

Editor's Page

Cardiology in the Next Two Decades: Just Imagine

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Over the last 30 years we have experienced incredible developments in cardiovascular medicine and all of us – doctors, nurses, technicians, workers in medical and pharmaceutical companies, and of course, patients – have enjoyed the fruits of success.

I remember at the start of 1985, when I was at Westminster Hospital in London, we literally made a patient jump up in the air when we applied a DC shock for ablation of the atrioventricular node and His bundle, in order to relieve his symptoms and prevent the consequences of further tachyarrhythmias. I also remember the pacemakers that steadily paced the right ventricle, while atrioventricular systems were rarely used. Finally, I remember black-and-white M-mode echocardiography, and angioplasty – at first without stents, naturally.

Since that time, everything has evolved considerably, both in technology and in practice. Nowadays, cardiovascular medicine, cardiology and cardiac surgery are happy to be recognised as extremely proficient medical specialties that offer their patients around 10 years more life. This is in stark contrast to other specialties such as oncology, where in spite of huge investments, the mean prolongation of life is estimated at only 8 to 10 months.

It goes without saying that all the important advances in cardiovascular medicine have been due to great strides in the technical sciences, such as microelectronics, information technology and materials science.

Looking at the recent past, it is a real challenge to the vision and imagination of any cardiovascular physician to attempt to predict the expected developments over the next 25 years. Personally, I am writ-

ing these lines in the hope that my judgement will be proved correct, and that patients will receive all possible benefit from this wonderful specialty of cardiovascular medicine.

Let us, then, challenge our imagination with the following:

- a. Sudden cardiac death. Today, progress in both secondary and primary prevention for those who have a low ejection fraction has been significant, thanks to implantable defibrillators. It still remains to find effective protection for the enormous number of individuals who die suddenly, with no apparent cause. This means all those who develop an acute coronary syndrome from rupture and thrombosis of an atheromatous plaque. Here we need to treat a monstrous fault of nature called ventricular fibrillation. What is needed, and what we hope will be developed over the next 20 years, is a small, subcutaneously implantable defibrillator, without leads. A defibrillator the size of a large coin.
- b. Degeneration of heart valves. The progress in heart valve replacement, using a trans-arterial or trans-valvular approach, will continue and much more advanced and resilient valves will be developed.
- c. Vessel deterioration and mechanical replacement of tissues. One of the dreams of the cardiovascular physician is the manufacture of tissues, using the whole spectrum of genetics, molecular biology, and cell culture. I believe that the latest technologies, such as 3-D printing of tissue, will show dramatic progress, to the point where they are practically viable. This will mean that biologically and

histologically compatible replacement vessels will be available for our use.

- d. Digital medicine and patient monitoring. Over the next few years we will see amazing developments with regard to the monitoring of patients with cardiovascular problems. The electrocardiogram, heart rhythm and blood pressure, will be monitored in real time and all the biometric data will be stored in huge open electronic repositories. The analysis of the data will open up tre-

mendous possibilities to national health systems, and by extension to patients.

I would like to conclude this short article by saying that in the field of cardiovascular medicine the best is yet to come. As physicians, specialists in this field, we are fortunate in being able to watch it happen. Of course, our patients will need to feel that all of us, and the industry in particular, are working systematically for their benefit.