Tumor Markers

Tumor markers are certain chemical substances in the body, which are associated with cancer cells or are produced in excessive quantities in cancer.

Utility:

(1) Cancer screening
(2) Diagnosis & staging of cancer
(3) Asessment of tumor load
(4) Choosing treatment modality
(5) Follow up
(6) Detection of recurrence

Detection/ measurement:
ELISA, RIA

Examples:

Category	**Tumor marker**	**Associated cancer**
Oncofetal antigen	AFP	HCC, Germ Cell Tumors
	CEA	Colorectal cancer, Other GI cancers, Ca Breast, Ca Lung
Hormone	HCG	Germ Cell Tumors
	Ectopic hormones	Various (esp SCLC)
	Calcitonin	Medullary Ca Thyroid
Enzyme	LDH	NHL, Germ Cell Tumors
	Prostatic Acid Phosphatase	Ca Prostate
	Neuron Specific Enolase	Neuroblastoma
Tumor-associated protein	Prostate Specific Antigen	Ca Prostate
	CA-125	Ca Ovary, Ca Breast, Other gynaecologic cancers
	CA-72.4	GI cancers
	CA-19.9	Ca Pancreas, Other GI cancers
	Ca-15.3	Ca Breast
Immunoglobulines		Multiple myeloma

Immunotherapy

Active→ Non-specific→BCG
Specific→ Cancer vaccines
Passive→ Monoclonal antibodies
Adoptive→TIL infusions, LAK cell infusions, IL-2
Restorative→ Levamisole
Cytomodulatory→ IFN

Cancer Screening

Cancer	Starting Age	Modality	Frequency	When to stop
Ca Cervix	Within 3 years of onset of sexual activity; Latest by age 21 years	Pap smear	Annual	May be done every 3 years if 3 consecutive negative results; May be stopped at age 70 or after TAH+BSO for benign disease; Continue life long for patients with h/o ca cervix or CIN
Ca Colon & Rectum	Age 50 years; earlier in high-risk cases	Stool for FOBT Flexible sigmoidoscopy Colonoscopy	Annual Every 3 years Every 10 years	
Ca Prostate	Age 50 years; earlier in high risk cases, such as African-Americans, positive family history (age 45 years)	Serum PSA DRE	Annual	
Ca Breast	Age 20 years Age 40 years (earlier in high-risk cases, eg BRCA1/BRCA2 positive OR family history of Ca Breast)	BSE CBE Mammography	Monthly Every 6-12 months Annual	Age 70 years