

# Infective endocarditis and dental considerations

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## Abstract:

*Infective endocarditis is a condition in which the heart valves are invaded by microorganisms usually bacteria. The hallmark of infective endocarditis is the presence of large friable vegetations on the heart valves. The vegetations consist of platelet and fibrin and surround the microorganisms and seem to protect them from normal host defenses and antibiotics. Some dental procedures in some patients may cause development of bacterial endocarditis. Bacterial endocarditis due to dental procedures is largely preventable by taking appropriate measures.*

**Key words:** bacterial endocarditis, dental procedures, antibiotic prophylaxis.

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## Introduction:

Infective endocarditis is a condition in which the heart valves are invaded by microorganisms. Usually bacteria are the principal causative agent and hence the condition is named as bacterial endocarditis. However apart from bacteria other organisms like fungi and viruses are capable of causing this condition and hence it is named as 'infective endocarditis. The hallmark of infective endocarditis is the presence of large friable (light) vegetations on the heart valves. The vegetations consist of platelet and fibrin and surround the microorganisms and seem to protect them from normal host defenses and antibiotics. The vegetations may be single or multiple and may involve more than one valve. The appearance of vegetation is influenced by the type of microorganism responsible for the infection and the degree of host immune response to the infection. The aortic and mitral valves are the most commonly affected although the tricuspid valve may also be involved particularly in intravenous drug abusers. Some dental procedures in some patients may cause development of bacterial endocarditis. Bacterial endocarditis due to dental procedures is largely preventable by taking appropriate measures.<sup>1</sup>

Virtually any type of microorganism is capable of causing infective endocarditis although most cases are caused by

bacteria. Blood borne bacteria (bacteremia) are the requirements for infective endocarditis. Acute and subacute bacteremia may result due to infection elsewhere in the body e.g periodontitis, dental treatment procedures, surgical procedures and urinary catheterization. Infection occurs when microorganisms are implanted on the endocardial surface during episodes of bacteremia. Bacteria causing infective endocarditis have been subdivided into two groups: high virulence and moderate to low virulence. Coagulase positive *Staphylococcus aureus* is highly virulent and commonly causes acute bacterial endocarditis. The viridans group of *Strepto cocci* is low virulent commensals in the oral cavity and commonly causes subacute bacterial endocarditis.<sup>2</sup>

## Risk factors:

1. Cardiac abnormalities: Any cardiac abnormality that increases hemodynamic trauma to the endocardial surface such as high pressure shunts within the heart e.g ventricular septal defect or chronic valvular disease (rheumatic fever) increases the risk of infective endocarditis.
2. Prosthetic heart valve.
3. Intravenous drug abusers.
4. Immune suppression.<sup>3</sup>

**Dental Considerations:** The most important goal of dental treatment in patients with valvular heart disease and prosthetic heart valve is to prevent infective endocarditis. The dental treatment procedures known to induce gingival or mucosal bleeding may cause transient bacteremia that rarely last for more than 15 minutes. However within 15 minutes bacteria may lodge (stick) themselves on previously injured or abnormal heart valve which may result in infective endocarditis. The patients with cardiovascular disease who are associated with risk of infective endocarditis are grouped into:

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**Antibiotic prophylaxis against Subacute Bacterial Endocarditis<sup>5</sup>:**

Situation	Agent	Regimen
Standard prophylaxis	Amoxycillin	Adults: 2 gChildren: 50 mg/kg orally 1 hour before procedure.
Unable to take oral medication	Amoxycillin	Adult: 1 g IV/IMChildren: 50 mg/kg IV/IM
Allergic to Penicillin	Clindamycin	Adults: 600 mgChildren: 20 mg/kg 1 hour before procedure.
Allergic to Penicillin and unable to take oral medication	Cefazolin	Adults: 1 gChildren: 25 mg/kg 30 minutes before surgery.

1. Negligible risk category: The low risk category includes patients with implanted cardiac pace makers, previous history of coronary artery bypass graft (CABG).
2. Moderate Risk group: The moderate risk category includes patients with patent ductus arteriosus, atrial septal defect, ventricular septal defect, aquired valvular dysfunction (due to rheumatic fever).
3. High risk Category: high risk category includes patients with prosthetic heart valves, previous history of infective endocarditis, complex cyanotic congenital heart disease (Fallot’s tetralogy) and surgically constructed systemic pulmonary shunts.

The American Heart Association recommends antibiotic prophylaxis prior to dental treatment (e.g dental extractions, periodontal surgery, intra ligamentary local anesthetic injection, periapical surgery) for risk category patients antibiotic prophylaxis should be initiated one hour before

surgery and should not be continued for more than 6-8 hours.<sup>4</sup>

**Conclusion:**

Bacterial endocarditis due to dental procedure is largely preventable. Appropriate prophylaxis should be given to risk category patients before surgery.

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