

A G E N D A

APRIL 19-21, 2017

MILLENNIUM KNICKERBOCKER HOTEL
CHICAGO

**Innovating for
Continence:**

**The
Engineering
Challenge**

W E D N E S D A Y , A P R I L 1 9

PRE-CONFERENCE WORKSHOPS

Our workshops offer you the opportunity to explore in depth - guided by international experts - a selection of topics. Workshop leaders will review for you what is known about their given subject, and share their experiences and insights, with a particular focus on identifying unmet needs and highlighting opportunities for new approaches.

CONCURRENT WORKSHOPS A, B, OR C
5:30 p.m. to 7:00 p.m

WORKSHOP A **WHICH PRODUCTS WORK BEST FOR WHOM AND WHY?**

*Alan Cottenden, PhD; Margaret Macaulay, RN, PhD;
Jeff Albaugh, RN, PhD; Kaoru Nishimura, RN*

Although there are not many distinct categories of containment products for incontinence (catheters, pads, urine drainage bags, etc.), there are a bewildering number of design variants within each category and figuring out which of them will best meet the needs of a particular individual is challenging. In this workshop, Alan Cottenden (Engineer, University College London, England) will facilitate a discussion in which Margaret Macaulay (Nurse, University College London, England), Jeff Albaugh (Nurse, North Shore University Health System, Chicago) and Kaoru Nishimura (Nurse, Japan Continence Action Society, Japan) will draw on their long experiences as continence nurses to explain how the process of identifying the best product(s) for an individual works, using case studies that illustrate the key issues. Along the way, they will suggest where there are needs for product improvements. As part of the workshop, Ms. Nishimura will present an update on the latest products available in Japan. This is intended to be an interactive session, and there will be an opportunity to examine products for yourself – including some recent introductions - and ask your questions.

WORKSHOP B **WHAT CHALLENGES DO THE BLADDER AND BOWEL PRESENT?**

Jeannette Potts, MD and Christine Norton, RN, PhD

This workshop is designed to provide an introduction to the misbehaving bladder and bowel for those new to incontinence, as well as those interested in a refresher. Dr. Potts (Urologist, USA) and Professor Norton (Continence Nurse, England) will explain what commonly goes wrong with bladders and bowels, respectively, and describe the consequences for their owners.

WORKSHOP C **WHAT'S NEW ON CATHETERS?**

Mandy Fader, RN, PhD

In this workshop, Professor Fader (Nurse, University of

Southampton, England) will describe and discuss recent results and on-going, world-wide projects to establish evidence-based guidelines for the effective use of intermittent and indwelling catheters. In particular, she will suggest how product needs and opportunities may change in the next few years in the light of recent and imminent data.

BREAK AND LIGHT DINNER FOR WORKSHOP ATTENDEES
7:00 p.m. to 8:00 p.m.

CONCURRENT WORKSHOPS D OR F
8:00 p.m. to 9:30 p.m.

WORKSHOP D

WHAT'S THE LATEST ON CONTAINMENT PRODUCTS?

Alan Cottenden, PhD and Mandy Fader, RN, PhD

In this workshop, Professor Cottenden (Engineer, University College London, England) and Professor Fader (Nurse, University of Southampton, England) will review and evaluate the significance of recent and ongoing work relating to incontinence containment products in their centers and around the world. This will certainly include absorbent products, indwelling and intermittent catheters, male devices, incontinence-associated dermatitis, quality of life measures and health economics relating to product use, international product standards, the latest Cochrane reports, and new website development.

WORKSHOP F **HANDS-ON BIOMIMETICS**

Denise DeLuca, PE

Denise DeLuca (Director and Co-Founder of BCI: Biomimicry for Creative Innovation, and teacher on the Masters of Sustainable Design program at the Minneapolis College of Art & Design) will use her plenary lecture to explain how taking note of nature's ways of solving problems can inspire fresh approaches to our own design work, and this workshop will offer the opportunity to try your hand at it. Ms. DeLuca will provide you and your "design team" with a design challenge, along with inspirational insights from nature, to stimulate you to think biomimetically as you come up with a solution!

THURSDAY, APRIL 20

PLENARY SESSION

7:30 a.m. to 8:30 a.m.
BREAKFAST

8:30 a.m. to 8:50 a.m.
WELCOME

Alan Cottenden, PhD, Conference Chair

Professor Cottenden will provide a welcome and opening remarks about the 2017 conference.

8:50 a.m. to 9:20 a.m.
UROGYNACOLOGY FOR ENGINEERS

Douglas Tincello, MD, FRCOG

How does the female lower urinary tract work when all is well? What can go wrong, and what are the consequences in terms of damaged functionality? What can be done to help? Does it work? In this lecture, Professor Tincello - a urogynaecologist based in Leicester, England - will explain, focusing particularly on what those keen to develop effective assistive technology need to know and understand if they are to be successful. In the process, he will draw on current and recent work from his own group, as well as others' work worldwide, and suggest where the unmet needs are.

9:20 a.m. to 9:50 a.m.
LESSONS FROM OFF THE BEATEN PATH

John Rogers, PhD

One of the key characteristics of modern technology is the blurring of the boundaries between traditional disciplines such as materials science, physiology, chemistry and electronics and much of today's most exciting work is being done by those who have set up camp in the overlaps, drawing on the cultures and expertise of multiple disciplines. Professor Rogers - a materials scientist based at Northwestern University in Chicago - is one such person, and in this lecture he will draw on his multi-disciplinary expertise in such areas as wearable electronics, novel sensors, unusual materials and controlled adhesion to provoke those of us working in incontinence technology to think afresh about the possibilities open to us.

9:50 a.m. to 10:05 a.m.
DISCUSSION

10:05 a.m. to 10:35 a.m.
SMART DEVICES FOR FEMALE URINE AND FECES COLLECTION

Mark Harvie, MS and Mark Plante, MD, FRCS(C), FACS

At our 2015 conference, Mr. Harvie (engineer) and Dr. Plante (urologist) shared the fascinating story of how they developed novel active products for men with urinary

incontinence, starting out with the challenge to meet the requirements of continent US Air Force pilots needing to empty their bladder during long missions. Since then, they have broadened their work to address the anatomically more demanding needs of women with urinary incontinence and people of either gender managing fecal incontinence. In this lecture, Mr. Harvie will bring us up to date, sharing design insights along with laboratory data and results from user trials.

10:35 a.m. to 11:05 a.m.
INCONTINENCE AND THE AGING BLADDER

Tomas L. Griebling, MD

Why does the risk of being incontinent increase with aging? How does your bladder change as you get older? What can go wrong? In this lecture, Dr. Griebling - a urologist based in Kansas City - will outline the aging process of the lower tract, focusing on the changes that most commonly give rise to incontinence. He will explain what forms the incontinence may take and describe the key characteristics that those keen to develop effective incontinence management technology need to understand to be successful, such as the contexts in which the incontinence occurs, along with typical volumes, flow rates and frequencies.

11:05 a.m. to 11:20 a.m.
DISCUSSION

11:20 a.m. to 11:40 a.m.
BREAK

11:40 a.m. to 12:10 p.m.
CAN YOU PRINT ME ONE OFF?

Richard Day, PhD

Thumb through any current technology magazine and you will likely find an article on 3D printing - the process of building three-dimensional structures by depositing materials "ink-jet-printer style", which is done layer by layer. It is a technology that is already finding applications in multiple fields, including medicine, where it is being used to make prototype products quickly and cheaply and to tailor-make bespoke devices for individuals. But what could it bring to the challenges of incontinence? In this lecture, Dr. Day - a life scientist working with incontinence technology at University College London - will describe what is currently possible and what is becoming possible, drawing on examples from his own and others' work.

12:10 p.m. to 12:20 p.m.
DISCUSSION

THURSDAY, APRIL 20 *Continued*

12:20 p.m. to 1:20 p.m.

PATIENT PANEL

A key step in successful engineering design is to establish a clear understanding of what consumers want, what matters to them, what their perspectives are, and what their priorities are. In this session we will hear from a patient panel, with each panelist having many years of managing his or her incontinence. We will ask them to describe: how their bowels and bladders misbehave, how they currently manage their type of incontinence (including describing the strengths and weaknesses of their current products), what their incontinence stops them from easily doing, what they would like to be able to do, and finally to describe what their perfect product would need to do.

1:20 p.m. to 2:30 p.m.

LUNCH

2:30 P.M. TO 3:00 P.M.

WE'VE COME A LONG WAY, BUT THERE IS SOME WAY TO GO

Diane Newman, DNP, FAAN

If we could travel back in time to see what incontinence technology looked like when the more mature professionals in our field now were juniors in training, what differences would we notice? In this lecture, Dr. Newman - our Honorary President for the 2017 conference - will give us a guided tour of the changes she has seen over her 30 years as a nurse specializing in incontinence care, describing what impact they have had on the quality of life of users and drawing our attention to the remaining challenges she would most like to see addressed.

3:00 p.m. to 3:30 p.m.

DOWN TO EARTH LESSONS FROM SPACE

Thatcher Cardon, MD, MBA

How do astronauts cope with urinating and defecating when they are wearing those all-enveloping space suits? Not very well, it seems! In 2016, NASA launched the Space Poop Challenge, inviting inventors to come up with ways of dealing with urine, feces and menstrual fluids for 144 hours, in the event of an emergency. The winning design - from over 5000 entries - came from Dr. Cardon, a USAF colonel, family practice physician and flight surgeon, drawing on his experience with minimally invasive surgery. In this lecture, he will share his story. Perhaps there are some lessons from space for those of us tackling similar problems here on Earth!

3:30 p.m. to 3:45 p.m.

DISCUSSION

3:45 p.m. to 4:15 p.m.

WHAT'S NEW IN THE BOWEL WORLD?

Christine Norton, RN, PhD

What's been happening in the field of fecal incontinence

lately? In this lecture, Professor Norton - experienced continence nurse at King's College London - will provide a review of recent and ongoing work worldwide, and draw on the experiences of her patients to identify the unmet needs and priorities of those who rely on continence technology to manage the challenges of their misbehaving bowels.

4:15 p.m. to 4:45 p.m.

CATHETERS AND URINARY TRACT INFECTIONS: A NEW SOLUTION TO AN OLD PROBLEM

Toby Jenkins, PhD and Brian Jones, PhD

Catheter associated urinary tract infection (CAUTI) continues to be a common complication for long-term users of indwelling catheters, despite the expenditure of considerable effort and ingenuity to devise effective solutions. In this lecture, Dr. Jenkins (a chemist) and Dr. Jones (a microbiologist) will outline the challenges and report on their recent teamwork on a new and promising approach to control catheter blockage and encrustation, a key complication of CAUTI. They will discuss methodologies for constructing an early warning system for catheter blockage, which could be used in tandem with an antimicrobial technology to create a theranostic device: therapeutic and diagnostic.

4:45 p.m. to 5:00 p.m.

DISCUSSION

5:00 p.m. to 6:30 p.m.

BREAK

6:30 p.m. to 8:00 p.m.

THE 2017 POSTER SESSION AND COCKTAILS

8:00 P.M. to 10:00 P.M.

CONFERENCE DINNER

FRIDAY, APRIL 21

7:00 a.m. to 8:00 a.m.

BREAKFAST

8:00 a.m. to 8:30 a.m.

UNDER ATTACK: URINE, FECES AND SKIN

Donna Zimmaro Bliss, PhD, RN, FAAN

Sore skin is a common problem among those who use pads, catheters and other products to contain their leaked urine and / or feces, causing much discomfort and occasionally culminating in such severe wounds as pressure ulcers. In this lecture, Dr. Bliss - an incontinence specialist nurse with a particular interest in skin health - will draw on her clinical and research experience to describe the problems that can arise with current therapies to threaten skin integrity. Along

the way, she will highlight the unmet needs for which product improvements or new products might deliver significant benefits for both users and caregivers.

8:30 a.m. to 9:00 a.m.

PELVIC FLOOR THERAPY IN HIGH DEFINITION: FROM IDEA TO PRODUCT

Jeroen Voorham, MSc

It's not obvious that a young undergraduate student in aeronautical engineering at the Delft University of Technology, The Netherlands, should choose to start his professional career by focusing on incontinence technology. However, Mr. Voorham's mother is a physical therapist who is passionate about providing better help for her patients with pelvic floor dysfunction, and she is keen to explain the needs to her engineering son. In this lecture, Mr. Voorham will tell the story - from idea to product - of MAPLe, the device he designed for high-definition visualisation of pelvic floor activity.

9:00 a.m. to 9:15 a.m.

DISCUSSION

9:15 A.M. TO 9:45 A.M.

WHAT DO MEN WANT?

Mandy Fader, RN, PhD

In principle, men who need to prevent or contain urine leakage have a greater variety of products from which to choose than women. Along with absorbent products, catheters and occlusive devices they also have external catheters and body-worn urinals. But what works best for whom and why? And how can we help men to access all their options? In this lecture, Professor Fader will draw on recent work from her own group - and others worldwide - to outline the strengths and limitations of the various product categories for men with different needs, lifestyles and priorities, and identify the unmet needs and opportunities for improvement.

9:45 a.m. to 10:15 a.m.

BIOMIMETICS: LEVERAGING NATURE'S STRATEGIES

Denise DeLuca, PE

Are you looking for wildly innovative solutions to challenging design problems? You need look no further than your own backyard. Biomimetics leverages functional strategies from nature to develop innovative solutions to human technological challenges. Velcro copies the burr's strategy for sticking to fur, while solar panels copy plants' idea of converting energy from the sun into a more useable form. Earth is water-based, so nature is full of strategies for managing fluids; are there lessons for us for managing incontinence? In this lecture, Ms. DeLuca will explain the basic what, why,

and how of biomimetics and describe examples of current biomimetic technologies. She is Director and Co-Founder of BCI: Biomimicry for Creative Innovation and teaches in the Masters of Sustainable Design program at the Minneapolis College of Art & Design.

10:15 a.m. to 10:30 a.m.

DISCUSSION

10:30 a.m. to 10:50 a.m.

BREAK

10:50 a.m. to 11:20 a.m.

NEW STRETCHABLE ELECTRONICS FOR INCONTINENCE IMPLANTS

János Vörös, PhD

A major challenge facing anyone seeking to develop incontinence technology implants is that the materials conventionally used for sensors and electronic circuits are much stiffer than bladder and bowel tissues, a mismatch that limits their function and durability. In this lecture, Professor Vörös - from the Laboratory for Biosensors and Bioelectronics at ETH in Zurich, Switzerland - will describe his recent work to develop new stretchable implantable electronics to address this problem. In describing his work, he will focus particularly on developing strain sensors that provide continuous information about the fullness of the bladder. This might become useful for those with overactive bladders, as it will give them an early warning that their bladder will soon contract.

11:20 a.m. to 11:50 a.m.

LESSONS FROM ORIGAMI

Spencer Magleby, PhD

Origami - the art of paper folding - has been used for millennia to produce intriguing and decorative artifacts, but in recent years it also has inspired novel design approaches for such items as compact communications antennae and expandable surgical devices. Are there any lessons here for incontinence technology? Might principles imbedded in origami suggest ways of enabling a product to flip easily between one configuration optimized for ease of deployment, and another designed to optimize its function when in place? How best can you fold planar sheets of material to achieve close and comfortable fits to curved body surfaces? In this lecture, Dr. Magleby - a professor of mechanical engineering at Brigham Young University - will draw on examples of origami-inspired designs from a diversity of fields to provoke fresh thinking among the designers of incontinence technology among us.

11:50 a.m. to 12:05 p.m.

DISCUSSION

12:05 p.m. to 12:35 p.m.**A URINARY PROSTHESIS FOR WOMEN WITH UNDERACTIVE BLADDER***Kevin Connolly*

Much technology for managing misbehaving bladders focuses on containing unintended leakage, but there are also people who have the opposite challenge: their bladders won't empty effectively. In this lecture, Mr. Connolly – CEO of Vesiflo – will describe a novel device that addresses this problem and its long and winding path to commercialization. In addition, he will discuss pivotal trial results, clinical experience to date and a device-based condition management system.

12:35 p.m. to 12:55 p.m.**SOCIAL ROBOTICS: BRINGING MACHINES TO LIFE***Alex Mihailidis, PhD, PEng*

The word “robot” conjures up a range of vivid images, from the totally impersonal devices integrated into production lines for spray-painting cars, or assembling computers, to R2D2 and C-3PO, the quirky, lovable, Star Wars characters. To date, robots have had little direct impact on our everyday lives, in general, and the healthcare of frail or elderly people, in particular. However, the signs are that this is set to change. In this lecture, Professor Mihailidis – Professor of Rehabilitation Engineering in Toronto - will describe the environments in which incontinence may be managed in a robot-rich future.

12:55 p.m. to 1:10 p.m.**DISCUSSION****1:10 p.m. to 2:15 p.m.****LUNCH****2:15 p.m. to 2:30 p.m.****PRESENTATION OF POSTER AWARDS****2:30 p.m. to 3:10 p.m.****STRESS INCONTINENCE: A NEW APPROACH***Kevin Connors, MSEE, MBA*

Urine is, essentially, incompressible, so when a woman coughs, increasing her abdominal pressure, that pressure increase is transmitted very efficiently to her bladder neck. If her bladder closure mechanism has been compromised, she leaks: stress incontinence. What if, instead, that pressure transmission could be blunted by introducing some compressibility into the system? In this lecture, Mr. Connors - founder of Solace Therapeutics Inc. - will describe his company's work to do just that by developing an air-filled, and therefore compressible, balloon that can be inserted into the bladder. He will explain how it works and share the results of lab work and initial clinical studies.

3:10 p.m. to 4:00 p.m.**FLIGHTS OF FANCY***Alan Cottenden, PhD; Christine Norton, RN, PhD;**Rick Rader, MD; Christopher Payne, MD;**Jeff Albaugh, RN, PhD*

What will incontinence management technology look like in 20 years' time, say? Will the products of 2037 be recognizably similar to those of 2017, involving incremental improvements and minor variations on familiar themes? Or might we have come up with some radically different approaches by then? Either way, in this session, a selection of experienced clinicians will stimulate our thinking by dreaming a dream or outlining what they would like the products of 2037 to be able to do, that today's products struggle - or totally fail - to deliver. We have asked our “dreamers” to be imaginative, provocative - outrageous, even - in sharing their flights of fancy, and not to worry about how their dreams might be realized. That challenge will fall to the designers among us!

4:00 p.m. to 4:30 p.m.**DISCUSSION AND CLOSING REMARKS***Alan Cottenden, PhD, Conference Chair*

INNOVATING FOR CONTINENCE PAST HONORARY PRESIDENTS

2007

Mr. Ray Laborie
President and Founder
LABORIE

2009

Mr. Alan Herbert
Chairman and Chief Executive Officer
Hollister Incorporated

2011

Christopher Payne, MD, FACS
Professor of Urology
Stanford School of Medicine

2013

Robert Linsenmeier, PhD
Professor of Biomedical Engineering
Northwestern University

2015

Christine Norton, PhD, MA, RN
Professor of Clinical Nursing
Kings College, London and
Imperial College Healthcare, London

PANELISTS

We wish to thank our Patient Panelist contributors to this conference, who through their courage and personal experiences provide us all with a new depth of understanding and a renewed commitment to this cause. It is only through their eyes that we gain the perspective necessary to create and develop the products that continue to be needed in the global marketplace for both urinary and bowel incontinence. THANK YOU!

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