

A G E N D A

APRIL 6-8, 2009 ■ LINCOLNSHIRE, ILLINOIS



MONDAY, APRIL 6

1:00 PM – 6:00 PM

PRE-CONFERENCE WORKSHOP

INNOVATING BEYOND TECHNOLOGY

Beth mAcdonald, Daniel Formosa, PhD

Many companies have reached the point where they can no longer rely on technology to provide a competitive edge. While the newest technology may be important, it's often not enough – especially when the competition has caught up with similar or identical performance. Are there alternative opportunities for innovation? Recently we have been witnessing “personal meaning” taking precedence over technology – consumers want to know less about technical specifications, and more about what works “for me.”

Think personally about the best product or experience you ever had. It included not only the things that were promised or expected – it probably included a few surprises. Maybe even a few things you would find difficult to adequately explain to others. The ability to exceed expectations is critical to innovative products and experiences. Creating things that deliver on a personally meaningful level requires a multi-track approach – understanding needs and desires even beyond what someone may be able to vocalize.

How can we conquer this new frontier? This workshop will cover a number of topics, ranging from physical to psychological to social aspects of user needs, all on the critical path to designing successful products and services. We'll break it into five topics:

- Design Thinking (the meaning of design, past and present)
- Biomechanics
- Perception
- Emotion
- 2009, the Internet, the meaning of brands, boomers, and radical thinking in the presence of consumer anarchy

Being a workshop, we'll also make sure that everyone attending is put to work. We'll be exploring these topics as a group, with activities that will give everyone a chance to meet, think and interact. The only requirement: bring both a body and a brain - preferably your own.

Ms. mAcdonald's background includes a variety of projects as an executive with Johnson & Johnson for two decades. She was the driving force behind the breakthrough incontinence product, Serenity. Beth currently heads a consulting firm based in Manila.

Dr. Formosa's work has been included in the permanent collection of the Museum of Modern Art. He is a founding member of Smart Design in New York City and a consultant in product design and design research. His Doctorate is in Ergonomics and Biomechanics.

4:00 PM – 5:30 PM

PRE-CONFERENCE WORKSHOP

FROM CONCEPT TO MARKET: DEVELOPMENT CYCLE OF BIOMEDICAL DEVICES

Al Maslov, BSEE, MSEE, MBA – Chair

Speakers: Jeff Bark, MS; Jay Goldberg, PhD; David Hughes, MBA

This workshop's aim is to provide real life examples of the methods by which a product idea goes through the steps from its inception through development, pre-market evaluation and to the market. It looks at the systematic way in which medical device companies approach product development. The presenters have nearly 100 years in aggregate of experience in the medical device industry and academia.

Mr. Maslov spent over 35 years prior to his retirement in the medical device industry with Baxter International and Hollister Incorporated.

6:30 PM – 9:30 PM

PRE-CONFERENCE WORKSHOP

TECHNOLOGY FOR MANAGING INCONTINENCE:

WHERE ARE THE GAPS AND THE NEEDS?

Alan Cottenden, PhD

Fresh from chairing the team of experts who contributed the chapter on *Management with Continence Products* to the fourth International Consultation on Incontinence, Alan Cottenden will describe the consultation's findings for each of the main product categories, majoring on identifying the strengths and shortcomings of existing products and highlighting the opportunities and challenges for improvements. He will cover: absorbent products, indwelling and intermittent catheters, external catheters, urine drainage bags, occlusive devices, commodes, handheld and body-worn urinals and products for fecal incontinence, skin care and odor control.

Work on the fourth International Consultation on Incontinence (<http://www.congress-urology.org/congress2008/accueil.html>) has been underway since 2007 and it is due to be published at about the same time as *Innovating for Continence 2009*. As with the previous consultations, some 150 experts from around the world have joined forces to write a book which captures the state of our knowledge across the field, covering such topics as epidemiology, diagnostics, surgery, pharmacology and management with continence products.

Dr. Cottenden has been involved in continence technology R&D for 27 years and is the Technical Director of the Continence and Skin Technology Group, University College London.

TUESDAY, APRIL 7

7:00 AM – 8:00 AM

BREAKFAST

8:00 AM – 8:15 AM

WELCOME AND INTRODUCTIONS

Alan Cottenden, PhD, Chair 2009 Innovating for Continence: The Engineering Challenge

TUESDAY, APRIL 7 *Continued*

8:15 AM — 8:45 AM

LESSONS FROM MOTHER NATURE

Phillip Messersmith, PhD

Many scientists and engineers have found inspiration for solving their problems by studying nature's solutions; for example, low-drag swim suits, self-cleaning windows, camouflage clothing, and versatile robots from studying shark skin, lotus leaves, moth coloration and insect/gecko locomotion, respectively. In this lecture, Phillip Messersmith will explain some of the principles of *biomimetics* – as this nature-inspired approach to problem solving is called – drawing on many examples, including his own work to develop a water-resistant surgical adhesive, inspired by studying the protein glues employed by mussels to resist the forces of tidal waters to detach them from their rocks. The possible use of biologically-inspired materials for treatment of incontinence will be discussed.

Dr. Messersmith is a Professor of Biomedical Engineering and Materials Science and Engineering and a member of the Institute for BioNanotechnology in Medicine at Northwestern University.

8:45 AM — 9:15 AM

A NEW BLADDER PLEASE

Earl Y. Cheng, MD

Many people with incontinence must dream of the freedom that would be theirs if they could exchange their misbehaving bladder for a brand new one. Exciting progress in tissue engineering is bringing the dream closer to reality; indeed, the first tissue engineered bladders have already been implanted in clinical trials with promising results. This lecture will review progress so far and discuss what is likely to be achievable in the next few years.

Dr. Cheng is a pediatric urologist at Children's Memorial Hospital in Chicago.

9:15 AM — 9:30 AM

DISCUSSION

9:30 AM — 10:00 AM

URINARY CATHETERS IN THE PRESENT DAY

Marcus Drake, MD

The Foley catheter has been around for many years, and it is still the main device used for draining urine directly from the bladder, despite some severe limitations. Marcus Drake will describe the challenges faced in developing alternatives for draining urine from the bladder and where current work has looked at trying to overcome the limitations. Research priorities for further work will be highlighted.

Dr. Drake is consultant urologic surgeon at the Bristol Urological Institute in Bristol, U.K. His clinical and research focus is on Female and Reconstructive Surgery and Neurourology.

10:00 AM — 10:10 AM

DISCUSSION

10:10 AM — 10:30 AM

BREAK

10:30 AM — 11:10 AM

INCONTINENCE AND SKIN HEALTH

Alan Cottenden, PhD

David Cottenden, MS, PhD Candidate

Wearers of incontinence pads commonly experience skin damage, soreness and discomfort in the diaper area. When skin is occluded by pad materials – especially if they are wet – the outer-most layer of the skin (the stratum corneum) becomes over-hydrated making it susceptible to abrasion damage by friction against the pad and vulnerable to chemical irritation and bacterial colonization. This lecture will describe recent work at University College London to determine the nature of incontinence – related skin problems; devise robust methods for measuring skin wetness and friction between skin and pad materials; and develop mathematical models to describe skin/pad interactions.

Dr. Cottenden has been involved in continence technology R&D for 27 years.

David Cottenden taught mathematics before embarking on his PhD.

11:10 AM — 11:20 AM

DISCUSSION

11:20 AM — 12:10 PM

KEYNOTE SPEECH

THE CHALLENGE OF FECAL INCONTINENCE

Professor Christine Norton, PhD, RN

The almost unimaginable humiliation of a public episode of bowel incontinence has not to date stimulated a response to provide solutions from the engineering and manufacturing community. Fecal incontinence affects 1% of adults yet is seldom even mentioned, even among health professionals. Pads do nothing to disguise odor and will not contain loose stool reliably. Collection devices are cumbersome and are only suitable for the bed-bound. Occlusive devices are mostly too uncomfortable to tolerate. Designing solutions that can accommodate variations in anorectal anatomy, the vagaries of bowel habit and stool consistency (including gas), and yet be comfortable in an exquisitely sensitive area, is a challenge few have been brave enough even to contemplate.

Christine Norton, PhD, MA, RN is Professor of Gastrointestinal Nursing at King's College London and Nurse Consultant (Bowel Control) at St. Marks Hospital in London.

12:10 PM – 12:25 PM

A LOOK AT THE LIVES OF THOSE AFFECTED BY URINARY INCONTINENCE

Thom R. Nichols, MS, MBA, CSSBB

Who are those that are seeking help and information concerning urinary incontinence? What is their story? This presentation will address: who are these people - that is - what are their respective demographics, other health associated problems; how incontinence affects their lives, their perception of health, social life, family life, spouse/life partner relationships; and sexual life? Comparisons with the general population will be made. The techniques or treatments they have tried in the management of incontinence, and how successful the techniques have been, will be discussed.

Mr. Nichols is a biostatistician and holds the position of Adjunct Professor of Research Methodology at the Lake Forest Graduate School of Management, Lake Forest, Illinois. He is the Principal Clinical Research Statistician for the Department of Global Clinical Research, Hollister Incorporated.

12:25 PM – 1:25 PM

INCONTINENCE ON A DAILY BASIS: PATIENT PANEL

In this session we will learn about managing incontinence from a panel of individuals, each having many years of experience in managing either urinary and/or fecal incontinence. A key step in successful engineering design is to establish a clear understanding of what consumers want and what matters to them; what are their perspectives and priorities. We will ask them to describe how their incontinence occurs, how they currently manage (including describing the strengths and limitations of their products); what their incontinence stops them from doing that they would like to do; and to describe their wished for perfect product.

Panelists include: Alan Emig, Ed Kaps, Ginger Lane, Paul LaPorte, Missy Lavender, Amy McElroy, Nancy Norton, and Diana Underwood. Panel Chair - Dr. Alan Cottenden

1:25 PM – 2:25 PM

LUNCH

2:25 PM – 3:05 PM

BREAK-OUT SESSIONS

Upon registering each attendee will be assigned to one of three groups. Please consult the following Break-Out chart in order to attend each session (A, B, or C) at your Group's assigned time.

GROUPS WILL ROTATE AS FOLLOWS:

BREAKOUT SESSION:	TUESDAY 2:25 PM – 3:05 PM	WEDNESDAY 11:35 AM – 12:15 PM	WEDNESDAY 2:15 PM – 2:55 PM
A	RED	BLUE	GREEN
B	BLUE	GREEN	RED
C	GREEN	RED	BLUE

BREAK-OUT SESSION A

IS THERE A CURE FOR INCONTINENCE ON THE HORIZON?

Christopher Payne, MD

All people with incontinence would like to be cured if possible, but is it possible any time soon? Drawing on his experience at the fourth International Consultation on Incontinence, Chris Payne will review new and imminent cure approaches in surgery, pharmacology, tissue engineering, etc. and assess their likely impact on future needs for incontinence management options.

Dr. Payne is Associate Professor of Urology at Stanford University and an internationally-recognized expert in urinary incontinence.

BREAK-OUT SESSION B

LOOKING INSIDE THE HUMAN BODY

Margot Damaser, PhD

Many innovations have been made recently in medical imaging and display systems, making visualization of anatomical structures easier, more accurate, and more specific for diagnosis and treatment. We are developing a virtual reality display system for visualization of lower urinary tract and pelvic floor structures that could eventually be used for education and medical personnel on the complicated anatomy of the pelvic floor, or teach patients about their condition and the treatments available. It could be used by surgeons to practice a complicated surgery beforehand and test out alternative approaches. Pre-operative imaging combined with sophisticated display systems could be used to actively help surgeons identify structures in the operating room, providing intra-operative guidance. Potential research uses include investigation of the role of different structures in continence and the effect of pathologies on the maintenance of continence. This talk will summarize our work and that of others in this area as a basis for a discussion of potential applications of this technology.

Dr. Damaser is Assistant Professor in the Cleveland Clinic Lerner College of Medicine and has been conducting research on the biomechanics of incontinence for over 12 years.

BREAK-OUT SESSION C**WHAT ENGINEERS NEED TO KNOW ABOUT INCONTINENCE***Catherine DuBeau, MD*

The bladder is unfortunately a misunderstood and unglamorous muscle within the body. This introduction to incontinence for engineers will cover: How the bladder should work; what goes wrong, why, and what are the consequences; how much urine do people with incontinence leak, how often, and under what circumstances; and how is age and sex a factor in solving this challenge.

Dr. DuBeau is Professor in Geriatrics in the Department of Medicine at the University of Chicago. Her research and clinical expertise is in incontinence of the elderly.

3:10 PM – 3:40 PM

CREATIVE CHAOS*Beth mAcdonald*

An experience of synergy and juxtaposition...a chance to have fun and ENJOY chaos...generate a little mental electricity...shift the way you think of the industry...30 minutes of buzz. No way to experience it except by being there...so be there.

Beth mAcdonald heads an industrial design consultancy in Asia and has been working as a consultant in the areas of leadership, innovation, and creativity.

3:40 PM – 4:00 PM

BREAK

4:00 PM – 4:30 PM

**ARE YOU THINKING WHAT I'M SEEING?
DESIGN AND THE ROLE OF PERCEPTION***Daniel Formosa, PhD*

Design used to be about things – objects we created to serve a purpose. The fields of design and engineering have historically focused on the physical object. That's where our training has been rooted. Things are changing. Consumers are now telling us that design is not about the thing – it's about the experience. In all product categories, experience, perception and emotion are playing enormous roles in design. Special attention needs to be given to healthcare products, where involvement is so personal. Extra special attention needs to be given to continence products – an extra-personal issue. This talk will discuss the role of perception in design.

Dr. Formosa is a consultant in product design and design research. His Doctorate is in Ergonomics and Biomechanics.

4:30 PM – 4:40 PM

DISCUSSION

4:40 PM – 5:30 PM

BACK TO THE FUTURE

This session will report on initiatives which have occurred as a direct result of the launch of the *Innovating for Continence* conference series in 2007, including:

- **TACT3 – Reducing the Impact of Continence Difficulties for Older People** – Eleanor van den Heusen
- **Spreading the Word: The Value of Student Design Competitions in Producing Urological Engineers** – Jay Goldberg, PhD; David Levin
- **Innovating Presentations at BMES and NIH: Blazing the Path for a New Type of Conference** – Margot Damaser, PhD
- **Linking Biomedical Engineering Students to Continence Issues** – Rob Linsenmeier, PhD

6:00 PM – 7:15 PM

COCKTAIL RECEPTION

7:15 PM – 10:00 PM

DINNER

Host: Al Maslov - Mr. Maslov is a member of the 2007 and 2009 *Innovating for Continence* Planning Committees.

Keynote Speech: "Making a Difference in the Journey of Life" - Alan Herbert, Honorary President of *Innovating 2009*, and Chairman and CEO of Hollister Incorporated.

WEDNESDAY, APRIL 8

7:00 AM – 8:00 AM

BREAKFAST

8:00 AM – 8:30 AM

WHAT THE NOSE KNOWS*Johan Lundstrom, PhD*

The fear of smelling is a daily cause of anxiety for millions of people with incontinence. For many, the risk – real or imagined – that leaked urine will emit a detectable odor is frightening enough to warrant limiting social interactions, recreational activities or career aspirations. Unfortunately, the olfactory sense is still poorly explored and little is known regarding its function. Only now are we starting to understand that odors emitted by humans (so-called endogenous odors) are not processed as general odors by the human brain. Endogenous odors enjoy a greater access to emotional brain centers and are processed faster than general odors. In this lecture the speaker will use examples from both our everyday life and brain imaging studies to explain how and why the olfactory system is unique among our sensory systems and how this knowledge can provide insights to the problem of smell and inform the development of incontinence products.

Dr. Lundstrom is an Assistant Professor at the Monell Chemical Senses Center in Philadelphia.

8:30 AM – 9:00 AM

ARE SMART TEXTILES SMART ENOUGH TO TACKLE INCONTINENCE?*Sundaresan Jayaraman, PhD*

Smart textiles sense heat, moisture, chemicals, light, pressure and body functions and log the information or, cleverer still, respond by changing their properties to deliver desired effects. In theory, they might keep you warm, dry, moisturized and free of bacteria, odor and stains while measuring your heart rate. Technology innovations are the key to enhancing the quality of life for everyone. It has the potential to successfully address both the psychological and physical consequences of incontinence. In this paper we will examine the issue of incontinence and lay the foundation of a framework for the engineering design of potential solutions to the problem. We will then discuss the role of interactive textiles as a key enabler in realizing a feasible solution. Finally, we will discuss the importance of technology innovation in bringing about transformation change in the area of incontinence to ultimately enhance the quality of life for those suffering from it.

Dr. Jayaraman is a Professor at Georgia Institute of Technology, School of Polymer, Textile & Fiber Engineering & College of Management.

9:00 AM – 9:15 AM

DISCUSSION

9:15 AM – 9:55 AM

STRATEGIES FOR MODULATING THE “ELECTRICAL” CIRCUITS OF INCONTINENCE*Karl Thor, PhD; Changfeng Tai, PhD*

From the perspective of electrical engineering, the nervous system is a complex electrical circuit. Bladder function including continence and micturition is controlled by this neural electrical circuit. In order to design new implantable neuroprosthetic devices to promote continence or control micturition, the input-output function of the neurourological system needs to be identified. In the second part of this lecture, the neural circuits (i.e. reflexes) controlling the lower urinary tract described in the first part of the lecture will be used as examples to identify their output responses to electrical stimulations of a variety of frequencies (0.5 Hz to 10 kHz). Based on the responses of the neurourological system, a novel neuroprosthetic device to restore both continence and micturition functions following spinal cord injury will be discussed. An overview of currently available neuroprosthetic devices for continence or micturition will also be discussed and compared.

Dr. Thor has founded three companies or subsidiaries that target LUT dysfunction and has served on, and been awarded funding by, various NIH, VA, and private non-profit study sections. He is a member of the International Continence Society and the World Health Organization’s Continence Basic Science Committee.

Dr. Tai is an Assistant Professor in the Department of Urology at the University of Pittsburgh. He is a senior member of IEEE and the Society for Neuroscience. He has a PhD degree in biomedical engineering from the Xi’an Jiaotong University in China.

9:55 AM – 10:05 AM

DISCUSSION

10:05 AM – 10:30 AM

COFFEE BREAK

10:30 AM – 11:30 AM

**THE CHALLENGES OF CARING:
THE CAREGIVERS PERSPECTIVE**

Many people with incontinence rely on the help of caregivers – be they professional or family members – to manage their incontinence. In this session we will invite a panel of experienced caregivers to share their perspective on the challenges of managing incontinence successfully. We will ask them to describe the product limitations they have encountered and the impact of those limitations on the quality of life of users – both the person with incontinence and the caregiver. We will also ask them to describe their priorities for product improvements.

Panelists include: Kaoru Nishimura, RN, Japan’s first Continence Advisor and Chair of the Japan Continence Action Society; Sharon Roberts, a gerontologist and leader in The Pioneer Network; Carrie Carls, a WOCN nurse whose research includes penile clamps and SUI in female athletes; Laura Mazzenga, an advanced practice urology nurse at Northwestern Memorial Hospital in Chicago; Lynne Katzmann, PhD, CEO of Juniper Communities; and Ty Bryant, founder of the New-Life Foundation.
Panel Chair - Professor Christine Norton.

11:35 AM – 12:15 PM

BREAKOUT SESSIONS

12:15 PM – 1:30 PM

LUNCH

1:30 PM – 2:00 PM

COATINGS AND BIOSENSORS – COMMON INTERFACIAL ISSUES*Pankaj Vadgama, PhD*

Materials in contact with tissues and biofluids are subject to biological reactive changes which are similar on the micro-scale, regardless of how differentiated they appear to be at the macro-scale. So whilst, say, blood, tissue and urine appear to present distinct colloid and cell mediated challenges to the foreign surface, fundamental processes driven by surface chemistry, charge, profile and even micromechanics have common affects on biomolecules and cell membrane components. Our ability to harness materials' interfacial properties in a way that leads to desired "macro-scale" outcomes is still at an early stage, but holds the key to enhanced biocompatibility. Because of their exquisite surface sensitivity, biosensors are perhaps the most vulnerable to adverse interfacial outcomes and incontinence devices such as urinary catheters are especially vulnerable to microbial colonization, but the underlying drivers are surprisingly similar. Catheter devices are one of the mainstays of urine incontinence control. Chronic catheterization has been a major problem with regard to opportunistic infection by microorganisms with a special propensity for colonizing material surfaces. Accordingly, greater attention needs now to be paid to the fundamentals of surface design and the biophysics of surface/colloid interactions. In practical terms, a convergence of materials strategies for biosensors and incontinence devices could provide short term clinical gain.

Dr. Vadgama's work is focused upon biomedical materials at IRC in Biomedical Materials, Queen Mary, University of London.

2:00 PM – 2:10 PM

DISCUSSION

2:15 PM – 2:55 PM

BREAK-OUT SESSIONS

3:00 PM – 4:00 PM

FROM GOOD IDEAS TO GREAT PRODUCTS

The journey from the initial idea for a product through to success in the market place is fraught with challenges. In this session we will examine a live case-study presented by David Barda, COO of Fred Bergman Healthcare (Australia) and Philippa Lewis, CEO of Sanicare (Australia) – an example of a good idea on its way to market – describing the story so far and discussing the hurdles yet to be negotiated. Following the case-study, a panel of experts: David Hughes, Lynne Katzmann and Beth mAcDonald, will contribute their analysis and expertise.

This session will be chaired by Beth mAcDonald.

4:00 PM – 4:15 PM

CONFERENCE EVALUATIONS

4:15 PM – 4:45 PM

CONFERENCE SUMMARY*Alan Cottenden, PhD*

4:45 PM – 6:00 PM

WINE AND CHEESE PARTY



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