Cancer Grading and Staging

1. The stage of the cancer describes the size of the tumor and how far it has spread from where it originated.
2. Grade describes the appearance of the cancerous cells.
3. Staging and grading of cancer allows the doctor to determine its size and whether it has spread and the best treatment possible.

Cancer Stages

Stage 0	Cancer is where it started and it hasn't spread
Stage 1	Cancer is small and it hasn't spread
Stage 2	Cancer has grown but hasn't spread

Stage 3	Cancer is larger and may have spread to the surrounding tissues and/ or lymph nodes
Stage 4	Cancer has spread from where it started to at least one other body organ also known as secondary or metastatic cancer.

TNM (Tumor-Node-Mteastasis) Classification

1. Its a widely used staging system accepted ny the Union of International Cancer Control(UICC) and the American Joint committee on cancer (AJCC)

T	Size of Primary tumor

N	Amount of spread to nearby lymph nodes
M	Presence of metastasis

2. Metastasis is the spread of cancer tumors to other parts of the body forming tumors known as secondary tumors or metastatic tumor.
3. A number is added to each letter to indicate the size of the primary tumor and the degree of cancer spread

TX	Primary tumor cannot be evaluated
T0	No evidence of Primary tumor

Tis	Carcinoma in situ(abnormal cells are present but not have spread to neighboring tissue. Although not cancer CIS may become cancer and is sometimes called pre invasive cancer.
T1,T2,T3,T4	Size and/or extent of primary tumor
NX	Regional lymph nodes cannot be evaluated
N0	No regional lymph node involvement

N1,N2,N3	Degree of lymph node involvement(number and location of lymph nodes)
MX	Distant metastasis cannot be evaluated
M0	No distant metastasis
M1	Distant metastasis is present

Examples

1. Breast cancer: T3 N2 M0 refers to a large tumor that has spread outside the breast ti nearby lymph nodes but not to other parts of the body.
2. Prostate cancer T2 N0 M0 means that the tumor is located only in the prostate and has not spread to any other part of the body.
3. For many cancers, TNM combinations

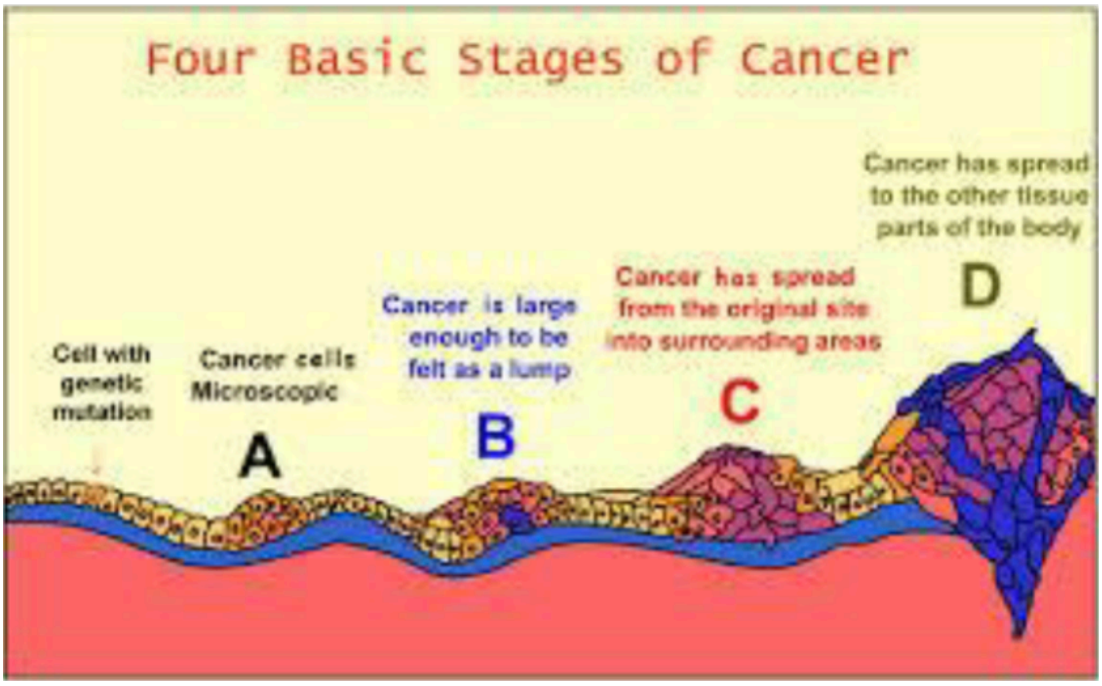
correspond to one of the five stages that differ among different cancers. Ex: bladder cancer T3 N0 M0 is stage 3 whereas colon cancer T3 N0 M0 is stage 2.

4. Cancers of the Brain and spinal cord do not have TNM designation and are staged according to their cell type and grade. Different staging systems are also used for leukemias and lymphomas.

Tests done for staging

1. Physical exams
2. X-rays, CT scans, PET scans, MRI scans
3. Blood, Urine tests where cancer biomarkers molecule indicate the presence of cancer.
4. Pathology of tumor biopsy(examination of a tissue sample under microscope) and cytology(study of cells from tumors) on blood sample

5. Surgical reports



Cancer Grades

1. The grade of cancer depends on what the cell looks like under a microscope.

Lower Grade		Slower- growing cancer
Higher Grade		Faster-growing cancer
GX	Grade cannot be assessed (undetermined grade)	

G1	Well differentiated(low grade)	Cancer cells that resemble normal cells and aren’t growing rapidly
G2	Moderately differentiated(intermediate grade)	Cancer cells that don’t look like normal cells and are growing faster than normal cells

G3	Poorly differentiated(high grade)	Cancer cells that look abnormal and may grow or spread more aggressively.
G4	Undifferentiated (high grade)	

Normal cell	Cancer cell
Large cytoplasm	Small cytoplasm
Single nuclei	Multiple nuclei
Single nucleolus	Multiple and large nucleoli
Fine chromatin	Coarse chromatin