Your Lung Pathology Report

When samples are collected from your lung during a biopsy (or cytology procedure)[1], they are studied by a doctor with special training, called a **pathologist**. After testing the samples, the pathologist creates a report that details what was found, which can then be used to help manage your care.

The information here is meant to help you understand medical terms you might find in your pathology report after a lung biopsy. (If you are found to have lung cancer and have surgery to treat it, a separate pathology report would be created after testing the part of the lung that was removed. That report might contain some of the same information below, as well as other information.)

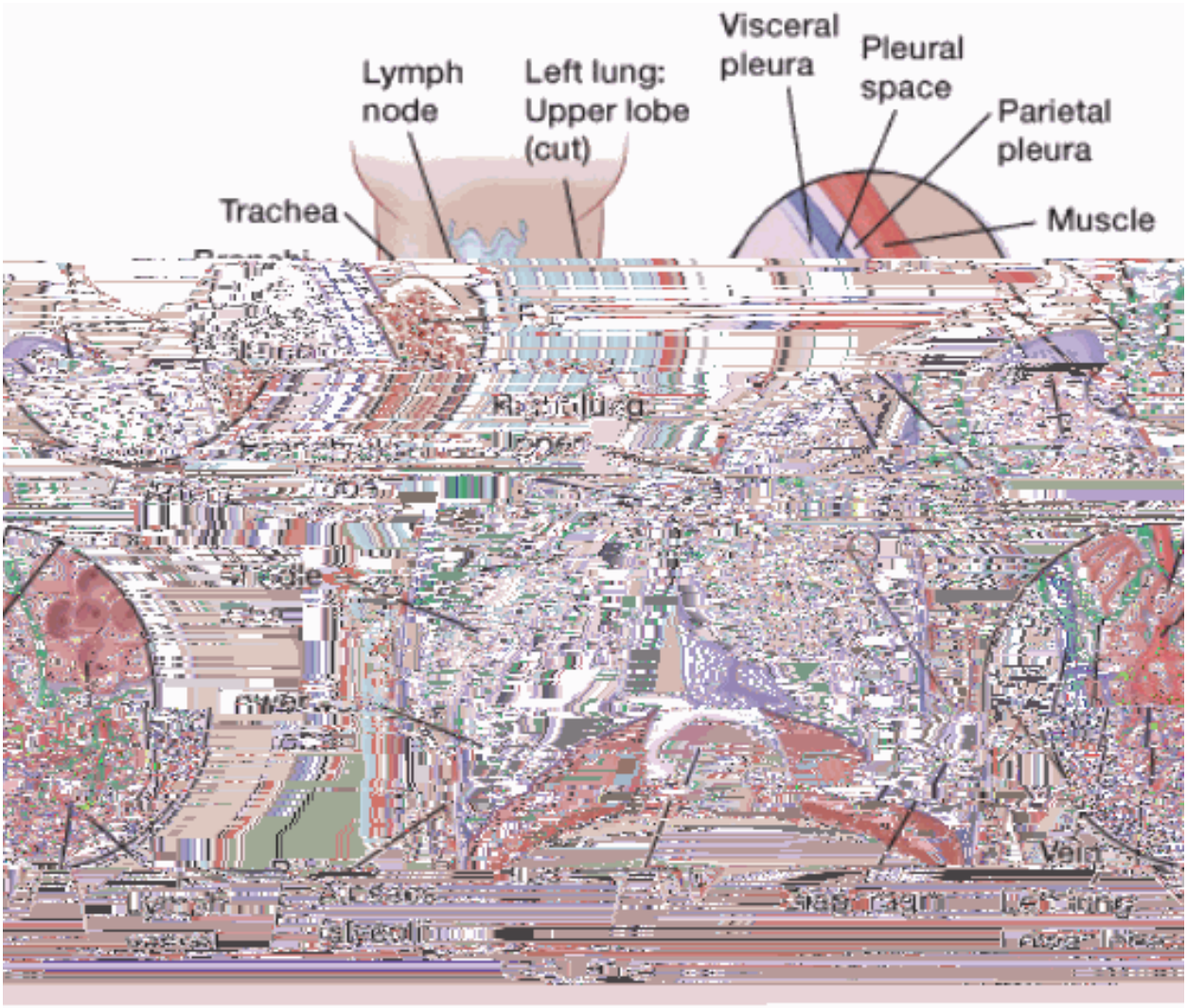
Lung pre-cancers and related conditions

These findings are not lung cancer, but some of them could become cancer if left untreated.

In-situ carcinoma (carcinoma in situ)

Carcinoma is the general medical term for a cancer that starts in the cells that line organs. Neary all lung cancers are carcinomas. In the lung, carcinomas most often start in the cells that line the inside of the bronchi, bronchioles, or alveoli, which are the

passageways inside the lung (from biggest to smallest).



If the carcinoma cells are only in the top layer of cells of the bronchi, bronchioles, or alveoli, without growing into the deeper layers below, it is called **in-situ carcinoma** or **carcinoma in situ (CIS)**. This is considered a pre-cancer, not a true lung()1e2Scinom7

- When it is the least abnormal, it is called **mild dysplasia**.
- When it is most abnormal, it is called **severe dysplasia**.
- **Moderate dysplasia** is in between the other two.

The more severe the squamous dysplasia is, the more similar it is to squamous cell carcinoma in situ (see above). If squamous dysplasia is seen on a biopsy, it might mean that there is something more serious, like in-situ or invasive carcinoma, somewhere else in the lung that wasn't sampled on this biopsy.

Lung cancer types and descriptions

Carcinoma

Carcinoma is the general medical term for a cancer that starts in the cells that line organs. In the lung, carcinomas can start in the cells that line the inside of the bronchi, bronchioles, and alveoli, which are the passageways inside the lung (from biggest to smallest). Carcinoma is by far the most common kind of lung cancer[5].

Once carcinoma cells have grown deeper than the top layers of cells in the lung passageway, the cancer is called an **invasive** or **infiltrating carcinoma**. At this point the cancer cells can spread (metastasize) outside of the lung to lymph nodes and other parts of the body. Invasive carcinomas are considered true lung cancers and not pre-cancers.

There are different types of lung carcinomas. They are named based on how the cells look under the microscope.

Squamous carcinoma or squamous cell carcinoma

Squamous carcinoma or squamous cell carcinoma is a type of non-small cell lung cancer (NSCLC) where the cells look like the flat cells (called *squamous cells*) that line the airways. It is a common type of lung cancer in the United States.

Adenocarcinoma

Adenocarcinoma is a type of non-small cell lung cancer (NSCLC) where the cells look like gland cells, such as the glands that secrete mucus in the lungs. This is the most common type of lung cancer in the United States.

If the report mentions lepidic, papillary, micropapillary, acinar, mucinous, or solid

adenocarcinoma…

These terms describe different types of lung adenocarcinoma, which are based on how the cells look and are arranged under the microscope (called *growth patterns*). Some tumors look basically the same throughout the tumor, and some look different in different areas of the tumor. Some growth patterns have a better prognosis (outlook) than others.

Since some tumors can have a mixture of patterns, the pathologist can't always tell all the types contained in a tumor just based on a biopsy that samples only a small part of the tumor. To know what types a tumor contains, the entire tumor must be removed.

Small cell carcinoma

Small cell carcinoma (also known as small cell lung cancer, or SCLC) is a type of lung cancer that starts in neuroendocrine cells, which are like nerve cells in some ways, and

changes that cause them to grow too much and form tumors. These are known as **neuroendocrine tumors** or **neuroendocrine cancers**. (Neuroendocrine cells in other parts of the body can also form tumors and cancers.)

Typical carcinoid tumors tend to be slow growing, and only rarely spread outside the lungs.

Atypical carcinoid tumors are much less common than typical carcinoids. They tend to grow a little faster and are somewhat more likely to spread to other organs. Seen under a microscope, atypical carcinoids have more cells in the process of dividing and look more like a fast-growing tumor. Some of the features of an atypical carcinoid that may be mentioned in your report include: **mitotic figures** or **mitoses** (an indication of how fast the tumor is growing) and **necrosis** (areas of the tumor that are dead).

Some carcinoid tumors can release hormone-like substances into the bloodstream, which might cause symptoms[8]. Lung carcinoids do this far less often than carcinoid tumors that start in the intestines.

To learn more about these tumors, see Lung Carcinoid Tumor[9].

Some other types of lung cancer can start in neuroendocrine cells, including smalls, inTj 0 g 0 72 417t

D2-40 (podoplanin), calretinin, WT-1, BAP-1, CEA, cytokeratin (CK) 5/6, HBME-1, Ber-EP4, TTF-1, and/or CD15 (LeuM1)

These tests are sometimes used to help tell if a tumor that includes the lining of the lung (pleura) is a mesothelioma (see above) or an adenocarcinoma of the lung.

EGFR, K-RAS, ALK, BRAF, ROS1, RET, MET, HER2, and/or NTRK

from which they arose.

The grade of the cancer is often related to how fast it is likely to grow and spread (with poorly differentiated cancers tending to grow the fastest). For many types of cancer, the grade is important in determining a person's prognosis (outlook), as well as the best treatment options.

The grade typically doesn't affect treatment options for most lung cancers. However, for the non-mucinous type of lung adenocarcinoma, the presence of more than 20% of what are considered "high-grade" (poorly differentiated) components (solid, micropapillary, cribriform, or complex glandular patterns) is linked with worse outcomes.

Tumor size

If the entire tumor has been removed, the pathologist will measure its size by looking at it (called the **gross examination**), or, if it is very small, measure it under the microscope.

Often, what is reported is how big across it is in the area where the tumor is the largest. This is called the **greatest dimension** of the tumor, as in "the tumor measured 2.2 centimeters (cm) in greatest dimension." In general, smaller tumors have a better prognosis (outlook).

A biopsy typically only samples a part of the tumor, so measurements of its overall size aren't included in a biopsy pathology report. In this case your doctor will most likely rely on tumor measurements from an imaging test such as a CT scan to help determine the stage of the cancer (see below) and how it might affect your treatment options.

Cancer stage

The stage of the cancer is a measure of the extent of the cancer, including its spread to other parts of the body.

TNM categories

The stage of a lung cancer is based on 3 main pieces of information, each of which is represented by a letter:

- **T** stands for the main (primary) **tumor** (its size and if it has grown into nearby

structures).
- **N** stands for spread to nearby lymph **nodes**.
- **M** is for **metastasis** (spread) to distant parts of the body.

Each category is assigned a number (and sometimes a lowercase letter), based on how much cancer there is (for example, T1a, N0, M0, etc.), with higher numbers (and letters) used for more advanced cancers.

Once the T, N, and M categories have been determined, they are combined to create an overall stage, which is given a number from I (1) to IV (4), sometimes followed by an uppercase letter (for example, stage IIIB). Again, higher stage numbers (and letters) mean the cancer is more advanced.

If the report is for a biopsy specimen, staging information is not usually given, because the pathologist would need to have the entire tumor and nearby lymph nodes to determine the T and N categories.

If surgery has been done to remove a lung tumor and nearby lymph nodes, the staging information is indicated by a lower-case letter “p” put before the T and N. So, in your pathology report, pT would be followed by numbers and letters based on the size of the tumor and some other information about it. pN would be followed by numbers and letters based on the extent of spread to nearby lymph nodes that may have been removed at the same time as the lung tumor.

The pathologist typically does not report the M category, as they often cannot determine whether there is spread to distant parts of the body just based on surgery to remove a lung tumor and nearby lymph nodes. The M category is often based on the results of imaging tests such as CT scans, MRIs, and PET scans, sometimes along with a biopsy of an area of suspected cancer spread.

Ask your doctor how the stage of your cancer might affect your treatment.

Vascular, lymphatic, angiolymphatic, or lymphovascular invasion

Tumors sometimes grow into small blood vessels and/or lymphatic vessels. When this is seen under the microscope it is called *vascular*, *lymphatic*, *angiolymphatic* or *lymphovascular* invasion. If cancer cells are present in these vessels, it means there is a higher chance that the cancer has spread outside the lung, although this does not always occur. Talk to your doctor about how this finding might affect your treatment.

D2-40 (podoplanin) and CD34

D2-40 and CD34 are special tests (immunohistochemical stains done on tissue slides) the pathologist might use to help identify vascular, lymphatic, lymphovascular, or angiolymphatic invasion. These tests are not always needed.

Hyperlinks

cancer care as well as editors and translators with extensive experience in medical writing.

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