Your Prostate Pathology Report: Cancer (Adenocarcinoma)

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When biopsy samples are collected from your prostate, they are studied by a doctor with special training, called a pathologist. After testing the samples, the pathologist creates a report on what was found. Your doctor can use this report to help manage your care.

The information here is meant to help you understand some of the medical terms you might see in your pathology report after your prostate is biopsied.

(If you are found to have prostate cancer and then have surgery to treat it, a separate pathology report will be created after testing the removed prostate gland and nearby structures. That report might contain some of the same information below, as well as other information.)

What is a ‘core’ on a prostate biopsy pathology report?

The most common type of prostate biopsy is a core needle biopsy. For this procedure, the doctor inserts a thin, hollow needle into the prostate gland. When the needle is
pulled out it removes a small cylinder of prostate tissue, which is called a core. The doctor will typically remove cores from several different areas of the prostate during a biopsy.

The pathologist will give each core (biopsy sample) a number (or letter) in your pathology report, and each core will get its own diagnosis. If cancer or some other problem is found, it is often not in every core, so you need to look at the diagnoses for all of the cores to know what is going on.

**Adenocarcinoma and other types of prostate cancer**

**Adenocarcinoma** is a type of cancer that develops in gland cells, such as the cells that make up most of the prostate. Adenocarcinoma is by far the most common type of cancer found in the prostate gland.

Much less common types of cancer that can start in the prostate include:

- Small cell neuroendocrine carcinoma
- Large cell neuroendocrine carcinoma
- Urothelial (transitional cell) carcinoma

The treatment and outlook for these rare cancers are typically different from those for prostate adenocarcinoma.

**If the biopsy report mentions intraductal carcinoma as well as regular prostate cancer (adenocarcinoma)...**

If the biopsy finds prostate adenocarcinoma (the most common type of prostate cancer), an additional finding of intraductal carcinoma might affect the treatment options your doctor recommends.

If the biopsy shows high-grade adenocarcinoma (cancer), which is likely to grow quickly, finding intraductal carcinoma as well isn’t likely to change your treatment options.

But if the biopsy shows a low-grade cancer (which is likely to grow slowly) and intraductal carcinoma is seen as well, your doctor might be more likely to recommend active treatment options such as surgery or radiation therapy, rather than active surveillance (not treating the cancer right away but watching it closely). This is because there’s likely to be high-grade (fast growing) cancer somewhere in the prostate, even if
it wasn’t detected by the biopsy.

If your biopsy shows both intraductal carcinoma and prostate cancer (adenocarcinoma), discuss what this might mean with your doctor.

If the biopsy report mentions perineural invasion...

Perineural invasion means that cancer cells were seen surrounding or growing alongside a nerve fiber within the prostate.

When this is found on a biopsy, it means that there is a higher chance that the cancer has spread outside the prostate. Still, perineural invasion doesn’t mean that the cancer has spread, and other factors, such as the Gleason score and amount of cancer in the cores, are more important.

In some cases, finding perineural invasion may affect your treatment options, so if your report mentions perineural invasion, discuss it with your doctor.

Prostate cancer grade (Gleason score and Grade Group)

If prostate cancer is found in a biopsy sample, the pathologist will assign it a grade, which is based on how abnormal the cancer looks under the microscope. Higher-grade cancers look more abnormal, and they are more likely to grow faster.

Gleason grade or Gleason score

Pathologists grade prostate cancers using the Gleason system.

- Grade 1 is assigned if the cancer looks a lot like normal prostate tissue.
- Grade 5 is assigned if the cancer looks very abnormal.
- Grades 2 through 4 have features in between these extremes.

Almost all prostate cancers are given a grade of 3 or higher; grades 1 and 2 are rarely used.

Since prostate cancers often have areas with different grades, a grade is assigned to the 2 areas that make up most of the cancer. These 2 grades are added to yield the Gleason score (also called the Gleason sum).

The first number assigned is the grade that is most common in the tumor. For example,
if the Gleason score is written as 3+4=7, it means most of the tumor is grade 3 and less is grade 4, and they are added for a Gleason score of 7.

Other ways that this Gleason score might be listed in your report are Gleason 7/10, Gleason 7 (3+4), or combined Gleason grade of 7.

If a tumor is all the same grade (for example, grade 3), then the Gleason score is reported as 3+3=6.

Although most often the Gleason score is based on the 2 areas that make up most of the cancer, there are some exceptions when a core sample has either a lot of high-grade cancer or there are 3 grades including high-grade cancer. In these cases, the way the Gleason score is determined is modified to reflect the aggressive nature of the cancer.

In theory, the Gleason score can be between 2 and 10, but scores below 6 are rarely used.

Based on the Gleason score, prostate cancers are often divided into 3 groups:

- Cancers with a **Gleason score of 6 or less** may be called well differentiated or low-grade.
- Cancers with a **Gleason score of 7** may be called moderately differentiated or intermediate-grade.
- Cancers with **Gleason scores of 8 to 10** may be called poorly differentiated or high-grade.

Biopsy cores might be samples from different areas of the same tumor or different tumors in the prostate. Because the grade can vary within the same tumor or between different tumors, different cores taken from your prostate may have different Gleason scores. Typically, the highest Gleason score is the one your doctor uses to determine your treatment options.

Most often, the Gleason score from your biopsy accurately reflects your cancer’s grade. But while it’s not common, it’s possible that the biopsy might have missed a higher grade (more aggressive) area of the cancer somewhere else in the prostate. For example, if you have your prostate removed (with a prostatectomy) to treat your cancer, the pathologist might find higher grade cancer when looking at the surgery specimen. This might affect your future treatment options.

**Grade Groups**
Grade Groups are a newer way to grade prostate cancer.

As noted above, currently the lowest Gleason score that pathologists assign to a cancer is a 6. A patient with a Gleason score 6 cancer might assume that his cancer is in the middle of the range of grades (which in theory go from 2 to 10), even though grade 6 cancers are actually the lowest grade seen in practice. This might add to their worry about the cancer and make them more likely to feel that they need to be treated right away.

Another problem with the Gleason grading system is that prostate cancers can be divided into more than just the 3 groups mentioned above. For example, men with a Gleason score 3+4=7 cancer tend to do better than those with a 4+3=7 cancer (even though they’re both “intermediate-grade” cancers). And men with a Gleason score 8 cancer tend to do better than those with a Gleason score of 9 or 10 (even though they’re all “high-grade” cancers).

Grade Groups range from 1 (most likely to grow and spread slowly) to 5 (most likely to grow and spread quickly):

- Grade Group 1 = Gleason 6 (or less)
- Grade Group 2 = Gleason 3+4=7
- Grade Group 3 = Gleason 4+3=7
- Grade Group 4 = Gleason 8
- Grade Group 5 = Gleason 9-10

Although eventually the Grade Group system may replace the Gleason system, the two systems are currently reported side-by-side.

**How important is the grade (Gleason score and Grade Group) of the cancer?**

The grade (Gleason score and Grade Group) of the prostate cancer is a very important factor in predicting its behavior and determining the best treatment options. Still, other factors are also important, such as:

- The blood PSA level
- The number of biopsy cores that contain cancer (for example, “7 out of 12”)
- How much of each biopsy core is made up of cancer
- Whether cancer was found in both sides (left and right) of the prostate
- Findings on imaging tests (particularly if the cancer has spread outside the prostate)
Other findings that do not affect treatment or outlook if cancer is found

High-grade prostatic intraepithelial neoplasia (PIN)

High-grade prostatic intraepithelial neoplasia (high-grade PIN) is a pre-cancer of the prostate.

If prostate cancer is found on the biopsy and high-grade PIN is mentioned as well, it doesn’t affect a person’s outlook or their treatment options. In this case, the term ‘high-grade’ refers to the PIN and not the cancer, so it has nothing to do with the Gleason score or how aggressive your cancer is.

Acute inflammation (acute prostatitis) or chronic inflammation (chronic prostatitis)

Inflammation of the prostate is called prostatitis. (Acute means it started recently, whereas chronic means it’s been going on for a while.)

Prostate inflammation can have different causes. Most often, prostatitis reported on biopsy does not need to be treated.

Inflammation (especially acute inflammation) might raise your prostate-specific antigen (PSA) blood level, but it is not linked to prostate cancer.

If prostate cancer is found on the biopsy and inflammation or prostatitis is mentioned as well, it doesn’t affect a person’s outlook or treatment options.

Atrophy, adenosis, or atypical adenomatous hyperplasia

All of these are terms for benign (not cancer) conditions the pathologist might see under the microscope, but that sometimes can look like cancer.

Atrophy is a term used to describe a shrinkage of prostate tissue.

- **Diffuse atrophy** affects the entire prostate gland. This is most often caused by hormone treatment or radiation therapy to the prostate.
- **Focal atrophy** only affects certain areas of the prostate. Focal atrophy can
sometimes look like prostate cancer.

**Atypical adenomatous hyperplasia** (sometimes called *adenosis*) is another benign condition that can sometimes be seen on a prostate biopsy.

If prostate cancer is found on the biopsy and any of these terms are mentioned as well, it doesn’t affect a person’s outlook or their treatment options.

**Atypical small acinar proliferation (ASAP), glandular atypia, or atypical glandular proliferation**

*All of these terms*[^4] mean that the pathologist saw some cells under the microscope that might be cancer, but there were too few of them to be sure. About half the time, any of these findings would mean that cancer is also present somewhere in the prostate. But if prostate cancer has already been found in the biopsy, these findings wouldn’t affect a person’s outlook or their treatment options.

**If the biopsy report mentions a seminal vesicle...**

The seminal vesicles are glands that lie just behind the prostate. Sometimes part of a seminal vesicle is sampled during a biopsy. This is not usually a cause for concern, unless cancer cells are found in the seminal vesicle (which would affect the stage[^5] of the cancer).

**Lab tests that might be done on prostate biopsy samples**

If the pathologist sees cells in the biopsy samples that might be cancer, different types of lab tests might be done to help tell if they are cancer cells. These tests are often **immunohistochemical (IHC)** stains done on very thin slices of biopsy samples, which are placed on glass slides and viewed under a microscope. Sometimes other types of tests are done as well.

Some of the tests that might be done include:

- High molecular weight cytokeratin (HMWCK) or 34BE12
- ck903
- ck5/6
- p63
- p40
- AMACR (racemase)
- PIN4 cocktail
- ERG

All of these tests can be used to help diagnose prostate cancer. But not everyone needs them, so whether or not your report mentions these tests has no effect on the accuracy of your diagnosis.

**What if my doctor asks that a special molecular test be done on my biopsy specimen?**

There are different reasons your doctor might order one of the newer types of tests that can be done on prostate biopsy samples. For example:

- Some tests can help tell how likely it is that a man has prostate cancer, even if cancer wasn’t seen in the biopsy samples. This can help guide whether another biopsy should be considered.
- If prostate cancer has been found, some tests can help determine if certain treatments are likely to be helpful.

If your doctor advises one of these newer tests, ask them about the purpose of the test and what the results might tell you.

**Hyperlinks**


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