Understanding Your Pathology Report: Prostate Cancer

What is a pathology report?

A pathologist is a doctor who specializes in diagnosing diseases by examining tissue from the body. You will probably never meet the pathologist, but samples of your prostate tissue that are removed during surgery or biopsy will be sent to the pathologist for review. He/she prepares a detailed summary of the findings, which is called the pathology report.

You should obtain a copy of your pathology report for your personal health records and to share with other physicians involved in your care. Understanding this report will help you in making treatment decisions.

What will you find on a pathology report?

The information contained in the report depends on whether the specimen is submitted from a biopsy (in which case "cores" of prostate tissue are received) or from a prostatectomy, which will include the entire prostate gland, seminal vesicles, vas deferens and lymph node(s). The report is broken down into a few sections, including some information about the patient, diagnosis (if known), procedure, a description of what was received by the pathologist and a description of what is seen under the microscope (a type of cancer, benign tissue, other tissue abnormalities). For any sections containing prostate cancer, the pathologist will identify the Gleason grade and score, as well as how much of the sample contained cancer. While all reports will contain the necessary information, the way they are presented varies greatly. To help you read your report, let’s go through each of these sections individually.

The report will include the date the specimen was collected and when it was received in the laboratory. It may or may not include some information about the patient’s diagnosis and the procedure that was performed (biopsy, prostatectomy).

Types of Specimens

When a prostate biopsy is performed, the physician takes 10 or more samples from multiple areas of the prostate gland using one of two biopsy methods. The most commonly used method is the transrectal biopsy, which uses a small ultrasound probe inserted in the rectum to guide the biopsy needles through the rectal tissue into the prostate. The second method is the transperineal biopsy, which is performed by inserting needles through the perineum (the skin between the scrotum and rectum) into the prostate tissue. The specimens submitted with a biopsy are referred to as "cores", which are cylindrically shaped pieces of prostate tissue removed by the needles. The prostate is shaped like a chestnut and surrounds the urethra, which urine drains through. The cores are taken from the top (apex), middle, and bottom (base) portions of both lobes (sides) of the gland.

In the case of a prostatectomy, the entire prostate gland is removed along with surrounding fat and tissue. The specimen may include the seminal vesicles (glands that produce about 60% of semen volume) and the vas deferens (the tube that carries semen to its destination). The specimen may also contain one or more lymph nodes.

Gross Description

This section is generally not that important to you, the patient. It is a description of what the pathologist received and what they see with the naked eye. It will describe how the specimens were received (in one container or separated into several) and how they are labeled. The pathologist may describe the color, type of tissue and size of the specimen(s) and any "inked" margins. (In a prostatectomy, the pathologist marks the edges of the specimen with ink for easier identification.)

Microscopic Diagnosis
This section may be called microscopic diagnosis or just diagnosis. This is the meat of the report, containing pretty much all we need to know. Let’s go through the things you might see in this section.

**Terms used to describe the tissue:**

- **Benign tissue:** this describes tissue that is not cancerous.
- **Tissue inflammation or prostatitis:** this inflammation or infection can be the cause of an elevated PSA when no cancer is found.
- **High grade prostatic intraepithelial neoplasia (PIN):** this is a benign condition, but is often seen in conjunction with a cancer and is considered to be a precursor to developing a cancer, i.e. pre-cancer.
- **Adenocarcinoma:** This describes the type of cancer that is found in 95% of prostate cancer cases. Other rare types, which compromise 5% of cases, include: small cell, mucinous, endometrioid, transitional cell, squamous cell, basal cell, adenoid cystic, signet-ring cell and neuroendocrine carcinomas. This article will only address adenocarcinomas.

For any specimen that contains adenocarcinoma, more details are provided and these are discussed below.

**Gleason Grade and Score**

The Gleason score is named after Dr. Donald Gleason, the pathologist who first studied and devised a scoring system to describe the aggressiveness of prostate cancers. This system helps us to separate the less aggressive prostate cancers from those that are more aggressive. In more technical terms, it represents the “grade” of the tumor, which is a measure of the degree of differentiation of prostate cancer cells. Differentiation refers to how “normal” a cancer cell appears under a microscope when compared to a normal prostate cell. If the cancer is poorly differentiated or undifferentiated, then it looks very abnormal. If the cancer is well differentiated, then it looks similar to normal cells. As you might expect, the more aggressive cancers are poorly differentiated, and these tumors have little or no regulation of their growth, allowing them to multiply in an uncontrolled manner (thus making it an aggressive cancer).

The Gleason score is actually a sum of two Gleason grades. The grade is a number from 1-5, with 1 being the most well differentiated and 5 being the most poorly differentiated pattern. The pathologist assigns a primary grade to the tumor cells that make up the majority of the tumor and a secondary grade to the cells comprising a minority of the tumor. The Gleason score is then the sum of these two most dominant grades. Thus, the potential range of Gleason scores are from 2 (1+1) to 10 (5+5). The most prominent (primary) grade is either reported as the Gleason grade or is the first number in the score. For example:

- In a report of Gleason 7 (3+4), grade 3 is the most prominent.
- In a report of Gleason grade 4, score 7; grade 4 is the most prominent, with the total score being 7 (therefore grade 3 is the second most prominent score).

Be aware that when a prostate is biopsied for diagnosis and then subsequently removed with a radical prostatectomy, Gleason scores are the same between the biopsy and surgery specimens only 75% of the time. In about 20% of the cases, the surgery specimen actually ends up having a higher Gleason score (and thus a more aggressive cancer) than what was previously found on the initial biopsy. The reverse (lower Gleason score at surgery than at biopsy) happens less than 5% of the time. These discrepancies can be due to an incomplete biopsy or the expertise of the pathologist. Because the pathologist’s interpretation is subjective, it is important to have your tumor reviewed by an expert pathologist. Many experts recommend having a second pathologist review the specimen to be sure the Gleason grading is correct.

The Gleason score has been very clearly correlated with expected trends in biochemical (PSA) relapse-free survival and overall survival. In other words, it is a very strong predictive and prognostic tool in the management of prostate cancer patients.

**How Much Tumor is Present?**

This information can be presented in a variety of ways. In a biopsy core specimen, the pathologist may report the amount using a measurement in millimeters and/or a percentage of the core. They will also state how many cores contained cancer cells; i.e. tumor present in 4 out of 5 cores. This information can help determine the tumor’s overall size and aggressiveness.

A prostatectomy specimen report will describe what percent of the gland contains cancer. The prostate is made up of a central...
zone, transitional zone and peripheral zone. The pathologist will identify which zones contain cancer. If the tumor extends outside the prostate gland, this will be described as involving or extending beyond the prostate capsule (capsular involvement). If capsular involvement is present, the report may specify the percent of involvement. The pathologist examines the seminal vesicles for any tumor and reports this as well.

Your report may comment on margins. This is the area at the edge of the specimen that was submitted. When performing a cancer surgery, the surgeon attempts to remove the entire tumor and some normal tissue surrounding it. This area of "normal tissue" is important because any stray cancer cells may be included in this. If the edge (or margin) contains tumor, there may have been cancer cells left behind. The goal of surgery is to achieve a "clear margin", that is, clear of any cancer cells. In the case of a positive margin, further treatment may be required.

If a prostatectomy sample contained surrounding fat and/or lymph node(s), the pathologist will note if these tissues contain cancer cells.

**Staging**

"Staging" is used to describe and group cancers based on the size and extent of the tumor. Different staging systems are used for each type of cancer. The staging system most commonly used for prostate cancers is the American Joint Committee on Cancer (AJCC) staging system. This system utilizes the extent of the primary tumor (labeled T0-4b), the absence or presence of cancer in the lymph nodes (Nx-3), and the existence of metastasis (Mx-1b) to assign a TNM rating, which corresponds to a stage. See the article [All About Prostate Cancer](#) for complete staging information.

**Putting it all together**

In prostate cancer, both Gleason score and staging are used to determine the aggressiveness of the cancer and what treatment is needed. By understanding the basics of the report, you will be better able to discuss your treatment options with your healthcare team.

OncoLink is designed for educational purposes only and is not engaged in rendering medical advice or professional services. The information provided through OncoLink should not be used for diagnosing or treating a health problem or a disease. It is not a substitute for professional care. If you have or suspect you may have a health problem or have questions or concerns about the medication that you have been prescribed, you should consult your health care provider.