THE LAZARUS DEVICE AND SUDDEN CARDIAC DEATH

Tuesday morning – my out patient clinic begins at 9.00 am. The label on the door says "Arrhythmia Clinic" but this is where I see patients and families at risk of sudden death.

The first family nervously sits down. A letter from the GP explains that Ben, their 11 year old, had suddenly died during the night some months ago. The first wave of grief had passed, but now they had to understand why Ben had been taken from them. The coroner's report had not helped much – "death due to heart failure". After a few minutes discussion I discovered that there were several similar deaths amongst young men in the family; it seemed likely that an inherited disease might run through this family. I arranged for counselling, genetic testing and various investigations for the immediate family and, thankfully the coroner had retained a small piece of tissue from Ben that we could test for abnormal genes.

Sue, my second patient was a young woman who had suffered from "fits" for most of her life. Then a very long attack occurred and an ambulance was called. The diagnosis from the paramedics was "cardiac arrest", the heart had stopped. When I reviewed this young woman's history it seemed likely that all her fits had been mini cardiac arrests. A few simple tests later and the situation was clear; Sue had an intermittent cardiac rhythm disturbance (arrhythmia) that stopped her heart. So far she had escaped death, but only just. Urgent treatment was needed.

Next through the door came Fred, a 42 year old man who had a wife and two children. He had suffered a sudden heart attack (myocardial infarction) some months previously. Fred had stopped smoking now and his high blood cholesterol level had been belatedly treated. But the infarction had left his heart dangerously weak. His doctor had run some tests showing that he had a one in three chance of dropping down dead, due to dangerous arrhythmias, during the next year if not properly treated. The diagnosis and prognosis were obvious, I arranged for the treatment that would not much later save his life.

The heart usually beats 100,000 times a day and every heart beat goes unnoticed. But rhythm disturbances of the heart are commonplace and when they occur the patient knows all about it – palpitations with anxiety and distress, chest pain often with breathlessness, dizziness, sometimes blackouts and not infrequently sudden death. Those with milder rhythm disturbances may need nothing but re-assurance to cope with their occasional irregularity of heart beat. Sustained rapid heart beats can now be completely cured, simply by identifying the source of the disturbance and cauterizing (ablation) the spot. The energy is delivered through the tip of a wire inserted through a vein and negotiated back into the heart.

A remarkable treatment now exists for those who suffer from cardiac arrest. Small electronic devices called implantable cardiac defibrillators (ICDs) can be inserted beneath the skin and connected to the heart by wires. ICDs shock the heart back into normal rhythm from the deadly arrhythmia known as ventricular fibrillation, when the heart is contracting ineffectively many hundreds of times each minute.

During the last decade an effective treatment for nearly every cardiac arrhythmia has been designed or discovered. Hardly anyone with a cardiac arrhythmia need continue to suffer from the problem. But the spectacular effectiveness of the ICD is very dramatic. It literally "raises the dead". A victim falls to the ground dead, but moments later a small shock is delivered, the patient comes round, stands up, and literally walks off. Almost everyone who has witnessed such an incident is struck by the almost miraculous chain of events; the ICD is known as the "Lazarus device".

The biggest problem is how to find the patients who need an ICD. Ben, the dead boy certainly needed an ICD but it was too late for him. Investigation of his family and Ben's tissue sample showed that his brother and father were also at risk from the same inherited problem. Both received an ICD, inserted as a day-case procedure under local anaesthetic and light sedation. Sue, who had multiple "fits" and a cardiac arrest, turned out to have a condition that would respond to medical therapy and she was treated with a beta blocker. For Fred, whose heart attack had weakened his heart, an ICD was necessary and fortunately he got one, which resuscitated him automatically three months later.

There are many more patients like those who attended my clinic that day. In the United Kingdom about 75,000 people die suddenly each year, that is one out of eight deaths, very many from ventricular fibrillation. Shamefully most go unrecognised until it is too late to help. Those who survive a cardiac arrest are obvious candidates for ICD treatment unless other effective therapies exist. The Public Access Defibrillator programmes from the Department of Health and the British Heart Foundation provide lightweight external defibrillators that are prominently positioned like fire extinguishers in public places. These devices save lives but these people are vulnerable to recurrence of their arrhythmia and often need their own ICD to prevent untimely death.

Screening programmes are always expensive and when the likelihood of rare events is sought there are often more false positive predictions than there is identification of those truly at risk. Much of modern research emphasises accurate prediction. Genetic studies are now very helpful when inherited disease is suspected. Routine heart studies such as the electrical trace of the heart beat is crucial for those involved in top-class competitive sports, and patients with known heart disease. Assessment of the strength of the heart beat with simple ultrasound studies gives vital information

When the National Service Framework for Coronary Heart Disease was introduced it failed to include a chapter on cardiac arrhythmia and sudden death. This fundamental deficiency will be corrected this year. Recommendation and targets for general practitioners, general physicians/cardiologists and specialists must be defined and promulgated. The funding implications must be recognised and managed. Finally, the views of doctors and patients will have been acknowledged. Astonishingly effective therapies will now be offered to the patients who will greatly benefit from them.