


Military Medical Academy
 Annual International Congress of Cardiology
 in collaboration with
 Egyptian Society of Cardiology

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Case Presentation

MVP with Fever Post Tooth Extraction

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Case Scenario

- Mrs. N Magdy is a 32 years old lady known to have MVP with mild MR not known to be diabetic or hypertensive
- C/O tooth aches
- She went to her dentist and he discovered that she will need a root canal procedure

Infective Endocarditis

- Adult population
 - MVP – prominent predisposing factor
 - High prevalence in population
 - 2-4%
 - 20% in young women
 - Accounts for 7 – 30% NVE in cases not related to drug abuse or nosocomial infection
 - Relative risk in MVP is largely confined to patients with murmur
 - MVP with murmur – incidence IE 52/100/000 pt. years
 - MVP w/o murmur – incidence IE 4.6/100,000 pt. years



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Antibiotic prophylaxis

- YES
- NO



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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

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Procedures at highest-risk of IE

Recommendations	Class	Level
A. Dental procedures <ul style="list-style-type: none"> Antibiotic prophylaxis should only be considered for dental procedures requiring manipulation of the gingival or periapical region of the teeth or perforation of the oral mucosa. 	IIa	C
<ul style="list-style-type: none"> Antibiotic prophylaxis is not recommended for local anaesthetic injections in non-infected tissues, treatment of superficial caries, removal of sutures, dental X-rays, placement or adjustment of removable prosthodontic or orthodontic appliances or braces, or following the shedding of deciduous teeth or trauma to the lips and oral mucosa. 	III	C
B. Respiratory tract procedures <ul style="list-style-type: none"> Antibiotic prophylaxis is not recommended for respiratory tract procedures, including bronchoscopy or laryngoscopy, transnasal or endotracheal intubation. 	III	C
C. Gastrointestinal or urogenital procedures or TOE <ul style="list-style-type: none"> Antibiotic prophylaxis is not recommended for gastroscopy, colonoscopy, cystoscopy, vaginal or caesarean delivery or TOE. 	III	C
D. Skin and soft tissues procedures <ul style="list-style-type: none"> Antibiotic prophylaxis is not recommended for any procedure. 	III	C

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Cardiac conditions at highest risk of IE

Recommendations	Class	Level
Antibiotic prophylaxis should only be considered for patients at highest risk of IE: 1. Patients with any prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair. 2. Patients with previous IE. 3. Patients with congenital heart disease. a. Any cyanotic congenital heart disease. b. Any type of congenital heart disease repaired with a prosthetic material whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains.	IIa	C
Antibiotic prophylaxis is not recommended in other forms of valvular or congenital heart disease.	III	C

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European Heart Journal (2018), 39, 3075–3123. doi:10.1093/eurheartj/ehy319



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Case Scenario

- 2 weeks later she C/O fever (38.5) , rigors and loss of appetite
- She consulted her family doctor who ordered CBC,ESR, CRP and urine analysis
- She started anti pyretic and received broad spectrum antibiotics



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Case Scenario

- ESR 85
- CRP 55
- CBC mild anaemia with leukocytosis
- Urine analysis showed RBCs , Casts, No crystals or gravels
- NO clinical improvement



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Common Peripheral Manifestations of Infective Endocarditis.

Splinter hemorrhages (**Panel A**) are normally seen under the fingernails. They are usually linear and red for the first-two to three days and brownish thereafter.

Panel B shows conjunctival petechiae.

Osler's nodes (**Panel C**) are tender, subcutaneous nodules, often in the pulp of the digits or the thenar eminence.

Janeway's lesions (**Panel D**) are nontender, erythematous, hemorrhagic, or pustular lesions, often on the palms or soles.



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Any further investigations ??

- Blood cultures
- Echocardiography



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Follow up

- Blood cultures >>>> negative
- Echocardiography >>>> MVP of anterior leaflet with mid MR
- Symptoms increasing in severity



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Infective Endocarditis???

ESC 2015 modified criteria for diagnosis of IE:

Major criteria

- Blood cultures positive for IE
- Typical microorganisms consistent with IE from 2 separate blood cultures:
 - Viridans streptococci, *Streptococcus gallolyticus* (*Streptococcus bovis*), HACEK group, *Staphylococcus aureus*; or
 - Community-acquired enterococci, in the absence of a primary focus; or
 - Microorganisms consistent with IE from persistently positive blood cultures:
 - ≥ 2 positive blood cultures of blood samples drawn >12 h apart; or
 - All of 3 or a majority of ≥ 4 separate cultures of blood (with first and last samples drawn ≥ 1 h apart); or
 - Single positive blood culture for *Coxiella burnetii* or phase I IgG antibody titre $>1:800$
2. Imaging positive for IE
- Echocardiogram positive for IE:
 - Vegetation
 - Abscess, pseudoaneurysm, intracardiac fistula
 - Valvular perforation or aneurysm
 - New partial dehiscence of prosthetic valve
 - Abnormal activity around the site of prosthetic valve implantation detected by PET/CT, 18 F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT.
 - Definite paravalvular lesions by cardiac CT.

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ESC 2015
Guidelines for
IE

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Infective Endocarditis???

ESC 2015 modified criteria for diagnosis of IE:

Minor criteria

- Predisposition such as predisposing heart condition, or injection drug use.
- Fever defined as temperature $>38^{\circ}\text{C}$.
- Vascular phenomena (**including those detected only by imaging**): major arterial emboli, septic pulmonary infarcts, infectious (mycotic) aneurysm, intracranial haemorrhage, conjunctival haemorrhages, and Janeway's lesions.
- Immunological phenomena: glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor.
- Microbiological evidence: positive blood culture but does not meet a major criterion as noted above or serological evidence of active infection with organism consistent with IE.

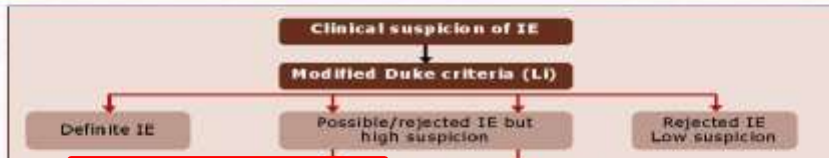
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ESC 2015
Guidelines for
IE

Infective Endocarditis???

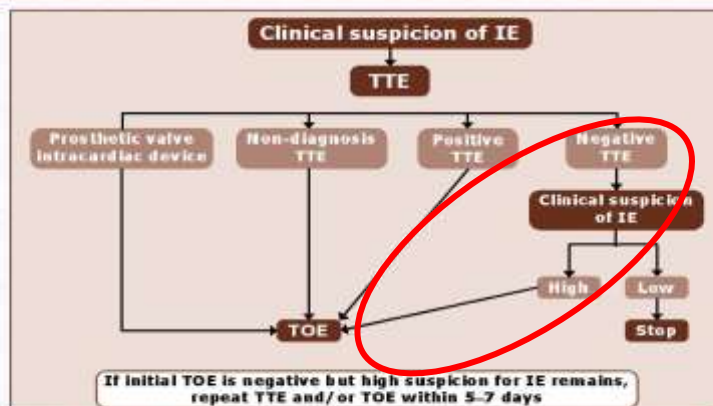
ESC 2015 algorithm for diagnosis of IE



Infective Endocarditis???

Echocardiography was repeated and revealed same data

Indications for echocardiography



Echocardiography in IE

Recommendations	Class	Level
A. Diagnosis		
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, when a prosthetic heart valve or an intracardiac device is present.	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

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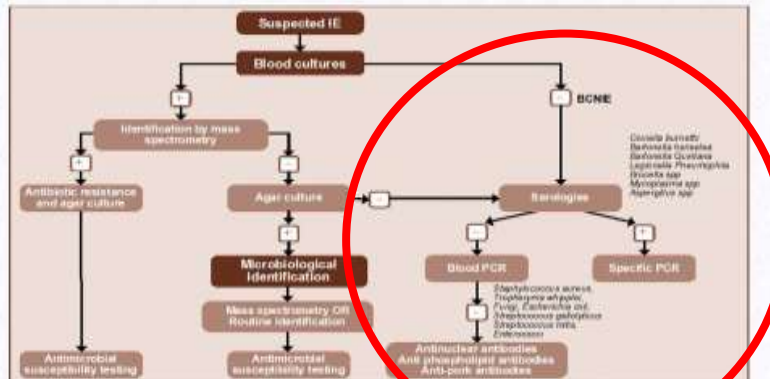
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What about negative blood culture?

Microbiological diagnostic algorithm



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Treatment

Antibiotic treatment Oral *Streptococci* and *Streptococcus bovis* group

Antibiotic	Dosage and route	Duration (weeks)	Class	Level
Strains penicillin-susceptible (MIC ≤ 0.125 mg/l) oral and digestive streptococci				
Standard treatment: 4-week duration				
Penicillin G	12–18 million U/day i.v., either in 4–6 doses or continuously	4	I	B
<i>or</i>				
Amoxicillin	100–200 mg/kg/day i.v. in 4–6 doses	4	I	D
<i>or</i>				
Ceftriaxone	2 g/day i.v. or i.m. in 1 dose	4	I	B
In beta-lactam allergic patients				
Vancomycin	30 mg/kg/day i.v. in 2 doses	4	I	C

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Treatment

Antibiotic treatment Oral *Streptococci* and *Streptococcus bovis* group

Antibiotic	Dosage and route	Duration (weeks)	Class	Level
Strains relatively resistant to penicillin (MIC 0.250–2 mg/l)				
Standard treatment:				
Penicillin G	24 million U/day i.v., either in 4–6 doses or continuously	4	I	B
<i>or</i>				
Amoxicillin	200 mg/kg/day i.v. in 4–6 doses	4	I	B
<i>or</i>				
Ceftriaxone	2 g/day i.v. or i.m. in 1 dose	4	I	B
<i>with</i>				
Gentamicin	3 mg/kg/day i.v. or i.m. in 1 dose	2	I	B
In beta-lactam allergic patients				
Vancomycin	30 mg/kg/day i.v. in 2 doses	4	I	C
<i>with</i>				
Gentamicin	3 mg/kg/day i.v. or i.m. in 1 dose	2	I	C

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3 Days later the lady developed left sided weakness

How can this event affect your plan of treatment ?



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Echocardiography in IE

Recommendations	Class	Level
B. Follow-up under medical therapy		
Repeat TTE and/or TOE are recommended as soon as a new complication of IE is suspected (new murmur, embolism, persisting fever, HF, abscess, atrioventricular block).	I	B
Repeat TTE and/or TOE should be considered during follow-up of uncomplicated IE, in order to detect new silent complications and monitor vegetation size. The timing and mode (TTE or TOE) of repeat examination depend on the initial findings, type of microorganism, and initial response to therapy.	IIa	B
C. Intra-operative echocardiography		
Intra-operative echocardiography is recommended in all cases of IE requiring surgery.	I	B
D. Following completion of therapy		
TTE is recommended at completion of antibiotic therapy for evaluation of cardiac and valve morphology and function.	I	C

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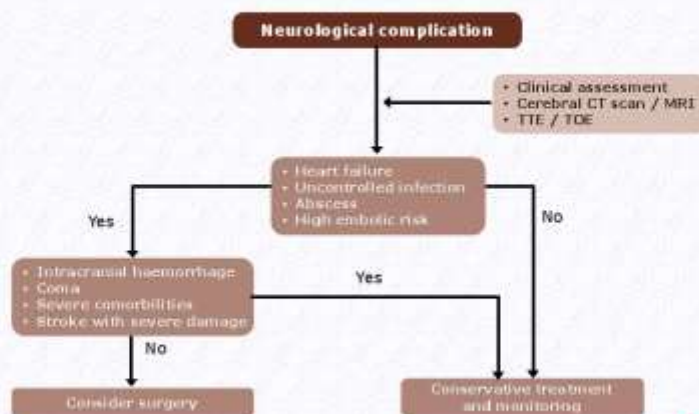


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Indications and timing of surgery

Indications for surgery	Timing	Class	Level
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
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
2. Uncontrolled infection			
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 infection.	Urgent	IIa	B
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
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	B

Management of neurological complications



Take Home Message

- *There is a lack of scientific evidence for the efficacy of infective endocarditis prophylaxis. Thus, antibiotic prophylaxis is recommended only for patients with the highest risk of IE undergoing the highest risk dental procedures*
- *Good oral hygiene and regular dental review are more important than antibiotic prophylaxis to reduce the risk of IE.*
- *The proposed reduction of antibiotic prophylaxis is not evidence-based, but reflects an expert consensus opinion. Additional epidemiological surveys must be done to monitor the potential consequences of guideline modifications on IE epidemiology.*



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Take Home Message

- *Echocardiography and blood cultures are the cornerstone of diagnosis of IE.*
- *When the diagnosis remains only possible or even rejected but with a persisting high level of clinical suspicion, echocardiography and blood culture should be repeated, and other imaging techniques should be used*



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Take Home Message

- *After a first neurological event, if cerebral hemorrhage has been excluded and neurological damage is not severe (i.e. coma), surgery indicated for HF, uncontrolled infection, abscess, or persistent high embolic risk should not be delayed*



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