

The Jacobs Institute Newsletter

A Dose of Medical Innovation

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Ji'S TOP 10 LIST OF GREATEST MOMENTS OF 2015.

We reflect back on a successful year where we strengthened relationships with industry by providing programs to more than 300 physicians and industry engineers and sales representatives, educated nearly 700 students and teachers about vascular disease, and garnered public attention for the cutting-edge, collaborative medical breakthroughs we foster to improve patient care in WNY.

We look forward to making even greater strides in 2016!

#1: Ji Garners International Media Coverage

Breakthrough Use of 3D Printing to Treat Aneurysm



The Jacobs Institute's Chief Medical Officer, Dr. Adnan Siddiqui, was featured on the front page of *The Buffalo News* on December 8, 2015, using 3D printing as an innovative medical approach (<http://bit.ly/1N0TpO2>). Stratasys, a leading global provider of 3D printing and additive manufacturing solutions, visited JI and learned about our collaboration with University at Buffalo to 3D print patient-specific brain arteries. Stratasys filmed a promotional video here, highlighting how their 3D printers can be used for surgical planning to impact patients' lives (https://www.youtube.com/watch?v=SKAbkEXD_Wk).

To promote the video, JI hosted an educational event for local WNY media. The story highlighted how Dr. Siddiqui's use of a Stratasys-3D-printed aneurysm model allowed him to plan for a surgery in advance, thereby reducing complications. It was featured in media outlets locally (Buffalo News, Buffalo Business First, WBFO), nationally (CNBC), and even internationally (BBC). The 3D-printed aneurysm model was that of a 49-year old Western New York mother of 3. University at Buffalo's Dr. Ciprian Ionita, a key JI partner, produced the 3D model using a Stratasys printer.



Buffalo Business First <http://bit.ly/1l18Ph1>
Time Warner Cable <http://bit.ly/1NP58g6>
WBFO <http://bit.ly/202rg2v>
CNBC article <http://cnb.cx/1N6vp90>
BBC Article <http://bbc.in/1T1jVYT>

#2: Celebrating Our Past & Future

June Event with Family and Friends

Key members of Buffalo's health care community-including physicians at the cutting-edge of vascular treatment-joined with western New York philanthropists and members of the Jacobs Family on June 4th. Together, they



celebrated the legacy of Dr. Lawrence Jacobs and explored Dr. Nick Hopkins' vision for medical innovation in the Jacobs Institute's (JI's) forthcoming idea to Reality Center (i2R). The dinner was attended by over 100 members of the Buffalo community, including University at Buffalo President, Dr. Satish Tripathi, and Kaleida Health CEO, Jody Lomeo. Reflecting on its namesake and its founder, while priming itself to launch the Idea to Reality Center (i2R), the Jacobs Institute had much to celebrate with its partners, friends, and supporters.

#3: JI Impacts WNY Heart Valve Replacement Patient

Power of Collaboration

Jl's internship program fostered a collaboration that impacted a WNY patient in need of a heart valve replacement. Rick Izzo, intern, wanted to print a 3D heart model for his summer project. He worked with Rose Hansen, RN, PhD, Valve Coordinator for GVI's Structural Heart Program. She identified a patient in need of a transcatheter mitral valve replacement, for which a 3D model would be useful for surgical planning.



Rick worked with Chip Ionita, PhD, from UB's Toshiba Stroke and Vascular Research Center (TSVRC) on the 8th floor of UB's Clinical and Translational Research Center (CTRC). He also worked with Stratasys, an Israeli-based company which manufactures 3D printing equipment. Stratasys offered to print a multi-material 3D heart model that would serve as a more realistic replica on which the surgeon could practice hours in advance of the actual surgery. The ability to practice the complicated surgery before performing it on the patient meant smoother problem-solving in the surgery and less time on the operating table.

In August, Vijay Iyer, MD, PhD, FACC, FSCAI, Director of Structural Heart Intervention for Kaleida Health, performed the Gates Vascular Institute's (GVI's) first native vessel transcatheter mitral heart valve replacement.



The JI-assembled team from the university, hospital, industry, and JI staff rallied around the patient to provide the best possible treatment in a challenging circumstance, paving the way for future cutting-edge treatments and surgical planning.

#4: Lt. Governor Hochul Visit

Featured in NY State Economic Development Tour

In August, JI was one of three sites selected to showcase Governor Cuomo's economic development plan to revive New York. Along with Solar City and Buffalo Manufacturing Works, 90 visitors from the Governor's Upstate Revitalization



Initiative conference--including Lieutenant Governor Kathy Hochul--visited JI to learn how we are leveraging our economic development grant.

A news story on the visit can be found here:

Time Warner Cable <http://bit.ly/1HGzTAj>

The Buffalo News <http://bit.ly/1JcBipB>

#5: Inaugural Needs Identification Program with Industry

Helping Industry Improve Their Medical Devices

The JI also held the first session of its Clinical Needs Identification Program (CNIP) in April. The program guides the participant teams through the clinical needs identification stage of the biodesign process so they emerge at the end of the week with clear, validated needs statements. These needs statements can subsequently be used to develop new medical device solutions. The CNIP is a one-week experience that combines clinical immersion in the cath lab and the operating room, roundtable discussions, group work, physician-led educational sessions on neurovascular diseases and treatments with training in the needs identification methodology.



The participants were struck by how critical it is to observe the full clinical context to understand how product performance is impacted by many different factors and how it tested their assumptions and opened their eyes to new possibilities. One participant said that the program "was a critical experience to better appreciate the challenges being faced by clinicians on a daily basis". We are looking forward to using participant feedback to continuously update and improve our industry- and physician-facing programs.

#6: Educated Nearly 700 Students & Teachers

Experiential Learning for Our Community

The JI carries out educational programs for a variety of constituencies including middle, high school, and college students and teachers. In 2015, close to 700 students and teachers came through JI.



In 2015, the JI hosted a total of 245 students from 9 middle and high schools in its Brain Boot Camps. The Brain Boot Camp is a unique opportunity to teach students about the brain. Students hold real brains, work on a medical simulator, see a 3D printed heart, watch a pre-recorded medical procedure (if appropriate), and tour our unique facility. Our 1.5-2

hour Brain Boot Camps are meant to educate and inspire.

Along the way, students also hear various professionals tell about their own career path that brought them here. The boot camps emphasize that there are many opportunities in a variety of fields that exist in the health care ecosystem on the campus. JI lets students know that in addition to doctors and nurses, dieticians, physical and occupational therapists, hospital administrators, biomedical engineers, medical illustrators, communicators, and facility managers also keep the hospital going strong.



Students also learn about the high rates of heart attack and stroke in western New York and the ways they can be prevented, and about the use of endovascular surgery to treat heart attack, stroke and other vascular diseases.

#7: Broadcasting Live Surgery

Local and National Audiences Impressed

The location of the Jacobs Institute (JI), Kaleida Health's Gates Vascular Institute (GVI), and the University at Buffalo's Clinical and Translational Research Center (CTRC) in one building has many advantages, one of which is the JI's



ability to broadcast live endovascular cases being performed in the GVI around the world for training and educational purposes. This fall, the JI used its AV system to broadcast live neuro endovascular procedures from the GVI's fourth floor catheterization labs to two international conferences - the Congress of Neurological Surgeons (CNS) in New Orleans on September 30th and the Transcatheter Cardiovascular Therapeutics (TCT) Conference in San Francisco on October 15th. The GVI was one of only three sites broadcasting to the CNS conference that hosted over 3,000 neurosurgeons and other health care professionals and one of nine national sites broadcasting to the TCT conference that had over 12,000 attendees.

In addition to their educational importance, the broadcasts offer the JI the opportunity to invite potential supporters to the JI for lunch where they watch the live cases, learn about the JI's idea to Reality (i2R) Center and its ongoing activities, and get hands-on experience on the endovascular simulator and 3D printed vascular flow models. Fifteen people attended the CNS broadcast and ten people the TCT broadcast.

#8: Launched JI Meeting Services Division

Now Hosting Medical Conferences

The Jacobs Institute launched a Meeting Services division this spring,

overseeing the coordination and execution of three medical conferences annually. The conferences were previously hosted by another company, which is no longer in business. JI was a natural home for the meetings that are more than 20 years old. JI's Founder, Dr. Nick Hopkins, and the team of UB-affiliated neurosurgeons, are the creators and leaders of the conferences.



The Cerebrovascular Complications Conference, or 3C, was the first hosted by the Jacobs Institute in Jackson Hole, Wyoming, June 18-21. It welcomed close to 100 attendees from around the U.S., specializing in a variety of neurosurgery fields.

#9: Featured in Three Videos

Partnered with Industry & NY State

Owed to our strategic relationships with industry, the dynamic and brilliant surgeons with whom we work, and our aim to bolster



economic development in WNY, JI was the site for filming three videos in 2015.

The videos were about: the Corindus vascular surgical robot used in the Gates Vascular Institute, Stratasys 3D printers creating an aneurysm model for surgical planning, and the innovation owed to economic development investments in New York State by the Governor. All are beautifully done and feature JI's work , and some of our staff.

Corindus video starring Dr. Vijay Iyer

<http://bit.ly/1ixzsUk>



Stratasys video starring Dr. Adnan Siddiqui & his patient

<http://bit.ly/20tcRML>

Empire State Development "Tomorrow Starts Today"

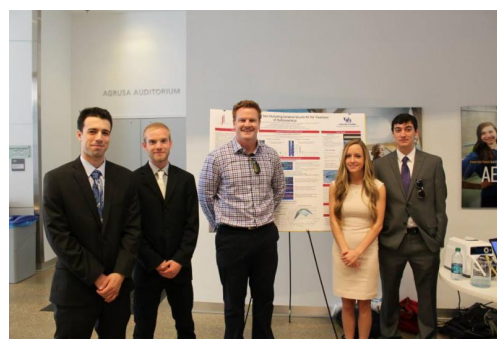
<http://bit.ly/1V2ptUf>

#10: Project Presented at Engineering Conference

Jl-led Student Team Selected

Led by a JI staff member, a team of University at Buffalo's students was accepted to present their research into a novel method to evaluate the performance of hydrocephalus shunts at the Biomedical Engineering Society's 2015 Annual Meeting. Further, the group was one of three groups, out of 4,000 eligible projects, that were selected to pitch their idea

to multibillion-dollar medical device manufacturer Medtronic in "BME's Technology Transfer and Licensing Best Practices in Transforming Technologies from Academia and Clinic into Industry" session at the meeting.



Mike Springer, JI's Director of Operations & Entrepreneurship, is a biomedical engineer by training. In 2015, he served as an advisor for a team of four University at Buffalo (UB) biomedical engineering seniors. Over two semesters, Mike mentored them through the engineering process, following the Stanford Biodesign framework. The students sat with University at Buffalo Neurosurgery (UBNS) pediatric neurosurgeon Renee Reynolds, MD, FAANS, to learn about the disease, and shadowed Jody Leonardo, MD, FAANS, in her patient clinic and in the operating room to better understand hydrocephalus, shunts, and shunt failures.

Hydrocephalus is a brain condition, often in children, where there is a buildup of fluid in the brain that is generally treated with a tube, called a shunt, which drains fluid and redirects it into the stomach. Although shunting technology has existed for more than 60 years, no technology has been invented to overcome the most common failure: blockages at one particular tip of the catheter tubing.

The group's project was to figure out why this blockage occurs, and to propose a design which would mitigate it. The team developed both real-world and computer models which would give them insight into the problem. They successfully used methods that allowed them to "see into the brain" as the shunt worked. The computer models represented a novel way to simulate the shunt's performance in an actual patient. The system they developed may one day allow for the development of shunts that can reduce the failure rate, improve patient's quality of life, and reduce familial burden and worry.

The Jacobs Institute mission is to create the next generation of medical technology to improve the treatment of vascular diseases--such as heart attack and stroke--in Western New York and beyond.

The institute was named in memory of the late Lawrence D. Jacobs, MD. Located in the heart of the Buffalo Niagara Medical Campus (BNMC) in downtown Buffalo, the Jacobs Institute is positioned between University at Buffalo's Clinical and Translational Research Center (CTRC) and Kaleida Health's Gates Vascular Institute (GVI).



As such, the Jacobs Institute is uniquely positioned to foster collaborations of the best minds and collisions of new ideas.

We invite you to **come innovate with us, where ideas improve lives.**

Please visit <http://www.jacobsinstitute.com>

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