

## THE DEVELOPMENT AND TESTING OF TWO PRODUCTS TO IMPROVE THE QUALITY OF LIFE AND INCREASE THE CONFIDENCE OF PAD WEARERS

### Hypothesis / aims of study

This product development project set out to solve two problems identified by continence product users. Cheryl Gartley, the president and founder of the Simon Foundation for Continence in America, requested two products that would improve the confidence and quality of life, of people who use continence pads. The products requested were underwear, which alerts the wearer to a pad leak and a urine odour detector.

When seated it can be difficult to discern when a continence pad has failed and urine can spread into outer clothing soaking clothes and furniture, with embarrassing consequences. One aim of the project was to develop underwear that could be worn over a pad that would detect wetness and alert the wearer to a pad leakage event.

The other product we aimed to develop was a colour change odour detector that would respond to sub olfactory levels of stale urine odour. Fear of odour has been found to be a major concern for women who use continence pads (1).

### Study design, materials and methods

#### **Wetness detecting underwear**

The project employed a user-centred design approach to developing the design specification for the underwear. An iterative approach was employed to the underwear design to develop a prototype for the pilot clinical tests. Minor changes to the design were made before the full clinical evaluation began. Technically the underwear functions by means of two conductive paths, embroidered around the edge of where the pad would normally be positioned. When the conductive paths are joined by liquid in the fabric between the paths, an electronic signalling system that is mounted on the underwear with press-studs, is triggered to vibrate.

#### **Colour change odour detector**

Headspace gases from different urine samples were analysed to determine the volatile responsible for stale urine odour. Although there are individual differences between urines, all urines contain urea which can be broken down into ammonia as urine ages. A reversible colour change dye that reacts to low levels of ammonia was chosen as an indicator to be incorporated into the odour detector device. Focus groups were held to draw out important design criteria for the odour detector products and to understand the circumstances and conditions that will govern the use of the device.

Prototypes of both devices have been fabricated and clinical evaluations carried out.

### Results

Two prototype products aimed at increasing confidence and self-esteem of continence pad users have been developed and tested. Focus groups and where participants preferred, individual interviews, highlighted a number of design issues and also illustrated very powerfully the depth of distress, insensitive and inadequate treatment of continence issues cause.

### Interpretation of results

Whilst continence pads can be an effective way of restoring social continence to adults experiencing involuntary urine loss, there are a number of problems associated with continence pads use. These results show that technology can usefully be applied to reducing some of the anxiety associated with the use of pads to manage continence difficulties.

### Concluding message

Putting users at the heart of the design process is an effective means of developing products to cope with the sequelae of continence treatments.

### References

1. Getliffe K, Fader M, Cottenden A, Jamieson K, Green N. Absorbent products for incontinence: 'treatment effect' and impact on quality of life. *J Clin Nurs* 2007; 16: 1936–45.

<i>Specify source of funding or grant</i>	New Dynamics of Ageing - UK Research Councils, cross council funding scheme
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Brunel University Ethics committee and the Southmead Research Ethics Committee
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes