



Thoracic Surgery

Jessica Donington, MD, MSCR | Professor of Surgery | Chief, Section of Thoracic Surgery

Sewing Together the Inner Workings of Thoracic Surgery: Dr. Maria Lucia Madariaga Prehabilitates Patients Prior to Cancer Treatment

Maria Lucia Madariaga, MD, is an expert thoracic surgeon who specializes in complex airway disorders, lung cancer, lung transplantation and esophageal disease. Dr. Madariaga also has considerable experience in transplant immunology and large animal research. Moreover, she is the principal investigator of the Organ Perfusion Laboratory at the University of Chicago.

Sewing it all together

For Dr. Madariaga, the desire to be a surgeon began at an early age. As a child, she had a keen interest in anatomy. “I like cutting and working with my hands and sewing things,” she said. “As a kid, I dissected my pet goldfish when they died.” Dr. Madariaga’s ardent interest in the craft of sewing manifested a profound realization. As she got older, she made the striking correlation between sewing and healing, the patient aspect of it and how a surgeon establishes a deep connection to a patient—one to one.

As a surgeon, it’s a colossal responsibility to take a patient through a surgery; Dr. Madariaga was drawn to that relationship. “I also valued the fact that it’s teamwork,” she said.

Prehabilitation and partnership

Lung cancer prehabilitation is a fundamental opportunity to increase treatment options, reduce treatment-related morbidity, and improve physical and mental health outcomes. After a patient receives a cancer diagnosis, the prehabilitation process can include physical and mental health assessments to prepare the body and mind for the intensity of cancer treatment. Pinpointing current areas of concern and anticipating future complications are the first vital steps in improving surgical outcomes.

Since Dr. Madariaga arrived in the Section of Thoracic Surgery, she and her colleague, Professor of Surgery Mark K. Ferguson, MD, have been researching frailty and prehabilitation. “We recognize frailty as a syndrome where patients have different levels of strength or robustness going into their operation or hospital stay, and there are lots of different (intricate) ways to measure frailty,” she said.

In the field of thoracic surgery, patients tend to be older and have other pre-existing medical conditions; to that end, surgery is extremely detrimental to fragile bodies. Although minimally invasive, it’s still a serious surgery; it’s imperative that Dr. Madariaga and her team make sure the patient is fit for surgery. There are various measurements to determine, as fitness can be interpreted in different ways. “So, you have to put all these pieces together for how they function in their daily lives, how they can climb the staircase and how they can perform in different physical tests,” she said. “The number one thing to do is to establish how we identify frailty.”

Once established, Dr. Madariaga and Dr. Ferguson partner with anesthesiologist Daniel Rubin, MD, who is immensely interested in frailty and using technology to address it. “Anesthesia is the other half of the surgical coin; they see all of our patients,” said Dr. Madariaga. “They help us take the patient through a surgery.” Drs. Madariaga and Ferguson also partner with geriatrician Megan Huisigh-Scheetz, MD, who comprehensively evaluates vulnerable patients, from their cognitive ability and frailty status to their functionality. Together, they discuss the issues that surface with thoracic patients, identify who is frail and design a custom-made plan of care for each patient—a key factor to the program’s successful progression forward is partnership.

The collaborative nature of a multidisciplinary team makes for creative and methodical planning to care for thoracic patients. “I think that collaboration between all these different specialties is very helpful, because everyone has a different background coming into it,” said Dr. Madariaga. “You know, we might have a different approach of how we want to address and identify frailty.” The overall goal is to have a



way to standardize frailty identification through screening. Once it’s identified that patients are at risk, Dr. Madariaga joins forces with her team of experts to determine what can be done before surgery, in the hospital and after surgery. As frailty is associated with worse outcomes post-surgery, she and her team scrutinize each case carefully and design a plan that will enhance the patient’s physical condition prior to treatment.

In the UChicago Medicine thoracic surgery clinic, frailty screening is performed for any patient coming in for surgery who is over the age of 50. While there is no ideal time to initiate prehabilitation prior to surgery, the general stance is that any bit of prehabilitation is better than none at all, and here at UChicago Medicine we have a mixture of prehabilitation options for patients.

We’re currently launching a monitored physical therapy program that incorporates high-intensity interval training (HIIT), which is a program that patients can have at home. There is an app that patients can download to their smartphones that sends them reminders to do daily exercise. The app has links and interactive videos to aid in improving their endurance, strength and flexibility, which is critical to optimizing surgical outcomes. “Through our working group we are establishing different options,” said Dr. Madariaga. “Different surgical specialties might have different requirements for prehabilitation, like orthopaedic surgery versus vascular surgery, so I think the options for prehab are wide.”

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For the love of the game

Along with her clinical and academic pursuits, Dr. Madariaga is zealous about mentoring future surgical leaders and providing direction, insight and guidance as they move through their budding careers; a true mentor fortifies an educational ecosystem with ample encouragement and inspiration.

For the up-and-coming surgeon, it is crucial to be situated amongst like-minded mentors who value excellence in patient care and surgical skills, and who collectively allow a safe educational space, like Chief of Thoracic Surgery Jessica Donington, MD, MSCR, whom Dr. Madariaga describes as “warm, down-to-earth, supportive and the best chief ever.”

“One of the things that a good mentor gives you is a safe space to make mistakes,” said Dr. Madariaga. “To make mistakes, it’s OK. It’s not the end of the world, you’re not a bad person and you gotta try again.” What she teaches trainees are valuable lessons from her own mistakes. “Like placing a chest tube, for example. Very simple procedure, but you could do it really well or not well at all, and there’s lots of different tips and tricks along the way to doing that, and I learned those because I made mistakes and then corrected them, and now, I pass it forward,” she said.

The winding road to the operating room requires a steady grip strengthened by passion, a sharp focus on the destination and the unrelenting desire to not only educate, but learn from others. “What I like to do is reassure them that anyone can really do it, as long as you love it,” said Dr. Madariaga. “Love for something can take you a long way through, and most things can be taught and improved with practice.”



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