LEC 9

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Neoplasia, Neoplasm, Tumor

Neoplasia

- Neoplasia means 'new growth.'
- It is an abnormal and uncontrolled proliferation of cells.
- The growth continues even if the original stimulus is removed.
- It forms the basis of tumor development.

Neoplasm

- A neoplasm is the final product of neoplasia.
- It refers to a new mass of tissue (a tumor).
- It can be benign or malignant.
- It grows independently and autonomously.

Tumor

- The word 'tumor' means swelling or mass.
- It is not always related to cancer.
- Swelling may be due to inflammation or fluid accumulation.
- In modern medicine, it often refers to a neoplasm.

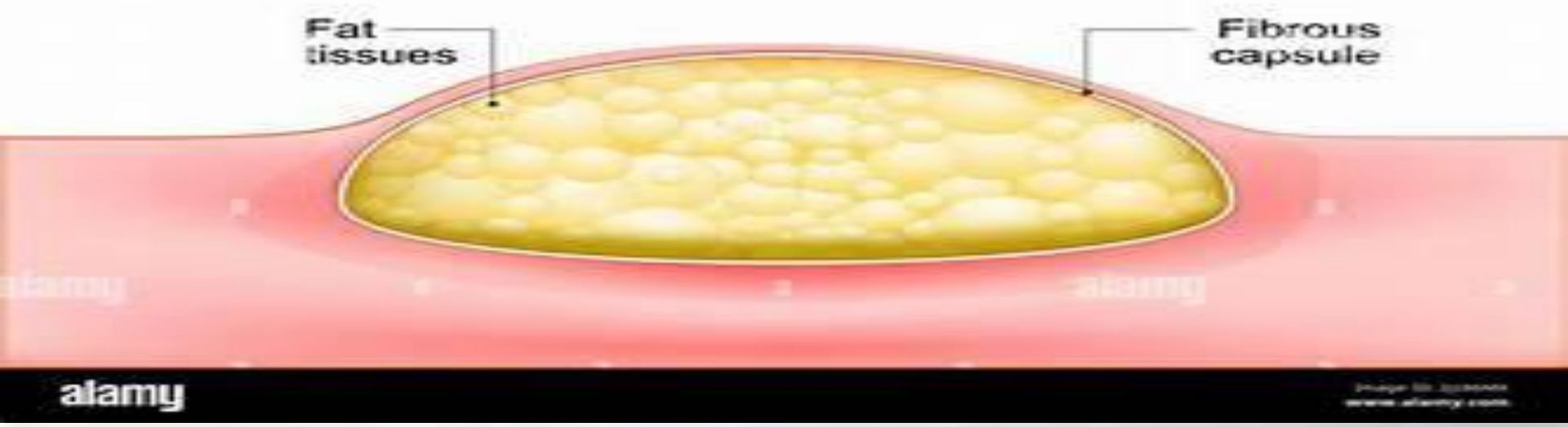
Classification of Neoplasms

- Benign tumors.
- Malignant tumors.
- Classification depends on behavior, appearance, spread, and complications.

Benign Tumors

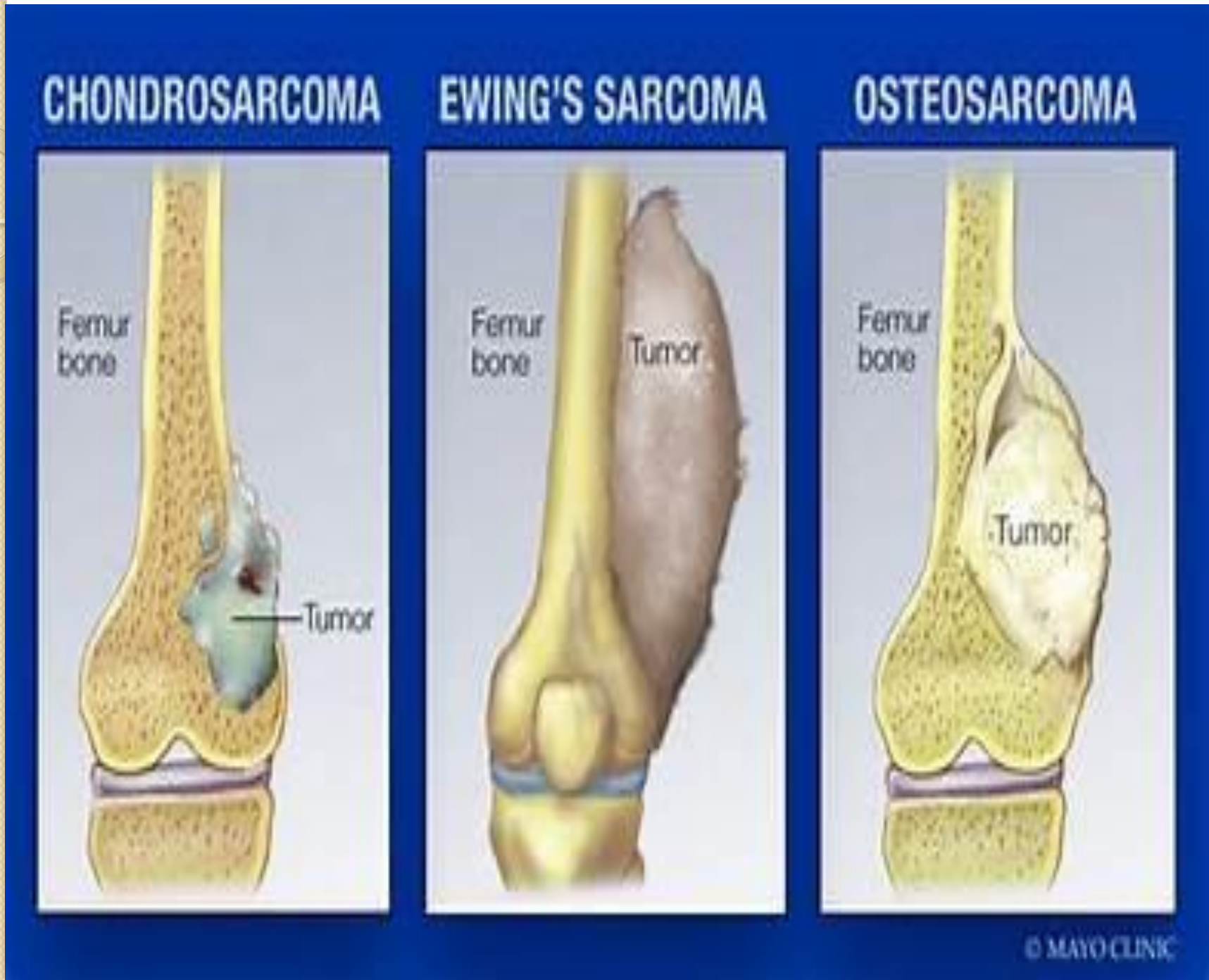
- Slow growth.
- Do not spread to other parts of the body.
- Often well circumscribed or encapsulated.
- Example: Lipoma (fatty tumor).

Lipoma



Malignant Tumors

- Rapid and uncontrolled growth.
- Invade surrounding tissues.
- May spread to distant sites (metastasis).
- Examples: Carcinoma, Sarcoma.


CHONDROSARCOMA
Femur bone
Tumor
EWING'S SARCOMA
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OSTEOSARCOMA
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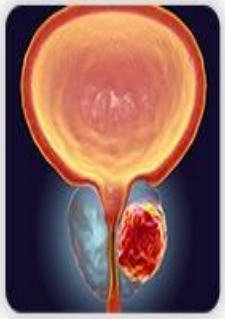
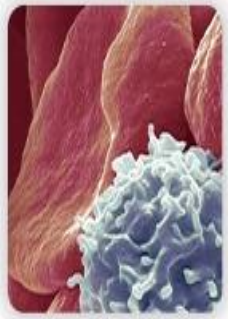
Tumor
© MAYO CLINIC

COLORECTAL CANCER

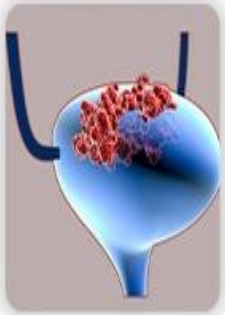


PROSTATE CANCER



LEUKEMIA CANCER

PANCREATIC CANCER



BLADDER CANCER

LUNG CANCER

OVARIAN CANCER

BREAST CANCER

Cancer Care Pune

TYPES OF CANCER

Basics of Tumor Nomenclature

- Most benign tumors end with the suffix '-oma.'
- Carcinoma: malignant tumor of epithelial origin.
- Sarcoma: malignant tumor of connective tissue.
- Leukemia/Lymphoma: malignant tumors of blood and lymphoid tissues.

Examples of Tumor Names

- Fibroma: benign tumor of fibrous tissue.
- Fibrosarcoma: malignant tumor of fibrous tissue.
- Adenoma: benign tumor of glandular tissue.
- Adenocarcinoma: malignant tumor of glandular tissue.

Characteristics of Tumors

- Differentiation: How similar tumor cells are to normal cells.
- Rate of Growth: Benign tumors grow slowly; malignant tumors grow rapidly.
- Invasion: Malignant tumors invade surrounding tissues; benign do not.
- Metastasis: Ability of malignant tumors to spread to distant sites.
- Recurrence: Malignant tumors have higher risk of returning after removal.

Grading and Staging of Cancers

- Grading: Evaluation of tumor differentiation and aggressiveness.
- Staging: Assessment of tumor spread in the body.
- Both guide prognosis and treatment

Grading of Tumors

- Reflects how much tumor cells resemble normal tissue.
- Based on cytologic atypia and architectural disruption.
- Well-differentiated → Low grade.
- Moderately differntiated→intermediate grade
- Poorly differentiated → High grade.
- Indicates biological aggressiveness.

- • Grade 1 (Well differentiated): Cells resemble normal tissue; mild atypia; low mitotic activity.
- • Grade 2 (Moderately differentiated): Moderate loss of differentiation and architecture; noticeable atypia; moderate mitoses.
- • Grade 3 (Poorly differentiated): Marked atypia; high mitotic index; disorganized growth.
- • Grade 4 (Undifferentiated/Anaplastic): No resemblance to normal tissue; extreme atypia; very aggressive.

Common Grading Systems

- Broders system (based on differentiation).
- Nuclear grading systems.
- Organ-specific grading:
  - Breast: Nottingham (tubules, pleomorphism, mitoses)
  - Prostate: Gleason score
  - Soft tissue sarcomas: FNCLCC system

Staging of Tumors

- Determines tumor size, nodal involvement, metastasis.
- Strongly correlates with patient survival.
- Essential for treatment planning.

TNM Staging System

- T: Primary tumor size and extent.
- N: Regional lymph node involvement.
- M: Presence of distant metastasis.
- Combined into stages I–IV.

Stage Groupings

- Stage I: Localized tumor.
- Stage II–III: Increasing local and regional spread.
- Stage IV: Distant metastasis.
- Higher stage → worse prognosis.

Organ-Specific Grading Systems

- Breast (Nottingham): Tubule formation, nuclear pleomorphism, mitotic count.
- Prostate (Gleason Score): Based on glandular architecture; scores 6–10.
- Soft Tissue Sarcoma (FNCLCC): Differentiation, mitotic index, necrosis.
- SCC: Based on keratinization and atypia.

An Ending

Is Not The End