



31 GIORNATE CARDIOLOGICHE TORINESI

TURIN
October
24th-26th
2019

PRAGMATIC APPROACH TO ACUTE INFECTIVE ENDOCARDITIS

E. CECCHI

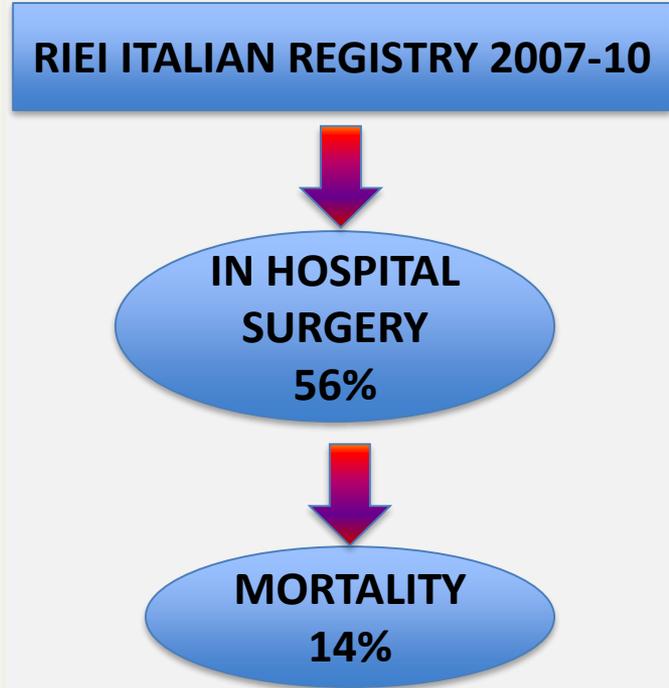
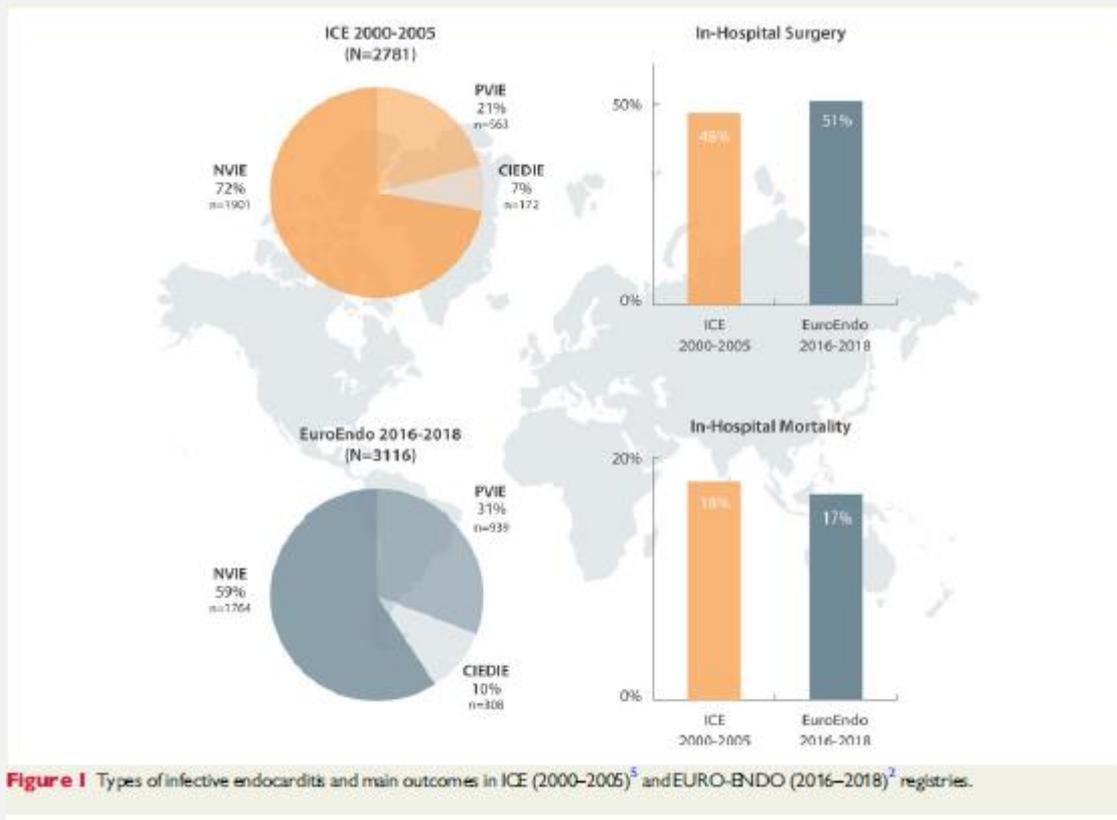
S.C.CARDIOLOGIA, OSP. MARIA VITTORIA

ASL CITTA' DI TORINO

Take-home messages: EURO-ENDO registry

- 1. IE more frequently affects men around 60 years of age.**
- 2. PVIE, CDRIE, nosocomial, staphylococcal and enterococcal endocarditis are more frequent.**
- 3. Oral streptococcal endocarditis is less frequent, and its frequency has not increased since implementation of the 2009 and 2015 recommendations restricting indications for antibiotic prophylaxis.**
- 4. New imaging techniques ([¹⁸F]FDG PET/CT) have emerged and are used in several countries worldwide.**
- 5. The prognosis of IE is still unacceptably poor and more aggressive management of this deadly disease remains necessary.**

The 1-year mortality from IE has not improved in over 2 decades.



MANAGEMENT OF IE: CLINICAL AND LOGISTICAL CHALLENGE

European Heart Journal Advance Access published August 29, 2015



European Heart Journal
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ESC GUIDELINES

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)

Role of the 'Endocarditis Team'

1. The 'Endocarditis Team' should have meetings on a regular basis in order to discuss cases, take surgical decisions, and define the type of follow-up.
2. The 'Endocarditis Team' chooses the type, duration, and mode of follow up of antibiotic therapy, according to a standardized protocol, following the current guidelines.
3. The 'Endocarditis Team' should participate in national or international registries, publicly report the mortality and morbidity of their centre, and be involved in a quality improvement programme, as well as in a patient education programme.
4. The follow-up should be organized on an outpatient visit basis at a frequency depending on the patient's clinical status (ideally at 1, 3, 6, and 12 months after hospital discharge, since the majority of events occur during this period⁵⁷).

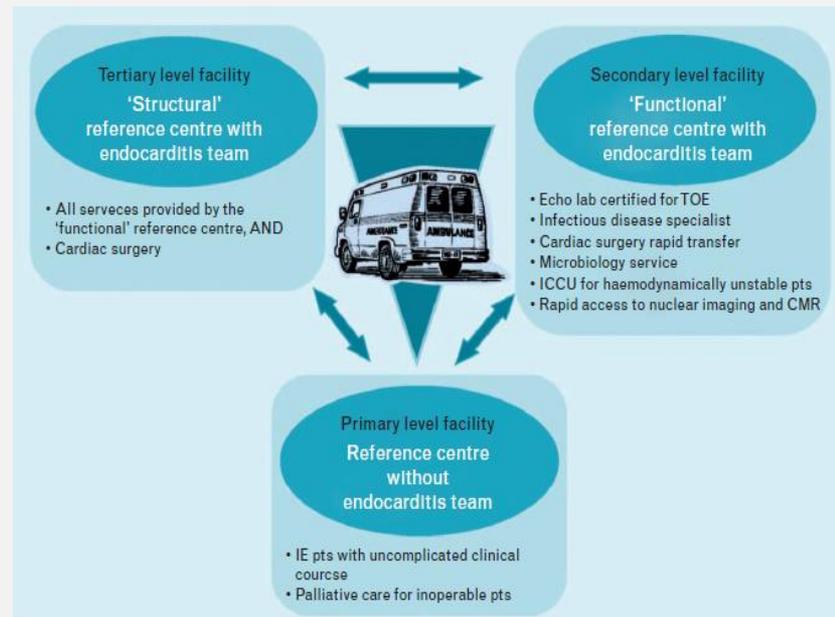
Characteristics of the reference centre

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 (HF, abscess, large vegetation, neurological, and embolic complications).
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.

Practical implementation of the Endocarditis Team in 'functional' reference centres: the Italian hospital network experience and recommendations of the Italian Society of Echocardiography and Cardiovascular Imaging

J Cardiovasc Med 2019, 20:414–418

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CLINICAL CHALLENGE

DIAGNOSIS

**EARLY
DIAGNOSIS**

**High index of clinical suspicion
Appropriate investigation in high risk patients**

IMAGING

**PROGNOSTIC
STRATIFICATION**

**SURGERY AND
TIMING FOR
SURGERY**

EARLY DIAGNOSIS

- Awareness and clinical **suspicion** are the first important step, even though not sufficient. It is difficult to define the threshold to start the diagnostic work-up for IE.
- Fever or inflammatory syndrome and murmur in patients at risk
- Signs and symptoms
- Preliminary evaluation

Table 1 Patients at risk of infective endocarditis (IE)

Cardiac predisposition
Intravenous drug users
Hemodialysis
Nosohusial IE
Diabetic patients
Elderly patients
Intracardiac devices
Nosocomial IE
Immunodepression
<i>Staphylococcus aureus</i> sepsis

DIAGNOSTIC EVALUATION

**BLOOD
CULTURES**



**ECOCARDIOGRAM TT
/TE**

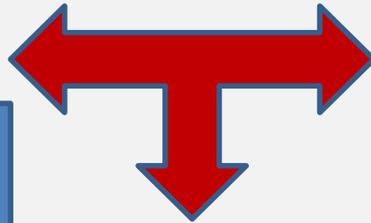
**INFECTIOUS DISEASE
SPECIALIST**



CARDIOLOGIST

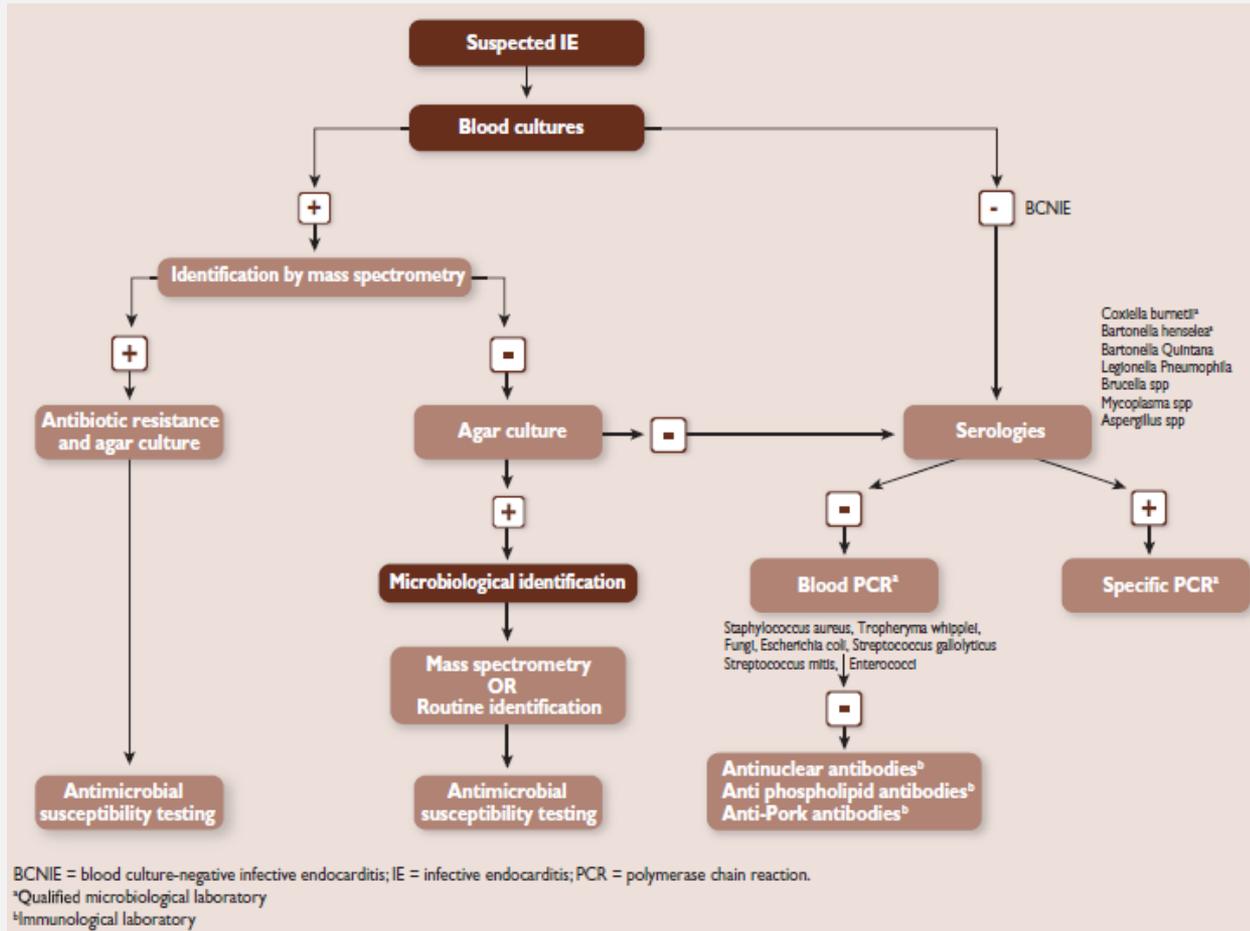
MICROBIOLOGIST

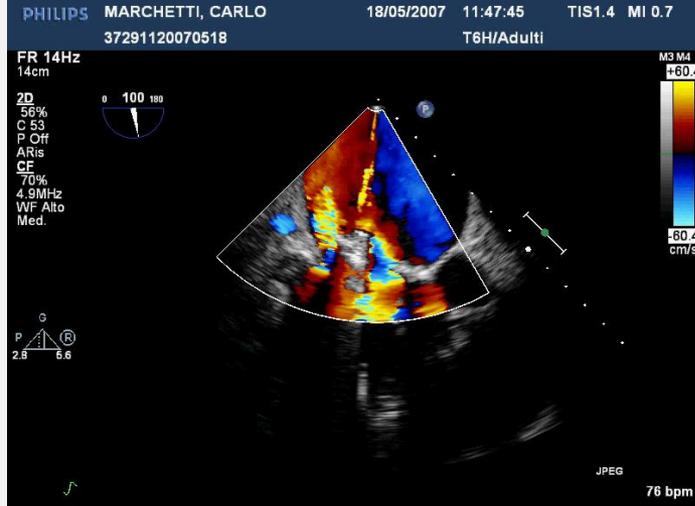
SEROLOGY



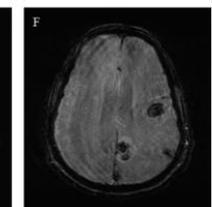
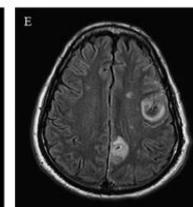
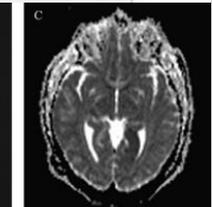
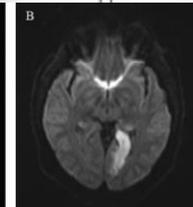
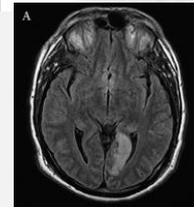
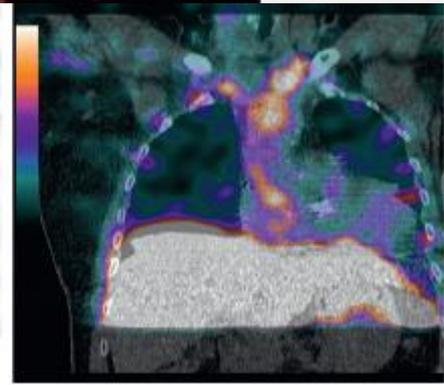
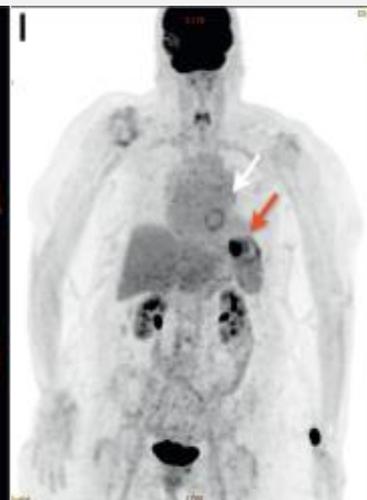
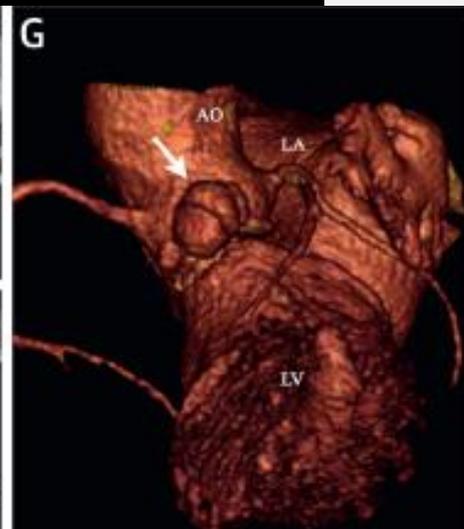
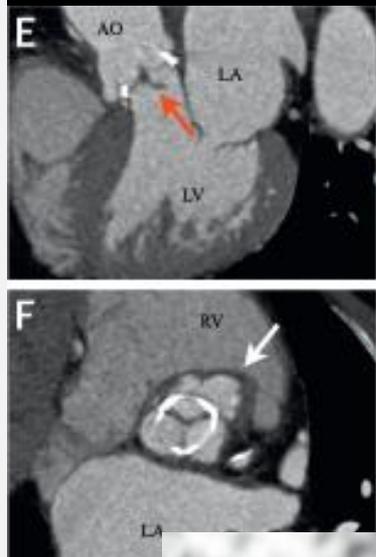
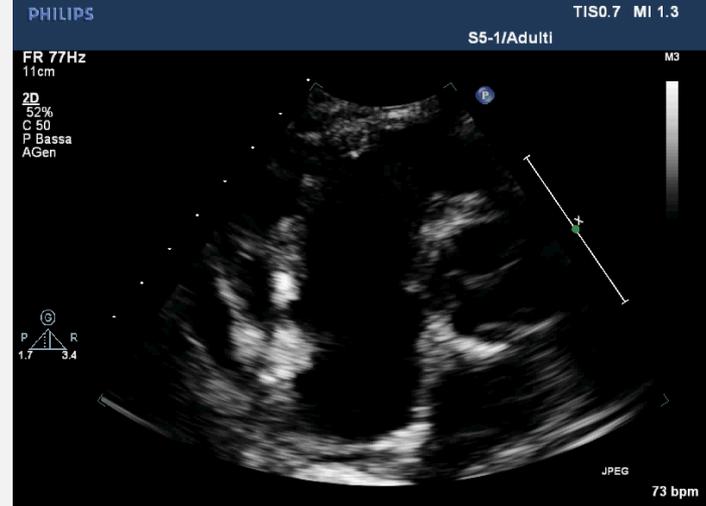
**POLYMERASE
CHAIN REACTION
(PCR)**

DIAGNOSTIC EVALUATION MICROBIOLOGY





IMAGING



ESC 2015 ALGORITHM

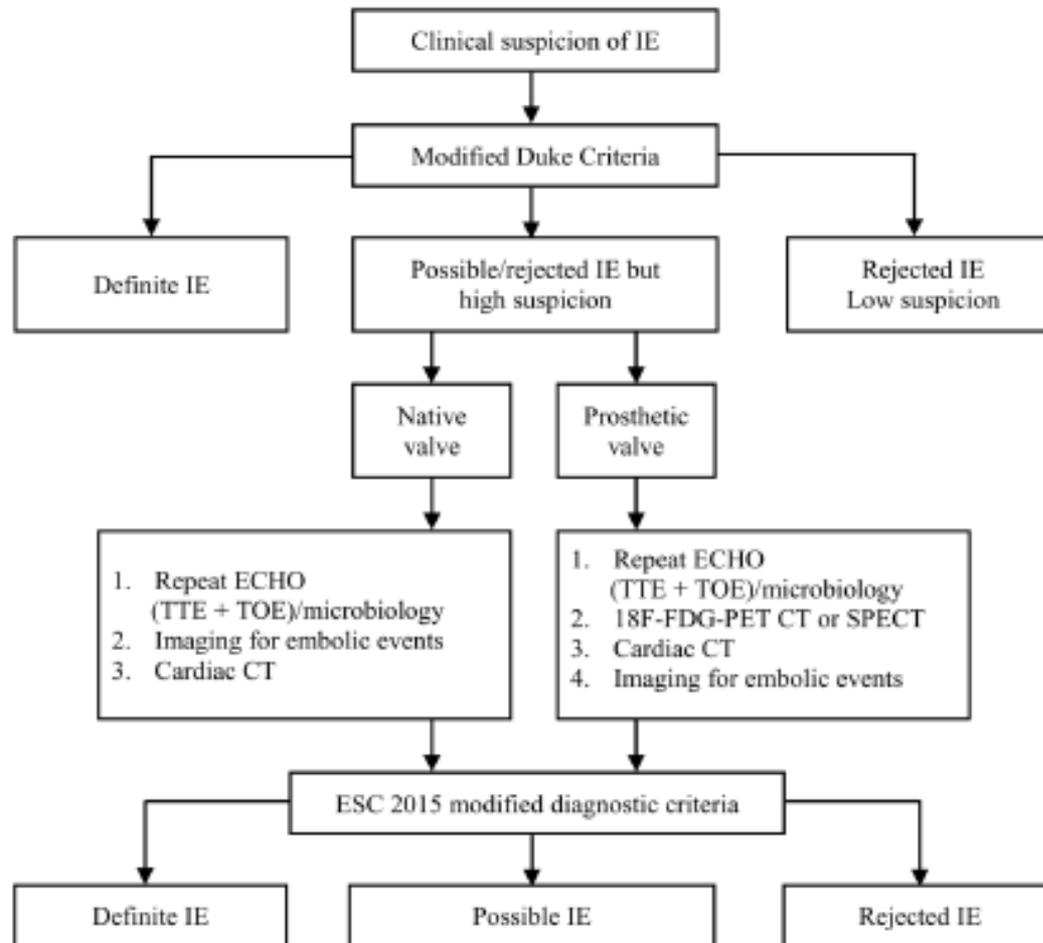
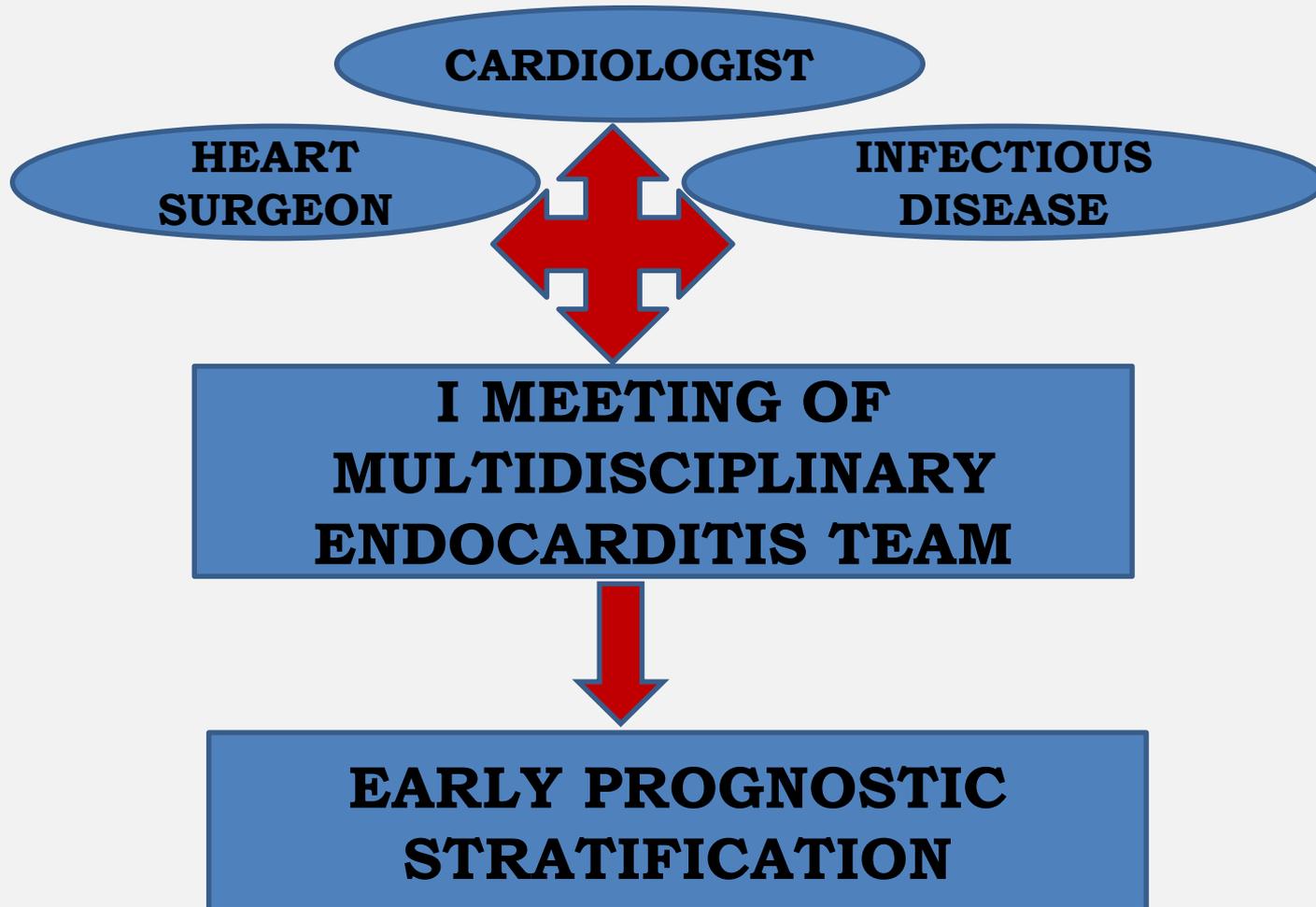


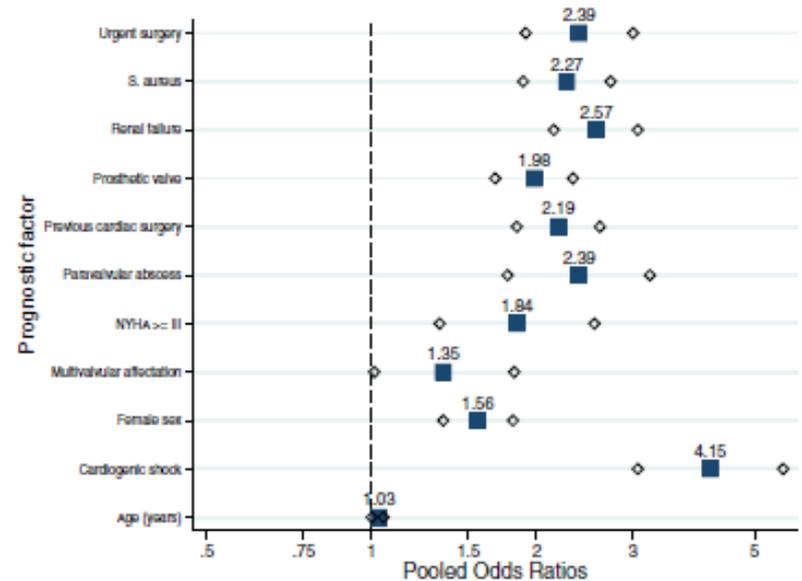
Figure 4. Diagnostic criteria for infective endocarditis. Taken from the 2015 European Society of Cardiology (ESC)

DEFINITE IE DIAGNOSIS



PROGNOSTIC STRATIFICATION

SURGICAL RISK ESTIMATION



Varela Barca. Infection 2019

SCORE INDEX

DOUBT IMPACT ON MORTALITY P.S

EUROSCORE II, BETTER vs I

DEVELOPMENT OF NEW SPECIFIC IE SCORE

Patient characteristics

- Older age
- Prosthetic valve IE
- Diabetes mellitus
- Comorbidity (e.g., frailty, immunosuppression, renal or pulmonary disease)

Clinical complications of IE

- Heart failure
- Renal failure
- >Moderate area of ischaemic stroke
- Brain haemorrhage
- Septic shock

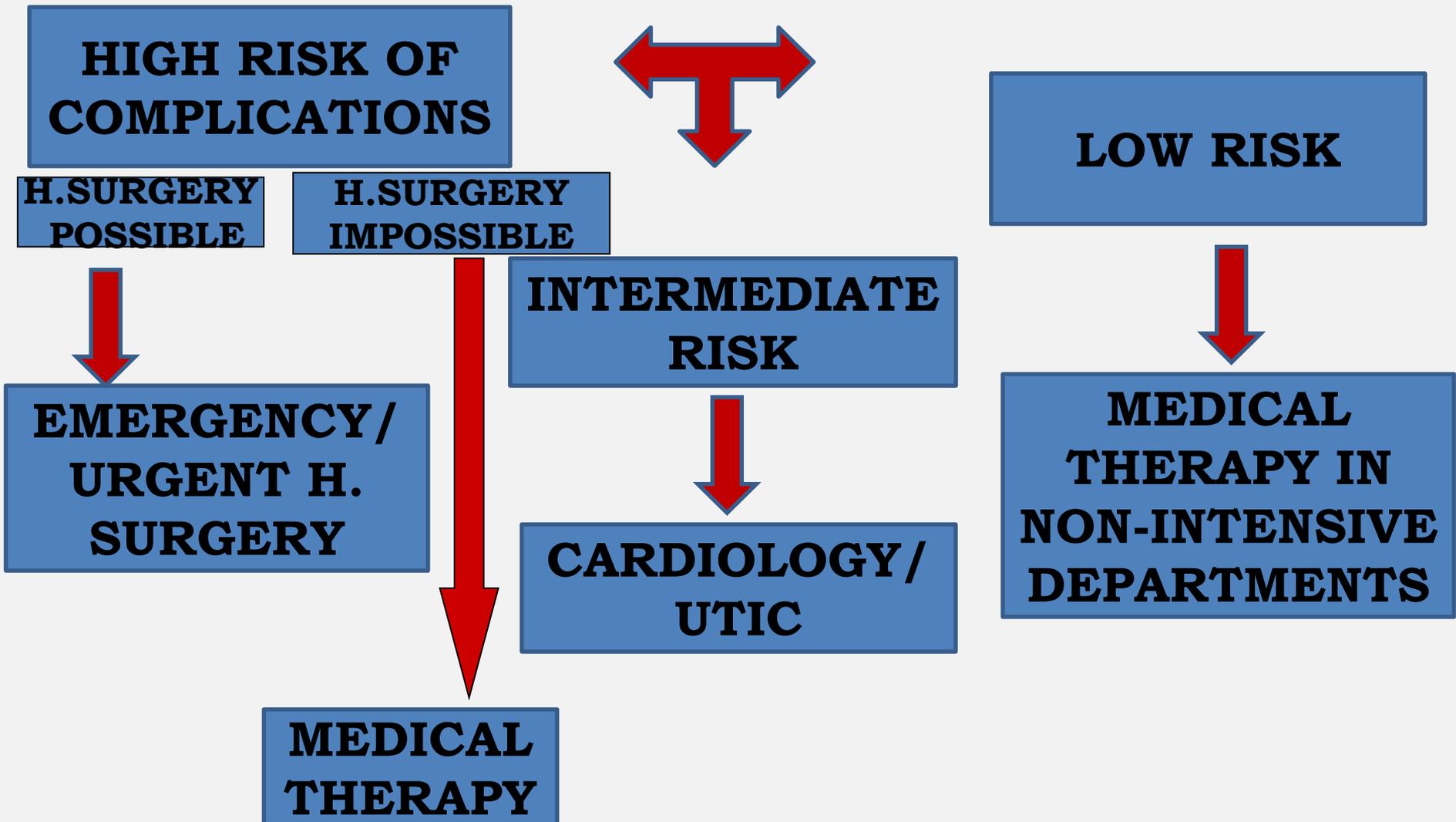
Microorganism

- *Staphylococcus aureus*
- Fungi
- Non-HACEK Gram-negative bacilli

Echocardiographic findings

- Periannular complications
- Severe left-sided valve regurgitation
- Low left ventricular ejection fraction
- Pulmonary hypertension
- Large vegetations
- Severe prosthetic valve dysfunction
- Premature mitral valve closure and other signs of elevated diastolic pressures

EARLY PROGNOSTIC STRATIFICATION



HEART SURGERY

AHA Guidelines 2015 (89)		Class, Level of Evidence	ESC Guidelines 2015 (68)	Class, Level of Evidence	Timing†
Heart failure	Early surgery* is indicated in patients with IE who present with valve dysfunction resulting in symptoms or signs of HF	I, B	Aortic or mitral NVE, or PVE with severe acute regurgitation, obstruction, or fistula causing refractory pulmonary edema or cardiogenic shock	I, B	Emergency
	Early surgery* is indicated in patients with PVE with symptoms or signs of HF resulting from valve dehiscence, intracardiac fistula, or severe prosthetic valve dysfunction	I, B	Aortic or mitral NVE, or PVE with severe regurgitation or obstruction causing symptoms of HF, or echocardiographic signs of poor hemodynamic tolerance	I, B	Urgent
Uncontrolled infection	Early surgery* is indicated in patients when IE is complicated by heart block, annular or aortic abscess, or destructive penetrating lesions	I, B	Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	I, B	Urgent
	Early surgery* is reasonable for patients with relapsing PVE	IIa, C			
	Early surgery* should be considered, particularly in patients with IE caused by fungi or highly resistant organisms (e.g., VRE, multidrug-resistant gram-negative bacilli)	I, B	Infection caused by fungi or multiresistant organisms	I, C	Urgent/elective
	Early surgery* is indicated for evidence of persistent infection (manifested by persistent bacteremia or fever lasting >5-7 d, and provided that other sites of infection and fever have been excluded) after the start of appropriate antimicrobial therapy	I, B	Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci PVE caused by staphylococci or non-HACEK gram-negative bacteria	IIa, B IIa, C	Urgent Urgent/elective
Prevention of embolism	Early surgery* is reasonable in patients who present with recurrent emboli and persistent or enlarging vegetations despite appropriate antibiotic therapy	IIa, B	Aortic or mitral NVE, or PVE with persistent vegetations >10 mm after ≥1 embolic episode despite appropriate antibiotic therapy	I, B	Urgent
	Early surgery* is reasonable in patients with severe valve regurgitation and mobile vegetations >10 mm	IIa, B	Aortic or mitral NVE with vegetations >10 mm, associated with severe valve stenosis or regurgitation, and low operative risk	IIa, B	Urgent
	Early surgery* may be considered in patients with mobile vegetations >10 mm, particularly when involving the anterior leaflet of the mitral valve and associated with other relative indications for surgery	IIb, C	Aortic or mitral NVE, or PVE with isolated very large vegetations (>30 mm)	IIa, B	Urgent
			Aortic or mitral NVE, or PVE with isolated large vegetations (>15 mm) and no other indication for surgery	IIb, C	Urgent

HEART SURGERY TIMING

- **ONLY ONE RCT STUDY (KANG 2012) → FAVORS EARLY SURGERY**
- **OTHERS STUDIES ONGOING**
- **'EARLY' DIFFERS SIGNIFICANTLY BETWEEN ESC AND US GL**
- **NO PROVEN BENEFIT IN DELAYING SURGERY ONCE AN INDICATION HAS BEEN ESTABLISHED**
- **VERY LOW MORTALITY IN CENTERS OF EXCELLENCE WITH HIGH LEVEL EXPERIENCE**

