

NOTABLE CANCER CENTER MEMBER

William Catalona, MD



As a young medical student at Yale University, William Catalona, imagined life as a physician and anticipated how he would use his newly acquired skills to provide his patients with the best care possible. But Catalona now Professor of Urology at Northwestern University's Feinberg School of Medicine and Director of the Clinical Prostate Cancer Program at the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, also wanted to make a contribution to medical science. "I was hoping I could give something back," he says.

Catalona approached one of his professors and was advised to choose a problem with a high rate of incidence that medicine had been struggling to solve without success. After exploring several options, Catalona homed in on the two most important problems facing prostate cancer patients at the time: late diagnosis and the unacceptable side effects of surgical treatment.

"Prostate cancer was the most common cancer in men and the second leading cause of cancer death," Catalona says. "The majority of those diagnosed already had metastases and a poor prognosis." One of the reasons for this was because the only available diagnostic test was a digital rectal exam. The exam was not only unpleasant for patients, but its accuracy was dependant on the expertise of the physician and varied widely depending on the individual doctor's skill and experience.

In addition, the surgical techniques then used to remove tumors resulted in impotence and often left patients incontinent as well, something many considered worse than the disease itself. So, starting in the 1980's, Catalona set out to address these two urgent problems—and eventually helped solve them both.

Dr. Catalona was the first to demonstrate that the Prostate-Specific Antigen (PSA) test, a simple blood test that involves little discomfort or inconvenience for the patient, could be used as a screening tool for prostate cancer, allowing doctors to detect the disease far earlier than they had been able to with the rectal exam alone.

Previously used as a monitoring test to determine whether a patient was responding to treatment, Catalona wondered if the PSA could also be used as a diagnostic tool. His research proved it could and his findings were published in *The New England Journal of Medicine* in 1991. Soon after, the PSA test became the gold standard for prostate cancer diagnosis, allowing physicians to detect the disease in its earliest stages for the first time. “With the PSA test, there has been a 75 percent reduction in the percentage of men with metastatic disease at the time of diagnosis since 1992,” says Catalona. “And there has been a 37 percent decrease in age-specific death rates in the US alone.”

Later that decade, Dr. Catalona also conducted the initial feasibility studies and headed the multi-institutional research program that led to the refinement of the PSA test, called the “free” PSA. This blood test, which came to market in 1997, allows physicians to better determine the level of antigen present in a patient’s blood whose initial PSA results are just slightly elevated and fall within a “gray zone.” This sensitive test helps doctors determine which patients should undergo a biopsy and which can skip the procedure.

Catalona was mentored by Patrick C. Walsh, the surgeon who developed the nerve-sparing radical prostatectomy, while he was a urology resident at the Johns Hopkins Hospital in Baltimore. This new technique, which preserved sexual function and helped patients avoid other devastating side effects associated with earlier surgeries, revolutionized prostate cancer treatment. Today, Catalona has become

the foremost expert in the procedure, having performed more of them than any other surgeon—over 5,000 to date—treating patients from throughout the world.

Though the PSA tests and nerve-sparing surgery have moved detection and treatment forward, Catalona continues to look for new ways to save and improve lives by concentrating on cancer genetics. “There have got to be even better ways to diagnose and treat this disease,” he says. “If we can unravel the genetics of cancer, we might come up with better diagnostics, treatments, and maybe even ways to prevent it.”

Catalona is currently co-chair of a Specialized Program of Research Excellence (SPORE) grant at the Lurie Cancer Center that involves close collaboration with all other prostate cancer SPOREs (11, total). The principal goal of this research is to identify risk allele signatures for aggressive and non-aggressive cancers using DNA samples and patient histories. Researchers in the program are examining data collected from all participating institutions, including Northwestern University, the Mayo Clinic, the University of Chicago, and others to see if the alleles in patients with varying forms of aggressive or indolent tumors show different patterns, or “signatures.” (The study is also dedicated to innovative therapeutics, cancer prevention, and ways to improve patients’ quality of life.)

This focus of the SPORE project was first suggested by Catalona who, along with Jeffrey Gulcher, PhD, co-founder of the biopharmaceutical company deCODE Genetics, and other deCODE scientists, discovered and validated several risk alleles for prostate cancer. Using DNA samples and patient histories supplied by Catalona’s patients, their research demonstrated that risk is associated with the “dose” of alleles an individual receives from their parents. (They also found that these alleles could make someone more susceptible to either prostate or breast cancer, depending on the patient’s gender.) The deCODE genetics, Inc. research group, including Catalona as the principal North American collaborator published their findings in an article for *Nature Genetics* in 2006.

Catalona is also a part of the International Consortium for Prostate Cancer Genetics (ICPCG), a group of researchers working to

find out why prostate cancer is inherited in some families, as well as a multi-institutional study of a new tumor marker, called Pro-PSA, for which the researchers hope to gain FDA approval. He says preliminary studies show the marker may prove to be an even more accurate screening tool for prostate cancer than the PSA test.

In addition to his research efforts, Catalona runs the Urological Research Foundation, a fundraising organization established over 20 years ago to provide patient education and support research into the prevention, detection, and treatment of cancer and other diseases of the prostate.

Reflecting on his career as both a researcher and clinician, Catalona says he enjoys working in both arenas. “Seeing patients every day, getting to know them, and seeing what their biggest problems are allows me to focus on those areas in my research,” he notes. He also savors the opportunity to help patients and families directly. “I really think it’s important for patients to have doctors whom they can trust, who will be their advocates,” he says. “Cancer patients and their families go through such a trying time and it's very, very gratifying when you can make this difficult experience nothing more than a bump in the road for them.”