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Answering Your Questions on prostate cancer



Prostate Cancer Canada values your feedback and would appreciate if you could complete an online survey about this brochure. Please go to **prostatecancer.ca** for a link to the 5 minute survey. The survey will be available until November 30th, 2012.

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SECTION 1:

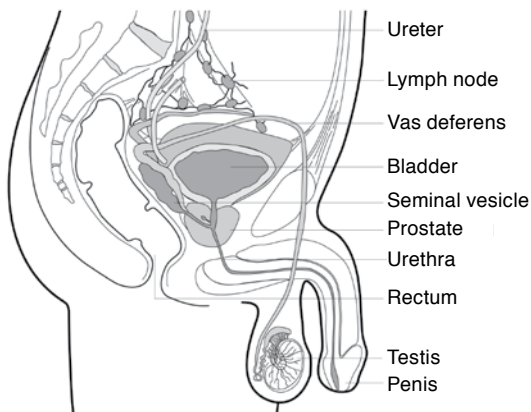
THE BASICS

Understanding prostate cancer may seem overwhelming at first. In this section, we will explain the basics: the who, what, where, when and why of prostate cancer.

What is the prostate?

The prostate is a part of the male reproductive system. It adds nutrients and fluid to sperm. Normally the size of a walnut, the prostate can be divided into right and left “lobes.” It is located in front of the rectum, just below the bladder. It surrounds the urethra, the tube that carries urine and semen through the penis.

The growth of cells in the prostate, both healthy and cancerous, is stimulated by testosterone. Male hormones, including testosterone, are produced almost entirely by the testicles¹, with only a small percentage produced by the adrenal glands (small glands found just above the kidneys).



What is prostate cancer?

Prostate cancer is the most common cancer to affect Canadian men. One in seven men will be diagnosed with the disease in their lifetime.²

Prostate cancer is a disease where some prostate cells have lost normal control of growth and division. They no longer function as healthy cells.

A cancerous prostate cell has the following features:

- Uncontrolled growth
- Abnormal structure
- The ability to move to other parts of the body (invasiveness).

It is important to note that not all clusters of cells growing in a mass are cancerous, and that a prostate with an irregular shape is not necessarily cancerous either. It is advisable to ask your doctor what it may be.

Prostate cancer can be slow-growing and some men who develop prostate cancer may live many years without ever having the cancer detected. It is important to get screened regularly so that if you do develop prostate cancer, the appropriate action can be taken. A significant proportion of prostate cancers, if untreated, may have serious consequences.

Who gets prostate cancer?

There is no single cause of prostate cancer. However, there are some factors that make developing prostate cancer more likely.

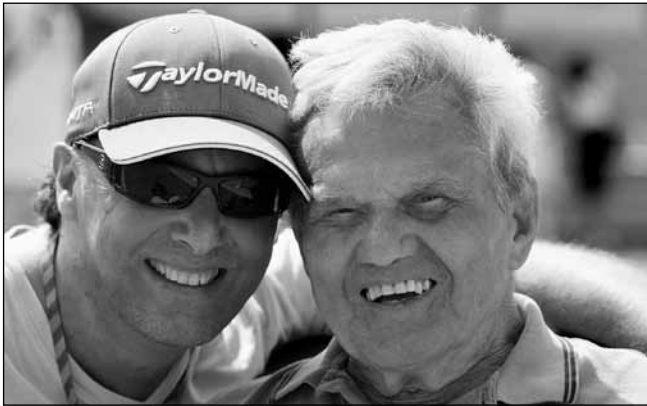
Age: The chance of getting prostate cancer rises quickly after a man reaches age 50, and almost two out of three prostate cancers are found in men over 65.² Age is the most important risk factor for prostate cancer.

Race: It is not known why, but prostate cancer is more common in men of African or Caribbean descent and less common in men of Asian descent.

Family history: Your risk of prostate cancer is increased if close family members have had the disease.

Diet: Men who eat a low-fibre, high-fat diet have a higher rate of prostate cancer. Research suggests that saturated fat (commonly found in processed foods, whole-milk dairy products and fatty cuts of meat) increases the production of the hormone testosterone, which may help prostate cancer cells grow.

Remember, it is possible to develop prostate cancer even when none of these risk factors are present.



How can I tell if I have prostate cancer?

Typically, the first symptoms of prostate cancer are difficulty urinating, frequent urination, and blood in the urine. However, symptoms are not always present especially in the early stages of prostate cancer. If detected and treated in its earliest stages (when the cells are only in the prostate), your chances of survival are greatly increased. Early detection is key.

There are two main tests that are used to determine whether it is likely you have prostate cancer, even

if there are no obvious symptoms. These are the prostate-specific antigen (PSA) test and the digital rectal exam (DRE).

The PSA Test

This is a simple blood test that your doctor can order. It measures the amount of prostate-specific antigen (PSA) in your blood. PSA is a protein produced by the prostate that helps keep semen in liquid form. Typically, prostate cancer glands release more PSA into the blood circulation than healthy prostate glands. Therefore, a high PSA level can be a warning sign of prostate cancer.

The digital rectal exam

In a digital rectal exam (DRE), your doctor will feel the size and shape of the prostate by inserting a gloved and lubricated finger into the rectum. The area where most prostate cancers are found can be felt during this test. A healthy prostate feels soft, rubbery, smooth, symmetrical, regular and even. Any lumps, or hard, woody or irregular areas of the prostate may indicate the presence of cancer and will require further testing.

It is important to remember that no test is perfect. Combining the PSA blood test with a DRE provides your doctor with more information and helps to increase the accuracy of these early detection methods.

Why is testing important?

Regular testing increases the likelihood of cancer being detected at an early stage when there are more treatment options and the chance of cure is highest.

A higher than normal amount of PSA in the blood is a possible indicator of prostate cancer, although other conditions of the prostate can also increase PSA levels.

Non-cancerous Prostate Conditions

Prostatitis

This is a non-cancerous infection or inflammation of the prostate. Prostatitis can develop rapidly (acute) or slowly (chronic) and is either bacterial or nonbacterial. Treatments can include antibiotics and anti-inflammatory drugs.

Benign Prostatic Hyperplasia (BPH)

BPH is an overgrowth of cells in the prostate, causing the prostate to become enlarged. It is common in men over 50 years of age.

Some men will not experience any symptoms with this condition. Other men may find that urine flow is reduced or stops altogether due to the enlarged prostate squeezing the urethra. Complications of untreated BPH include urinary stoppage, repeated bladder infections, bladder stones, and back-pressure on the kidneys leading to kidney failure. Depending on how bothersome the symptoms are and whether there are complications from the condition, BPH may be treated with changes to diet and lifestyle, medication, or surgery.

Prostatic Intraepithelial Neoplasia (PIN)

In the case of PIN, there is abnormal and uncontrolled growth of cells that line the surface of the prostate.

High-grade PIN is sometimes considered a pre-cancerous condition. That does not necessarily mean that prostate cancer will develop. But it does mean that men with this condition need to be monitored more closely, sometimes with additional biopsies.

SECTION 2:

TESTING + DIAGNOSIS

This section provides information about tests that are used for early detection and diagnosis. It also covers tests that are used to find out what type of prostate cancer is present and how far the cancer has spread.

Early Detection of Prostate Cancer

Prostate Cancer Canada encourages men over the age of 40, as part of their annual check up, to initiate a conversation with their doctor about early detection of prostate cancer, which may include PSA testing and a Digital Rectal Exam.



IS IT TIME FOR ME TO GET A PSA TEST?

How old are you?

Under 40

A healthy lifestyle and communication with your family doctor is important at this age for your prostate health.

40+

As part of your annual checkup, initiate a conversation with your doctor about early detection of prostate cancer, which may include PSA testing and a Digital Rectal Exam.

Be aware of the signs and symptoms of prostate cancer and its risk factors which include: age, family history and ethnic background.

Discussion About PSA Testing

The PSA test is a simple blood test that measures PSA levels in the blood. PSA levels rise when the size of the prostate, or the number of prostate cells, increase. It is important to note that the PSA test cannot diagnose prostate cancer or tell you what type of cancer may or may not be present.

Although further testing and medical procedures such as blood tests may cause anxiety among some men, research has shown that a rapid rise in PSA levels may be a very strong sign of aggressive prostate cancer. Regular testing may result in early detection of the disease, at a stage when there are more options for treatment and a better chance of survival.

When deciding on whether to take the test, you should talk to your doctor and consider all aspects of the testing process.

What is a PSA Number?

A PSA number shows the amount of prostate-specific antigen (in nanograms) per millilitre of blood. Research has shown that normal PSA numbers vary by age and race so it is important to take these factors into account when looking at your PSA number. For example, because PSA levels rise naturally with age, a normal PSA number at age 40 is different from a normal PSA number at age 70.

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Other PSA Measurements

There are other measurements that can be taken with the PSA blood test in order to improve its accuracy as an indicator of prostate cancer.

PSA doubling time: The time it takes for your PSA number to double. PSA doubling time can give an idea about whether you have cancer and whether this cancer is likely to be aggressive or to have spread.

Percentage or “ratio” of free to total PSA: A ratio comparing the amount of free PSA to the total amount of PSA in the blood. Free PSA travels alone in the blood; it is not bound to any other blood proteins.

Free PSA comes from benign prostatic hyperplasia (BPH), not prostate cancer. The higher the percentage of free PSA, the less likely it is that prostate cancer is present. Readings of greater than 25 percent free PSA indicate that much of the elevated PSA is caused by BPH. A reading of less than 10 percent suggests that you are more likely to have prostate cancer.

PSA density: A ratio comparing the size of your prostate with your PSA number. Usually, a PSA density under 0.07 is considered normal. A high PSA density means there is more PSA being produced by a relatively small prostate and thus cancer is more likely. Your urologist often will use this information to decide whether to go ahead with a biopsy or not.

Further Testing and Diagnosis

The PSA test or DRE alone cannot diagnose prostate cancer. In order to determine whether or not you have prostate cancer, your doctor will perform one or more of the following exams and tests. If you do have prostate cancer, these tests can also help determine how advanced it may be. It is important to have this information to find the treatment best suited to you. See the **Prostate Cancer Treatment Strategies** pamphlet for more detailed information.

Transrectal Ultrasonography (TRUS)

This procedure allows a doctor to get a closer look at the prostate. An ultrasound probe is inserted into the rectum and positioned next to the prostate. This probe uses sound waves to create a picture of the prostate, allowing a doctor to assess its size.

TRUS is usually used as a guide to target the location(s) of the prostate the doctor intends to biopsy to confirm or rule out the presence of prostate cancer. TRUS also provides measurements for prostate size and, along with a PSA test, can determine PSA density. It cannot, on its own, indicate whether there is cancer or not.

CT Scan

The computerized tomography (CT) scan, also known as a CAT scan, is another test that your doctor may recommend. It is often used to check whether enlarged lymph nodes are visible, which is important as prostate cancer can spread through the lymphatic system.

If you have a CT scan, you will be asked to lie flat on a table inside a doughnut-shaped machine that will take multiple images of different sections of your body. These images are then combined through a computer to produce two and three dimensional pictures from inside the body. The whole process usually takes about an hour.

Biopsy

If your DRE and/or PSA level cause your doctor to suspect that you may have prostate cancer, the next step is usually a biopsy of the prostate. A biopsy removes a small amount of prostate tissue so that the cells can be tested.

A prostate biopsy is typically an outpatient procedure (does not require an overnight hospital stay). The doctor guides a biopsy gun — a hand-



held device with a small needle — through the wall of the rectum into the prostate gland. A small biopsy needle then removes a sample of prostate tissue (called a core). The doctor usually takes at least 10 cores. Areas that appear abnormal or feel abnormal during a DRE are targeted and biopsied but additional cores in normal-looking areas of the prostate are also sampled.

How a Biopsy is Performed

Your doctor will ask you to stop taking any blood thinners such as Coumadin, Plavix, or Aspirin for about a week before the prostate biopsy. Be sure to indicate what vitamins or other supplements you might be taking, as these can also thin the blood. You should talk to your doctor before starting to take any blood-thinning medications again.

1. You will need to use a laxative or have an enema before the biopsy, which can either be performed at the clinic, hospital, or at home.
2. Biopsies are generally performed under local anaesthetic. Under special circumstances, a doctor may recommend a general anaesthetic when a large number of cores will be taken or if technical difficulty with the biopsy is expected.
3. The biopsy itself takes about 20 to 30 minutes, but you may be asked to set aside a whole morning or afternoon so health professionals can monitor your reaction.

4. You need to take antibiotics before and after the biopsy because infection is a concern. You should follow directions carefully and finish the course of antibiotics prescribed.

Outside of vigorous exercise, most men can resume the majority of their normal activities on the same day as the procedure. If you experience soreness, you may be able to take Tylenol, not Aspirin, for relief. Talk to your doctor for advice.



Side-Effects

It is normal to experience soreness in your rectum and penis after a prostate biopsy. This usually goes away after a few hours. Minor bleeding from the rectum is also common for a day or so. You may notice some blood on the tissue paper following a bowel movement or some blood on the stool. About half of the men who undergo this procedure also have some blood in their urine. This is normal and will usually last about a week. You may also notice some blood in the semen. An abnormal color in the semen may last up to several weeks or months and it may turn from red to a brownish or rusty color. This is normal.

It is normal for a prostate biopsy to cause an increase in PSA levels. This does not mean you have cancer; it is a short-term reaction to the biopsy.

Uncommon and potentially dangerous side-effects include:

Extensive bleeding from the rectum

Very rarely, a biopsy needle nicks a small artery in the rectum, and bleeding will be more severe than normal. A large amount of blood may also be seen in the urine. Alert your doctor immediately if this occurs.

Infection

Infection is the main risk of a prostate biopsy. Therefore, antibiotics are usually given one or two days before the biopsy, the day of the biopsy and one to two days after to decrease the chance of infection. In spite of these precautions, about one in 50 men develop a significant infection³ that requires hospital admission and a longer course of antibiotics given via injection. If you develop a fever shortly after a prostate biopsy, you should consult your doctor or go to your local emergency department.

Results

A pathologist will examine the tissue samples to determine whether they are positive or negative for cancer. You might get a report that reads neither positive nor negative but “suspicious” or “atypical.” This result means that the cells do not look cancerous, but neither do they look normal. Talk to your doctor about these results.

If cancer is present, biopsy results will also include a cancer analysis. It will name the type of cancer and how abnormal the cancer cells are. A numerical grade expresses how abnormal the cells are. You may also be given some preliminary information about the stage of the cancer.

Positive/Negative: If the biopsy report is positive, it means the pathologist has found cancerous cells in the tissue samples. Negative means no cancer was found in any of the samples. Note: It is possible for a biopsy to miss cancer. It is estimated that any one biopsy may miss cancer in about 20 to 25 percent of cases.⁴

Type of Cancer: The biopsy report should indicate the location of the prostate where cancerous cells were found and what classification the cancer is. The biopsy should also provide information on how many cores contain cancer and how extensive the cancer is.

It is normal for a prostate biopsy to cause an increase in PSA levels. This does not mean you have cancer; it is a short-term reaction to the biopsy.

Bone Scan

If you have been diagnosed with prostate cancer, and there is a high risk for metastases (cancer spreading from the prostate to other areas of the body), your doctor may recommend a bone scan. The cancer is likely to have spread to the bones if it is an aggressive cancer (see next section on “Grading”); if the PSA number is high (over 20); and the cancer has spread beyond the prostate (see next section on “Staging”).

Prior to a bone scan, radioactive material is injected into a vein in your arm, which takes about two to four hours to circulate and become absorbed by the bones. Sometimes, you are able to leave the

hospital or medical centre for this period. During the scan, you usually lie still on a flat surface while a machine holding a gamma camera passes closely over your body. This records the pattern of radiation waves that your body emits. If prostate cancer has spread to the bones, it often shows up as a series of darker areas (called “hot spots”) along the spine, long bones, skull or ribs.

It is important to note that various injuries or abnormalities in bone metabolism show up on a bone scan, e.g., old fractures, arthritis, or bone infections. Checking the results of the scan against your medical history will help determine whether the cancer has spread to the bones.

On the Horizon for Testing and Screening Procedures

PCA3 Test

This is a molecular test that looks for a prostate cancer-associated gene, which can often be detected in the urine immediately after a prostate examination. The test gives your doctor an idea of how likely you are to have prostate cancer and whether a biopsy should be done. PCA3 may be especially helpful in identifying patients who should have a repeat biopsy e.g., those with a negative biopsy who continue to have high PSA levels. Clinical trials are currently being conducted in Canada and the US to further evaluate the potential of the PCA3 test.



MRI

Medical researchers have started to look at how MRI scanning can be safely used to reduce the number of invasive biopsies that men may have to go through. MRI scans show the whole prostate and the surrounding tissue, so tumours of all sizes and locations can be seen. Doctors can often tell from looking at a tumour how invasive the cancer, which can help determine the best treatment options.



Grading and Staging of your prostate cancer

The grade and stage of your prostate cancer are important considerations when deciding on treatment options. In both staging and grading, the lower the numbers the better the news.

Grade

A cancer's grade gives information about how fast the cancer is growing and how fast it is capable of spreading. It describes how closely its cells resemble normal cells of the area. There are two main methods of grading cancer: the general grading system and the Gleason grading system.

General Grading System

This system classifies cancer cells as low, intermediate or high-grade.

- **Low-grade:** These cancer cells look a bit like other prostate cells and retain many prostate cell qualities. The cells are arranged in patterns or glands almost resembling the normal prostate. These cancers usually grow slowly and are not aggressive.
- **Intermediate-grade:** These cancer cells are more abnormal looking than low-grade cancer cells. A pathologist can still recognize them as prostate cells, but they appear in a disorganised pattern. These cancers are intermediate in terms of aggressiveness.
- **High-grade:** These cancer cells are "wild looking" and do not resemble normal prostate cells at all. They are aggressive, and they grow and spread quickly.

The Gleason Grading System

This system grades prostate cancers on a scale of 1 to 5 based on how closely the individual units of cells are organized to resemble the normal prostate arrangement.

Gleason Score

Because there are often a number of different grades of cancer present within biopsy samples, a scoring system was developed. To determine a Gleason score, a pathologist first decides which two grades of cancer are most common in the patient's biopsied tissue. These grades are added together to reach a number between 2 and 10. For example, if cells that follow the Grade 3 pattern are most common, but some cells follow the Grade 4 pattern,

a man would have a Gleason score of 7 (dominant pattern 3 + secondary pattern 4 = 7).

A Gleason score of 6 or less is considered low, meaning the cancer has a tendency to grow slowly.

A Gleason score of 7 is considered intermediate, meaning the cancer has a moderate speed of growth.

A Gleason score of 8 to 10 is considered high. The cells usually grow quickly and the cancer can spread fast.

Most men have cancers with Gleason scores of 6 or 7, and less commonly 8, 9 or 10. Pathologists rarely, if ever, assign Gleason scores of 2, 3 or 4.

The Gleason score does not change with time e.g., the score would not increase from 6 to 8 if the cancer is allowed to grow. Some cancers have a particular Gleason score on the initial biopsy, but on repeat biopsy or after the prostate has been removed, the sample may be assigned a different Gleason score. This does not mean the cancer has changed in terms of its Gleason number, but that the cancer has different growth patterns and more than one Gleason score.



Stage

A cancer's stage gives information on how far the cancer has spread. It is determined by considering three factors:

- Size of tumor, and whether the cancer has spread beyond the prostate capsule or covering.
- Whether the cancer has spread to the lymph nodes close to the prostate.
- Whether there are any distant metastases.

There are two main staging systems: TNM staging system and the lesser used Whitmore-Jewett staging system.

TNM Staging System

The TNM staging system provides information about the cancer's size and how far it has spread. It is based on the extent of the tumor (T), whether cancer cells have spread to nearby (regional) lymph nodes (N), and whether distant metastasis (M) has occurred.

Whitmore-Jewett Staging System

A simpler, older system is the Whitmore-Jewett staging system, sometimes called the Jewett staging system. In this system, prostate cancer is classified by letter. Stage A is the earliest stage and stage D is the most advanced stage of cancer.

