Urinary Incontinence: How Technology Can Help

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A UK government-backed research centre has been established that specialises in new product development for urinary incontinence. Ideas and partners are sought.

A taboo subject
Intractable urinary incontinence is seldom mentioned at medical conferences and is rarely the subject of research and development (R&D) projects. Yet, approximately three million people in the United Kingdom (UK) suffer from some degree of urinary incontinence and the management of this costs the National Health Service an estimated £500 million (approximately €744 million) per annum.

The topic is not something that can be discussed over dinner in the same way as a heart problem: discussing your recently implanted pacemaker with a colleague is acceptable; whereas who would dare mention that they had recently been fitted with an indwelling catheter? Despite this reluctance to talk about the problem, new R&D initiatives are being taken up in this area. This will bring hope to the many millions of sufferers and also to the research community, which can, and wants to, apply its skills and expertise to this difficult medical condition.

When the mechanism fails
The human bladder, urethral sphincter and associated muscles and nerves form an extremely complex, well co-ordinated mechanism like so many other parts of the body. For many individuals, this functions normally without any appreciation of exactly what is going on. However, for those unfortunate enough to have a problem with one part of the mechanism, the result is often incontinence. In some cases, the sphincter (the valve that closes the bladder) weakens and cannot retain the urine in the bladder. For others, the detrusor muscles that squash the bladder may weaken or become overactive. All of these conditions cause incontinence, which has to be treated.

Long-term catheterisation is one option. It solves the problem of draining the bladder but may also cause other conditions (Figure 1) including bacteraemia, catheter blockage, bladder stones, periurethral infections, pyelonephritis, septicemia, bladder cancer and, on rare occasions, death.

The search for alternatives to an indwelling catheter or improving the ones that are currently available offers vast scope for new product innovation. Clinical teams worldwide are keen to try new technology, but rarely have access to all the parts of the supply chain necessary to take a new concept through to a final product that can be used on patients.

Finding alternative solutions
The clinical team at Southmead Hospital (Bristol, UK) is recognised as a world expert in the area of urinary incontinence. For many years the clinicians had been trying to encourage academics and industrialists to apply their skills to this complex clinical problem. Roger Feneley was one of the leading players during the 1990s and early 2000 who actively sought new partnerships outside the clinical community. This led to a partnership being formed with nine industrialists and four academic groups in the UK. This team, which was part-funded by the UK government under the Technology Foresight Programme, spent three years investigating a range of bladder drainage systems for people suffering from urinary incontinence. This project, NuTap was successful on three counts.

- It resulted in new products and a physical training model for clinical teams.

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It provided knowledge on how control systems applied to catheters using a replacement external valve can have a dramatic effect on the encrustation in a catheter.

It enabled laboratory models to be established and validated, which can be used to test new urinary incontinence products.

The project team was pleased with its success and committed to furthering its work in this area. The momentum had been built up and new treatments and possible future products identified. Most importantly the clinicians, academia and industry had established a partnership that could collectively deliver new products.

The Health Technology Co-operative

This convinced the clinical team to pursue and expand this approach. Together with some of the original industrial partners, plus new industrial companies and clinical support staff, the team pursued further funding to successfully establish the BioMed Health Technology Co-operative (HTC). It is co-ordinated by the BioMed Centre and based on the Southmead Hospital site.

Funded under the UK Department of Health’s Health Technology Devices programme, this infrastructure is specifically designed to encourage new product development by offering a range of facilities and initiating new partnerships. The BioMed Centre’s facilities include:

- A specialist, modern, patient-centred clinic for people with long-term indwelling catheters.
- A research resource to conduct clinical studies and early stage clinical trials, particularly for the testing of novel technologies and devices.
- A modern microbiology research laboratory housing in vitro bladder models (Figure 2) and analytical equipment to enable microbiological and analytical research and testing to be undertaken on existing and new technologies, devices and materials.
- Access to a range of clinical and scientific experts with national or international standing in the field of urinary continence.

Stimulating new product development is one goal of the BioMed HTC. As part of this activity, innovative ideas and partners are being sought. These may be research groups, industrialists, clinicians, support groups or individuals who have an innovative idea and who wish to be involved in developing this into a product to address urinary incontinence.

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Urology panel

An expert line-up of specialists in urology will be giving a series of talks at the MDT Collaboration Forum on 15-16 February 2006 at the NEC, Birmingham, UK. The speakers will address the following issues:

The Clinical Problems
Professor Roger Feneley, Emeritus Consultant Urologist, The BioMed Centre, Bristol Urological Institute, Southmead Hospital

The Microbiological Challenge
Dr David Stickler, Reader, Cardiff School of BioSciences, Cardiff University

Introducing New Devices
James Urrie, Product Manager, Mediplus Ltd

Neuromodulation of the Bladder by Implant
Professor Michael Craggs, Professor of Applied Neurophysiology, University College London; Director of Spinal Research & Consultant Clinical Scientist, Functional Assessment & Restoration Unit, London; Spinal Cord Injuries Centre, Royal National Orthopaedic Hospital NHS Trust, Stanmore.

Providing the Microsystems
Martin Fowler, Manufacturing Engineer, European Technology for Business Ltd

To view the full MDT Collaboration Forum programme, visit www.mdtcollaborationforum.com

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