NEOPLASIA
Neoplasia literally means "new growth."

A neoplasm, defined as "an abnormal mass of tissue the growth of which exceeds and is uncoordinated with that of the normal tissues and persists in the same excessive manner after the cessation of the stimuli which evoked the change."
All neoplasms depend on the host for their nutrition and blood supply.

A neoplasm is often referred to as a tumor, and the study of tumors is called oncology (from oncos, "tumor," and logos, "study of").

In oncology, the division of neoplasms into benign and malignant categories is important. This categorization is based on a judgment of a neoplasm's potential clinical behaviour.
A tumor is said to be *benign* when its microscopic and gross characteristics are considered to be relatively innocent, implying that it will remain localized, it cannot spread to other sites, and is amenable to local surgical removal; the patient generally survives. It should be noted, however, that benign tumors can produce more than localized lumps, and sometimes they are responsible for serious disease,
Malignant tumors are collectively referred to as cancers. Malignant, as applied to a neoplasm, implies that the lesion can invade and destroy adjacent structures and spread to distant sites (metastasize) to cause death.

Not all cancers pursue so deadly a course. Some are less aggressive and are treated successfully, but the designation malignant constitutes a red flag.
All tumors, benign and malignant, have two basic components: (1) the parenchyma, made up of transformed or neoplastic cells, and (2) the supporting, host-derived, non-neoplastic stroma, made up of connective tissue, blood vessels, and host-derived inflammatory cells.

The parenchyma of the neoplasm largely determines its biologic behavior, and it is this component from which the tumor derives its name.
The stroma is crucial to the growth of the neoplasm, since it carries the blood supply and provides support for the growth of parenchymal cells.

stromal cells and neoplastic cells carry on a two-way conversation that influences the growth of the tumor.
Benign tumors are designated by attaching the suffix -oma to the cell type from which the tumor arises.

A benign tumor arising in fibrous tissue is a *fibroma*; a benign cartilaginous tumor is a *chondroma*.

The nomenclature of benign epithelial tumors is more complex. They are classified sometimes on the basis of their microscopic pattern.

Others are classified by their cells of origin.
The term *adenoma* is applied to benign epithelial neoplasms producing gland patterns and to neoplasms derived from glands but not necessarily exhibiting gland patterns.

*Papillomas* are benign epithelial neoplasms, growing on any surface.

A *polyp* is a mass that projects above a mucosal surface, as in the gut, to form a macroscopically visible structure. Although this term is commonly used for benign tumors.

*Cystadenomas* are hollow cystic masses; typically they are seen in the ovary.
The nomenclature of malignant tumors essentially follows that of benign tumors, with certain additions and exceptions.

Malignant neoplasms arising in mesenchymal tissue or its derivatives are called sarcomas. A cancer of fibrous tissue origin is a fibrosarcoma, and a malignant neoplasm composed of chondrocytes is a chondrosarcoma.
Malignant neoplasms of epithelial cell origin are called *carcinomas*.

Carcinomas that grow in a glandular pattern are called *adenocarcinomas*, and those that produce squamous cells are called *squamous cell carcinomas*.

Sometimes the tissue or organ of origin can be identified, as in the designation of renal cell adenocarcinoma or cholangiocarcinoma, which implies an origin from bile ducts.
Sometimes the tumor shows little or no differentiation and must be called *poorly differentiated or undifferentiated carcinoma.*

The tumor cells may undergo *divergent differentiation,* creating so-called *mixed tumors.* The best example is mixed tumor of salivary gland. These tumors have obvious epithelial components dispersed throughout a fibromyxoid stroma,
Benign neoplasms are composed of well-differentiated cells that closely resemble their normal counterparts. A lipoma is made up of mature fat cells laden with cytoplasmic lipid vacuoles, and a chondroma is made up of mature cartilage cells that synthesize their usual cartilaginous matrix—evidence of morphologic and functional differentiation. In well-differentiated benign tumors, mitoses are extremely scant in number and are of normal configuration.
Malignant neoplasms are characterized by a wide range of parenchymal cell differentiation, from surprisingly well differentiated to completely undifferentiated. For example, well-differentiated adenocarcinomas of the thyroid may contain normal-appearing follicles. Such tumors sometimes may be difficult to distinguish from benign proliferations. Between the two extremes lie tumors loosely referred to as *moderately well differentiated*. 
Malignant neoplasms that are composed of undifferentiated cells are said to be *anaplastic*.

Lack of differentiation, or anaplasia, is considered a hallmark of malignancy. The term *anaplasia* literally means loss of the structural and functional differentiation of normal cells.
A benign neoplasm remains localized at its site of origin. It does not have the capacity to infiltrate, invade, or metastasize to distant sites, as do malignant neoplasms.

For example, as fibromas and adenomas slowly expand, most develop an enclosing fibrous capsule that separates them from the host tissue.
It should be emphasized, however, that *not all benign neoplasms are encapsulated*. For example, the leiomyoma of the uterus is discretely demarcated from the surrounding smooth muscle by a zone of compressed and attenuated normal myometrium, but there is no well-developed capsule.
Cancers grow by progressive infiltration, invasion, destruction, and penetration of the surrounding tissue.

The infiltrative mode of growth makes it necessary to remove a wide margin of surrounding normal tissue when surgical excision of a malignant tumor is attempted.
The term *metastasis* means the development of secondary implants discontinuous with the primary tumor, in remote tissues. *The properties of invasiveness and, even more so, metastasis, identify a neoplasm as malignant than any of the other attributes of a tumor.*

- Not all cancers have the ability to metastasize
Malignant neoplasms disseminate by one of three pathways:

(1) seeding within body cavities.

(2) lymphatic spread, or

(3) hematogenous spread.
Spread by seeding:

- occurs when neoplasms invade a natural body cavity. This mode of dissemination is particularly characteristic of cancers of the ovary, which often cover the peritoneal surfaces widely.
Lymphatic spread

- is more typical of carcinomas, whereas hematogenous spread is favored by sarcomas. There are numerous interconnections, however, between the lymphatic and vascular systems, and so all forms of cancer may disseminate through either or both systems.
The pattern of lymph node involvement depends principally on the site of the primary neoplasm and the natural pathways of lymphatic drainage of the site.

Carcinoma of the breast usually arises in the upper outer quadrant and first spreads to the axillary nodes.
Hematogenous spread

- is the most feared consequence of a cancer. It is the favored pathway for sarcomas, but carcinomas use it as well. As might be expected, arteries are penetrated less readily than are veins. With venous invasion, the blood-borne cells follow the venous flow draining the site of the neoplasm, with tumor cells often stopping in the first capillary bed they encounter.
Since all portal area drainage flows to the liver, and all caval blood flows to the lungs, the liver and lungs are the most frequently involved secondary sites in hematogenous dissemination.
The End