

Endocarditis: Some Basics

Key Points:

- Splinter hemorrhages, Osler nodes, Janeway lesions, etc. are RARE. Looks for focal neurological findings, splenomegaly, and petechiae on exam.
- The Duke Criteria for IE have a 76 - 100% sensitivity and an 88 – 100% specificity. The negative predictive value (NPV) is 92%.

Table 3: Physical Exam and Laboratory Findings in IE

Finding	% of cases
Fever	80-95
Audible murmur	85
New or changed murmur	15-47
Neurologic abnormalities	20-40
Splenomegaly	0-60
Petechiae	20-40
Splinter hemorrhages	15
Osler nodes	10-25
Janeway lesions	<10
Roth spots	<5
Anemia of chronic disease	50-90
Leukocytosis	20-66
Elevated ESR	90-100
Microscopic hematuria	50-70
Positive rheumatoid factor	40-50
Abnormal CXR (effusion, infiltrate, septic emboli)	67-85 (right-sided IE)

Table 5: Terminology used in Duke Criteria

Major Criteria	<ol style="list-style-type: none"> 1. Blood culture positive: <ol style="list-style-type: none"> a. Typical organism (alpha-hemolytic streptococcus, <i>S. bovis</i>, HACEK organisms, or community-acquired <i>S. aureus</i> or enterococcus without a primary focus) from 2 separate blood cultures <p style="text-align: center;">OR</p> b. Persistent bacteremia with any organism (2 positive cultures > 12 hours apart or 3 positive cultures or a majority of 4 or more cultures > 1 h apart) 2. Evidence of endocardial involvement <ol style="list-style-type: none"> a. Echo findings: mobile mass attached to valve or valve apparatus, or abscess, or new partial dehiscence of prosthetic valve b. New valvular regurgitation
Minor Criteria	<ol style="list-style-type: none"> 1. Predisposing condition: intravenous drug use or predisposing cardiac condition 2. Fever $\geq 38.0^{\circ}$ C 3. Vascular phenomena: arterial embolism, septic pulmonary emboli, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, Janeway lesions 4. Immunologic phenomena: glomerulonephritis, Osler nodes, Roth spots, rheumatoid factor 5. Echocardiogram findings consistent with endocarditis but not meeting major criteria 6. Microbiologic evidence: positive blood cultures not meeting major criteria, or serologic evidence of active infection consistent with endocarditis

Adapted from Durack DT, Lukes AS, Bright DK et al. New criteria for diagnosis of infective endocarditis. *Am J Med* 1994; 96: 200-9.

**Table 6: Proposed Modifications to Duke Criteria
for Diagnosis of Infective Endocarditis**

- The category “Possible IE” should be defined as at least 1 major and 1 minor criterion or 3 minor criteria
- The minor criterion of echocardiographic findings consistent with endocarditis but not meeting a major criterion should be eliminated, due to the widespread use of the more accurate transesophageal echo
- Bacteremia with *S. aureus* should be considered a major criterion, regardless of whether the bacteremia was nosocomially acquired or whether a removable focus of infection is found
- Positive Q fever serology should be made a major criterion

Adapted from Li JS, Sexton DJ, Mick N, et al. Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. *Clin Infect Dis* 2000, 30(4): 633-8.

All adapted from:

Calfée CS, Chambers HF: “Infective Endocarditis.” *Cecil’s Textbook of Medicine*, 22nd ed. In press, 2003.