

Infective Endocarditis

The questions signed by * are hard: read their explanation. ● Past Years ● TBL ● Others

This file belongs to the PULSE Cardiology question book: the explanations of the multiple choice answers and the model answers of the essay questions, in the words of the handout.

Answer Key | Multiple Choice Questions

Question no.	1	2	3	4	5	6	7	8	9	10	11	12
Answer	c	a	c	c	c	c	c	a	d	a	c	b

Question no.	13	14	15	16
Answer	a	c	d	d

► Second | Questions with a Note

Question no.	1
Answer	b

► Why this answer?

- Which of the following is the least cardiac lesion that can develop infective endocarditis?
(c) ASD
Infective endocarditis is rare in ASD due to the low pressure gradient between the two atria. VSD and PDA are among the congenital lesions where it is common, and pulmonary stenosis is not named as a rare site.
- The causative organism of infective endocarditis when the route of entry is dental procedures is:
(a) Streptococcus viridans
After dental procedures and oral or upper respiratory surgery the organism is usually Strept. viridans. Staph. aureus follows cardiac surgery and catheterization, and Strept. faecalis follows gastrointestinal and genitourinary procedures.
- The least cardiac lesion that can develop infective endocarditis is:
(c) ASD
The disease is rare in ASD due to the low pressure gradient between the two atria. MR, VSD and PDA are common sites, and a narrow orifice (small defect) makes it more common, not less.
- Incidence of infective endocarditis is least in:
(c) ASD
Infective endocarditis is rare in ASD due to the low pressure gradient between the two atria. MR, VSD and PDA are high pressure lesions where it is common.

- 5 Populations not indicated for prophylaxis against infective endocarditis include:
(c) Mitral stenosis
 Infective endocarditis is not common in MS because of marked fibrosis and low pressure, and in MS prophylaxis is given only if there is a history of infective endocarditis or a mitral valve prosthesis. Prosthetic valves and a previous attack need prophylaxis, and so does the early period after device closure of a shunt.
- 6 * High risk groups of infective endocarditis include the following except:
(c) Mitral valve prolapse
 Prosthetic valves and I.V. drug addiction are named as settings of infective endocarditis, and a past history of infective endocarditis is an indication for prophylaxis. Mitral valve prolapse is not named; the answer is inferred from the list of underlying cardiac lesions.
- 7 A major criterion for the diagnosis of infective endocarditis is:
(c) Vegetations on echocardiography
 Echo showing vegetations, new regurg or valve ring abscess is a major Duke criterion. A predisposing heart condition and embolic or immune manifestations such as splinter haemorrhages and Osler's nodes are minor criteria.
- 8 Suspect a perivalvular abscess in patients with IE who develop:
(a) A new heart block
 A valve ring abscess lies next to the conduction tissue, so a new heart block in endocarditis should raise suspicion of it; the handout lists both valve ring abscess and aortic valve endocarditis with 2nd degree or complete heart block as indications for surgery. Petechiae, splinter haemorrhages and clubbing are general manifestations.
- 9 Which heart valve is most likely to be involved in infective endocarditis in intravenous drug users?
(d) Tricuspid valve
 In I.V. drug addicts the right valves are affected, esp. the tricuspid, with Staph and Candida as the infecting organisms.
- 10 A 38-year-old male IV drug abuser presents with malaise, fatigue and rigors. His temperature on admission...
(a) Systolic murmur at left sternal border
 In I.V. drug addicts the right valves are affected, esp. the tricuspid. Tricuspid regurgitation gives a pansystolic murmur heard best at the lower sternal edge in inspiration, that is a systolic murmur at the left sternal border.
- 11 The following organism is a cause of culture-negative infective endocarditis:
(c) Fungal organism
 Culture -ve endocarditis may be due to prior use of antibiotics or infection with other organisms e.g. fungi, rickettsia. Strept. viridans, Staph. aureus and Strept. faecalis are the usual culture +ve organisms.
- 12 Which of the following is an echocardiographic indication of surgical management in infective endocarditis?
(b) Valve ring abscess
 Valve ring abscess is one of the conditions that require surgical treatment. Valve replacement is for severe valvular damage, so moderate MR is not enough.
- 13 Which of the following should be avoided in the treatment of infective endocarditis?
(a) Bacteriostatic antibiotics
 Bactericidal drugs in large doses and parenterally should be used, so bacteriostatic antibiotics are avoided. Combinations are used, e.g. penicillin or ampicillin plus streptomycin or gentamycin.
- 14 Commonest organism producing acute bacterial endocarditis is:
(c) Staphylococcus aureus
 Acute bacterial endocarditis is caused by highly virulent organisms, and its regimen is aimed at Staph. aureus and Gram -ve bacilli. Strept. viridans and Strept. faecalis are the organisms of SBE.
- 15 * All of the following may produce hemiplegia by cerebral embolism except:
(d) Right atrial myxoma
 Emboli from the right side of the heart go to the lungs, as the handout shows for right sided endocarditis, so a right atrial myxoma does not cause cerebral embolism. Cerebral embolism with hemiplegia occurs in infective endocarditis and embolic stroke secondary to AF; mitral valve prolapse is a left-sided valve lesion.

16 Which of the following is not a clinical finding associated with infective endocarditis?

(d) Erythema nodosum

Osler's nodules, Roth spots (retinal haemorrhagic infarctions) and splinter haemorrhages are all manifestations of infective endocarditis. Erythema nodosum is not one of them.

► Second | Questions with a Note: why this answer?

1 Osler's nodules in patients with infective endocarditis are typically seen in:

(b) Palm & sole

Osler's nodules are tender intracutaneous nodules in the pulps of the fingers and toes and may be on the hands and feet. Palm and sole is the only option on the hands and feet.

Model Answers | Essay Questions

1 Enumerate indications of surgical management of infective endocarditis.

Surgical treatment may be required in the following conditions:

- * **Valve replacement** in: severe valvular damage e.g. MR, AR, and resistant cases.
- * Replacement of **infected prosthesis**.
- * Excision of infected **ductus arteriosus or coarctation**.
- * **Fungal endocarditis**.
- * **Valve ring abscess**.
- * **Aortic valve endocarditis** with 2nd degree or complete heart block (CHB).

2 Summarize the laboratory & radiological investigations needed for diagnosis of infective endocarditis in pediatrics. What are Duke criteria for diagnosis?

(I) Laboratory investigations

① **Blood culture**

- It is the **most important** investigation (+ve in **80%** of cases).
- Samples are cultured under aerobic and anaerobic conditions [and results are looked for after **2 days up to 21 days**].
- Bone marrow culture if blood culture is repeatedly -ve.
- Culture -ve endocarditis may be due to:
 - Prior use of antibiotics.
 - Infection with other organisms e.g. fungi, rickettsia.

② **Blood picture**

- Normocytic anaemia.
- Leucopenia with monocytosis in SBE.
- Polymorphonuclear leucocytosis in ABE.

③ **ESR and C-reactive protein:** increased but not as high as in rheumatic fever.

④ **Urine analysis**

- Microscopic or macroscopic haematuria.
- Proteinuria and casts.

⑤ **Immunological tests**

- Increased gamma globulins.
- False +ve rheumatoid factor.
- False +ve serological tests for syphilis.

Modified Duke's criteria

Diagnosis: **2 major**, or **1 major + 3 minor**, or **5 minor**.

* **Major**

- +ve blood culture:
 - 3 of 3 samples (if more, the majority +ve) taken over **> 1 h**, or
 - typical organism from 2 cultures, or
 - persistently +ve cultures taken **> 12 hs** apart.
- Echo: vegetations, new regurg or valve ring abscess.

* **Minor**

- Predisposing heart condition.
- Fever **$\geq 38^{\circ}\text{C}$** .
- I.V. drug misuse.
- Embolic manifestation.
- Immune manifestation.
- Echo.
- Blood culture if suggestive but not definitive.

N.B. Possible diagnosis [not definitive] if one major & one minor, or 3 minor.

(II) Cardiac investigations

① **Echocardiography**, esp. trans-oesophageal (TOE) echo

- May detect vegetations.
- Detects the underlying cardiac lesion.
- Detects complications of endocarditis e.g. mitral and aortic incompetence.

② **CXR and ECG**

- May help in diagnosis of the underlying cardiac disease.