

From the Electrocardiograph to the Implantable Cardioverter Defibrillator: The History of Implantable Electrical Cardiac Devices.

Dr R A Bleasdale

21st June 2013

National Library of Wales, Aberystwyth

History of Medicine Society of Wales

The turn of the 20th century marked the beginning of our recognition that the cardiac cycle generates externally measurable electrical events which culminated in the development of the electrocardiograph. This was the dawn of our ability to record and understand cardiac rhythm disturbances such as the Stokes-Adams bradycardia attacks that had been described in the preceding century. Our ability to externally electrically stimulate the heart preceded our understanding of what was actually occurring in the heart by many decades. The successful long-term treatment of these rhythm disturbances would however require a remarkable and sometimes serendipitous collaboration between surgeons, electrical engineers, chemists, businessmen and patients. This was the birth of medical electronics. Their first challenge was to be able to deliver reliable and durable cardiac stimulation externally transcutaneously. Developments in battery technology governed the era of portability. Developments in surgical techniques and miniaturisation of these technologies governed the era of implantability. Further developments in battery technology and lead technology governed the era of durability. There then followed the final chapter of bringing pacing technologies and cardiac defibrillation technologies together resulting in completely implantable electrical cardiac devices that monitor the heart, pace the heart and defibrillate the heart appropriately without human intervention over a battery life of 5-10 years.