



**For men, these are the odds  
of getting prostate cancer.  
The fight is on to find better  
treatments and a cure.**



Prostate  
Cancer  
Foundation



**A**s president and CEO of Gen-Probe Corp., a biotechnology company in San Diego, Hank Nordhoff spends his days developing tests that detect disease. But there was one disease that Nordhoff almost didn't detect: his own.

His ordeal began in 1997, when, after having a routine physical and getting a clean bill of health, he took a careful look at his laboratory results. One of the blood test results—for a substance known as prostate-specific antigen, or PSA—had doubled in just one year, from 1.2 to 2.4 ng/ml (nanograms per milliliter). When he expressed concerns, his doctor brushed them off. “He told me that anything under 4.0 wasn't a cause for worry,” Nordhoff, now 64, recalls. But a female friend whose father was a prostate cancer survivor urged him to seek a second opinion.

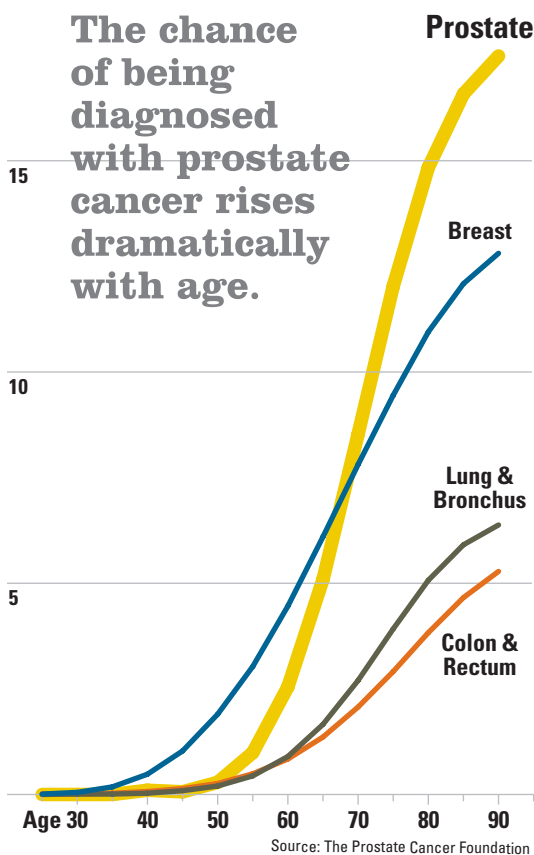
Her advice proved lifesaving. Nordhoff consulted with doctors at Johns Hopkins University who found that his rapidly rising PSA level was caused by a malignancy in the prostate, the walnut-sized gland located just above the bladder. Today, after being treated with surgery, radiation, and hormone therapy, he is back at work, focusing on other people's illnesses. And he is spreading the word about the importance of early diagnosis and treatment of prostate cancer. “If I'd not had surgery when I did, I probably would have died a few years ago,” he says.

Nordhoff is a walking billboard for the message that the Prostate Cancer Foundation, the world's largest philanthropic source of support for research on the disease, is committed to spreading. While myths about prostate cancer abound, one thing is clear: Early detection can save or

## Are You at Risk?

20%

**The chance of being diagnosed with prostate cancer rises dramatically with age.**



prolong lives. This message promises to become even more important as the eldest members of the baby-boom generation reach their 60s, a period when a man's risk of developing prostate cancer rises significantly. By 2020, some 50,000 men annually are expected to die from the disease, and specialists are looking to a variety of new diagnostic and treatment procedures, and anesthesia techniques, to help improve treatment outcomes and increase survival. “We're in a

race against time,” says Leslie D. Michelson, CEO of the foundation. “Baby-boomer men are rapidly moving into the target zone for prostate cancer.”

### Improving the Learning Curve

As the race for a just-in-time cure continues, however, public awareness of prostate cancer seems to be languishing at the starting line. In a recent survey conducted by the Prostate Cancer Foundation and the Gillette Prostate Cancer Challenge, researchers found that many people lack even basic information about the disease. For example, even though the prostate is exclusive to the male reproductive system, about a third of those surveyed said they believed women could develop prostate cancer. Moreover, nearly three-quarters of those surveyed said they thought prostate cancer was less common among men than breast cancer

is among women. (In fact, men are one-third more likely to develop prostate cancer than women are to develop breast cancer.)

While men are generally reluctant to speak with their doctors about prostate cancer, the survey indicates that, as Hank Nordhoff can attest, almost three-quarters would do so at the urging of the women in their lives. “Women don't realize how much influence they have with their husbands on matters of health,”

# IF YOU OR SOMEONE YOU KNOW HAS BEEN RECENTLY DIAGNOSED WITH **LUNG, PROSTATE, OR BRAIN CANCER**, YOU'LL WANT TO KNOW EVERYTHING ABOUT **PROTON THERAPY.**

## ANNOUNCING ANOTHER CANCER BREAKTHROUGH FROM THE CANCER EXPERTS AT M.D. ANDERSON.



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*Making Cancer History®*



says Michelson. “Daughters, wives, and partners may be our secret weapons.”

Getting men to talk to the doctor (and to regularly schedule prostate screening exams) is particularly important because prostate cancer in its early stages can be asymptomatic. Unchecked, the cancer can spread to other areas of the body, including the bones and lymph nodes. In some cases, though, warning signs are present. Common symptoms include frequent urination, including the need to go to the bathroom during the night; a painful or burning sensation; a preference to sit rather than stand to urinate; frequent pain or stiffness in the lower back, hips, or upper thighs; and an inability to urinate.

Most men should have two crucial screening tests annually, beginning at age 50 (earlier for those with a family history of prostate cancer or for African-American men): a digital rectal examination (DRE), during which a doctor accesses the prostate through the rectum and feels for hard or lumpy areas; and a PSA blood

test—the test that helped detect Hank Nordhoff’s cancer. Neither measure is foolproof. Physicians can miss cancers on a rectal exam. And the PSA level can be affected by many things, even by activities that cause vibrations in the body, such as motorcycle or horseback riding, or the use of a jackhammer or circular saw. It can also be temporarily elevated if a man has an ejaculation within three or four days prior to the test, explains Dr. Anthony D’Amico, professor and chief of radiation oncology at Brigham and Women’s Hospital in Boston.

Doctors once considered PSA levels of less than 4 ng/ml to be normal. But current research shows that it is not the absolute value of PSA that counts in most diagnosis, but rather the velocity with which the PSA rises. “A value of four versus a value of five does not give you much information,” says D’Amico. “But we know that if someone’s PSA went from one to four in a year, he’s more likely to have prostate cancer, and more likely to have an aggressive type.”

### Know Your Options

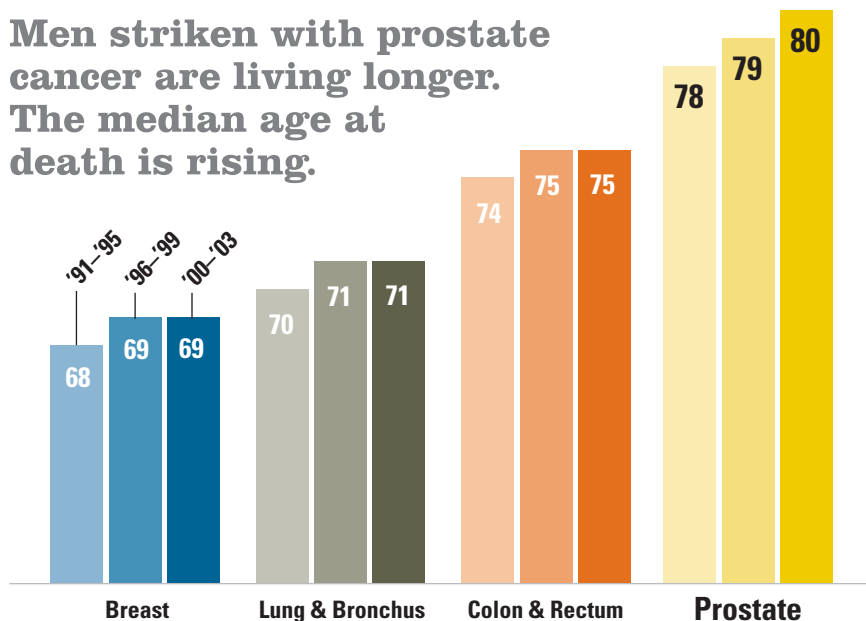
What if a man is among the one in six who develop the disease at some time in their lives? Men with prostate cancer must choose from an array of treatments, many of which have a number of variations. In general, three different initial types are available: active surveillance (also called watchful waiting), surgery, and radiation. Each of these treatments can result in a cure (defined as being disease-free for five years) in more than 90% of men with localized prostate cancer (cancer confined within the prostate). If a cancer has spread beyond the prostate to other parts of the body or is suspected to have spread, systemic therapies—those that work throughout the body—are often necessary, as well. Systemic therapies include hormone therapy, usually with a drug that inhibits the production of testosterone, and chemotherapy. (For a detailed discussion of each type of therapy, visit [prostatecancerfoundation.org](http://prostatecancerfoundation.org) and order a copy of the *Report to the Nation on Prostate Cancer: A Guide for Men and Their Families*.)

The best treatment for any given individual depends on a number of factors, including age, health status, and the degree of spread of the cancer. Quality-of-life issues are also a consideration, since some forms of treatment are accompanied by pain, as well as the risk of urinary or bowel difficulties, osteoporosis, and sexual dysfunction.

The good news is that new treatments to minimize some of these side effects are rapidly becoming available. The University of Pittsburgh Medical Center is experimenting with a new form of anesthesia procedure designed to manage the pain of prostate cancer surgery. Known as a specific paravertebral block, the procedure blocks nerves that supply sensation to the lower body. While paravertebral blocks have been used in other types of surgery, UPMC is the first to employ them to manage the pain of prostate cancer surgery.

## Improving Demographics

**Men stricken with prostate cancer are living longer. The median age at death is rising.**



Source: The Prostate Cancer Foundation



We see the prostate cancer patient today as the  
prostate cancer survivor of tomorrow.

Sometimes it's all in the details. Screening literally thousands of genes, UPMC researchers discovered that normal-appearing prostate tissue near a tumor has already undergone many of the genetic alterations that define cancer. This powerful computer-based method promises the hope of a test that will identify men who may harbor cancer — even though everything appears normal. And when it comes to surgery, UPMC's team of renowned surgeons are investigating new methods to reduce — or even eliminate — the side effects of prostate surgery. We believe that focusing on the smallest details can produce huge improvements in survival and quality of life.

UPMC



Doctors at UPMC have also been among the first to study the use of Fosamax, a drug usually given for osteoporosis, for the prevention of bone loss in prostate cancer patients treated with hormone therapy. While initially effective in halting the growth of tumors, the hormone therapy can put men at increased risk for bone fractures. In the study, UPMC doctors compared 112 men on oral Fosamax therapy with a similar group given only Vitamin D and calcium. The study, originally scheduled to last two years, was cut short because of dramatically positive early results. Fosamax provided results comparable to an intravenous drug on the market, but is less expensive. "The Fosamax was so successful that we did not feel it was ethical to continue the study in its present form," says Joel B. Nelson, MD, professor and chairman of the Department of Urology at the University of Pittsburgh Medical Center.

When prostate cancer has spread to the bone, it can produce a great deal of pain. While a number of analgesic agents have been developed to alleviate that pain, they are associated

with side effects such as constipation and nausea in addition to addiction concerns. A non-narcotic pain treatment alternative is Quadramet, produced by Cytogen Corp., a biopharmaceutical company in Princeton, N.J. Quadramet delivers a radioactive drug directly to the bones affected by the metastasized cancer. One dose can provide up to four months of pain relief for the 70% of patients who respond to the treatment, says Michael D. Becker, Cytogen's CEO.

### What Lies Ahead

Advances are also on the horizon in the surgical arena. One of the latest developments is the use of robotic surgery, in which a surgeon uses a three-dimensional computer vision system to manipulate robotic arms that hold special surgical instruments. The instruments, inserted into the abdomen through tiny incisions, are designed to allow a surgeon to perform prostate surgery in a minimally invasive fashion. Because robotics allows for smaller incisions than conventional surgery, the technique may shorten recovery time. But can robot-

ics replace the experienced hand of a surgeon? The jury is still out, says Dr. Nelson, who notes that use of robotic devices does not allow surgeons to use their own sense of touch. The devices also have not shown that they are significantly superior to conventional surgical techniques in terms of functional outcomes. "The robotic devices in use today are to prostate surgery what the Model T was to the car industry," he says. "They're a start, but companies should not rest on their current technologies." Moreover, successful prostate surgery is primarily dependent on the skill of the surgeon—not the technique, he says.

Another new weapon in the prostate cancer armamentarium is proton therapy. A highly precise form of radiation, proton therapy can strike a tumor with millimeter accuracy, and cause few, if any, side effects. Unlike traditional radiation therapy, during which X-ray beams go through tumors, affecting both healthy and unhealthy tissue along the path of the beam, proton beams enter the body and deposit most of their energy in the tumor, causing little or no damage to healthy tissue, says Dr. James Cox, head of the Division of Radiation Oncology at University of Texas M.D. Anderson Cancer Center in Houston. "When I started in this discipline 30 years ago, we gave radiation to large areas of the body because we couldn't determine the exact location of the tumor," says Cox. "But with modern imaging and proton therapy, we can now pinpoint the tumor and deliver radiation treatments with great precision."

M.D. Anderson is the first comprehensive cancer center to offer proton therapy to its patients. In May 2006, M.D. Anderson opened the 94,000-square-foot Proton Therapy Center, which attracts patients from around the world. "Our patients not only can take advantage of cutting-edge treatment, but they also have access to M.D. Anderson's internationally known experts in research

## A Breakthrough in Testing

Aureon Laboratories is dedicated to improving patient health care and advancing medicine by commercializing predictive tests for cancer recurrence. Aureon's first test, Prostate Px™, uniquely integrates a patient's clinical data with features derived from his prostate tissue sample and molecular markers. By combining these sources of information and applying advanced mathematics, Prostate Px is able to provide the patient with a more thorough picture of his individual risk.

Prostate Px is the first in a new generation of predictive tests from Aureon that combines the power of mathematics with biology and clinical practice. Until now, it has been very difficult to identify which patients fall into a high-risk category and which do not. Prostate Px can help relieve anxiety and assist both patients and their physicians in selecting the most appropriate treatment options.

To learn more about Prostate Px, visit [www.prostatepx.com](http://www.prostatepx.com).



and patient care," says Cox.

One of the big difficulties in managing prostate cancer treatment is knowing whether the cancer has spread and whether it is likely to in the future. To address the first issue, Cytogen has developed ProstaScint, a diagnostic imaging agent that allows a physician to map the spread of cancer from the prostate to other parts of the body. Cytogen describes ProstaScint as the first Food and Drug Administration–approved product targeting prostate-specific membrane antigen (PSMA), produced by cancer cells at all stages of the disease. In an attempt to help doctors predict whether cancers will recur, Yonkers, N.Y.-based Aureon Laboratories has developed Prostate Px, a test that predicts recurrence based on information from a patient's tissue (histology) samples, molecular markers, and clinical data. It can be conducted at the

request of any patient or doctor, who will simply forward the appropriate patient records and tissue samples to Aureon, according to CEO Vijay Aggarwal. "Prostate Px allows us to create a personalized prediction that can be used to devise a customized plan of care for the patient," he says.

Hank Nordhoff, inspired by his own experience with cancer, has also turned his attention to giving patients more information to guide their treatments. His company, Gen-Probe, is developing a new generation of molecular tests to more accurately detect prostate cancer and eventually differentiate between slow growing cancer and the aggressive ones that require treatment. Nordhoff says his work is his way of giving back. "Cancer makes you live each day as though it were your last. This is all bonus time, and I'm out to do something good."

—Annetta Miller

## Resources

**Men's Health Network (MHN)** is a non-profit educational organization comprised of physicians, researchers, public health workers, individuals, and other health professionals. MHN is committed to improving the health and wellness of men through education campaigns and workplace health programs. [www.menshealthnetwork.org](http://www.menshealthnetwork.org)

**The Prostate Cancer Foundation (PCF)** is the world's largest philanthropic source of support for prostate cancer research. For free guides about the disease, treatments, and nutrition, visit [www.prostatecancerfoundation.org](http://www.prostatecancerfoundation.org).

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## Targeting Tumors

**To help identify the spread of prostate cancer, a biotech company introduces the first FDA-approved noninvasive test that can pinpoint the disease.**

**W**hen prostate and other cancers spread from the original sites of the disease to other parts of the body, they frequently settle on bone mass, creating serious pain and other problems. One company that's been focusing on alleviating that pain is Cytogen Corp., which has combined the targeting ability of a bone-seeking molecule with the therapeutic potential of radiation.

The Princeton, N.J.-based company says its product, Quadramet, delivers radioactivity to areas of bone invaded by metastatic tumors. "It's a unique alternative for the relief of pain from any kind of tumor that spreads to the bone," asserts Michael D. Becker, president and CEO. "The radiation acts on the cause of the pain rather than

masking it." Becker says more than a dozen studies are underway to investigate Quadramet's apparent effectiveness in attacking the cancer itself.

Cytogen's other principal product is ProstaScint, a molecular imaging agent that enables a physician to map the spread of cancer from the prostate to elsewhere in the body. The company describes it as the first Food and Drug Administration–approved product targeting prostate-specific membrane antigen (PSMA) produced by cancer cells at all stages of the disease. The key word here is membrane, meaning the agent can show any site in the body where there is a prostate cancer cell, differentiating the antigen from the more commonly known PSA, which circulates in the bloodstream.

Radiation from an isotope attached to ProstaScint's antibody can be detected from outside the body by a gamma camera. That image identifies the site of a suspected tumor. Cytogen says that prior to ProstaScint there were no reliable, noninvasive tests to identify metastatic disease in prostate cancer patients. It's an innovation that can radically improve diagnosis and treatment. ■

# CYTOGEN



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**MAILROOM**

**MAN**

Top of the ladder or working your way up, prostate cancer doesn't care. It only cares that you're a man and that it can kill you. Attacking 1 in 6 American men, it kills over 30,000 a year.

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