

MIC Leadership

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Overview of the year

The year has passed very quickly and it is almost time to welcome the fourth cohort of Fellows. This year's Fellows packed as much as they could into twelve months. They began with an initial observation phase last summer and into the fall, dividing their time among numerous departments of interest. Narrowing down the hundreds of unmet needs took a lot of outside input and various voting rounds. By October they had narrowed the needs down to two and presented those to their Technical Advisory Group. After this meeting, the Fellows decided to pursue the unmet need of an emergency intubation device to be used by first responders.

The next couple of months were spent doing focused observations, engaging with medical personnel from across the United States, and even learning to intubate in the simulation center to fully understand the procedure. Toward the end of winter, the Fellows also kept themselves busy writing a business plan and entering the Michigan Business Challenge (MBC), in which their newly registered company, Brio Device LLC, finished in the final four. Building on experience they gained during the MBC, they had the opportunity to pitch to In Cube Labs while in the Bay Area with the Center for Entrepreneurship. As spring slowly arrived, the Fellows acquired business coaching through their participation in the Great Lakes Entrepreneurship Quest (GLEQ) and also participated in a Duke alumni business challenge (thanks to Doug's alumni status).

Also during the year the Fellows worked on a hospital room redesign for a pediatric treatment that requires the child to be in radiation shielded confinement for three to five days. They enlisted the help of the College of Architecture to develop a design plan for the treatment room that will be used once the clinical trials are complete and the treatment is common practice. Over the summer the Fellows worked feverishly to more fully develop their prototype, re-interview potential users, as well as get Brio Device ready to stand on its own two. What an amazing year and wonderful prospects for the year to come!



Where did they go George?

It is time to send the third cohort of Fellows out into the world and make space for the fourth class. At the beginning of 2010, the Fellows formed Brio Device LLC. All four are founders of the company and will continue to be involved on varying levels. Laura will continue to develop their intubation device and has applied for various forms of funding to do so. Hannah will be dividing her time so she can work on the business development for Brio while also working for her medical consulting firm BPL International. Sabina is returning to clinical practice in a Critical Care Fellowship at Mott Children's Hospital. She will also continue to assist Brio in device design and validation in her "free time". Doug has taken a position as an Entrepreneur in Residence and Technology Commercialization Officer for The Michigan Nanotechnology Institute for Medicine and Biological Sciences and will continue his involvement with Brio particularly in the areas of device design and business development.



Hail to the Victors!

The 2010-2011 team of MIC Fellows began the formation of the medical device spin-out company by entering the Michigan Business Challenge (MBC) competition in November, 2010. The professionalism demonstrated with their business plan, live presentations and Q&A sessions before panel of judges comprised of entrepreneurs and investors advanced them round-by-round through the competition to become one of the competition Finalists in February, 2011, at which point Brio Device, LLC was incorporated.

This experience groomed them well for the Ann Arbor SPARK Bootcamp and Competition in May when Brio won "Best of Bootcamp." First place awarded Brio a SPARK consulting engagement to accelerate the growth of the company, along with extensive national media exposure. Thereafter, Brio also competed in GLEQs "Boost" competition in Lansing, Michigan in June where they again were winners and recipients of a prize which included exclusive investor pitch invitations including one with the Blue Water Angels in Midland, Michigan.



Brio Device, LLC is headquartered in Ann Arbor. The company develops and commercializes airway devices uniquely positioned for adoption by emergency medical services. The flagship product is a "smart" device to improve the efficacy and safety of emergency intubation.

Sarns Fellowship Update

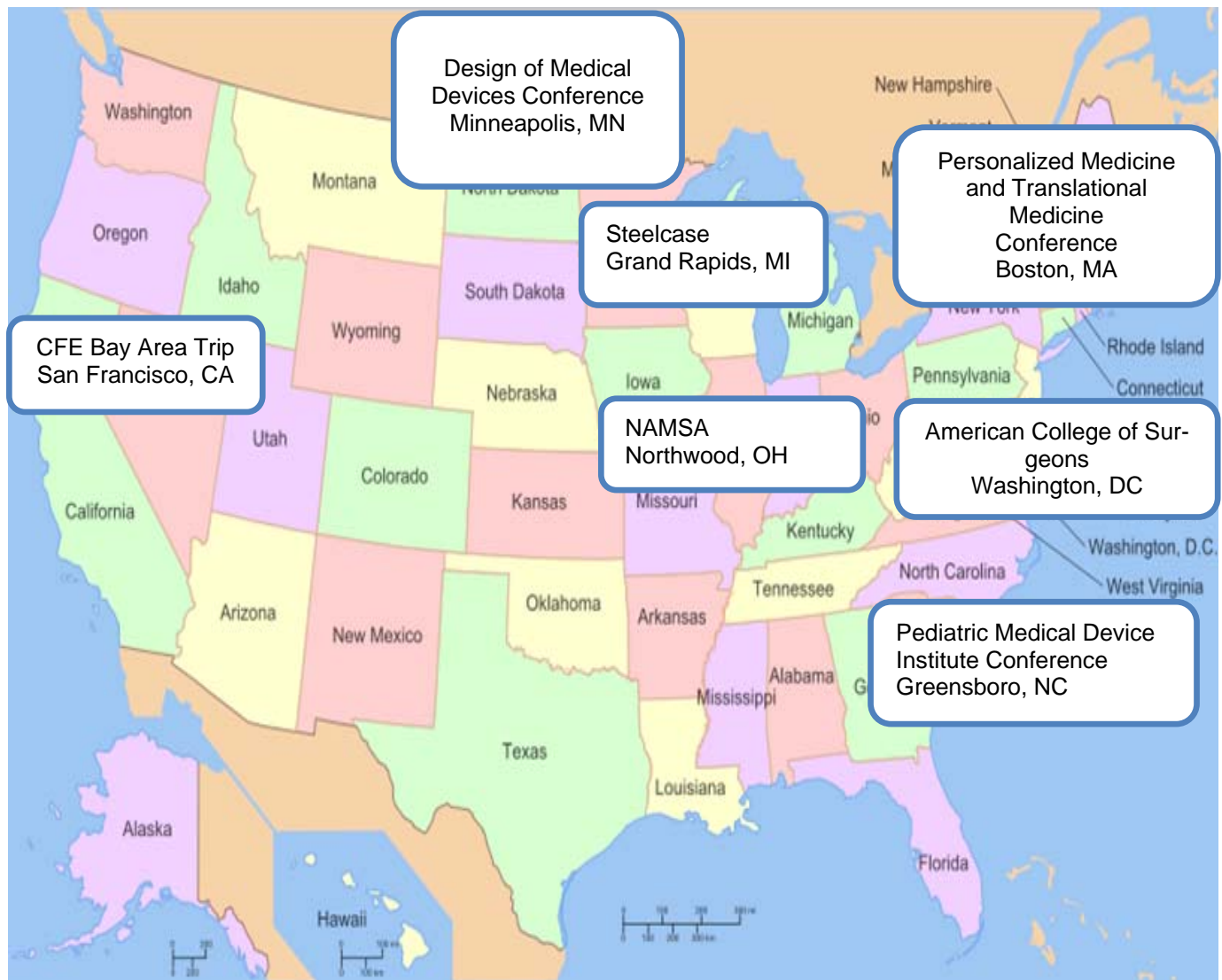


Supporters of the Dick Sarns Fellowship gathered in June at the headquarters of NuStep in Ann Arbor to celebrate the accomplishments of the 2010-2011 Fellowship Team and the MIC's Inventors Assistance Program. Mr. Sarns, Dr. Mulholland and Dr. Geiger all gave brief remarks about the progress that has been made by the Medical Innovation Center and the impact of Dick Sarns Fellowship. Doug Mullen, the first MIC Fellow to hold the Dick Sarns Fellowship, described his experiences over the past year and the value of the Fellowship on his professional development and career. Three faculty inventors, Drs. Barbara Miller, Ruthann Nichols and Jonathan Eliason, described their translational research projects that are being supported by the MIC's Inventor Assistance Program.



Anthony Tsai, MD has been named the second Dick Sarns Medical Innovation Fellow. Anthony graduated from the University of Pennsylvania with a BSE in Bioengineering. He received his MD from the Medical College of Philadelphia/Hahnemann University School of Medicine. In addition to completing a residency in general surgery, Anthony has completed fellowships in Fetal Surgery and Pediatric Minimal Invasive Surgery. True to his training as a physician-engineer, Anthony adds an exciting perspective to the new 2011-2012 class of Medical Innovation Fellows.

Traveling Fellows



Prototype Lab

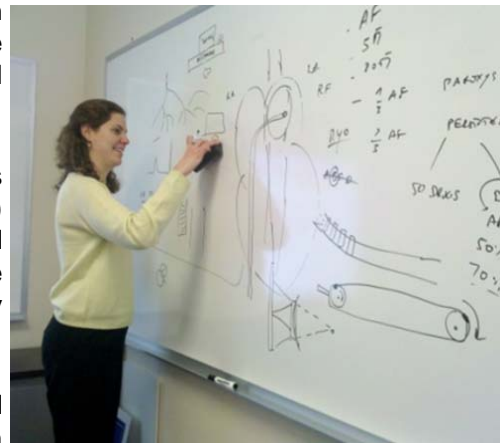
With the help of MIC Design and Prototype Lab Manager Michael Deiningner, the Fellows spent a significant amount of time in May and June to develop and test prototypes of the emergency intubation device. Focusing on producing a functioning bench top demonstration prototype, the Fellows used a combination of rapid prototyping printers as well as the more conventional machining to generate three different prototypes. The team was able to test out different concepts on airway mannekins at the Health Systems' Simulation Center in order to advance the design.

MIC Fellows Redesign Pediatric Oncology Treatment Room

The MIC Fellows hosted an ideation session at the University of Michigan Health System (UMHS) to design a safer, more comfortable and nurturing treatment room for pediatric patients receiving radioiodine labeled metaiodobenzylguanidine (I-131 MIBG). I-131 MIBG is a highly radioactive cancer treatment for neuroblastoma.

Neuroblastoma is the most common extracranial solid tumor in children and the most common cancer in infancy. There are 650 new pediatric cases of neuroblastoma diagnosed per year in the US. Over half of these cases occur in children less than 2 years of age. Once metastasized in children older than 18 months, cure rates are only 25-30% despite aggressive multimodal therapy with surgical, chemo, immune and radiation therapies.

The University of Michigan is completing a clinical trial with this targeted radioiodine labeled metaiodobenzylguanidine (I-131 MIBG) therapy with amazing results. While the tumor burden is decreased dramatically and results in long-term remission, the children become 'radioactive' for a three to five-day period and must be confined by strict isolation for that period of time.



The need for a redesign of the MIBG treatment rooms was identified while the MIC Fellows' were immersed in the clinical environment in the Department of Pediatric Oncology. There they observed a six-year-old child undergoing treatment for neuroblastoma and felt they could improve the experience for both the child and the caregivers.

Based on observations and discussion with clinicians, families and radiation safety experts, the MIC Fellows focused on three areas for improvement: patient and caregiver safety, communication between the isolated patient and family and overall room design.

The Medical Innovation Center ideation session brought together over thirty people with backgrounds in medicine, engineering, nuclear physics, architecture and business. The MIC also included high school students interested in pursuing life science professions.

Hundreds of ideas were generated to improve patient safety, staff safety, and the overall patient experience. The MIC Fellows, with support from the center's innovation coach, guided the group to distill the ideas down to twenty for consideration by Dr. Gregory Yanik, Professor of Pediatric Hematology and Oncology, and his team at UMHS.

The MIC Fellows along with Professor Sean Vance (University of Michigan College of Architecture) are refining the ideas for implementation at the new C.S. Mott Children's Hospital. The resulting room design from the ideation session has the potential to serve as a benchmark for various centers providing MIBG treatment across the country.

MIC in the Community

In addition to the educational experience, the Fellows are often involved as volunteers and ambassadors throughout the community. On a monthly basis, the Fellows prepare and serve food at Ann Arbor's Food Gatherers, a non-profit which exists to alleviate hunger and eliminate its causes in our community. In July, the team participated at the Hemophilia Walk at the Detroit Zoo as well as and Bracheal Plexus Palsy Day Camp at Howell Nature Center. In October, they helped with the day-of logistics at the MichBio Expo & Conference in Ypsilanti. They spoke at meetings, promoting the MIC at events such as Ann Arbor Rotary. They served as judges at a number of technology and med-device student competitions, including the LEGO Masterpiece competition in Flint. And they led observation, brainstorming and needs assessment training sessions for high school students at Pioneer High School and biomedical engineering students at University of Michigan and Case Western University. Throughout the community, MIC is involved.

MIC Fellows as Ambassadors for Innovation.

The MIC Fellows have taken the medical adage of “see one, do one, teach one” to heart and have taken the next step to serve as teachers of medical innovation. The Fellows presented a lecture on “Needs Assessment and Selection” as invited lecturers for Case Western Reserve University’s medical innovation course, BioDesign: Methods for Innovation in Biomedical Design. On February 15, the Fellows taught a multi-disciplinary class of senior engineering and medical students. The course instructor, Shubhayu Basu thanked the MIC and Fellows for coming down to Cleveland, finding “[the lecture] was very relevant and covered exactly what [he] needed to convey to the students.”



The Fellows were again invited to lecture on “Medical Space Observations and Identifying Needs” to Rachael Schmedlen’s Biomedical Engineering 499 course at the University of Michigan. In combination with last year’s Fellows, the lecture included real-time observation at the hospital cafeteria and needs generation exercises in addition to traditional didactics and theory.

The MIC Fellows propagate the innovative ideals learned through their year-long fellowship program as well as continue to serve as ambassadors of the unique program once they leave.



MIC Fellows Present “Anti-Disciplinary” Methodology in Japan

International Surgical Week was held in Yokohama, Japan this year. Included in the main program of the conference will be the University of Michigan’s Medical Innovation Center (MIC) presentation on “Anti-Disciplinary Needs-Based Design: Medical Innovation Fellowship as a Model for Healthcare Innovation.”

Fellow Sabina Siddiqui presented the Fellowship Program, curriculum and team composition as a method for surgical innovation and education in August to an international audience representing over 21 surgical societies. In addition to showcasing the success of the MIC and its three teams, Dr. Siddiqui and Jennifer Stovall represented the MIC to the international medical community and industry.

The presentation highlighted the educational process, noting that each MIC Fellow exits the program with a strong understanding of all the aspects of medical technology development and commercialization, achieving the ability to be conversant across disciplines. This training allows the Fellows to reach beyond their respective disciplines and provides a unique opportunity to train and develop the skills needed to better design solutions for some of healthcare’s most significant problems.



Who Knew?

The educational experiences and environments for the MIC Fellows are diverse. Of course traditional text books are included, such as the use of "BioDesign: The Process of Innovating Medical Technologies." There are interactive learning modules led by Inovo and Menlo Technology, which teach methods to collect observations, use software such as "MindMap" to organize the data, and vet the unmet needs. University faculty from multiple colleges across campus and physicians supply multiple hours of 1:1 tailored discussions. The Fellows attend international industry and medical conferences, such as the American College of Surgeons in Washington D.C. and the Design of Medical Device Conference in Minneapolis, MN. Steelcase, Inc. teaches observation techniques to the team at its headquarters in Grand Rapids, MI.

Most importantly, the Fellows learn by DOING. Once immersed in the clinical settings, the team

learns by watching and collecting information on unmet needs in real time. The Fellows follow these observation sessions by conducting extensive primary research interviews and secondary literature analysis on the unmet needs. They host and conduct brainstorming sessions to explore solutions. The Fellows use current technology in the UMHS Simulation Center to understand where the deficiencies lie. They prototype potential solutions in the labs. Ultimately, they apply what they've learned to build the business cases, start a business of their own and become entrepreneurs. The result is a phenomenal educational experience compressed into one year.



Top 10

So many unmet needs, so little time. Unfortunately, the Fellows were only able to work on two unmet needs this year even though they identified hundreds and researched over thirty. Below is their top ten list of pediatric projects worthy of further development .

1. Appendicitis Diagnosis: Address the need to accurately and rapidly diagnose appendicitis.
2. Reduce Injury to Bowel Tissue: Address the need to handle bowel gently during surgery.
3. Blood Flow Measurement: Address the need to accurately measure the flow of blood and oxygen in a patient without causing harm or additional complications to the patient.
4. Cystic Fibrosis Drug Delivery: Address the need to efficiently and effectively deliver cystic fibrosis drugs to patients.
5. Chest Tube Clogs: Address the need for more effective chest drainage without complications such as clogging.
6. Chest Tube Placement: Address the need to reduce damage, sepsis, and death from misplacement or dislodging chest drainage systems in children.
7. Fistula Treatment: Address the need to reduce complications and deaths associated with enteric fistulas.
8. Gastrostomy Tube Overnight Feeding: Address the need to ease caregiver anxiety instigated by overnight feeds with G-Tubes.
9. Patient Handoff: Address the need to reduce errors and improve efficiency of patient handoff in the hospital.
10. Lumbar Puncture: Address the need for more consistent placement and less painful lumbar punctures.

Fellows 2011 – 2012

Domain – Sleep Medicine



Anthony Tsai, MD

EDUCATION

MD, MCP/Hahnemann University, 2002

B.S.E. in Bioengineering, 1996

SELECTED WORK EXPERIENCE

Indiana University, Surgical and Chief Resident, 2007-2010

Children's Hospital of Philadelphia, Research Fellow, 2004-2007



Anna Ng, MHA

EDUCATION

MHA, Cornell University, 2011

BS, Cornell University, 2009

SELECTED WORK EXPERIENCE

National Data Archive on Child Abuse and Neglect, Digital Archive Assistant, 2010-2011

Berkshire Healthcare Systems Inc., Business Development Intern, 2010



Jay Johnson, MSE

EDUCATION

MSE, University of Michigan, 2011

BSE, University of Michigan, 2010

SELECTED WORK EXPERIENCE

University of Michigan, Lab Technician, Current

University of Michigan, Research Assistant, 2009-2011



Michael Johnson, MD/MBA

EDUCATION

MD/MBA, University of Michigan Medical School/Stephen M Ross School of Business, 2011

BA, Duke University, 1999

SELECTED WORK EXPERIENCE

Atlas Digital Solutions, Associate, 2010-2011

New York Presbyterian Hospital, Clinical Coordinator, 2002-2004

Random House, Inc., Sales Associate/Internet Marketing Associate, 1999-2001