

# innovation IN cancer care

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**I**nnovation can be found all over Yale Cancer Center: in research labs, medical clinics, specialty healthcare programs, community care centers, and clinical trials. Those areas of innovation often exist in isolation, however, unaware of each other. Part of Dr. LoRusso's goal at Yale Cancer Center is to link these disparate innovations into bigger and more powerful breakthroughs, and to accelerate the creation of new treatments that benefit patients.

Patricia LoRusso, DO, Associate Director for Innovative Medicine, joined Yale Cancer Center and Smilow Cancer Hospital at Yale-New Haven in August 2014. She came to Yale from the Barbara Ann Karmanos Cancer Institute at Wayne State University, where she focused on the development of new drugs for 25 years as director of one of the largest academic Phase I Clinical Trials Programs in the United States. Her hope is to use that immense operational and translational experience to help keep Smilow's leading-edge care constantly sharpened by new advances.

She has spent years thinking about innovation and translational medicine. Innovation has been the key to so many advances in cancer medicine. A driving force that led her to Yale was the capabilities for translational medicine. "Yale has amazing scientists and clinical faculty and an amazing patient population," said Dr. LoRusso. "The opportunities to use my team science and clinical research expertise to enhance the marriage of science and medicine at Yale were the underpinnings that drew me here. Additionally, I felt that my years of experience in operationalizing a clinical trials program could benefit the rapidly growing clinical research portfolio at Yale Cancer Center. There are many components that define a top tier clinical trials program. Yale has all those components. Bringing them together to benefit patients is what I envision as my contribution."

An innovative cancer institute, she added, distinguishes itself by the number of cutting-edge trials it has running, and the number of cutting-edge therapeutics available to patients.

She sees all the raw materials for innovation in place at Yale. "We have phenomenal scientists and clinicians," she said. Her task, she continued, is to integrate them by forming teams to move scientific breakthroughs into clinical trials. That will often translate into more investigator-initiated trials and more peer-review funding, important characteristics of a top tier cancer center. "I think it also brings a different level of excitement to your job, because team science brings the energy of many phenomenal

Alexandra Minnella,  
Dr. Patricia LoRusso,  
Associate Director for  
Innovative Medicine, and  
Dr. Joseph McLaughlin

human beings together for a common goal: improved outcomes for our patients.”

She expects some of these collaborations to lead to new innovations that can be tested in early phase clinical trials at Yale. A portfolio of early phase trials tends to build on itself, like compounding interest. Insights and results from such trials, if encouraging, lend themselves to later stage clinical investigation making potentially beneficial therapies available for even greater numbers of patients at Yale and across the

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world. The more high impact trials that open, said Dr. LoRusso, the more options available for a wider circle of patients, not just at the main hospital in New Haven, but in the Smilow Cancer Hospital Care Centers across the state.

To increase the number of trials and accelerate them, she added, the process needs to be streamlined. With investigator-initiated concepts, the bottlenecks are often drug availability and funding. “One of the grants that I was fortunate to bring to Yale was the National Cancer Institute Early Therapeutic Clinical Trials Network UM-1 grant. Yale is only one of a few centers in the country to now hold this prestigious grant,” she said. The grant enables investigator-initiated clinical trials based on drugs available in the NCI’s portfolio of pharmaceutical compounds.

Dr. LoRusso believes that streamlining the clinical trials process will lead to more innovation in drug development. Restructuring is also necessary, she said, because the design of many trials is changing, driven by the genomic revolution. Until recently, a trial typically focused on a single type of cancer. “But now, to be more efficient, early on, pharmaceutical companies want to test drugs on large numbers of patients representing more than one tumor type,” said Dr. LoRusso. “To accommodate such demands, we are reassessing and restructuring our clinical trials operations so we can accommodate those kinds of trials more efficiently and offer more new treatments to more patients.” Many trials of this sort are already underway—most notably currently, immunotherapy treatments that target several types of cancer. Other types of drug treatments are already beginning to follow this clinical trial paradigm.

Several new trials using innovative drugs and drug combinations are being conducted at Yale already, focused on a multitude of different tumor types. She commented, “there is phenomenal talent in both the preclinical and clinical landscape at Yale University and Yale Cancer Center. There are phenomenal scientists. The potential to advance patient outcomes with some of the science is enormous. If we can be successful with bringing even just a handful of their discoveries into the clinic, the benefit to patients with a variety of tumors

could be enormous.” She also expects Yale to attract more trials because of its recent designation by the NCI as one of two national “molecular characterization hubs,” which will do molecular profiling for early phase clinical trials.

Another element in the recipe for innovation is collaboration with pharmaceutical sponsors, which currently have the most innovative portfolio of novel drugs for clinical research. These companies are looking for new and exciting ways to partner with academic sites, particularly ones like Yale where there is so much expertise in pre-clinical science and cancer medicine. One of Dr. LoRusso’s goals in her new position is to increase strategic alliances with several sponsors, with the objective of identifying each party’s needs and working with their strengths. “That way we won’t have to reinvent the wheel every time we have a new clinical trial from them,” she said. “We want to be one of their preferred sites so we can expedite their trials and offer them to patients who could benefit.” The result, again, will be more therapies available for more patients.

Innovation in cancer care requires collaborations between various combinations of different parties including scientists, clinicians, the NCI, and pharma. All have their own interests, perspectives, and cultures. However, the common denominator will continue to always be the patient. “The first and main focus,” said Dr. LoRusso, “is always what we can do to improve outcomes for patients. Most of us go into oncology because we want to make a difference. It’s a war out there, and it’s us against cancer. The way to win a war is to bring the troops together with one common goal, and to have them understand who the true enemy is. I’ve always believed that if we can get everyone working together against our common enemy, we’re going to win this battle!”