The future of AF ablation catheter technologies

Design and technology consultancy Cambridge Design Partnership today announces that it has completed a research project to identify the future of medical technology to treat Atrial Fibrillation; a common and dangerous Cardiac condition affecting millions of people across the world. The report is designed to explore the emerging technologies that will lead to innovation in this field, and provide an unparalleled resource for organisations looking to develop treatments.

Atrial fibrillation is a type of cardiac arrhythmia (irregular heart beat) that affects up to 7 million people in Western Europe and the United States alone. There has been a 66%[1]increase in associated hospital admissions in the last 20 years and these figures are projected to grow over the coming decades[2]. Drugs are used to treat the condition, but are less than 50% effective and often have associated side effects. Atrial Fibrillation is a major contributory factor to strokes, and if left untreated can lead to congestive heart failure.

In the past, surgical treatments for Atrial Fibrillation required open-heart access followed by full-thickness incisions through the atrial walls. In recent times there has been a shift towards low-invasive treatments using ablation catheters, with Radio Frequency (RF) ablation being the leading method. With the annual cost per patient at around $3,600[3], the total cost of Atrial Fibrillation in the EU is estimated to be about $15.7 billion.

Dr Keith Turner who achieved his PhD at Oxford University, UK, has worked in medical device technology development for 20 years. He will attending Heart Rhythm 2012 [1] 9th-12th May, at the Boston Convention and Exhibition Centre in Boston, MA, USA. The Heart Rhythm Society is the international leader in science, education and advocacy for cardiac arrhythmia professionals and Keith will be talking to other industry professionals about the future of AF Catheter technology.

Drawing on a cross-section of top industry and clinical figures including leading electrophysiologists, as well as its own extensive experience in designing medical products, Cambridge Design Partnership’s report describes the future of ablation catheter technology as a means of treatment. It deals comprehensively and expertly with a wide range of subjects, from fluidics, through thermal management and the monitoring of lesion formation. Cambridge Design Partnership has been able to compile a comprehensive review of current solutions and identify future technologies that will form the fundamental drivers in this growing market.

Examples of enabling technologies that might feature in catheters in the longer term, and which are included in the report, are MEMS technologies, MRI-compliant components, force monitoring, advanced imaging techniques, real-time thermal modelling, and plastic electronics. All of these elements are currently undergoing exciting developments that may well make them ideally suited to incorporation in

catheters within the coming years.

Major manufacturers are currently competing on efficacy of their solutions. Several technologies are now being brought to market and the quest for commercially successful, next generation ablation catheters are driving a significant innovation effort across the industry. During the research process Cambridge Design Partnership spoke to leading electrophysiologists who described the drivers in their decision to adopt a particular technology and the forthcoming directions that could best meet their needs. The results found that the crucial goal was to create repeatable, contiguous, lasting lesions, and that device choice was substantially determined by the perception of the ability to achieve this.

Dr Keith Turner, Partner, Cambridge Design Partnership commented, “This is a hugely important area in medical development. The market is competing to create more effective ablation catheters and so the ability to identify inspired engineering solutions and implement them rapidly into new products is essential. The part I find most fascinating is hearing the views of the electrophysiologists on each of the new technologies currently under development because it implies that certain projects need a change of direction if they are to provide a return on investment. The report should prove interesting reading for senior strategic marketing and R&D managers who are directing these programmes. As a result of this research we are now in a position to help accelerate the progress of these vitally important technologies and offer companies a true insight into the needs of the experts on the front line who are treating this condition.”

An executive summary of the report is available of Cambridge Design Partnership’s website http://www.cambridge-design.co.uk/ [2] and the full report entitled ‘The future of AF ablation catheter technologies’ is available to interested parties on request. To request a copy please contact Dr Keith Turner at Cambridge Design Partnership on +44 (0)1223 264428 or by e-mail at kt@cambridge-design.co.uk [3]

References

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[2] Miyasaka Y, Barnes ME, Gersh BJ, Cha SS, Bailey KR, Abhayaratna WP, Seward JB, Tsang TSM, 2006. Secular Trends in Incidence of Atrial Fibrillation in Olmsted County, Minnesota, 1980 to 2000, and Implications on the Projections for Future Prevalence. Circulation, 114:119-125

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