



## Medicine for Managers

Dr Paul Lambden BSc MB BS BDS FDSRCS MRCS LRCP DRCOG FIHSCM

# Bacterial Endocarditis

**Bacterial Endocarditis, often referred to as Subacute Bacterial Endocarditis or Infective Endocarditis, is a relatively rare but serious infection of the inner lining or valves of the heart, usually caused by bacteria circulating in the bloodstream and attaching to damaged heart structures. Symptoms may be sudden and severe but more often develop insidiously over weeks with non-specific symptoms such as fever, chills, fatigue and weakness.**

Endocarditis, as its name suggests, affects the endocardium. The walls of the heart consist of several layers and the endocardium is the innermost layer, consisting of a smooth layer of endocardial cells (marked **1** on the diagram)



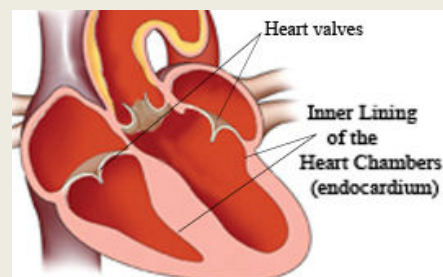
beneath which is some soft loose fibrous connective tissue (marked **1a** on the diagram). Deep to that is the myocardium (muscle layer) of the heart wall (marked **2** on the diagram) consisting of specialised muscle so effective that it can rhythmically contract, day in and day out for 70-100 years without stopping.

The endocardium not only covers the walls of the chambers of the heart but also forms

the valves between the chambers and between the heart and the great vessels (pulmonary artery and aorta).

Infective endocarditis is usually caused by bacteria which find their way into the bloodstream (bacteraemia) and are then carried to the heart.

Normally, of course, any bacteria in the blood are rapidly destroyed by the body's defence system and it is exceptional that endocarditis is the result of a bacteraemia.



On reaching the heart the bacteria may settle on a heart valve (especially one which is already damaged or is artificial) or any other part of the endocardium. The infected area then enlarges making the body's defence

mechanism less able to destroy it. Over time, collections of bacteria with blood clot and debris form **vegetations**. The photograph below illustrates some vegetations in a post-mortem specimen on the underside of a valve.

The vegetations interfere with the normal function of the valve(s) and a serious complication of infective endocarditis may occur if fragments of the vegetation break off and circulate in the blood to other parts of the body.



Endocarditis is rare, affecting only about three to eight people per 100,000/year.

It can affect anyone but the risk is increased in patients who have congenital heart defects or other heart disorders, have recently had heart surgery (when intravenous lines were placed), are intravenous drug users or have poor immunity in conditions such as HIV/AIDS.

Other factors include:

- Age: Median age of patients is 58 years (probably because of previous heart damage, prosthetic valves or pacemakers)
- Gender. Men are affected twice as often as women.

The symptoms of the disease are usually slowly progressive and of insidious onset (although it is occasionally quick if a virulent bacterium is the cause).

Indeed the full picture of the infection may take weeks or months to develop. Initial symptoms are therefore vague with feelings of being 'off colour' with fever, lethargy and fatigue, some shortness of breath, sometimes night sweats and possibly some weight loss.

Aches and pains may also occur. The non-specific nature of the symptoms and the relative rarity of the disease often results in considerable delay in diagnosis.

On examination, it may be possible to hear heart murmurs (additional heart sounds heard with the stethoscope), the result of disordered blood flow through the valves because of the vegetations.

There may be enlargement of the spleen, blood in the urine and sometimes signs associated with the fragments (emboli) thrown off from the vegetations which may result in features of stroke or splinter haemorrhages (*tiny blood clots which appear at first glance like splinters under the nails – see photograph*).



Infections may develop elsewhere in the body. If the heart becomes severely damaged, heart failure or dysfunction can result.

If a diagnosis of infective endocarditis is suspected the patient is admitted to hospital.

Investigations include chest X-rays, ECG, echocardiogram and blood tests to identify the extent of the heart damage and the causative organism. CT or MRI scans are also undertaken,

particularly if there is suspected valve damage or complications from emboli.

Treatment of infective endocarditis is by large doses of intravenous antibiotics over a prolonged period.

The choice of antibiotics depends on the sensitivity of the organisms (i.e. which germs are isolated and which antibiotics kill them).

Other treatment may be required to counteract and manage any consequences of heart damage. In severe cases with valve damage or abscess formation, surgery may be needed to repair or replace one or more valves and to drain any abscesses which may be present.

Potential complications are rare with early treatment but, when they occur, they are

generally the result of fragments of infected vegetation breaking off and circulating in the bloodstream. They can result in blood clots producing stroke, organ damage or heart failure

### ***In Summary:***

Infective endocarditis can be effectively treated and the outcome improves with early diagnosis.

Because of its frequently insidious nature the diagnosis is often delayed resulting in damage to the heart and its valves.

For that reason it is still sometimes fatal but fortunately these days such an outcome is very rare.

[paullambden@compuserve.com](mailto:paullambden@compuserve.com)