

Oncology is a branch of medicine that deals with the prevention, diagnosis, and treatment of cancer.

A medical professional who practices oncology is an oncologist.

Cancer survival has improved due to three main components including improved prevention efforts to reduce exposure to risk factors (e.g., tobacco smoking and alcohol consumption), improved screening of several cancers (allowing for earlier diagnosis), and improvements in treatment.

Cancers are often managed through discussion on multi-disciplinary cancer conferences where medical oncologists, surgical oncologists, radiation oncologists, pathologists,

radiologists, and organ-specific oncologists meet to find the best possible management for an individual patient considering the physical, social, psychological, emotional, and financial status of the patient.

It is very important for oncologists to keep updated with respect to the latest advancements in oncology, as changes in the management of cancer are quite common.

Risk factors

Tobacco

Tobacco is the leading cause of cancer and death from cancer.

Smoking is associated with increased risk of cancers of the lung, larynx, mouth, esophagus, throat, bladder, kidney, liver, stomach, pancreas, colon, rectum, cervix and acute myeloid leukemia.

Smokeless tobacco (snuff or chewing tobacco) is associated with increased risks of cancers of the mouth, esophagus, and pancreas.

Alcohol

Can increase the risk of cancer of the mouth, throat, esophagus, larynx, liver, and breast. The risk of cancer is much higher for those who drink alcohol and also use tobacco.

Obesity

Obese individuals have an increased risk of cancer of the breast, colon, rectum, endometrium, esophagus, kidney, pancreas, and gallbladder.

Age

Advanced age is a risk factor for many cancers. The median age of cancer diagnosis is 66 years.

Screening

Screening is recommended for cancers of breast, cervix, colon, and lung.

Signs and symptoms

Signs and symptoms usually depend on the site and type of cancer.

Breast cancer - Lump in breast and axilla associated with or without ulceration or bloody nipple discharge.

Endometrial cancer - Bleeding per the vagina.

Cervical cancer - Bleeding after sexual intercourse.

Ovarian cancer - Nonspecific symptoms such as abdominal distension, dyspepsia.

Lung cancer - A persistent cough, breathlessness, blood in the sputum, hoarseness of voice.

Head and neck cancer - Non-healing ulcer or growth, lump in the neck.

Brain cancer - A persistent headache, vomiting, loss of consciousness, double vision.

Thyroid cancer - Lump in the neck.

Esophageal cancer - Painful swallowing predominantly with solid food, weight loss.

Stomach cancer - Vomiting, dyspepsia, weight loss.

Colon & rectal cancer - Bleeding per rectum, alteration of bowel habits.

Liver cancer - Jaundice, pain and mass in right upper abdomen.

Pancreatic cancer - Weight loss, jaundice.

Skin cancer - Non-healing ulcer or growth, mole with a sudden increase in size or irregular border, induration, or pain.

Kidney cancer - Blood in the urine, abdominal lump.

Bladder cancer - Blood in urine.

Prostate cancer - Urgency, hesitancy, and frequency while passing urine, bony pain.

Testicular cancer - Swelling of the testes, back pain, dyspnoea.

Bone cancer - Pain and swelling of bones.

Lymphoma - Fever, weight loss more than 10% body weight in preceding 6

months and drenching night sweats which constitute the B symptoms, lump in neck, axilla or groin.

Blood cancer - Bleeding manifestations including bleeding gums, bleeding from the nose, blood in vomitus, blood in sputum, blood-stained urine, black colored stools, fever, lump in neck, axilla, or groin, lump in the upper abdomen.

Diagnosis and staging

Diagnostic and staging investigations depend on the site and type of malignancy.

Blood cancer

Blood investigations including hemoglobin, total leukocyte count,

platelet count, peripheral smear, red cell indices.

Bone marrow studies

Lymphoma

Excision biopsy of a lymph node for histopathological examination

Imaging tests such as computerized tomography (CT), positron emission tomography (PET CT).

Bone marrow biopsy

Solid tumors

Biopsy for histopathology and immunohistochemistry.

Imaging tests like X-ray, ultrasonography, computerized tomography (CT), magnetic resonance imaging (MRI) and PET CT.

Endoscopy including Nasopharyngoscopy, Direct & Indirect Laryngoscopy, Upper Gastrointestinal Endoscopy, Colonoscopy, Cystoscopy.

Treatment

Treatment depends on the site and type of cancer.

Solid tumors

Breast cancer

Treatment options include surgery, radiation, chemotherapy, hormonal therapy, and targeted therapy.

Cervical cancer

Treatment options include radiation, surgery, and chemotherapy.

Endometrial cancer

Treatment options include surgery, radiation, and chemotherapy.

Ovarian cancer

Treatment options include surgery, chemotherapy, and targeted therapy (VEGF inhibitors).

Lung cancer

Treatment options include surgery, radiation, chemotherapy, and targeted therapy (EGFR & ALK inhibitors).

Head & Neck Cancer

Treatment options include surgery, radiation, chemotherapy, and targeted therapy (EGFR inhibitors).

Brain cancer

Treatment options include surgery, radiation, chemotherapy, and targeted therapy (VEGF inhibitors).

Thyroid cancer

Treatment options include surgery and radioactive iodine.

Esophageal cancer

Treatment options include radiation, chemotherapy, and surgery.

Stomach cancer

Treatment options include chemotherapy, surgery, radiation, and targeted therapy.

Colorectal cancer

Treatment options include surgery, chemotherapy, and targeted therapy (EGFR & VEGF inhibitors).

Liver cancer

Treatment options include surgery, Trans-arterial chemotherapy (TACE), Radio-frequency ablation (RFA), and multi-kinase (Sorafenib).

Pancreatic cancer

Treatment options include surgery, radiation, and chemotherapy.

Skin cancer

Treatment options include surgery, radiation, targeted therapy.

Kidney cancer

Treatment options include surgery, multi-kinase inhibitors, and targeted therapy.

Bladder cancer

Treatment options include surgery, radiation, and chemotherapy.

Prostate cancer

Treatment options include surgery, radiation, chemotherapy, anti-androgens, and immunotherapy.

Testicular cancer

Treatment options include surgery, chemotherapy, and radiation.

Bone cancer

Treatment options include surgery, chemotherapy, and radiation.

Lymphoma

It includes Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL)

Hodgkins lymphoma (HL)

Chemotherapy with ABVD or BEACOPP regimen and Involved field radiation therapy (IFRT).

Non-Hodgkins lymphoma (NHL)

Chemo-immunotherapy (R-CHOP) for B cell lymphomas, and chemotherapy (CHOP) for T cell lymphomas.

Blood cancer

Includes acute and chronic leukemias. Acute leukemias include acute lymphoblastic leukemia (ALL), and acute myeloid leukemia (AML).

Chronic leukemias include chronic lymphocytic leukemia (CLL), and chronic myeloid leukemia (CML).

Acute lymphoblastic leukemia (ALL)

Intensive chemotherapy phase for initial 6 months and maintenance chemotherapy for 2 years.

Prophylactic cranial and stem cell transplantation for high-risk patients.

Acute myeloid leukemia (AML)
Induction with chemotherapy followed by consolidation.

Stem cell transplantation for high-risk patients.

Chronic lymphocytic leukemia (CLL):
Chemo-immunotherapy (FCR or BR regimen) for symptomatic patients.

Chronic myeloid leukemia (CML)

Targeted therapy as first-line treatment.

Specialties

The three main divisions:

Medical oncology: focuses on the treatment of cancer with chemotherapy, targeted therapy, immunotherapy, and hormonal therapy.

Surgical oncology: focuses on the treatment of cancer with surgery.

Radiation oncology: focuses on treatment of cancer with radiation.

Sub-specialties in Oncology:

Neuro-oncology: focuses on cancers of the brain.

Ocular oncology: focuses on cancers of the eye.

Head & Neck oncology: focuses on cancers of the oral cavity, nasal cavity, oropharynx, hypopharynx and larynx.

Thoracic oncology: focuses on cancers of lung, mediastinum, esophagus and pleura.

Breast oncology: focuses on cancers of the breast

Gastrointestinal oncology: focuses on cancers of stomach, colon, rectum, anal canal, liver, gallbladder, pancreas.

Bone & Musculoskeletal oncology: focuses on cancers of bones and soft tissue.

Dermatological oncology: focuses on the medical and surgical treatment of skin, hair, sweat gland, and nail cancers

Genitourinary oncology: focuses on cancers of the genital and urinary system.

Gynecologic oncology: focuses on cancers of the female reproductive system.

Pediatric oncology: concerned with the treatment of cancer in children.

Hemato oncology: focuses on cancers of blood and stem cell transplantation

Preventive oncology: focuses on epidemiology & prevention of cancer.

Geriatric oncology: focuses on cancers in the elderly population.

Pain & Palliative oncology: focuses on the treatment of end-stage cancer to help alleviate pain and suffering.

Molecular oncology: focuses on molecular diagnostic methods in oncology.

Oncopathology: A specialty of Pathology that focuses on the histopathological diagnosis of cancer.

As a significant portion of all general pathology practice is concerned with cancer, the practice of oncology is deeply tied to, and dependent upon, the work of both anatomical and clinical pathologists.

Nuclear medicine oncology: focuses on the diagnosis and treatment of cancer with radiopharmaceuticals.

Psycho-oncology: focuses on psychosocial issues in the diagnosis and treatment of cancer patients.

Veterinary oncology: focuses on the treatment of cancer in animals.

Progress and future

Survival of cancer has significantly improved over the past years due to improved screening, diagnostic methods and treatment options with targeted therapy.