

# Endocarditis



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## KEYWORDS

• Endocarditis • Infective endocarditis • Nonbacterial thrombotic endocarditis (NBTE)

## HOSPITAL MEDICINE CLINICS CHECKLIST

1. Suspect endocarditis in patients with a fever, new murmur, and signs of embolism.
2. Most common bacteria are *Staphylococcus*, *Streptococcus*, and HACEK (*Haemophilus*, *Aggregatibacter*, *Cardiobacterium*, *Eikenella*, and *Kingella*) organisms.
3. Modified Duke Criteria are the main criteria to make the diagnosis of endocarditis.
4. Typically at least 6 weeks of IV antimicrobial therapy is required for treatment.
5. Surgical intervention is indicated for acute valvular dysfunction resulting in heart failure.

## CLINICAL GUIDELINES

Guidelines published by American Heart Association (AHA) and the American College of cardiology (ACC) in 2014.

Duke's criteria for diagnosis of infective endocarditis (IE).

## INTRODUCTION

Endocarditis can be infectious or noninfectious (marantic) in origin. IE is infection of cardiac endothelium by microorganisms. Noninfectious causes include Libman-Sacks endocarditis (seen in patients with lupus) and in patients with malignancy.<sup>1</sup>

Vegetation is a characteristic lesion found in IE, usually involving cardiac valves (either native or prosthetic). Vegetations are usually formed by microorganism colonies, platelets, fibrin, and inflammatory cells. Other potential sites for vegetation

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formation are endocardial surface damaged by blood flow and intracardiac devices (eg, pacemaker, implantable cardioverter-defibrillator).

IE remains a life-threatening infection with high morbidity and mortality despite advances in diagnostic techniques, medical therapy, and surgical therapy.

## EPIDEMIOLOGY

*How prevalent is endocarditis? What are the common risk factors and complications for endocarditis?*

IE is prevalent worldwide. Its incidence ranges from 3 to 10 per 100,000 people.<sup>2-4</sup>

Rheumatic heart disease remains a major risk factor in developing countries. It matches the similar pattern of developed countries during the early antibiotic era. In high-income countries, prompt availability of diagnosis and proper antibiotics for streptococcal throat infection has helped to decrease rheumatic heart disease.<sup>4,5</sup> Intravenous (IV) drug use, degenerative valve disease, malignancy, diabetes, and congenital heart disease are among the major risk factors in developed countries.<sup>4</sup>

In the past, IE was more prevalent in younger age groups and now the trend is changing toward older patients.<sup>4</sup> Advances in medicine reflect the change in epidemiology of IE in developed countries.<sup>6</sup> Nearly 30% of contemporary cohorts are health care-acquired IE.<sup>2,3</sup> As the use of long-term IV lines and invasive procedures increases, there is an increase in staphylococcal bacteremia.<sup>4,7</sup> Intracardiac devices and prosthetic heart valves also serve as a potential nidus for the development of IE. There appears to be increase in infection burden with implantable cardiac devices which is associated with increase in financial costs and duration of hospital stay.<sup>8,9</sup>

IE risk in children is highest among children with endocardial cushion defects, cyanotic congenital heart disease, and ventricular septal defects.<sup>10</sup> The risk is reduced after repair of the defect with absence of any residual shunt or prosthetic material.

The in-hospital mortality for IE remains high (15%–20%) with 1-year mortality near 40%. The stroke rate is approximately 17% and embolization nearly 22% (not counting stroke). Moreover, heart failure occurs in nearly one-third of patients, intracardiac abscess in nearly 15% of patients, and the need for surgical therapy remains in almost half of the patients as per the 2014 AHA/ACC guidelines.<sup>2,11</sup>

Preexisting cardiac abnormalities, rheumatic heart disease, intracardiac devices, prosthetic heart valves, congenital heart disease, and IV drug use are factors that increase the risk of IE.

The previous classification based on onset of disease (acute, subacute, and chronic) is no longer used. Description of heart valves involved either native or prosthetic and the source of infection is more important for appropriate diagnostic work-up and therapeutic intervention.<sup>12</sup>

## PATIENT EVALUATION AND DIAGNOSIS

*When to suspect endocarditis? What are the common clinical features of endocarditis?*

Clinical features: IE is usually suspected in patient with the following symptoms.<sup>1</sup>

- Fever
- Murmur
- Congestive heart failure

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