PROSTATE CANCER: AN OVERVIEW

From the **Hypertext Guide to Prostate Cancer**

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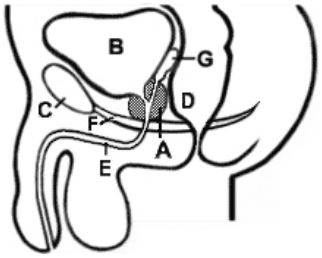
It's hard to focus when you start trying to learn about cancer, which is why you should begin with an overview. In less than half an hour it will give you a general idea of what this disease is and what you can do about it. After that, it will be much easier to understand what you find in books and other sources.

The author of this overview was treated in 1997. It is based on careful research, his own experience, and that of others who have dealt with prostate cancer.

FINDING THE CANCER

The prostate, located directly beneath the bladder, is part of the reproductive system. Most prostates are the size of a walnut (1/2-1 oz, 15-30 cc), but they can be much larger.

A prostate
B bladder
C pubic bone
D rectum
E urethra
F pelvic-floor muscles
G seminal vesicle



There are no clear symptoms of early-stage prostate cancer. It is usually detected with two tests and confirmed with another.

Digital rectal exam (DRE) A doctor presses a finger against the wall of the rectum next to the prostate (point D on the drawing). A slight hardness may indicate tumors.

PSA test Prostate-specific antigen (PSA) is part of the ejaculate. It is normal for some PSA to leak into the blood stream, but more may escape if tumors develop.

The PSA level is measured with a blood test, but it is not a completely reliable indicator of cancer. A PSA of less than 1.0 does not necessarily mean there is no cancer present, and one as high as 10 may not mean there is.

Things that affect PSA levels include age, race, volume (size) of the prostate, urinary infections, and a non-cancerous type of tumor called benign prostatic hyperplasia (BPH). In addition, PSA levels can vary from day to day, so high PSAs should be tested again in a few weeks. Temporary rises may also be caused by such things as sexual stimulation, ejaculation, or taking long bike rides, so avoid them for at least two days before a PSA test.

Biopsy The two types of biopsy are the *transrectal* (from inside the rectum) and the *transperineal* (from the area between the anus and the testicles). The patient should receive antibiotics before the biopsy to prevent infections, and a local anesthetic to reduce pain. A biopsy gun, guided by ultrasound, is used to inject a dozen or more very thin hollow needles into the prostate to collect samples of cells (*cores*).

ASSESSING THE CANCER

Things you must know before you can decide on a procedure.

GLEASON GRADES AND SCORE

A pathologist examines the cells in the biopsy cores and rates them from one (normal) to five (very deformed). These are the *Gleason grades*. The sum of the two most common grades is the *Gleason score* (for example, 2 + 4 = 6).

The more-common grade (the *primary*) is listed first. If it is higher than the other (the *secondary*), or the score is more than six, the cancer is probably more aggressive. A score of less than six suggests that the tumors are growing slowly.

Most pathologists must deal with many kinds of cells, so your Gleason score may not be accurate. Get a second opinion of the biopsy slides from one who specializes in prostate cancer.

STAGES

The *clinical stage* of the cancer is an estimate of the size of the tumors and how far the disease may have spread. The most common classification systems for prostate cancer stages are **TNM** (Tumor, Node, Metastasis) and **ABCD**.

T1-T2c or **A1-B2** are *local* or *organ-confined*. The tumor is still inside the prostate.

T3-T4b or **C1-C2** are *regional* or *extracapsular*. The tumor is near or just outside the edge (*capsule*) of the prostate.

N1-M1c or **D1-D2**) are *metastatic* or *systemic*. Cancer cells have reached the lymph nodes (N1-N3 or D1) or other parts of the body (M1-M1c or D2).

In the older I-IV system, I was equal to A1, II to A2-B2, III to C1-C2, and IV to D1-D2.

The stage is based on the DRE, PSA, Gleason score, how many biopsy cores contain cancer cells, the approximate sizes and locations of the tumors, and other tests.

OTHER TESTS

Magnetic resonance imaging (MRI), ultrasound, and other tests can help estimate your stage more precisely and establish a *baseline* against which the progress of your treatment can be measured. They may also be used to create 3D computer images of your prostate to help plan the procedure.

PREDICTING SUCCESS

Statistical tables called nomograms, based on the long-term results of the treatments of thousands of men, can be used to predict how successful your treatment is likely to be. There are, of course, other factors, such as your age and how much experience your specialist has, that can affect the outcome.

The National Comprehensive Cancer Network has estimated the risk of prostate cancer returning after treatment:

AMOUNT OF RISK	LOW	MEDIUM	HIGH	VERY HIGH
STAGE	T1-T2a	T2b-T2c	T3a	T3b-T4
PSA	0-9	10-20	20+	20+
GLEASON SCORE	2-6	7	8-10	8-10

LEARNING

Don't waste time and don't rush into anything. Unless the cancer has begun to spread, it is more important to make a carefully thought out decision than a quick one.

HOW TO IMPROVE YOUR CHANCES

Remain calm Stress makes life harder and may damage your immune system. Meditation, antidepressants, or other remedies may help. So will things that make you laugh.

Join a support group It helps to know that you are not the only one with this problem, and to meet men who have dealt with it successfully. Group members and specialists who speak to the group may provide useful information about treatments and doctors. (But be wary of anyone who strongly recommends doing what he did. He may really be trying to convince himself that he did the right thing.)

THE MORE YOU LEARN, THE BETTER YOUR CHANCES

Change your habits Exercise and healthful eating habits can slow cancer growth. Tumors need calories, so avoid sugars, fats, and alcohol. Excess weight may make it harder to treat the prostate, make tumors more aggressive, make PSA levels seem lower, and increase the chances the cancer will return.

Eat less of all kinds of meat, especially red. Avoid charred or fried meat or fish. Cut back on eggs and dairy products. Eat fruit, especially citrus, and plant foods, especially tomatoes, garlic, onions, broccoli, and green leafy vegetables. Nuts, beans, lentils, berries, whole grains, and olive oil are also good for you. Drink green, red, or white tea and lots of water. Be careful with vitamins and other kinds of supplements. Too many provide much more than the recommended daily amounts.

Talk to family and friends Your cancer worries them too. Talking about it will help them deal with it and may help you work out your own feelings.

Seek counseling Cancer takes an emotional toll, so you and your family might benefit from it before and/or after treatment.

Do your homework Learn as much as you can about prostate cancer and the treatments. Study your options carefully, and don't let anyone pressure you into making a decision before you've learned enough.

Sources of information Use as many as you can. E-patient communities, patient diaries, and books are the most useful. Medical studies, TV news, newspapers, and websites are the least. See the link to *Finding Reliable Medical Information* at the end of this document.

CHOOSING A PROCEDURE

There are more than half a dozen ways to treat prostate cancer. Don't pick one before you've talked to several kinds of specialists.

Your choice of a specialist may be more important than your choice of a procedure. Avoid those who have very little experience, who aren't up-to-date, or who just don't seem to care. If a doctor does not listen to you or answer your questions, find one who will.

Appointments Write down your questions before office visits. Use a recorder so you won't have to write down everything. Bring someone to help you focus. Be there ahead of time.

Keep records Request copies of your biopsy report, prostate volume, every test that was done, and all other important health information. Make a list of the causes of death of family members, the medicines, herbs, and supplements you take, and any major health problems you have had. Records are too often lost, misplaced, or not available, so print or photocopy an extra set and bring it to every appointment.

QUESTIONS TO ASK

First try to find out:

- Which procedures are likely to be appropriate for you.
- What the most likely side effects of each of them are.
- Who the best specialists for each type of procedure are.
- Where those specialists are located.
- If your insurer or managed-care organization will approve any procedure and specialist you choose.

Ask specialists:

- Are you board-certified for this procedure?
- How many of these procedures have you done?
- What are your personal success rates for your patients' long-term survival, incontinence, and erectile dysfunction?
- Will my age or health make this procedure too risky?
- What other tests should I have?
- How soon will my life be back to normal?
- **Then try to decide:**
- Which side effects worry you the most.
- Which procedure seems to make the most sense for you.

TREATING EARLY-STAGE CANCER

WAITING (watchful waiting, active surveillance, expectant management)

Premise PSA testing has made it possible to find cancers so small that many men never need to be treated. Consider waiting if the cancer seems to be growing very slowly, you have a low Gleason score, and your life expectancy is 10 to 20 years. You will probably live as long, without risking any of the painful, permanent side effects that a procedure might cause.

Practice PSA tests, DREs, and biopsies to monitor the cancer.

Advantages Exercise and better eating habits can slow tumor growth. And there will probably be plenty of time to be treated if it becomes necessary.

Disadvantages There may be tumors that were not found, or the cancer may begin to grow more rapidly. And it's not easy to keep from worrying.

THE PROCEDURES

Survival rates are about the same for all of the procedures, but rates of the major side effects are not. Any procedure could damage nerves, muscles, or organs, allow cancer cells to escape, or lead to life-threatening complications.

The following descriptions are not complete. You must do a lot of research before you choose one of them. It is important to know what is happening (or *should* be happening) at every step. Medical errors are not unusual, especially errors involving medications.

EXTERNAL RADIATION (external-beam radiation, EBRT, RT)

Premise Radiation damages cell DNA. Normal cells usually recover, cancer cells usually do not.

Practice Patients go to a center once a day five times a week for six to eight weeks—or twice a day for a shorter period.

Three-dimensional conformal radiotherapy (3D-CRT)
X-rays are aimed from several angles to distribute radiation evenly and limit damage to other tissues and organs. The more-advanced types of x-ray equipment are:

Intensity-modulated radiotherapy (IMRT) A computer adjusts hundreds of microbeams of variable intensities to match the shape of the prostate from every angle.

Image-guided IMRT (4D IGRT, IG-IMRT) Similar to IMRT, but it can also track small movements such as those caused by breathing. The beams instantly adjust to changes in the shape or position of the prostate.

Hadron radiation (particle therapy) The energy of proton, neutron, or ion beams can be focused to reach its strongest point inside the tumors. (But few centers offer forms of hadron radiation, and it is much more expensive than x-ray therapy.)

Advantages External radiation is usually painless. It can kill cancer cells at the edge of the prostate. Everyday life is only interrupted by the daily sessions.

Disadvantages Skin over the target area may become red and sensitive. Some diarrhea and urinary frequency is likely. You may feel tired.

INTERNAL RADIATION (brachytherapy)

PERMANENT IMPLANTS (seeds)

Premise If the source of the radiation is inside the prostate, it can be more powerful, better focused, and constant.

Practice Tiny metal cylinders containing radioactive material are inserted at precise locations. Radiation weakens over three to six months, depending on the material.

Advantages Fast and relatively painless. Seeds can be placed outside the prostate to kill cancer cells that might have escaped. Everyday life can soon be resumed.

Disadvantages Urinary urgency and diarrhea occur when the body starts to react to constant radiation. Misplaced or stray seeds can cause serious damage.

TEMPORARY IMPLANTS (high-dose radiation, HDR)

Premise Tumors that receive very high doses of radiation at the start of treatment have less chance of recovering.

Practice Highly radioactive materials are inserted in the prostate through temporary tubes for brief periods over several days. This is followed by a complete course of external-beam radiation.

Advantages Tumors receive higher doses of radiation than otherwise possible. Everyday life is only interrupted by the initial hospital stay and daily sessions of external-beam radiation.

Disadvantages Patients remain in a hospital bed during the first stage. Some diarrhea is likely. Patients may feel tired.

SURGERY (radical prostatectomy, RP)

Premise If the prostate comes out, so does the cancer.

Practice The prostate is removed and the urethra sewn back to the bladder. The types of prostatectomies are:

Retropubic A vertical incision about 4 inches (10 cm) long is made in the center of the lower abdomen.

Perineal A semi-circular incision is made behind the testicles.

Laparoscopic Miniature instruments and a tiny 2D video camera are inserted through several small incisions in the abdomen. They are controlled by a surgeon watching a television screen.

Robotic-assisted laparoscopic A form of laparoscopy in which the surgeon uses a computer to control the instruments and a 3D video camera.

Advantages The prostate is immediately examined to see if there are *positive margins* (indications that cancer cells reached the edge of the prostate). If they did, measures can be taken to kill them. Patients feel relieved because the prostate is no longer there.

Disadvantages Infections are common. Blood clots may occur in legs or lungs. Hernias may develop later on. A catheter must be worn for a week or more.

Note Some procedures for treating BPH (non-cancerous prostate tumors) are sometimes called prostatectomies.

FREEZING (cryotherapy, cryoablation, cryosurgery, cryo)

Premise Freezing kills cells.

Practice An extremely cold liquid or gas is sent through very thin hollow needles to create tiny balls of ice in the tumors.

Advantages It is fast, relatively painless, and comparatively inexpensive. Everyday life can soon be resumed.

Disadvantages Normal cells do not recover. Dead tissue may block the urethra. A catheter must be worn for about a week.

HEATING (high-intensity focused ultrasound, HIFU, FUS)

This procedure has not yet been approved for use in the United States but is available in some other countries.

Premise Extreme heat kills cells.

Practice High-energy ultrasonic waves are focused on tumors.

Advantages The heat only affects the tumors. Fast and relatively painless. Everyday life can soon be resumed.

Disadvantages Heat causes the prostate to swell, which may shift the tumors. Dead tissue may block the urethra. A catheter must be worn for about a week.

AFTER THE TREATMENT

Following the procedure, you should have a course of external-beam radiation or hormonal therapy (HT) to kill any cancer cells that might have escaped (*adjuvant therapy*).

If your prostate was very large or there were tumors near the edge, you might have had hormonal therapy before the procedure (*neoadjuvant therapy*) to shrink the prostate and tumors. HT must be carefully monitored because it may produce dangerous side effects.

Plan to remain nearby in case there are complications soon after the procedure. You will have to see the specialist a few times in the next few months for checkups.

If the cancer did not escape and there are no lasting side effects, you have a very good chance of leading a normal life. Continue to exercise, eat well, and have regular checkups.

SIDE EFFECTS OF THE PROCEDURES

How successful your treatment is depends on your age, stage, general health, the type of procedure, your specialist's skill, and a certain amount of luck.

Incontinence

Urinary problems may occur after a procedure and continue for a few weeks or longer. They may become permanent if organs, nerves, or muscles have been damaged, but there are ways to reduce or manage these problems.

Erectile dysfunction (ED, impotence)

Few men can have an erection right after a procedure. And if the nerves that control erections were damaged or removed, impotence may be a permanent condition. However, drugs and other solutions may still make it possible to have sex.

RECURRENCE

The longer you are cancer-free (*in remission*), the more likely it is that the cancer will not return. If it does, there are salvage therapies that may be able to stop it.

A recurrence of the cancer is usually detected by a rapid rise in PSA (*biochemical failure*). But PSA levels can go up and down in the months after a procedure, so a rise may only be temporary.

Worrying about recurrence only makes it harder to enjoy the good things in your life.

TREATING ADVANCED CANCER

If cancer spreads through the body (*metastasizes*), there are no treatments that can stop it, only ways to reduce pain and extend life. But if there are no more than five bone lesions (it is *oligometastatic*), aggressive treatment may produce significantly longer survival times.

HORMONAL THERAPY (androgen blockade, hormone blockade)

Premise Blocking testosterone production slows tumor growth.

Practice Drugs or, in some cases, castration (*orchiectomy*).

Advantages When tumors no longer need testosterone, growth can be slowed by stopping the drugs.

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Disadvantages Side effects may include hot flashes, anemia, abdominal pain, and liver failure. Tumors will eventually be able to grow with or without testosterone.

RADIOTHERAPY (radiation therapy, RT)

Premise Relieves pain by reducing the tumors that press against nerves and bones.

Practice External radiation or injections of radioisotopes that migrate to tumors.

Advantages Patients feel better and may live longer. Bones are less likely to break.

Disadvantages Side effects may include fatigue, lowered immunity, and skin reactions.

CHEMOTHERAPY (chemo)

Premise Certain drugs can target and kill rapidly dividing cells, slowing the spread of the cancer and relieving some symptoms.

Practice Drugs are delivered directly into the bloodstream (*intravenously*) during a hospital visit or using liquids, pills, or patient-operated devices.

Advantages Patients may live a little longer. (Some extremely expensive drugs may extend life by a few more months.)

Disadvantages It is not effective for very long. Strong side effects may occur, including reduced immunity, anemia, memory loss, vomiting, and nerve and kidney damage. Different chemotherapy drugs have different side effects.

COMPLEMENTARY AND ALTERNATIVE THERAPIES

Complementary therapies do not replace medical treatments, they supplement them. Some, like massage or meditation, will not compromise your treatment, but others, such as herbs or dietary supplements, might. Check with your doctor first.

Alternative therapies have no scientific basis. They are also very expensive, may interfere with your treatment, raise unrealistic hopes, and don't work.

CLINICAL TRIALS

Consider taking part in a clinical trial of a potential cure. It is not likely to save your life, but what is learned might save many lives in the future.

The Hypertext Guide to Prostate Cancer is one of several "high quality and informative sites" that address specific types of cancer. *Cancer information resources: digital and online sources*. PMID: 11955682

More recommendations at: http://goo.gl/T0ANU

Disclaimer This overview is only intended for educational purposes. It is not a substitute for informed medical advice from a physician.

HELPFUL INFORMATION

Finding Reliable Medical Information www.hypertext.org/ENGLISH/INFO.html
US Too support groups www.ustoo.org/ **International groups** www.ustoo.org/Chapter_NearYou.asp
Man to Man support groups (US) http://goo.gl/ylnugA
Australian support groups http://www.prostate.org.au/articleLive/pages/Support-Groups.html
British support groups http://www.patient.co.uk/selfhelp.asp
Canadian support groups http://www.prostatecancer.ca
New Zealand support groups http://prostate.org.nz
Cancer information in more countries http://goo.gl/Jhv7f5
Prostate Problems E-patient Group https://www.acor.org/listservs/join/115
National Cancer Institute's Cancer Information Service http://www.cancer.gov/aboutnci/cis/page1
Cancer Financial Assistance Coalition www.cancerfac.org/reading/advocacy-orgs.php
Consumer Health Resources www.citizen.org/hrg/links/index.cfm
American Cancer Society http://www.cancer.org/cancer/prostatecancer/index
PubMed search engine www.ncbi.nlm.nih.gov/sites/entrez
Prostate Cancer Research Institute newsletters http://pcri.org/insights-newsletter/
Biopsies and staging http://en.wikipedia.org/wiki/Prostate_biopsy
Chemotherapy http://goo.gl/8htCl
Erectile dysfunction http://goo.gl/X0wMS
Hormonal therapy http://goo.gl/iuzw1
Nomograms http://nomograms.mskcc.org/Prostate/HormoneRefractory.aspx
National Comprehensive Cancer Network Patient Guidelines http://goo.gl/RVAkJ2
PSA http://en.wikipedia.org/wiki/Prostate-specific_antigen
Urinary incontinence kidney.niddk.nih.gov/KUDiseases/pubs/uimen/index.aspx
Getting your medical records http://patients.about.com/od/yourmedicalrecords/a/getmedrecords.htm
Health Insurance in the United States www.hypertext.org/ENGLISH/INSURANCE.html

Books

A Primer on Prostate Cancer, Dr. Stephen Strum and Donna L. Pogliano
The Dattoli Challenge: Evaluating Your Prostate Cancer Treatment Options, Dr. Michael Dattoli and Jennifer Cash ARNP
Man to Man: Surviving Prostate Cancer, Michael Korda (patient)