New dimensions in continence technology

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Incontinence

... is characterised by the involuntary escape of urine/faeces to a degree that imposes a socially or hygienically unacceptable situation on the individual.
Impact of incontinence on sufferers and their family/carers

• embarrassment
• low self esteem
• fear of discovery
• restricted lifestyle
• social isolation
• skin damage

• smell
• increased laundry
• unpleasant to manage
• family friction
Prevalence of UK urinary incontinence

After Thomas et al, 1980 and OPCS 1988
Prevalence of UK faecal incontinence

After Norton
Prevalence of urinary incontinence

- Around 8-9% of adult population (3-4 million) (Royal College of Physicians, 1995)
- Around 35% of residential home residents
- Around 60% of nursing homes residents (150,000) (Peet et al, 1995)
Products for incontinence

Prevention
- e.g. commodes and urinals

Management / Containment
- e.g. absorbent pads, sheaths, catheters, legbags

Treatment
- e.g. implants, stimulators, alarms
Products to **prevent** incontinence: Commodes / toilet chairs
Products to **treat** urinary incontinence
Products to contain incontinence
Male devices
How many incontinent people use continence products?

Around 50% of incontinent people in community Estimated to use products (Roe et al, 1996)

- 35% use sanitary towels
- 10% use body-worn pads
- 5% use bedpads
- 1% use sheaths/catheters
How many incontinent people use continence products?

- More known about residential settings
- Around 70% of incontinent nursing home residents use continence aids
- Around 50% of incontinent residential home residents use continence aids

(Peet et al, 1995)
Products to contain or manage urinary incontinence

Prescription products (proportions of £60 million)

- ISC catheters
- ID catheters
- Valves
- Sheaths+
- Legbags
- Night bags
- Male devices
- Other

Prescription Cost Analysis: England 1999
Products to contain or manage urinary incontinence

Absorbent products (proportions of 69 million)

- Inserts
- All-in-ones
- Pants
- Underpads
- Reusables
- Children's

Continence Foundation, 2000
What is the evidence base for continence product selection?
What do we do ...?

- Clinical evaluations
- International standards

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Clinical evaluation or lab tests?

Clinical evaluations are:

• Able to address all round performance
• Hard to do well
• Time-consuming
• Expensive
• Open to subjectivity
• Imprecise

Technical evaluations are:

• Simple (usually)
• Quick (usually)
• Cheap (usually)
• Objective
• Address just one performance aspect
• Clinical relevance?

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QVP project (Quality, Value, Performance)

Module 1
• 100 subjects in residential care
• Heavy incontinence
• Large disposable products

Module 2
• 120 men/women living at home
• Heavy incontinence
• Disposable / reusable

Module 3
• 100 women
• Light incontinence
• Disposable / reusable

Module 4
• Development of QoL tool
• Products not incontinence
• Earlier pre and post-test interviews
What do we do ...?
Product design & development
Kylie pants
What do we do?
Absorbency science

Acquisition layer
Absorbent layer
Base layer
Backsheet
Peeplotter results

back 1 (till 180s)
left side (till 240s)
back 2 (till 300s)
right side (till 360s)
back 3 (till 420s)
Vertical wicking
What do we do?

Related research

Skin and incontinence / products

• TEWL (trans epidermal water loss)
• Skin friction
• Pressure changes with pads
Pads and pressure

Peak pressures (SD) recorded from three mattresses (standard, visco-elastic, surface-cut foam) under three conditions (naked, dry pad, wet pad)

<table>
<thead>
<tr>
<th>Pad condition</th>
<th>Pressure mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>naked</td>
<td>50</td>
</tr>
<tr>
<td>dry pad</td>
<td>60</td>
</tr>
<tr>
<td>wet pad</td>
<td>70</td>
</tr>
</tbody>
</table>

- Standard foam
- Visco-elastic foam
- Surface-cut VE foam
Naked buttocks on standard foam mattress

Unsmoothed pad on standard foam mattress
Existing methods for managing incontinence

- Handheld urinals
- Absorbent pads
- Indwelling catheters
Handheld female urinals
A Non-invasive Continence management System (NICMS)

UK partners:
• Brunel Institute for Bioengineering
• Continence & Skin Technology Group, UCL
• Medical Device Management
• Dept. of Design & Technology, Loughborough University
Non-UK partners

- KBOH, Netherlands
- Rehabilitation Centre, Lowenstein Hospital, Israel
- The Swedish handicap Institute, Stockholm
- Geriatric Dept., Broca Hospital, Paris
- Dept. of family medicine, Medical University of Lodz, Poland
Project aim

To develop a technologically sound device to address the needs of two groups of women:

Group A: limited mobility leads to functional incontinence

Group B: limited mobility with loss of sensation
Urinal design
UCL contribution

Nursing
- User evaluation
- Document preparation
- Ethics submission

Engineering
- Filter testing
- Urinal and pad development
Establishing size of opening in urinal interface
Urinal front pieces
Device on wheelchair
The Non-invasive Continence Management System
Where the hell?
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