Tumor Marker Tests

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Tumor markers are substances that can be detected in higher than normal amounts in the blood, urine, or body tissues of some people with certain types of cancer. A tumor marker may be produced by the tumor itself, or by the body in response to a cancer presence. When diagnosing cancer, blood and pieces of tumor tissue are tested, These tests help to determine the characteristics of the tumor (aggressiveness, rate of growth, and degree of abnormality). Tests for tumor markers may be used with other tests or x-rays to detect and diagnose some cancers.

Tumor markers may be proteins, antigens, or hormones. Tumor markers tests are not used alone in diagnosis because most markers can be found in elevated levels in people who have benign conditions, and because no tumor marker is specific to a particular cancer. Not every tumor will cause an elevation in the tumor marker test, especially in the early stages of cancer. Physicians can use changes in tumor marker levels to follow the course of the disease, to measure the effect of treatment, and to check for recurrence.

Listed on the next page are several different tumor markers for certain types of cancer. They are listed in alphabetical order. Certain tumor markers are simply more accurate than others in their sensitivity to detection of cancer. The more sensitive they are, the earlier it is possible to diagnose. Normal levels differ between people and between laboratories. The values listed on the chart are the normals established at The University of Iowa Hospitals and Clinics. Your physician is the best person to consult if you have concerns about your specific test level.

Abbreviation Guide

ml: milliliter
ng: nanogram
pg: picogram
ug: microgram
u/l: units per liter
U: International Unit
>: greater than
<: less than
≤: less than or equal to

Tumor Marker	Primary Cancer Site	Secondary Cancer Site (>50%)	False Positives	Other Benign Diseases Detected	Normal Values
Antidiuretic Hormone (ADH)	Small cell lung cancer, adenocarcinoma		Inappropriate secretion assoc. w/pneumonia	porphyria	1-5 pg/ml
Alpha-feto protein (AFP)	Liver, germ cell cancer of ovaries or testis		Pregnancy	cirrhosis, hepatitis, toxic liver injury, inflammatory bowel disease	0-6.4 IU/ml in men and nonpregnant women
BTA (Bladder Tumor Antigen)	Bladder		Recent invasive procedure, Infection Genitourinary tract, Cancer of kidney, ureters		Not detected

CA15-3 (carbohydrate antigen 15-3)	Breast	Often not elevated in early stages of breast cancer		benign breast & liver cancer	< 31 U/ml
CA19-9	Pancreas, colorectal			pancreatitis, ulcerative colitis, inflammatory bowel disease	< 33 U/ml
CA125	Ovarian	Breast, Colorectal	Pregnancy, menstration	endometriosis, ovarian cysts, fibroids, inflammatory bowel disease, cirrhosis, peritonitis, pancreatitis	0-35 U/ml
Calcitonin	Thyroid medullary carcinoma	Ectopic calcitonin-producing tumors (rare)			Basal: ≤ 0.155 ng/ml for men ≤ 0.105 ng/ml for women
Carcinoembryonic antigen (CEA)	Colon, Lung	Ulcerative cancer, Breast, Ovarian	Cigarette smoking *About 5% of the population has above normal CEA*	pancreatitis, hepatitis, COPD, lung infection, inflammatory bowel disease, biliary obstruction	< 3 ng/ml in non-smokers < 5 ng/ml in smokers
Creatin-kinase-BB	Breast, ovary, colon, prostate			renal failure, bowel infarction, stroke	40-200 u/l in men 35-150 u/l in women
hCG (human chorionic gonadotropin)	Trophoblastic disease	Germ cell tumors	Pregnancy, marijuana smoking, testicular failure	duodenal ulcers, cirrhosis, inflammatory bowel disease, benign breast, lung, pancreas, ovary, or GI cancer	> 31 U/ml
Lactic dehydrogenase (LDH)	Lymphoma, seminoma, acute leukemia, metastatic carcinoma			hepatitis, myocardial infarction	100-210 u/l
Neuron-specific enolase (NSE)	Neuroblastoma, small cell lung cancer				< 13 ng/ml

NMP 22	Bladder		Recent invasive procedure, Chemotherapy, Infection genitourinary tract, Benign genitourinary disease, renal or bladder stones		<10
Prostatic acid phosphatase (PAP)	Metastatic cancer of prostate, myeloma, lung cancer, osteogenic sarcoma			prostatitis, nodular prostatic hypertrophy	0.5-1.9 u/l
Prostate specific antigen (PSA)	Prostate			benign prostatic hypertrophy, nodular prostatic hyperplasia, prostatitis	< 4 ng/ml

This information is written primarily **for patients.**