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# Understanding Your Pathology Report: Prostate Cancer

When your prostate was biopsied, the samples taken were studied under the microscope by a specialized doctor with many years of training called a *pathologist*. The pathologist sends your doctor a report that gives a diagnosis for each sample taken. Information in this report will be used to help manage your care. The questions and answers that follow are meant to help you understand medical language you might find in the pathology report from your prostate biopsy.

## What does it mean if my biopsy report mentions the word *core*?

The most common type of prostate biopsy is a [core needle biopsy](#)<sup>1</sup>. 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 called a *core*. This is often repeated several times to sample different areas of the prostate.

Your pathology report will list each core separately by a number (or letter) assigned to it by the pathologist, with each core (biopsy sample) having 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 with you.

## What is adenocarcinoma?

Adenocarcinoma is the type of cancer that develops in gland cells. It is the most common type of [cancer found in the prostate gland](#)<sup>2</sup>.

## What is the Gleason grade or Gleason score? What do the numbers in the Gleason score mean, for example 3+4=7 or 3+3=6?

Pathologists grade prostate cancers using numbers from 1 to 5 based on how much the cells in the cancerous tissue look like normal prostate tissue under the microscope. This is called the *Gleason system*. Grades 1 and 2 are not often used for biopsies most biopsy samples are grade 3 or higher.

- If the cancerous tissue looks much like normal prostate tissue, a grade of 1 is assigned.
- If the cancer cells and their growth patterns look very abnormal, a grade of 5 is assigned.
- Grades 2 through 4 have features in between these extremes.

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 highest a Gleason score can be is 10.

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 may 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.

The higher the Gleason score, the more likely it is that your cancer will grow and spread quickly.

### **What does it mean to have a Gleason score of 6, 7, 8, or 9-10?**

Because grades 1 and 2 are not often used for biopsies, the lowest Gleason score of a cancer found on a prostate biopsy is 6. These cancers may be called *well differentiated* or *low-grade* and are likely to be less aggressive; that is, they tend to grow and spread slowly.

Cancers with Gleason scores of 8 to 10 may be called *poorly differentiated* or *high-grade*. These cancers are likely to grow and spread more quickly, although a cancer with a Gleason score of 9-10 is twice as likely to grow and spread quickly as a cancer with a Gleason score of 8.

Cancers with a Gleason score of 7 can either be Gleason score 3+4=7 or Gleason score 4+3=7:

- Gleason score 3+4=7 tumors still have a good prognosis (outlook), although not as good as a Gleason score 6 tumor.
- A Gleason score 4+3=7 tumor is more likely to grow and spread than a 3+4=7 tumor, yet not as likely as a Gleason score 8 tumor.

### **What does it mean when there are different core samples with different Gleason scores?**

Cores may be samples from different areas of the same tumor or different tumors in the prostate. Because the grade may vary within the same tumor or between different tumors, different samples (cores) taken from your prostate may have different Gleason scores. Typically, the highest (largest number) Gleason score will be the one used by your doctor for predicting your prognosis and deciding on treatment options.

### **Can the Gleason score on my biopsy really tell what the cancer grade is in the entire prostate?**

Because prostate biopsies are tissue samples from different areas of the prostate, the Gleason score on biopsy usually reflects your cancer's true grade. However, in about 1 out of 5 cases the biopsy grade is lower than the true grade because the biopsy misses a higher grade (more aggressive) area of the cancer. It can work the other way, too, with the true grade of the tumor being lower than what is seen on the biopsy.

### **How important is the Gleason score?**

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

- The blood PSA level
- Findings on rectal exam
- Findings on imaging tests

- How much of each core is made up of cancer
- The number of cores that contain cancer
- Whether cancer was found in both sides of the prostate
- Whether the cancer has spread outside the prostate

## What are Grade Groups?

Grade Groups are a new way to grade prostate cancer to address some of the issues with the Gleason grading system.

As noted above, currently in practice the lowest Gleason score that is given is a 6, despite the Gleason grades ranging in theory from 2 to 10. This understandably leads some patients to think that their cancer on biopsy is in the middle of the grade scale. This can compound their worry about their diagnosis and make them more likely to feel that they need to be treated right away.

Another problem with the Gleason grading system is that the Gleason scores are often divided into only 3 groups (6, 7, and 8-10). This is not accurate, since Gleason score 7 is made up of two grades (3+4=7 and 4+3=7), with the latter having a much worse prognosis. Similarly, Gleason scores of 9 or 10 have a worse prognosis than Gleason score 8.

To account for these differences, the Grade Groups range from 1 (most favorable) to 5 (least favorable):

- 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.

## **What does it mean if my biopsy report mentions special tests such as high molecular weight cytokeratin (HMWCK), ck903, ck5/6, p63, p40, AMACR (racemase), 34BE12, PIN4 cocktail, or ERG?**

These are special tests that the pathologist sometimes uses to help diagnose prostate

cancer. Not all patients need these tests. Whether or not your report mentions these tests has no effect on the accuracy of your diagnosis.

### **What does it mean if my biopsy mentions that there is perineural invasion?**

Perineural invasion means that cancer cells were seen surrounding or tracking along 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 treatment, so if your report mentions perineural invasion, you should discuss it with your doctor.

### **What does it mean if, in addition to cancer, my biopsy report also says high-grade prostatic intraepithelial neoplasia or high-grade PIN?**

[High-grade prostatic intraepithelial neoplasia \(high-grade PIN\)<sup>3</sup>](#) is a pre-cancer of the prostate. It is not important in someone who already has prostate cancer. 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.

### **What does it mean if, in addition to cancer, my biopsy report also mentions acute inflammation (acute prostatitis) or chronic inflammation (chronic prostatitis)?**

Inflammation of the prostate is called *prostatitis*. Most cases of prostatitis reported on biopsy are not caused by infection and do not need to be treated. In some cases, inflammation may increase your PSA level, but it is not linked to prostate cancer. The finding of prostatitis on a biopsy of someone with prostate cancer does not affect their prognosis or the way the cancer is treated.

### **What does it mean if my biopsy report also mentions atrophy, adenosis, or atypical adenomatous hyperplasia?**

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

**Atrophy** is a term used to describe shrinkage of prostate tissue (when it is seen under the microscope). When it affects the entire prostate gland it is called *diffuse atrophy*. This is most often caused by hormones or radiation therapy to the prostate. When atrophy only affects certain areas of the prostate, it is called *focal atrophy*. Focal atrophy can sometimes look like prostate cancer under the microscope.

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

Finding any of these is not important if prostate cancer is also present.

### **What does it mean if my 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 a cause for concern.

### **What does it mean if, in addition to cancer, my biopsy report also says atypical glands, atypical small acinar proliferation (ASAP), glandular atypia, or atypical glandular proliferation?**

[All of these terms](#)<sup>4</sup> mean that the pathologist saw something under the microscope that is worrisome for cancer, but he or she is not 100% sure that cancer is present. Finding any of these is not important if prostate cancer is also present.

### **What does it mean if my doctor asks for a special molecular test to be done on my biopsy specimen?**

These tests can help predict the prognosis (outlook) of your prostate cancer, and the results should be discussed with your doctor. The results do not affect your diagnosis, although they might affect your treatment options.

## **Hyperlinks**

1. [www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/how-diagnosed.html)
2. [www.cancer.org/cancer/prostate-cancer.html](http://www.cancer.org/cancer/prostate-cancer.html)
3. [www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/prostate-pathology/high-grade-prostatic-intraepithelial-neoplasia.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/prostate-pathology/high-grade-prostatic-intraepithelial-neoplasia.html)
4. [www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/prostate-pathology/atypical-prostate-pathology.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/prostate-pathology/atypical-prostate-pathology.html)
5. [www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/faq-initiative-understanding-your-pathology-report.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/faq-initiative-understanding-your-pathology-report.html)

Last Medical Review: March 8, 2017 Last Revised: March 8, 2017

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**Written by**

This series of Frequently Asked Questions (FAQs) was developed by the Association of Directors of Anatomic and Surgical Pathology to help patients and their families better understand what their pathology report means. These FAQs have been endorsed by the College of American Pathologists (CAP) and reviewed by the American Cancer Society.

Learn more about the FAQ Initiative ([www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/faq-initiative-understanding-your-pathology-report.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/faq-initiative-understanding-your-pathology-report.html))<sup>5</sup>

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