



Tumor Markers

What are they?

- They are substances produced by the body in response to cancer growth or by cancer tissue itself.
- Found in the blood, urine, or body tissues.
- Can be produced directly by the tumor or by non-tumor cells as a response to the presence of a tumor.

Classification

1. Cancer-related markers:

- They are related to the presence of certain cancerous growth in tissue.
- There is a large overlap between the many different tumor tissue types and the markers. so these markers might not be specific in making a diagnosis.
- Examples of these markers are CEA, CA19-9, CA125.

2. Tissue-specific markers:

- Tissue-specific markers are related to specific tissues which have developed cancer.
- Examples include PSA, beta-HCG – (Human chorionic gonadotropin).

Why are they done?

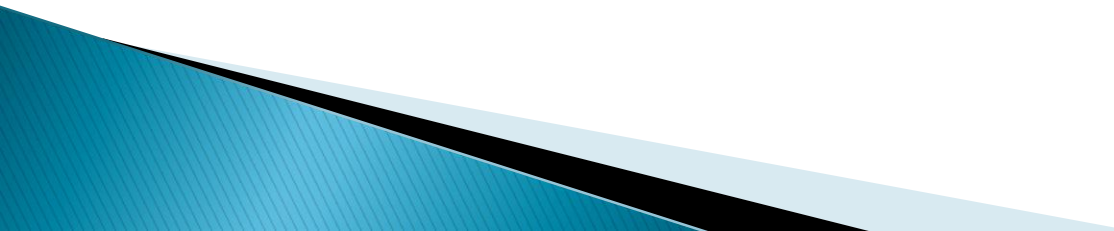
- May used in people with a strong family history of a particular cancer. PSA testing may used to screen for prostate cancer.
- Help in the Diagnosis In a person who has symptoms, tumor markers may be used to help identify the source of the cancer, such as CA-125 for ovarian cancer, and to help differentiate it from other conditions.

- ▶ Remember that tumor markers cannot diagnose cancer by themselves but aid in this process.

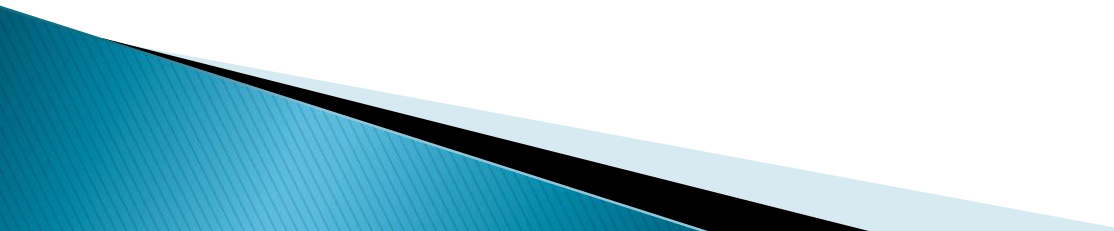
Guide Treatment.

- A few tumor markers, such as Her2/neu, will give doctors information about what treatments their patients may respond to (for instance, breast cancer patients who are Her2/neu positive are more likely to respond to Herceptin treatment)trastuzumab.

Monitor Treatment.

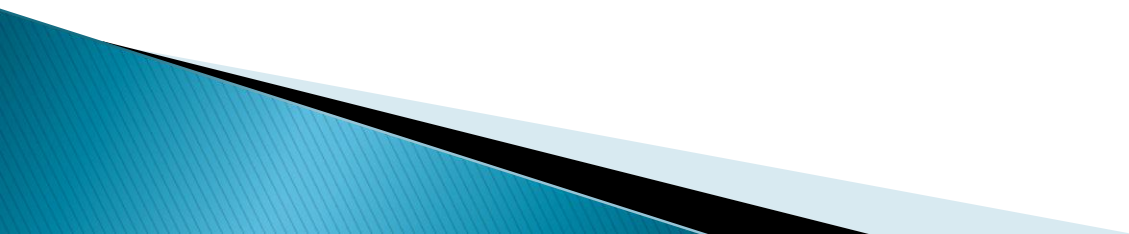
- if the marker level drops, the treatment is working;
 - The information must be used with care, however, since other conditions can sometimes cause tumor markers to rise or fall.
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Determine Recurrence

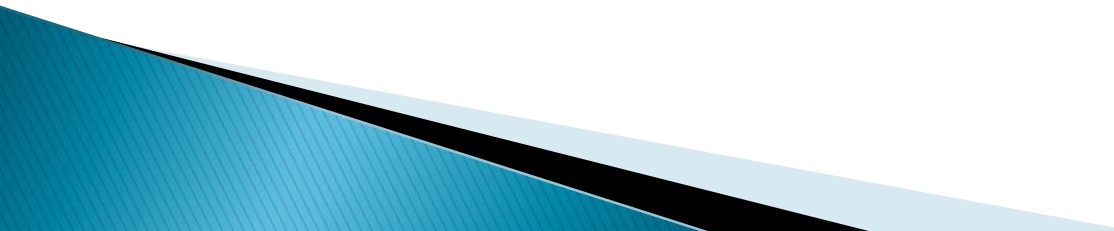
- ▶ If a tumor marker is elevated before treatment, low after treatment, and then begins to rise over time, then it is likely that the cancer is returning. (If it remains elevated after surgery, then chances are that not all of the cancer was removed.)
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Examples.....

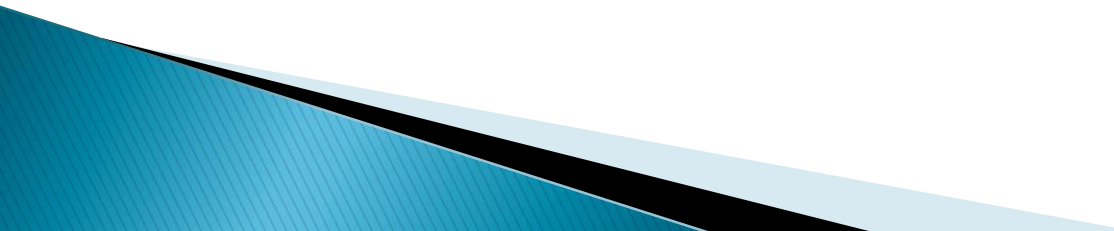
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Alpha-fetoprotein (AFP)

- Alpha-Fetoprotein is a normal fetal serum protein synthesized by the liver, and yolk sac.
 - AFP can help diagnose and guide the treatment of liver cancer (hepatocellular carcinoma).
 - also mild elevated in acute and chronic hepatitis– germ cell tumors– normal pregnancy.
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Carcinoembryonic antigen (CEA)

- ▶ CEA is not used to diagnose or screen for colorectal cancer, but it is the preferred tumor marker to help predict outlook in patients with colorectal cancer.
 - ▶ CEA is also the standard marker used to follow patients with colorectal cancer during and after treatment.
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- ▶ Cancer patients whose CEA blood tests rise at the beginning of chemotherapy and then fall (CEA flare) do better than patients with a consistently rising CEA.

Prostate-specific antigen

- ▶ Is a protein (It is a serine protease) produced by the cells of the prostate gland.
- ▶ present in small quantities in the serum of men with healthy prostates, but is often elevated in the presence of prostate cancer.

CA 125

- CA125 is an antigen present on 80 percent of nonmucinous ovarian carcinomas.

CA19-9

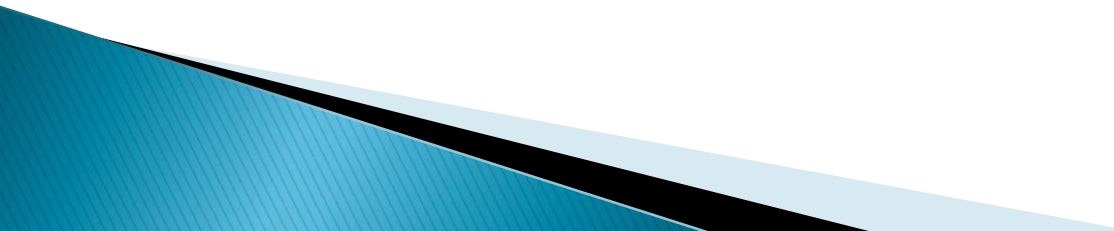
- ▶ CA19-9 is a monoclonal antibody generated against a colon carcinoma cell line .
- ▶ It is found it to be elevated in ~40 percent of cases of gastric cancer.
- ▶ ~40 percent of colon cancer, and ~90 percent of pancreatic cancer.
- ▶ Has been proposed to differentiate benign from malignant pancreatic disease.

- ▶ Carcinoid syndrome is confirmed by measuring elevated concentrations of 5-hydroxyindoleacetic acid (5-HIAA), a metabolite of serotonin, in a 24-hour urine collection

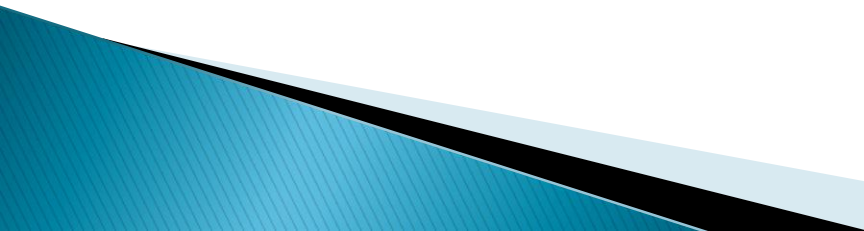
Human Chorionic Gonadotropin

- ▶ HCG is a hormone normally produced by the syncytiotrophoblastic cells of the placenta and is elevated in pregnancy.
- ▶ Its used as a tumor marker for gestational trophoblastic disease and germ cell tumors.

Breast ca

- ▶ Oestrogen (ER) and progesterone (PR) receptors. Positive results indicate that the tumour may be sensitive to hormonal manipulation.
 - ▶ HER2 receptor. Breast cancers that have high levels of expression of HER2 indicate that the tumour may respond to trastuzumab (Herceptin), an antibody directed against
 - ▶ the HER2 receptors.
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Acid Phosphatase

- ▶ This enzyme is found in high concentrations in the normal prostate as well as in primary and metastatic prostate cancers.
 - ▶ It may also be elevated in up to 6 percent of cases of benign prostatic hypertrophy and other conditions.
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Alpha-fetoprotein (AFP)

- ▶ Ovarian germ cell tumours.
- ▶ testicular teratoma.
- ▶ hepatocellular cancer.

Beta-2-microglobulin

- ▶ Non hodgkin lymphoma, myeloma.

CA 19-9 (Cancer antigen 19-9)	Pancreatic, sometimes colorectal and bile ducts
CA-125 (Cancer antigen 125)	Ovarian
Calcitonin	Thyroid medullary carcinoma

Thank you

