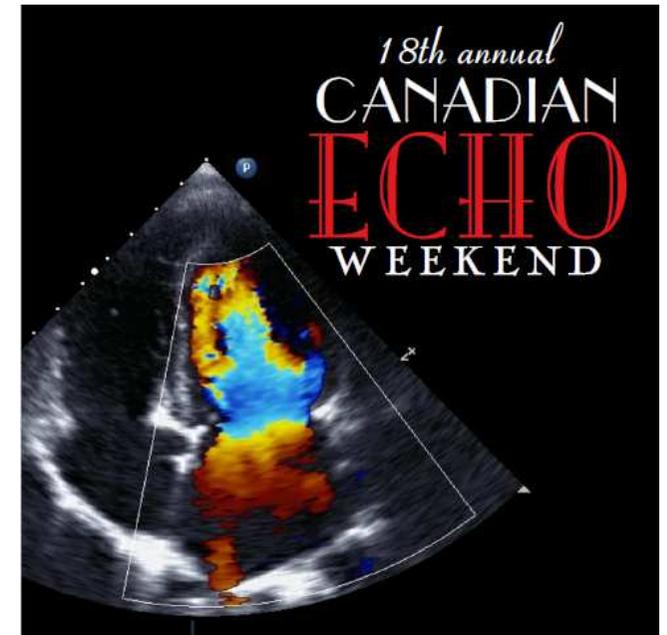


# Spotlight session

## **Infective Endocarditis: A changing disease**



Gilbert Habib  
La Timone Hospital  
Marseille - France

Toronto, April 8<sup>th</sup> 2016

# Endocarditis: a changing disease

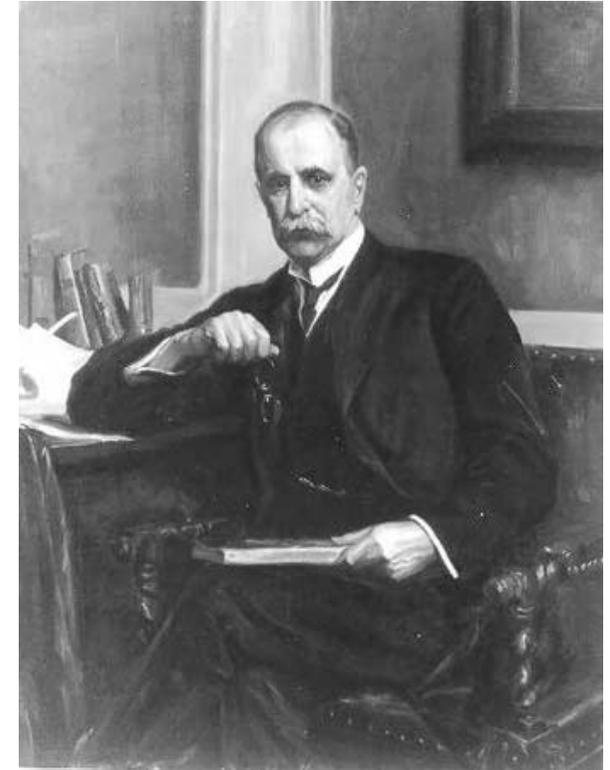
## ● new high-risk subgroups

- *IVDA*
- *elderly*
- *intracardiac devices*
- *nosocomial diseases*
- *hemodialysis*
- *congenital heart disease*

## ● new microorganisms

- *Coxiella burnetii*
- *Bartonella spp*
- *Tropheryma whipplei*

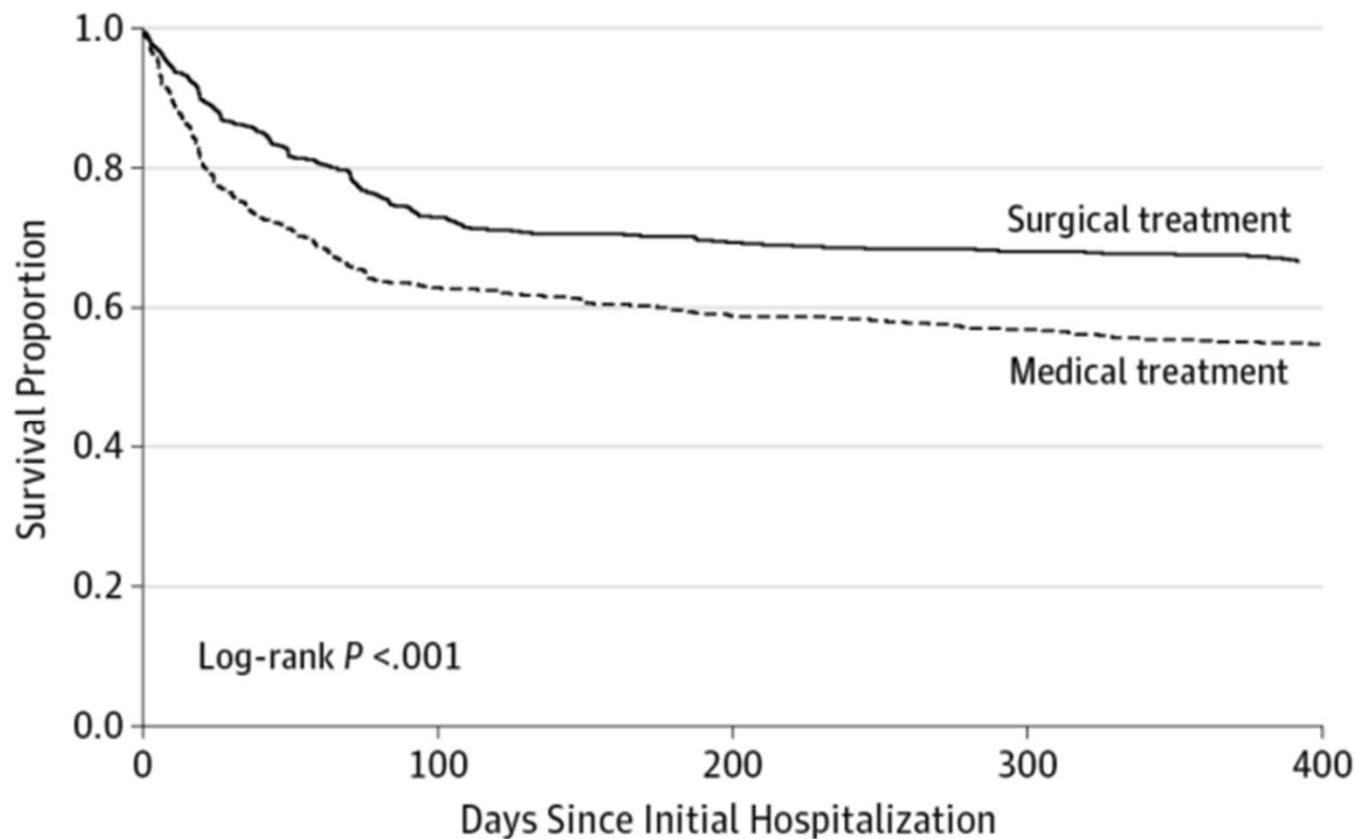
- *atypical clinical presentation*
- *more difficult to diagnose*



# Endocarditis: still a deadly disease!!

Lalani T- JAMA 2013

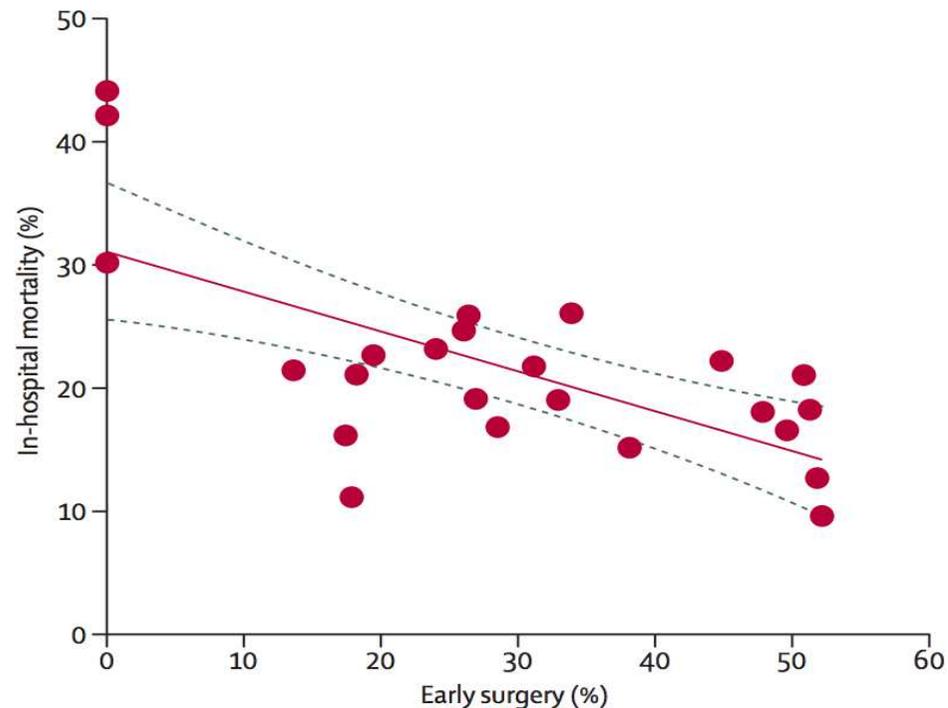
- unacceptably high (20-50%)



# Endocarditis: still a deadly disease!!

Thuny F, Habib G . Lancet 2012;10;379:965-75

**Meta-analysis from 24 studies including 8539 patients**



**WE NEED**

- **early diagnosis**
- **early ATB therapy**
- **early surgery**



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DE MARSEILLE



# 2015 ESC Guidelines for the management of infective endocarditis

The Task Force for the Management of Infective Endocarditis of the  
European Society of Cardiology (ESC)

Endorsed by: European Association for Cardio-Thoracic Surgery  
(EACTS), the European Association of Nuclear Medicine (EANM)

# Changes in new ESC guidelines

1. Multimodality imaging
2. New diagnostic criteria and algorithm
3. The “Endocarditis Team”
4. Early surgery

# Management of IE

1. prevention
2. the “Endocarditis Team”
3. diagnosis
4. treatment
5. specific situations

# Main principles of prevention in IE

1. The principle of antibiotic prophylaxis when performing procedures at risk of IE in patients with predisposing cardiac conditions is maintained.
2. Antibiotic prophylaxis must be limited to patients with the highest risk of IE undergoing the highest risk dental procedures.
3. Good oral hygiene and regular dental review are more important than antibiotic prophylaxis to reduce the risk of IE.
4. Aseptic measures are mandatory during venous catheter manipulation and during any invasive procedures in order to reduce the rate of health care-associated IE.
5. Whether the reduced use of antibiotic prophylaxis is really associated with a change in the incidence of IE needs further investigations



# Cardiac conditions at highest risk of IE

Recommendations	Class	Level
<p>Antibiotic prophylaxis should only be considered for patients at highest risk of IE:</p> <ol style="list-style-type: none"><li>1. Patients with a prosthetic valve, including transcatheter valve, or a prosthetic material used for cardiac valve repair.</li><li>2. Patients with previous IE.</li><li>3. Patients with congenital heart disease.<ol style="list-style-type: none"><li>a. any cyanotic congenital heart disease</li><li>b. congenital heart disease repaired with prosthetic material whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if there remains residual shunt or valvular regurgitation.</li></ol></li></ol>	<b>IIa</b>	<b>C</b>
<p>Antibiotic prophylaxis is not recommended in other forms of valvular or congenital heart disease.</p>	<b>III</b>	<b>C</b>



# Non-specific prevention measures

**These measures should ideally be applied to the general population and particularly reinforced in high-risk patients.**

- Strict dental and cutaneous hygiene. Dental follow-up should be performed twice a year in high-risk patients and yearly in the others.
- Disinfection of wounds.
- Eradication or decrease of chronic bacterial carriage: skin, urine.
- Curative antibiotics for any focus of bacterial infection.
- No self-medication with antibiotics.
- Strict asepsis control measures for any at-risk procedure.
- Discourage piercing and tattooing.
- Limit the use of infusion catheters and invasive procedure when possible. Favour peripheral over central catheters, and systematic replacement of the peripheral catheter every 3–4 days. Strict adherence to care bundles for central and peripheral cannulae should be performed.



# Management of IE

1. prevention
2. ***the “Endocarditis Team”***
3. diagnosis
4. treatment
5. specific situations

# The « Endocarditis team »

- **Characteristics of the reference centre**

1. Immediate access to diagnostic procedures should be possible, including TTE, TOE, multislice CT, MRI, and nuclear imaging.
2. Immediate access to cardiac surgery should be possible during the early stage of the disease, particularly in case of complicated IE
3. Several specialists should be present on site (the “Endocarditis Team”), including at least cardiac surgeons, cardiologists, anaesthesiologists, ID specialists, microbiologists and, when available, specialists in valve diseases, CHD, pacemaker extraction, echocardiography and other cardiac imaging techniques, neurologists, and facilities for neurosurgery and interventional neuroradiology.

# The « Endocarditis team »

Recommendations	Class	Level
Patients with complicated IE should be evaluated and managed at an early stage in a reference centre, with immediate surgical facilities and the presence of a multidisciplinary “Endocarditis Team”, including an ID specialist, a microbiologist, a cardiologist, imaging specialists, a cardiac surgeon, and if needed a specialist in CHD.	<b>IIa</b>	<b>B</b>
For patients with non-complicated IE managed in a non-reference centre, early and regular communication with the reference centre and, when needed, with visit to the reference centre, should be made.	<b>IIa</b>	<b>B</b>

# Management of IE

1. prevention
2. the “Endocarditis Team”
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# The Duke echographic criteria

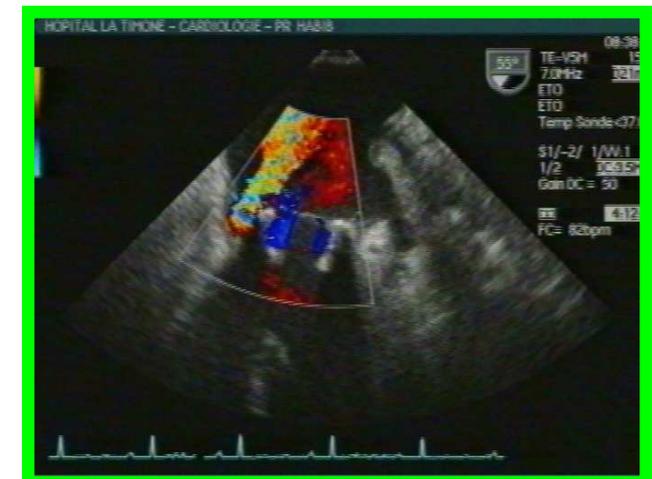
Durack DT Am J Med 1994 ; 96 : 200-9



*vegetation*



*abscess*



*new dehiscence  
of prosthetic valve*

# Recommendations for the practice of echocardiography in infective endocarditis

**Gilbert Habib (France)\*, Luigi Badano (Italy), Christophe Tribouilloy (France),  
Isidre Vilacosta (Spain), and Jose Luis Zamorano (Spain)**

**Scientific Committee: Maurizio Galderisi (Italy), Jens-Uwe Voigt (Belgium),  
Rosa Sicari (Italy)**

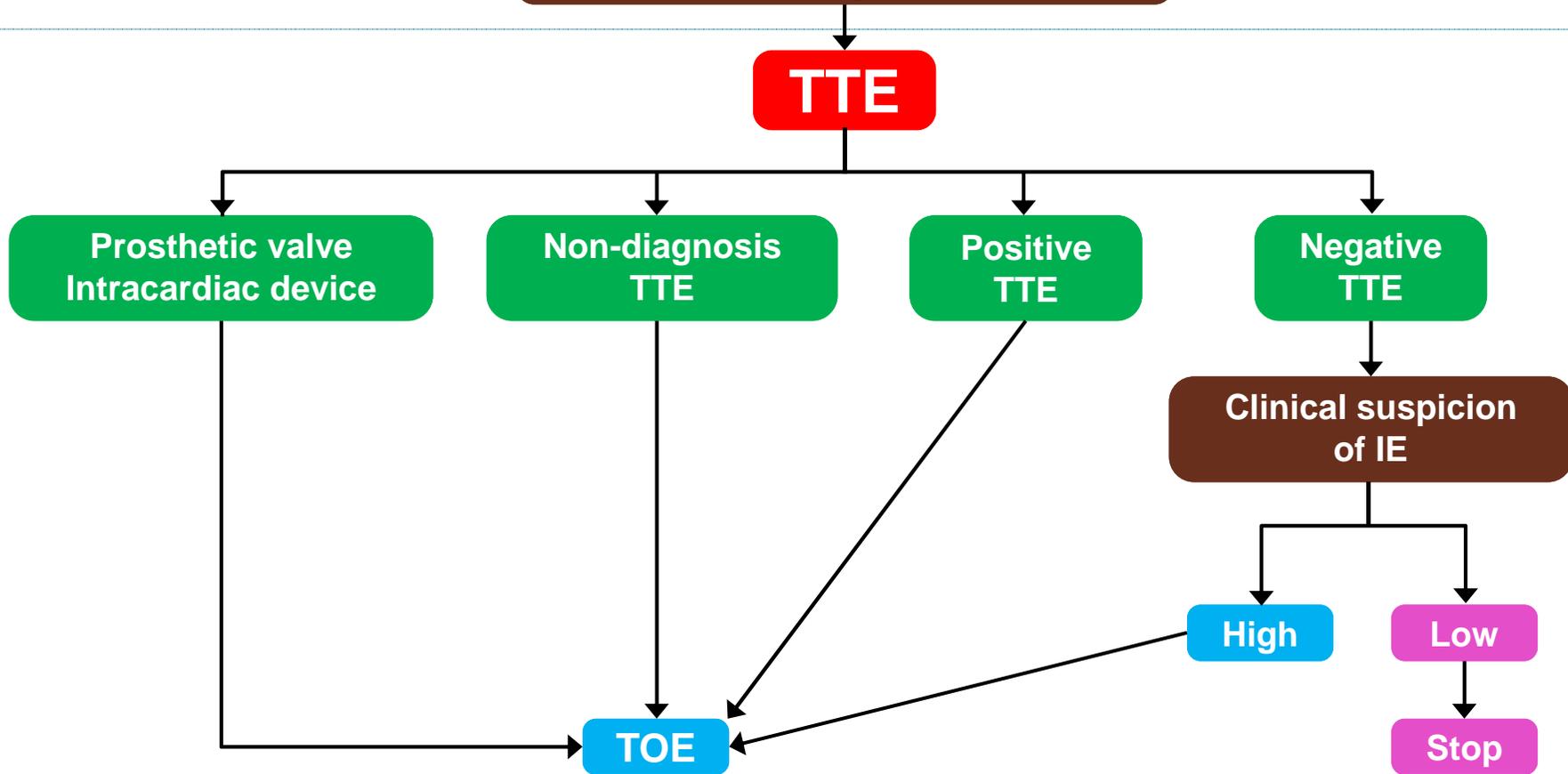
**Document Reviewers: Bernard Cosyns (Belgium), Kevin Fox (UK), Svend Aakhus  
(Norway)**

**On behalf of the European Association of Echocardiography**

Service de Cardiologie, CHU La Timone, Bd Jean Moulin, 13005 Marseille, France

Received 20 December 2009; accepted after revision 30 December 2009

# Clinical suspicion of IE



If initial TOE is negative but high suspicion for IE remains,  
repeat TTE and/or TOE within 5-7 days

# Echocardiography in IE

Recommendations	Class	Level
<b>A. Diagnosis</b>		
TTE is recommended as the first-line imaging modality in suspected IE.	I	B
TOE is recommended in all patients with clinical suspicion of IE and a negative or non diagnostic TTE.	I	B
TOE is recommended in patients with clinical suspicion of IE, in case of prosthetic valve or intracardiac device.	I	B
Repeat TTE/TOE within 5–7 days is recommended in case of initially negative examination when clinical suspicion of IE remains high.	I	C
Echocardiography should be considered in <i>Staphylococcus aureus</i> bacteraemia.	IIa	B
TOE should be considered in the majority of adult patients with suspected IE, even in cases with positive TTE.	IIa	C



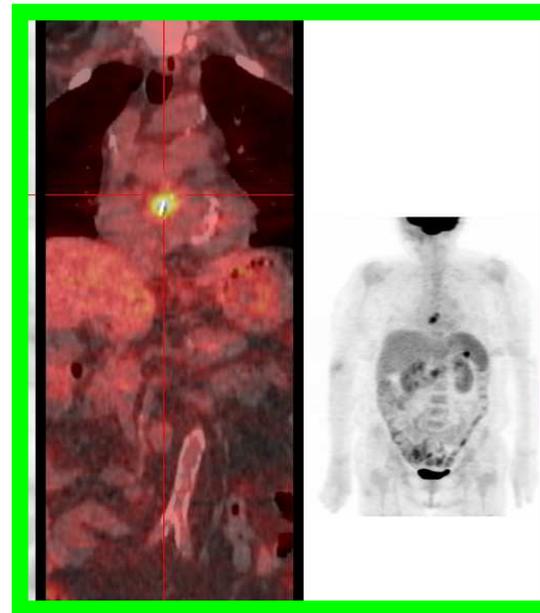
# Echo is not 100% sensitive

- 1. very small (< 2 mm) vegetation**
- 2. non vegetant endocarditis**
- 3. prosthetic and pacemaker endocarditis**
- 4. mitral valve prolapse with thickened valves**
- 5. vegetation not yet present or already embolized**

# $^{18}\text{F}$ FDG-PET-CT in endocarditis



**First TOE**



**$^{18}\text{F}$ FDG-PET-CT**



**Follow-up TOE**

# ESC 2015 modified criteria for diagnosis of IE

## Major criteria

### 1. Blood cultures positive for IE

- a. Typical microorganisms consistent with IE from 2 separate blood cultures:
- b. Microorganisms consistent with IE from persistently positive blood cultures:
- c. Single positive blood culture for *Coxiella burnetii* or phase I IgG antibody titre >1:800

### 2. Imaging positive for IE

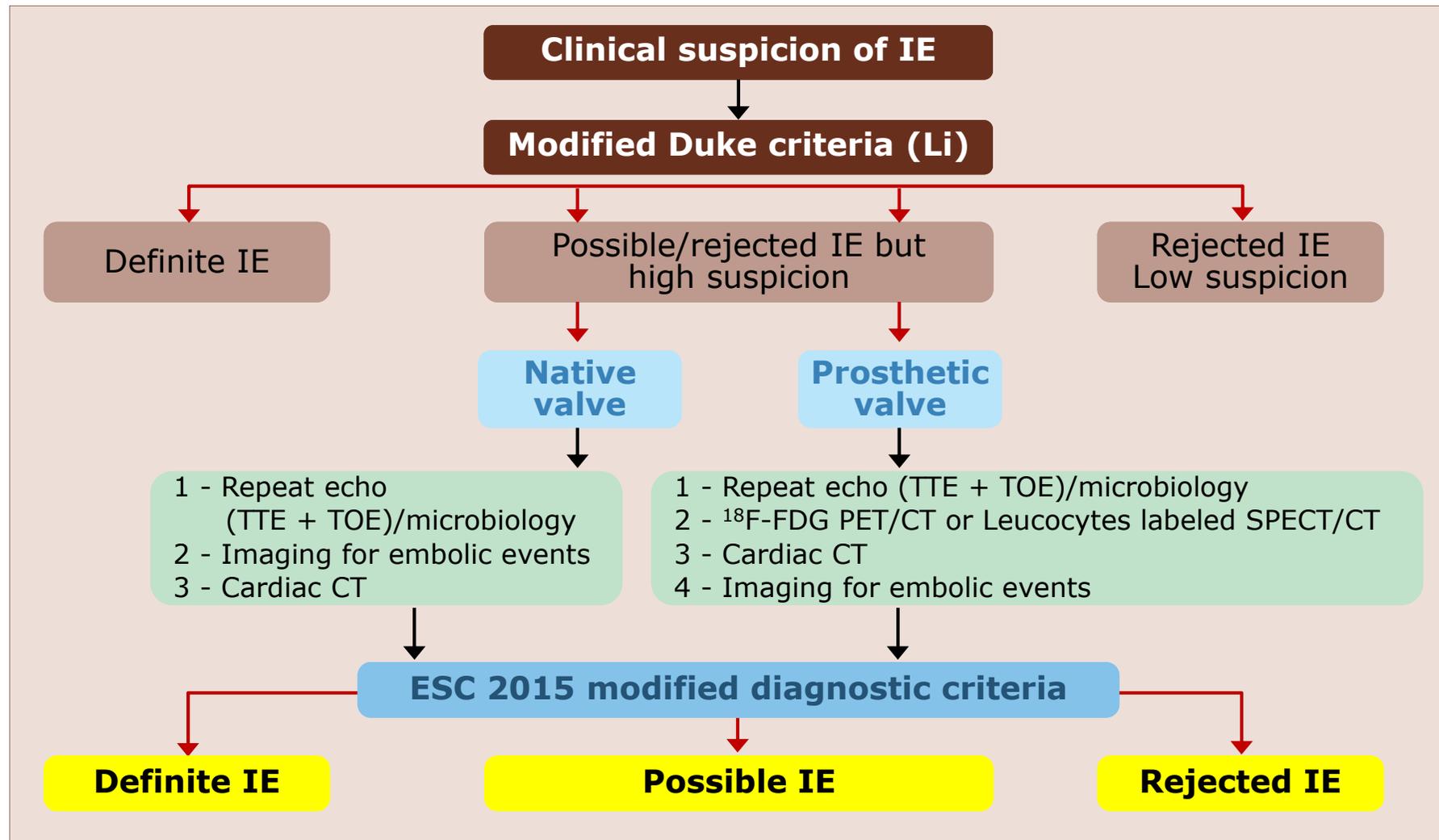
#### a. Echocardiogram positive for IE:

- Vegetation
- Abscess, pseudoaneurysm, intracardiac fistula
- Valvular perforation or aneurysm
- New partial dehiscence of prosthetic valve

**b. Abnormal activity around the site of prosthetic valve implantation detected by <sup>18</sup>F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT.**

**c. Definite paravalvular lesions by cardiac CT.**

# ESC 2015 algorithm for diagnosis of IE



# Management of IE

1. prevention
2. the “Endocarditis Team”
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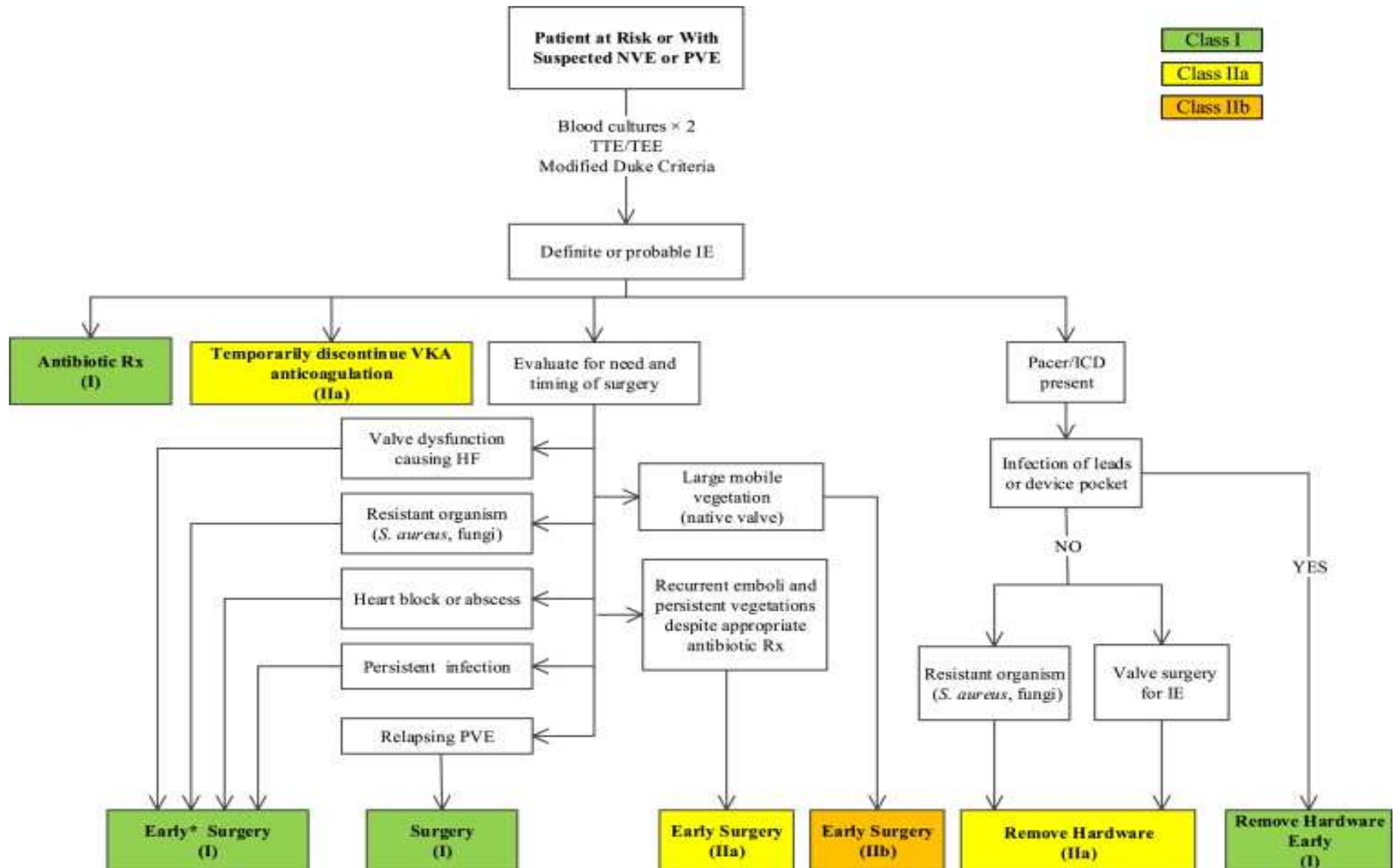
# Indications and timing of surgery

Indications for surgery	Timing	Class	Level
<b>1. Heart Failure</b>			
Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock.	Emergency	I	B
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
<b>2. Uncontrolled infection</b>			
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation).	Urgent	I	B
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
PVE caused by staphylococci or non-HACEK Gram negative bacteria.	Urgent/elective	IIa	C
<b>3. Prevention of embolism</b>			
Aortic or mitral NVE or PVE with persistent vegetations >10 mm after one or more embolic episode despite appropriate antibiotic therapy.	Urgent	I	B
Aortic or mitral NVE with vegetations >10 mm, associated with severe valve stenosis or regurgitation, and low operative risk.	Urgent	IIa	B
Aortic or mitral NVE or PVE with isolated very large vegetations (>30 mm).	Urgent	IIa	B
Aortic or mitral NVE or PVE with isolated large vegetations (>15 mm) and no other indication for surgery.	Urgent	IIb	C



# ACC – AHA guidelines 2014 (valvular disease)

Nishimura RA - JACC – 2014 – 63: e57 - e185



Class I  
Class IIa  
Class IIb



# Embololic risk under therapy

## The risk of new embolism

- 1. Dramatically decreases after initiation of ATB**
- 2. Is still high during the first 2 weeks of ATB**
- 3. Is related to the size and mobility of the vegetation**
- 4. Is also related to other than echocardiographic factors**
- 5. Can be reduced by very early surgery ?**

# Management of IE: summary

- 1. Changing disease, but persistent high mortality**
- 2. Reduce prophylaxis, increase prevention**
- 3. Multimodality imaging for diagnosis**
- 4. New diagnostic criteria and new ESC diagnostic algorithm**
- 5. Early surgery**
- 6. Multidisciplinary “endocarditis team”**

