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# Aspects of Human Disease

This series outlines, briefly, the clinical presentation, diagnosis and management of the 31 chronic medical problems which are most common and important in the developed countries, but space also precludes coverage of acute infections and most malignant disease.

## 5. Infective endocarditis

Infective endocarditis (IE) is a rare but potentially life-threatening infection, predominantly affecting damaged heart valves. Platelet-fibrin deposits may form along the free margins of damaged valves, where there is turbulent blood flow. These sterile vegetations (aseptic thrombotic endocarditis) may become infected with organisms, resulting in large friable vegetations. Cardiac lesions which predispose to infective endocarditis include:

- Congenital or acquired valvular defects;
- Prosthetic heart valves;
- Atrial and ventricular septal defects;
- Patent ductus arteriosus;
- Complex congenital heart disease (tetralogy of Fallot);
- Surgically constructed systemic-pulmonary shunts.

Individuals who have had uncomplicated myocardial infarcts, coronary angioplasty, coronary artery bypass grafts, and cardiac pacemakers inserted do not have an increased risk of developing IE.

Oral viridans streptococci (*Streptococcus mutans* and *sanguis*) have complex attachment mechanisms which enable them to adhere to damaged endocardium and are responsible for approximately 50% of cases of IE. Viridans

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streptococci enter the bloodstream (bacteraemia) during tooth extractions and other oral procedures, including toothbrushing and scaling. The majority of bacteraemias are transient, self-limiting and are not associated with any systemic complications. The factors which determine the development of IE are complex, but a susceptible cardiac surface (damaged endocardium) and high bacterial loads within the circulation appear to be important.

### Clinical features

The clinical features of IE are highly variable, often with an insidious onset, but should be considered in any individual presenting with fever and a new or changing heart murmur. Symptoms and signs reflect:

- Progressive heart damage (valve destruction and heart failure);
- Infection (fever, malaise, night sweats and weight loss);
- Embolic damage of organs (brain, lungs, spleen and kidneys);
- Immune complex formation leading to vasculitis, arthritis, renal and retinal damage.

### Diagnosis

- Clinical history and presentation;
- At least three sets of blood cultures over 24 hours before starting antibiotics;
- Electrocardiogram (ECG) may show conduction abnormalities;
- Echocardiography (ECHO) may identify vegetations and enables assessment of valvular and cardiac function;
- Urine Stix to detect microscopic haematuria;
- Serological testing to identify atypical organisms (eg Legionella).

### Management

Without treatment, IE is fatal in approximately 30% of cases, so the patient should be admitted to hospital for intravenous antibiotic therapy, usually benzylpenicillin and gentamicin. If staphylococcal endocarditis is suspected, vancomycin should be substituted in place of penicillin. In severe cases, such as prosthetic valve endocarditis, early removal of the infected valve and insertion of a sterile replacement may be needed.

Patients at risk of endocarditis should receive intensive preventive dental care to minimize the need for dental intervention. In many countries there are national guidelines on the use of antimicrobial prophylaxis against IE if dental interventions are needed. Although the efficacy of such antimicrobial prophylaxis may be questionable, individuals with susceptible cardiac lesions (as outlined earlier) should be given antibiotic therapy prior to undergoing procedures likely to result in bacteraemia. Medicolegal and other considerations suggest that one should act on the side of caution, and dentists are encouraged to liaise with the patient's cardiologist or physician for advice if necessary. Currently, antibiotic prophylaxis is mandatory for IE susceptible patients who are to undergo particularly:

- Subgingival procedures including scaling;
  - Dental extractions;
  - Oral or periodontal surgery, including raising mucogingival flaps;
- Other procedures where antibiotic prophylaxis may be indicated include:
- Endodontic manipulation beyond the root apex;
  - Orthodontic banding;
  - Intraligamentary injections.