

FAQS: LUNG CANCER

UNDERSTANDING YOUR PATHOLOGY REPORT: A FAQ SHEET

When your lung was biopsied, the samples taken were studied under the microscope by a specialized doctor with many years of training called a pathologist. The pathology report is used by your treating doctor to help make decisions about managing your care. This FAQ sheet is designed to help you understand the medical language used in the pathology report.

1. What is “carcinoma”?

Lung “carcinoma” is essentially synonymous with lung “cancer”. Although it is a malignant tumor, it can be curable when diagnosed early.

2. What is “infiltrating” or “invasive”?

These words mean the same. The normal lung is made of air passages (bronchi) that end in a group of blind-ending sacs (acini) where your blood gets oxygenated. Carcinomas originate in the inner lining of bronchi or acini and when they grow and break out of this inner lining, they are “invasive” or “infiltrating”, which means that the tumor cells now have the potential to spread (metastasize) to other parts of your body.

3. What does it mean if my carcinoma is called “squamous carcinoma” or squamous cell carcinoma”?

Depending on whether carcinoma begins in the bronchi (ducts) or in the acini (air-filled sacs), they may look different under the microscope. “Squamous carcinoma” or “Squamous cell carcinoma” is the name of a type of lung cancer that arises mainly from the bronchi. It is one of the most frequent types of lung cancer in Western countries.

4. What does it mean if my carcinoma is called “adenocarcinoma”?

Depending on whether carcinoma begins in the bronchi (ducts) or in the acini (air-filled sacs), they may look different under the microscope. Adenocarcinoma is the name of a type of lung cancer that arises mainly from the acini. It is one of the most frequent types



of lung cancer in Western countries and is rapidly becoming the most common form of lung cancer in these countries.

5. What does it mean if the following terms are used to describe the adenocarcinoma: “papillary”, bronchioloalveolar”, “mucinous”, “micropapillary”, or “solid”?

These terms describe different types of lung adenocarcinoma which are identified by the tumor cells’ growth in the lung when the pathologist looks under the microscope. The tumor may have a uniform microscopic appearance or sometimes there can be a mixture of microscopic patterns in the same tumor. Some growth patterns (for example, bronchioloalveolar) have a better prognosis than others (for example, micropapillary). Since some tumors may have a mixture of patterns, a definitive diagnosis of these types of cancer cannot always be established on biopsy, which samples only a small part of the tumor. A definitive diagnosis of these types of cancer can only be made once the entire tumor, removed by wedge resection, lung lobe resection (lobectomy), or lung resection (pneumonectomy), can be studied.

6. What does it mean if my carcinoma is called “small cell carcinoma”, “oat cell carcinoma”, or “small cell undifferentiated carcinoma”?

“Small cell carcinoma”, “oat cell carcinoma”, or “small cell undifferentiated carcinoma” is a very aggressive type of lung cancer that has often spread outside the lung when it is initially discovered. Therefore, it is typically not amenable to surgical excision. However, it is initially very responsive to treatment with chemotherapy and radiation. The chemotherapy regimen is usually different than that used for other (non-small cell) lung carcinomas. Typically, after a year or two, the cancer begins to grow again (recurs).

7. What does it mean if my carcinoma is called “large cell carcinoma” or “large cell undifferentiated carcinoma”?

In some cases, the cancer does not microscopically resemble squamous cell carcinoma, adenocarcinoma, small cell carcinoma, or any of the other more rare variants of lung cancer. These cancers are “undifferentiated large cell carcinoma” or “non-small cell carcinoma”. The prognosis of these tumors is better than small cell carcinoma and in general they are treated in the same way as adenocarcinoma of the lung.

8. What does it mean if my cancer is called “malignant mesothelioma”?

These are cancers that arise on the outer surface (pleura) of the lung. They are often associated with prior exposure to asbestos. Typically these tumors have a poor prognosis. Mesotheliomas can have different microscopic appearances, with some having “epithelial” features, others “spindled” or “sarcomatoid” features, and still others



“mixed epithelial and spindle cell” features. The prognosis of malignant mesothelioma does not vary significantly with its microscopic appearance, although therapy may vary.

9. What does it mean if my report says that there is “metastatic carcinoma to the lung”?

Cancers from other organs (such as the gastrointestinal tract) often spread to the lung. Even though they are in the lung, they are not primary (originating in the lung) lung cancers. For example, if an adenocarcinoma of the colon (i.e. colon cancer) spreads (metastasizes) to the lung it is not the same as a primary adenocarcinoma of the lung (see FAQ 4 above). When cancers from other sites have spread to the lung, their prognosis is significantly worsened.

10. What does it mean if my carcinoma is “well-differentiated”, “moderately differentiated”, or “poorly differentiated”?

These terms are used to indicate how aggressive your carcinoma is likely to be. They are assigned by a pathologist on the basis of the tumor’s microscopic appearance. Well-differentiated carcinomas tend to be more slowly growing, with a better prognosis. Poorly-differentiated carcinomas are the most aggressive tumors, with a worse prognosis, and moderately-differentiated carcinomas have an intermediate prognosis.

11. What does it mean if my report says “typical carcinoid” or “atypical carcinoid” tumor?

Typical carcinoid tumors are considered low grade (relatively indolent) types of lung cancer, and are not associated with smoking. Their prognosis is typically excellent. Atypical carcinoid tumors have certain microscopic features that indicate the potential for more aggressive behavior. 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 (when areas of the tumor are dead).

12. What is “vascular”, “angiolymphatic” or “lymphovascular invasion”? What if my report mentions D2-40 (podoplanin) or CD34?

Tumors can break into small vessels seen under the microscope and this is called “vascular”, “angiolymphatic” or “lymphovascular invasion”. The presence of tumor in vessels is associated with an increased risk that the tumor has spread outside the lung, although this does not always occur. Usually the first site to which lung cancers spread are the lymph nodes in the lung itself followed by lymph nodes in your chest adjacent to the lung (peribronchial, hilar, and subcarinal lymph nodes) and near the heart (mediastinal lymph nodes). Tumor spread to lymph nodes is a bad prognostic finding, as is the finding of tumor cells in other organs. D2-40 and CD34 are special tests that the pathologist may use to help identify “vascular”, “lymphovascular” or “angiolymphatic”

invasion. These tests are not necessary in every case. If your report does not mention this type of invasion, it means that it is not present. Even if it is present, your cancer could still be very curable, depending on other factors. How the presence of this finding will affect your specific treatment is best discussed with your treating doctor.

13. What is the significance of the reported size of the tumor?

The pathologist typically will measure the greatest dimension (diameter) of the tumor as seen under the microscope or if it is visible by gross (naked eye) examination. Cancers on bronchial or needle biopsy are not given a measurement because they are not accurate, sampling only a portion of the tumor. A more accurate measurement will be done on the subsequent resection of the entire tumor by wedge resection, lung lobe resection (lobectomy) or lung resection (pneumonectomy). In general, the larger the tumor, the worse the prognosis.

14. What is the significance of the stage of the tumor?

The stage of the tumor is a measurement of the extent of the tumor in the lung as well as whether there is any spread of the tumor beyond the lung. A stage is typically not given for a needle biopsy specimen because the pathologist does not have the entire tumor to evaluate. The stage is usually reported using the letters T, N, and M, where T stands for tumor, N for lymph nodes, and M for distant metastasis. A “p” before each letter stands for the “pathologic” stage assigned by the pathologist (as opposed to the clinical stage suspected by your treating physician prior to the resection of the tumor). “pT”, followed by numbers and letters, indicates the size of the tumor along with other information about the tumor, the larger the number the poorer the prognosis. “pN” followed by numbers and letters indicates the presence, if any, of tumor spread to lymph nodes (see below) that may have been removed with the resection specimen. The pathologist does not report pTM as the pathologist cannot determine whether there is spread to distant sites (ie. liver, bone) because this must usually be determined by radiographic studies. There are criteria, including information not always on the pathology report, to group TNM stages into 4 major stage groups, I to IV, correlating with increasing extent and poorer prognosis. Detailed information on Staging is present at the American Cancer Society web-site: www.cancer.org and at the American Joint Committee on Cancer web-site: www.cancerstaging.org, “staging resources”. How the stage of your tumor will affect your therapy is best discussed with your treating physician.

15. What does it mean if my report mentions special studies such as p63, cytokeratin 5/6 (CK5/6), and TTF-1?

p63, cytokeratin 5/6, and TTF-1 are special tests that the pathologist sometimes uses to help distinguish whether the cancer is adenocarcinoma or squamous cell carcinoma.

16. What does it mean if my report mentions special studies such as **CK7** (cytokeratin 7), **CK20**, **CDX2**, gross cystic duct fluid protein (GCDFP), mammaglobin, estrogen receptor (ER), progesterone receptor (PR), along with TTF-1 or PE-10?

These tests are sometimes used to help determine if a cancer in the lung is primary (ie originated in the lung) or represent a metastasis (spread) to the lung from another organ. Not all cases need these tests. Whether your report does or does not mention these tests has no bearing on the accuracy of your diagnosis.

17. What does it mean if my report mentions special studies such as CD56, chromogranin, or synaptophysin?

These tests are sometimes used to help determine if a lung cancer is a small cell carcinoma. These tests can also be used to help make the diagnosis of carcinoid or atypical carcinoid tumor.

18. What does it mean if my report mentions special studies such as mesothelin, D2-40 (podoplanin), calretinin, CEA, cytokeratin (CK) 5/6, HBME-1, Ber-EP4, TTF-1, CD15 (LeuM1), WT-1?

These tests are sometimes used to help determine whether a tumor in the lung is mesothelioma or an adenocarcinoma of the lung.

19. What does it mean if in addition to a diagnosis of cancer my report also says “atypical adenomatous hyperplasia” or “squamous dysplasia” or “squamous cell carcinoma in-situ (DCIS)”?

All of these terms are pre-cancerous conditions that the pathologist can identify under the microscope. These typically are of no importance when seen on needle biopsy if there is invasive cancer elsewhere in the biopsy specimen. If they are seen on a wedge resection, lung lobe resection (lobectomy), or lung resection (pneumonectomy) for cancer, they may be important if present at or near a margin (see FAQ 21 below).

20. What if my report mentions EGFR or K-ras?



These molecular biology tests help to determine which tumors could respond to specific types of chemotherapy. How the results of your tests will affect your therapy is best discussed with your treating physician.

21. What if my report mentions “margins” or “ink”?

When a lung carcinoma is removed (wedge resection, lung lobe resection, or lung resection, the pathologist coats the outer (peripheral) aspect of the specimen with ink, sometimes different colored ink. If tumor extends to the ink, it indicates that it has not been completely removed (it is at a surgical “margin”). However, the surgeon may have removed additional tissue at the time of surgery to guard against this possibility. The management of “invasive carcinoma”, “in-situ carcinoma” (pre-cancer), squamous dysplasia (pre-cancer), or “atypical adenomatous hyperplasia”(pre-cancer) at a margin is best discussed with your treating physician.

22. What does it mean if my report also has any of the following terms: “scarring”, “emphysema”, “emphysematous changes”, or “inflammation”?

All of these terms are non-cancerous changes that the pathologist sees under the microscope and usually are of no great importance when seen on a biopsy or resection where cancer is present.

23. What if my report mentions any of the following: “granulomas”, “methenamine silver (GMS)”, “acid fast bacilli (AFB), or Periodic Acid Schiff (PAS).

Granulomas are structures seen under the microscope that are often, although not necessarily, an indication of certain types of infection. Sometimes, the infectious organisms can be detected with special stains (i.e. GMS, stains for AFB, and PAS) that the pathologist can apply to the microscopic slides. While most granulomas are infectious, other causes will be considered by your physician, including sarcoidosis, allergic reactions, and “dust”-induced lung disease (pneumoconiosis).