



Collaboration Leads to Innovation

CROSS-CURRICULA WORK ESTABLISHES A NEW STANDARD OF PATIENT CARE USING 3D PRINTING

“You can be the best surgeon in the world, but still having a 3D model is very useful. It provides guidance and allows for a more successful comprehensive surgery. The surgeons I work with tell me that planning with a 3D model saves time in the operating room, which ultimately improves patient outcomes.”

– Nicole Wake, Sackler Institute of Graduate Biomedical Sciences, New York University School of Medicine

CASE STUDY



Nicole Wake works with physicians to take patient-specific imaging and use the Stratasys J750™ to 3D print specific, personalized and color-coded 3D prints of patients' kidneys and prostates.

PUSHING BEYOND LIMITS

Thanks to cross-discipline collaboration, the LaGuardia Studio at New York University (NYU) is leading in innovative design. The LaGuardia Studio, a centralized high-end 3D printing Studio, services the entire university community including students, professors, staff, researchers and alumni. “Here at the LaGuardia studio, we deal with a range of clients,” said Andrew Buckland, technical lead at the LaGuardia Studio. Buckland’s role is to be the expert in residence and help students, professors and researchers from the medical and engineering schools, as well as the hospital, school of business and the fine arts. Staff at the LaGuardia Studio have helped the university community in creating everything from prosthetics and models of tumors to a recreation of a 16th century Polyglot Bible.

One of the challenges and thrills of working at the LaGuardia Studio is solving creative challenges. “What gets me personally excited in the realm of 3D printing are the people who are pushing the limits,” said Buckland. “It’s the people looking for the cutting edge in 3D printing, not the people who just want to make a product because they can in 3D.”

Often, researchers come into the lab with an idea of what problem they want to solve, but do not know if it’s something that 3D printing technology can help them achieve. Those are the challenges that Buckland finds the most exciting. “We’re constantly pushing the limits... This has allowed us to help drive education and innovation here at the university and help faculty develop course work directly around the technology as it emerges on the market.”

BRIDGING THE GAP TO DRIVE INNOVATION

Nicole Wake, a Ph.D. candidate in Biomedical Imaging at the Scalar Institute of Biomedical Science at the New York University School of Medicine (NYUSOM), utilizes LaGuardia’s Stratasys J750 to help solve complex problems. Through conversations with a surgeon in NYU’s urology department, Wake recognized the need and opportunity for innovation. “Together we started a new, collaborative project combining radiology and urology for 3D printed kidney and prostate tumor models,” Wake said.

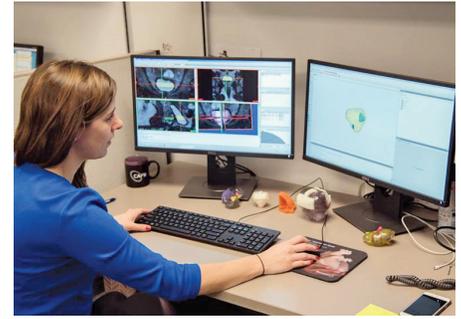
Rather than just using traditional 2D imaging, Wake works with physicians to create patient-specific, personalized, color-coded 3D prints of patients’ kidneys and prostates. “This is something that’s completely new for the surgeons,” Wake said. “These are actual patient models and we can use the models for pre-surgical planning or intra-operative guidance.”

Not only do the models help guide surgeons in the OR, they help patients gain a better understanding of their care.

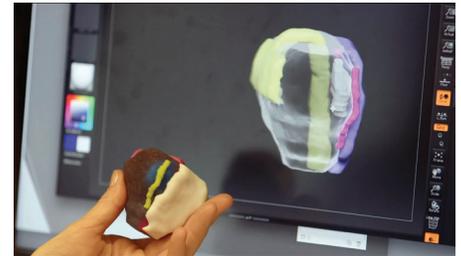
“The 3D models help explain the disease to the patient, which is really helpful, because patients don’t typically understand how to interpret radiological images. Having a model to show the patient their cancerous structure or lesion, and the organ itself along with the surgical plan, is very helpful for all involved,” Wake said.

“We can also use the 3D models to teach our medical students and residents about patient-specific anatomy and pathology,” Wake said.

Wake has now begun a two-year clinical trial in partnership with Stratasys to study how multi-material, multi-color 3D printed models can change and improve patient care. As part of Wake’s research, she will print patient-specific, multi-material kidney and prostate tumor models on a Stratasys J750 for 100 patients as part of a randomized prospective study at NYUSOM. Wake aims to measure the impact these patient-specific 3D models can have on pre-surgical planning versus using traditional 2D models. Ultimately, Wake hopes her application of 3D medical models will help lay the groundwork for a new standard of patient care, and help to establish reimbursement for these models.



3D printing at NYUSOM is building collaboration between the radiology and urology departments, raising the standard of patient care.



Wake 3D prints full-color models of kidney and prostate tumors based on patient-specific anatomy and pathology.



The Stratasys J750 enables better visualization into patient anatomy via full-color, patient-specific models, which can lead to more specialized and better care.

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