# Diagnostic Criteria for Infective Endocarditis

Infective endocarditis (IE) can be diagnosed using the 2023 Duke–International Society for Cardiovascular Infectious Diseases criteria, which are listed below. A definitive diagnosis of IE requires two major criteria, a combination of one major criterion with three minor criteria, or five minor criteria.

| MAJOR CLINICAL CRITERIA | |
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| **Microbiologic** | **Positive blood cultures, defined as one of the following:**<br>• Microorganisms that commonly cause IE, isolated from at least two separate blood culture sets<br>• Microorganisms that occasionally or rarely cause IE, isolated from at least three separate blood culture sets<br>*OR*<br>**Positive laboratory tests, defined as one of the following:**<br>• Positive PCR or other nucleic acid–based technique for *Coxiella burnetii*, *Bartonella* species, or *Tropheryma whipplei* from blood<br>• *C. burnetii* antiphase I IgG antibody titer >1:800 or *C. burnetii* isolated from a single blood culture<br>• Indirect immunofluorescence assays for detection of IgM and IgG antibodies to *Bartonella henselae* or *Bartonella quintana*, with IgG titer ≥1:800 |
| **Imaging** | Evidence of endocardial involvement on echocardiography, cardiac CT, or $^{18}$F-fluorodeoxyglucose ($^{18}$F-FDG) PET/CT imaging |
| **Surgical** | Evidence of IE by direct inspection during cardiac surgery |
| **MINOR CLINICAL CRITERIA** | |
| **Predisposing conditions** | **Any of the following:**<br>• Previous history of IE<br>• Prosthetic valve<br>• Previous valve repair<br>• Congenital heart disease<br>• More than mild regurgitation or stenosis (of any etiology)<br>• Endovascular intracardiac implantable electronic device<br>• Hypertrophic obstructive cardiomyopathy<br>• Injection drug use |

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| **Fever** | Temperature >38.0°C |
| **Vascular phenomena** | Clinical or radiologic evidence of arterial emboli, septic pulmonary infarcts, cerebral or splenic abscess, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, Janeway lesions, or purulent purpura |
| **Immunologic phenomena** | Positive rheumatoid factor, Osler nodes, Roth spots, or immune complex–mediated glomerulonephritis |
| **Microbiologic evidence** | **Any of the following without meeting a major microbiologic criterion:**<br>• Positive blood cultures for a microorganism consistent with IE but not meeting the requirements for a major criterion<br>• Positive culture, PCR, or other nucleic acid–based test for an organism consistent with IE from a sterile body site other than cardiac tissue, cardiac prosthesis, or arterial embolus<br>• A single finding of a skin bacterium by PCR on a valve or wire without additional clinical or microbiologic supporting evidence |
| **Imaging** | Abnormal metabolic activity as detected by $^{18}$F-FDG PET/CT within 3 months of implantation of prosthetic valve, ascending aortic graft (with concomitant evidence of valve involvement), intracardiac device leads, or other prosthetic material |
| **Physical examination** | New valvular regurgitation identified on auscultation if echocardiography not available (worsening or changing of preexisting murmur is not sufficient) |

**Source:** Fowler VG et al. The 2023 Duke–International Society for Cardiovascular Infectious Diseases criteria for infective endocarditis: updating the modified Duke criteria. *Clin Infect Dis* 2023 Aug 22; 77:518. PMID: 37138445

*Last reviewed Nov 2023. Last modified Nov 2023. The information included here is provided for educational purposes only. It is not intended as a sole source on the subject matter or as a substitute for the professional judgment of qualified health care professionals. Users are advised, whenever possible, to confirm the information through additional sources.*

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