09

# Accelerating Innovation in Medical Care:

## Advancements & Opportunities in Architecture, Design, Mobility and BioMedical Engineering

The conference will explore interrelationships between the biomedical field and architecture, design and mobility engineering as a means of accelerating innovations in medical care. Topics include ways to enhance and showcase new multi-disciplined innovations, technology and science.

**Conference**
Tuesday, April 28, 2009
8:00 a.m. – 4:30 p.m.
**The Inn at St. John's, Plymouth, Michigan**

**Simulation Facility Tour and Dinner**
Monday, April 27, 2009
5:00 p.m. – 8:00 p.m.
**Henry Ford Hospital Simulation Facility, Detroit, Michigan**

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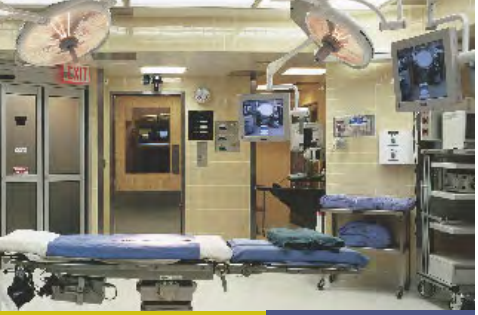
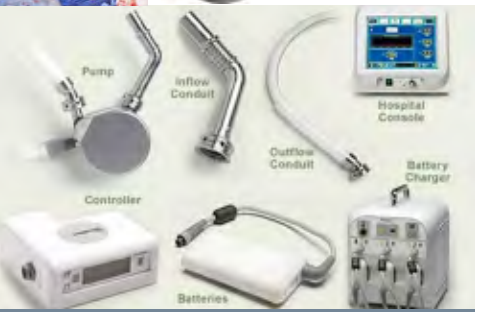


DuraHeart
TERUMO Implantable LVAS






# CONFERENCE KEYNOTE SPEAKERS

## THE OPERATING ROOM OF THE FUTURE

Traditional operating rooms are inefficient and overcrowded. Patient data are not integrated and displayed to caregivers in a timely fashion, and turnover time between cases is lengthy. The Operating Room of the Future is a testament to the power of collaboration. It was launched at Massachusetts General Hospital in August of 2002, as a fully functional operating room for minimally invasive procedures as well as for open surgery. It represents an extraordinary convergence of disciplines – clinicians, institutions, and private companies.

**Julian Goldman**, *MD, Director of Interoperability, Center for Integration of Medicine & Innovative Technology (CIMIT)*
Dr. Julian Goldman attended SUNY Downstate Medical Center and completed his anesthesiology residency and fellowship at the University of Colorado, where he concentrated on artificial intelligence applications for medical monitoring and simulation and modeling. In addition to his CIMIT appointment, Dr. Goldman practices clinical anesthesia in the MGH Operating Room of the Future, serves as a Physician Advisor to Partners HealthCare Biomedical Engineering and as Medical Director of the Biomedical Engineering Model Shop.

## THE DURAHEART INNOVATION STORY

The DuraHeart™ Left Ventricular Assist System (LVAS) is a third generation circulatory support device intended to provide cardiac support for patients who are at risk of death due to end-stage heart failure. It is currently the only approved implantable LVAS combining a centrifugal pump with an active magnetic levitation technology, which provides long-term reliability and minimizes the potential for blood damage and thrombus formation. The development project began at R&D center, Terumo Corporation, Japan as a part of a Japanese National Project funded by the Ministry of International Trade and Industry in 1995. The project was moved from Japan to Ann Arbor, Michigan for product realization in 2000. The first human clinical trial was launched in 2004 in Europe and CE-mark was granted in 2007. This presentation will outline the history of the DuraHeart development as well as more than 50 years of history of "artificial heart" development.

**Chisato Nojiri**, *MD, PhD, Chairperson and Chief Medical Officer, Terumo Heart Inc.*
At age 39, Dr. Chisato Nojiri gave up her successful practice as a heart surgeon to pursue her dream of developing a new type of device that could save the lives of thousands of patients with no other hope. She has pursued this dream relentlessly despite many setbacks. The popular television show, The Professionals, recently featured Dr. Nojiri's story, in which she was called "Unstoppable."

In addition to her current position at Terumo Heart, Inc, Dr. Nojiri is a Visiting Assistant Professor, Department of Cardiovascular Surgery, The Heart Institute of Japan, Tokyo Women's Medical University. She also serves as Senior Executive Officer and Advisor, R&D Center, for Terumo Corporation.

Dr. Nojiri is the recipient of the Grand Prize for the 2007 Nikkei Innovator Award, Grand Prize for Woman of the Year 2008 (Nikkei Woman), and the 2008 Technology Award from the Japanese Society for Artificial Organs.

# PANEL DISCUSSION

**Challenging Times - Multidisciplinary Approach:**
**Can We Change From Narrow-Band to Broad-Band Thinking Fast Enough?**
Panelists will explore methods, techniques and tools that can be utilized to think across disciplines, technologies and industries in order to accelerate innovation.

**Brian Boniface**, *Product Development Engineer, Terumo Cardiovascular Systems Corp.*
**Jon Booth**, *Manager MEC Group, Design Systems, Inc.*
**James Geiger**, *MD, Executive Director, University of Michigan Medical Innovation Center*
**William Hamman**, *MD, PhD, Beaumont Hospitals*
**R. Reade Harpham**, *Manager of Industrial Design & Human Factors, Battelle Memorial Institute*
**Ronald L. Harris**, *PE, SAVE International Greater Michigan Chapter President*
**Brenda Jones**, *Managing Director, University of Michigan Medical Innovation Center*
**Richard Matovina**, *Chief Product Development Engineer, Terumo Cardiovascular Systems Corp.*
**John Schneider**, *Manager Business Development, Design Systems, Inc.*
**Charles J. Shanley**, *MD, Beaumont Hospitals*
**Jack A. Stein**, *Senior Engineer, EM Systems, Terumo Cardiovascular Systems Corp.*
**Panel Moderator: Dr. Armand Ash**, *Lead Professor of Systems Engineering, Associate Professor of Electrical & Biomedical Engineering, University of Detroit Mercy*

# EDUCATIONAL SESSIONS

**Transforming Ideas into Innovations with a Multidisciplinary Approach**
**James Geiger**, *MD, Executive Director, University of Michigan Medical Innovation Center*
**Brenda Jones**, *Managing Director, University of Michigan Medical Innovation Center*
The intersection between medicine, engineering and business forms the backbone of the Medical Innovation Center at the University of Michigan. The presentation will explore the center's one-year fellowship program. Attendees will gain an understanding of the unique characteristics of the innovation process employed by the center, the positives and negatives of working in a multidisciplinary team, as well as the issues that must be understood when commercializing medical innovations.

**Medical Care in Space: The Challenges and Risks Space Travel and Colonization Pose for Medical Care, and How Life on Earth Can Benefit**
**Mark A. Powell**, *Attwater Consulting, Stevens Institute of Technology*
Astronauts are an extremely healthy and fit lot. Yet the rigors of space travel and the lack of availability of medical care away from planet Earth expose astronauts to serious health risks during every mission. Yet, probably due to the basic good health of this elite group, few serious health problems have actually been observed in space missions to date. This presentation will discuss the potential health risks that may be experienced by astronauts in the space environment, and describe some of the risk assessment methods developed by engineers to produce quantitative risk assessments when there is very little actual health event data. These methods not only help health care in space, but can be used effectively on earth.

**What Do Green and Health Care Have to Do With One Another?**
**Dan Jacobs,** *LEED AP, Senior Principal, Director of Sustainable Design, A3C Collaborative Architecture*
**Jan Culbertson**, *Senior Principal, A3C Collaborative Architecture*
Green and health both help patients and healthcare staff live healthier lives. Much research has been done about how healthy buildings contribute to healthy individuals. Discover some of the current research on wellness as it relates to building design. Attendees will learn which hospitals have already received USGBC's LEED status for their environmentally appropriate and responsible design, as well as what is happening with leading edge green hospitals and with the USGBC's new LEED requirements for Healthcare.

**Bench to Bedside: Patient Therapies and Tomorrow's New Cures**
**The Chili's Care Center at St. Jude's Children's Research Hospital**
**Scott D. Courtney**, *AIA, LEED AP, Associate, SmithGroup*
The 340,000-square foot Chili's Care Center at St Jude Children's Research Hospital is dedicated to the integrated treatment of catastrophic diseases in children. The facility, which opened in January 2008, represents a fundamentally new building type that vertically integrates biomedical research, acute inpatient care at a 45-day length-of-stay and diagnostic and therapeutics facilities. Attendees will learn the ways researchers and the clinical staff are integrated into the patient care team to achieve better patient outcomes.

**Simulation Analysis Used For Facility Space Planning of an Emergency Department**
**Lillian Miller**, *Associate/Senior Program Analyst, Albert Kahn Associates*
Computer simulation software is useful in analying a process that has variable arrival rates of an entity and that requires resources at variable activity times. Attendees will be introduced to a case study of an emergency department in a Michigan hospital and learn how computer simulation analysis, as practiced by industrial engineers, can be used in space planning by architects for health care facilities.

**Healthcare Trends and Challenges and the High Performance Healthcare Facility**
**Daniel R. Beney**, *PE, LEED AP, EDAC, Associate, Medical Planner/Engineer, Harley Ellis Devereaux*
Presenters will address current and future healthcare trends and challenges. Attendees will learn how the design of a healthcare facility can address these challenges and provide solutions to increase efficiency and improve patient outcomes. The presentation will provide examples of highly efficient, resilient and adaptable systems and the process needed to emulate these systems during the design and construction of healthcare facilities.

**Inactivating Airborne Pathogens through Air Sanitization**
**Frank Stamatatos**, *Director of Business Development, Strion Air, Inc.*
The Centers for Disease Control and Prevention (CDC) estimates that more than 2.5 million patients annually acquire an infection while hospitalized in U.S. hospitals for other health problems. Each year, nosocomial infections kill more people than car accidents, homicides, poisonings, fires, and drowning combined. The rate of nosocomial infections has more than doubled in the past 20 years and an increasing number of these infections are due to inadequate HVAC systems that fail to protect at-risk patients. Attendees will be presented with StrionAir's technology, which provides a unique solution to the airborne pathogen and particle threat, deploying new air sanitization technology that both captures and inactivates harmful microorganisms and other dangerous objects in the air stream.

**Application of Ultra Violet Germicidal Irradiation and Standard High Efficiency Filtration in HVAC Systems as an Alternative to HEPA Filtered Laminar Air Flow for Orthopedic Surgical Suites and Intensive Care Units**
**Tim Leach**, *Chief Executive Officer, Vigilair Systems, Inc.*
Nosocomial infections constitute a major health threat affecting hundreds of millions of people worldwide, and are the direct cause of morbidity and death in large numbers of patients. These infections also increase the length of stay in hospitals, and have associated annual costs up to $50 billion. Attendees will learn the test protocols to isolate, identify, and quantify pathogens within HVAC equipment. In addition, design parameters for the integration of Ultra Violet Germicidal Irradiation with standard HVAC filtration to treat the HVAC system surfaces and air-stream will be demonstrated.

## Schedule:

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| 7:30 am | Registration opens |
| 8:00 am – 4:15 pm | Exhibit Tables Open |
| 8:00 am – 9:00 am | Breakfast/Keynote |
| 9:00 am – 11:45 am | Session Speakers |
| 11:45 am – 1:15 pm | Lunch/Keynote |
| 1:15 pm – 2:45 pm | Session Speakers |
| 3:15 pm – 4:15 pm | Panel Discussion / Q & A |

## Cost to attend the conference:

**$149** ESD, INCOSE and Affiliate Council Members
**$169** Non-members
**$129** Students and Seniors
**$223** to attend the conference and become a member of ESD – includes a one-year subscription to Crain's Detroit Business – A $113 value.

## Optional tour and dinner cost:

**Monday, April 27, 2009**
Henry Ford Hospital, Detroit

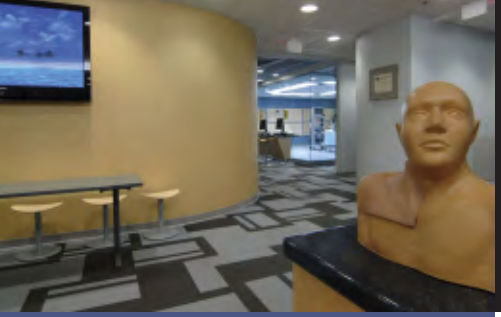
| | |
|---|---|
| 5:00 pm | Registration |
| 5:30 pm – 6:45 pm | Tour |
| 7:00 pm – 8:00 pm | Dinner/Keynote |

**$40** ESD, INCOSE and Affliliate Council Members
**$20** Students and Seniors

## Cost to attend the conference and tour/dinner:

**$169** ESD, INCOSE and Affiliate Council Members
**$189** Non-members
**$149** Students and Seniors
**$243** to attend the conference, tour/dinner and become a member of ESD – includes a one-year subscription to *Crain's Detroit Business* – A $113 value.

## To register, visit www.esd.org or call 248-353-0735.



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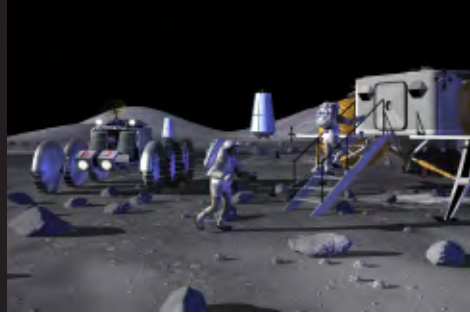

## HENRY FORD HOSPITAL SIMULATION FACILITY

A $5 million, 12,000-square-foot facility, the largest in the Midwest, opened in September 2007 at Henry Ford Hospital allowing health care professionals to practice and augment their skills using state-of-the-art simulations including computers and mannequins that can simulate hundreds of different medical conditions.

The tour will include a presentation by **Dr. Craig Reickert**, *Director of Surgical Programs for the Center for Simulation Education and Research, Henry Ford Hospital*, and an after dinner presentation by **Marco Capicchioni**, *Vice President, Facility, Real Estate and Support Services, Henry Ford Hospital*.


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