General Practitioners' Handbook with extracts based on the Continuing Medical Education (CME) programme

by

TATA CANCER CARE FOUNDATION

supported by an educational grant from

Pfizer

AUGUST 2022 – JUNE 2023

Medico-legal Disclaimer

This handbook has been compiled using the CME extracts from clinicians across Tata Memorial Centre, Mumbai, Assam Cancer Care Foundation, Sri Venkateswara Institute of Cancer Care & Advanced Research (SVICCAR) – Tirupati, Ranchi Cancer Hospital & Research Centre (RCHRC) – Ranchi, Homi Bhabha Cancer Hospital & Research Centre – Varanasi and the Tata Cancer Care Foundation. The contents of this handbook are intended to serve as a reference for educational and training purposes only and all the information is provided in good faith.

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About This Handbook

This handbook is specifically developed for the use of General Practitioners (GPs) who are the first point of contact for majority of individuals with suspected cancers.

Moreover, due to the limited 'free of cost' oncology-related platforms currently available to GPs, this handbook will be of immense importance.

The modules range from the Introduction, Risk Factors, Natural History, Prevention and Early Detection of Cancers, Overview of Cancer Diagnosis & Management, Overview of Common Cancers, Palliative Care and Cancer Control.

Acknowledgement

Thanks are due to Pfizer for the educational grant provided to conduct the Continued Medical Education (CME) program aimed at creating greater cancer awareness amongst the General Practitioners, who play a significant role in identifying the early signs and symptoms of cancer and in turn, can refer the suspects for early diagnosis and timely treatment, if needed.

TCCF also acknowledges the contributing expert faculty from the Tata Memorial Centre Mumbai, Assam Cancer Care Foundation (ACCF), Assam, Sri Venkateswara Institute of Cancer Care & Advanced Research (SVICCAR), Tirupati, Ranchi Cancer Hospital & Research Centre (RCHRC), Ranchi, Fortis Hospital, Mumbai and our team from the TCCF Corporate Office.

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Cancer In India Factsheet And Background To The Continuing Medical Education (CME) Program

Cancer is a public health problem. Every year over **14 lakh** new cases of cancer are detected in India. **70%** of these cases are diagnosed in later stages, making disease management and control difficult. Doctors have a vital role to play in cancer control, from identification of symptoms to screening to diagnosis, treatment, management, and post-therapeutic surveillance. Strategies are needed that will enable overcoming the gap between warning signs and delayed diagnosis.

Through the CME series, the expert faculty provided a thorough understanding of the common cancers around us, their natural history and risk factors, the recent advancements in diagnostic paraphernalia, and the methods of management with certain emphasis on palliative care and patient welfare schemes.

The CME comprised 5 Units, which were further sub-divided into Modules.

Unit 1: Introduction, Risk Factors, Natural History, Prevention, and Early Detection;

Unit 2: Overview of Diagnosis and Management;

Unit 3: Overview of Common Cancers;

Unit 4: Palliative Care;

Unit 5: Cancer Control.

UNIT 1: MODULE 1

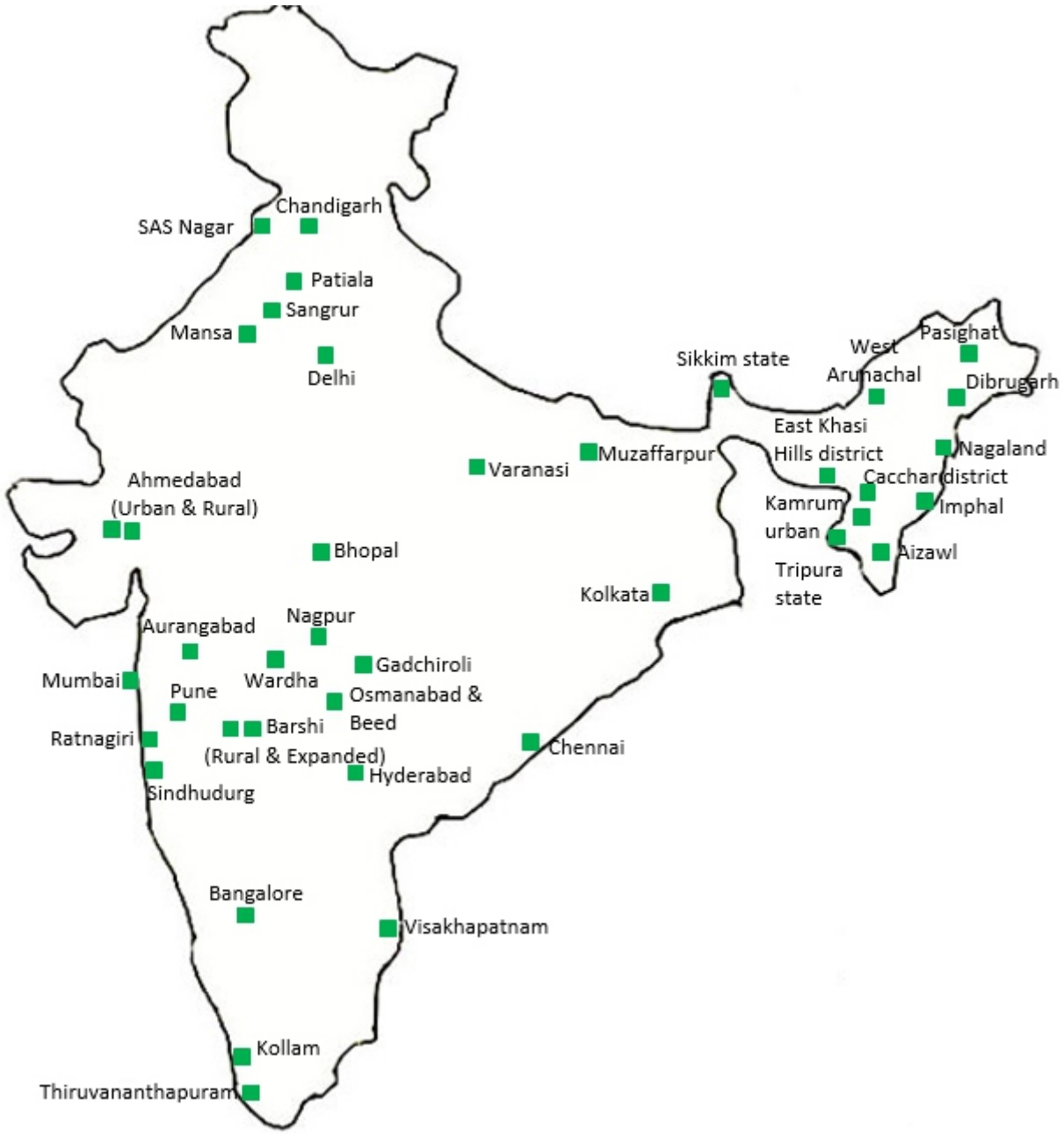
INTRODUCTION TO CANCER, CANCER FACTSHEET, EPIDEMIOLOGY

Professor Rajesh Dikshit
Director, Centre for Cancer Epidemiology
Tata Memorial Centre, Mumbai

This module touched upon:

- The epidemiological description of the various cancer registries;
- All cancer sites;
- The crude Mortality Incidence (MI) ratio of all cancers together in the Indian states by sex, 2016;
- The Percentage of total cancer Disability Adjusted Life Years (DALYs) due to different types of cancers by sex in India, 2016;
- Cancer burden by broad anatomical sites of cancer - 2020 and 2025 ;
- Projected cancer burden, incidence and mortality of the top cancers in India including the risk factors of each cancer type- with its modifiable risk factors.
- A brief on the role of tobacco & alcohol, infective factors, physical inactivity,
- Environmental Pollution;
- Cancer Prevention and Control.

The various cancer registries in India :

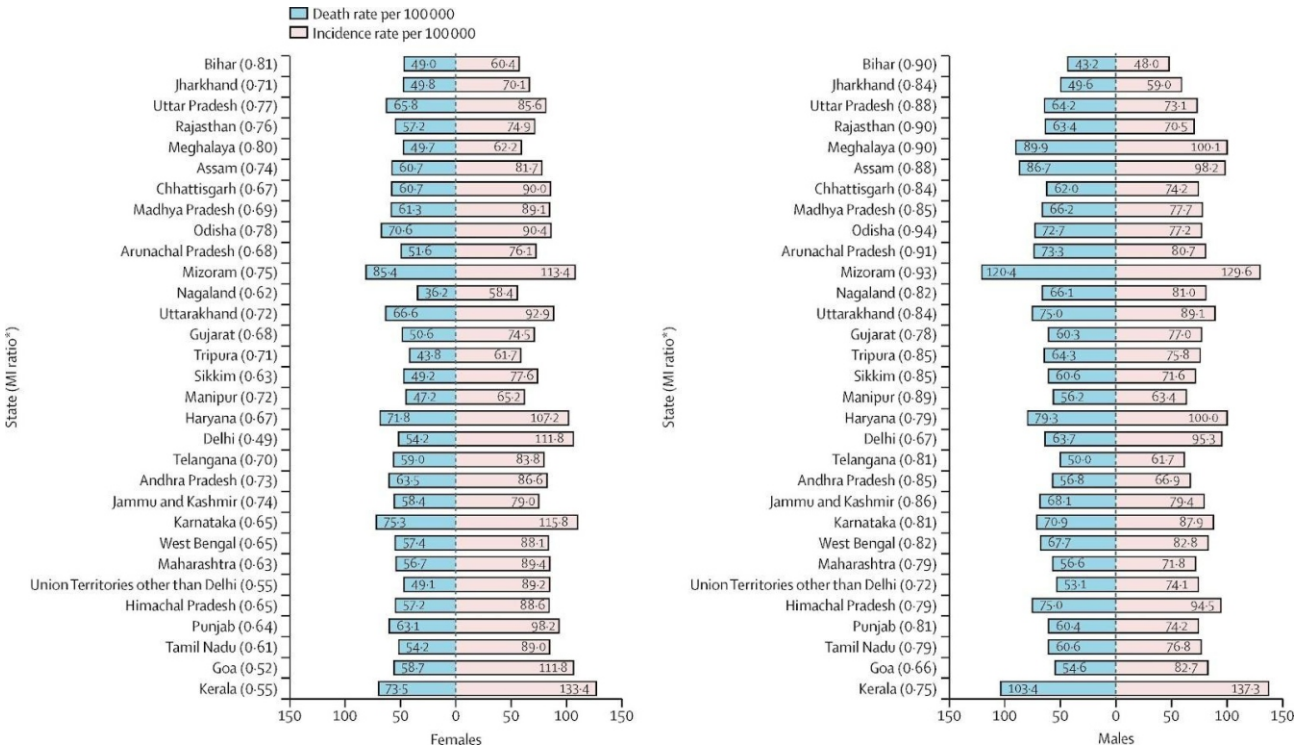


Population Based Cancer Registries in India

Cancer all sites for male & female were discussed from the Report of

- National Cancer Registry Programme (2012-2016),
- Cancer Incidence and Mortality in Sangrur District, Punjab State, India: 2015 – 2016,
- Cancer Incidence and Mortality in Mansa District, Punjab State, India: 2015 – 2016,
- Cancer Incidence and Mortality in SAS Nagar, Punjab State, India: 2015 – 2016,
- Cancer Incidence and Mortality in Chandigarh Union Territory, India: 2015 – 2016,
- Cancer Incidence and Mortality in Varanasi District, Uttar Pradesh State, India: 2017,
- Global Cancer Observatory, 2020

Crude MI ratio of all cancers together in the states of India by sex, 2016



MI=mortality-incidence. *MI ratio is calculated by dividing crude death rate per 100 000 by the crude incidence rate per 100 000. The sequence of the states is from the lowest to the highest epidemiological transition level in 2016.

The Percentage of total cancer DALYs due to different types of cancers by sex in India, 2016

DALYs=disability-adjusted life-years. *The other neoplasm category was not included in this figure. The types of cancers are colour-coded in groups based on their ranking in both sexes combined.

Both sexes combined		Females		Males	
Types of cancers*	% of total cancer DALYs	Types of cancers*	% of total cancer DALYs	Types of cancers*	% of total cancer DALYs
1 Stomach cancer	9·0%	1 Breast cancer	16·8%	1 Lung cancer	10·4%
2 Breast cancer	8·2%	2 Cervical cancer	10·8%	2 Lip and oral cavity cancer	9·6%
3 Lung cancer	7·5%	3 Stomach cancer	9·0%	3 Pharynx cancer other than nasopharynx	9·1%
4 Lip and oral cavity cancer	7·2%	4 Colon and rectum cancer	6·1%	4 Stomach cancer	9·0%
5 Pharynx cancer other than nasopharynx	6·8%	5 Lip and oral cavity cancer	4·6%	5 Leukaemia	6·0%
6 Colon and rectum cancer	5·8%	6 Ovarian cancer	4·6%	6 Colon and rectum cancer	5·6%
7 Leukaemia	5·2%	7 Lung cancer	4·4%	7 Oesophageal cancer	5·1%
8 Cervical cancer	5·2%	8 Leukaemia	4·3%	8 Larynx cancer	4·8%
9 Oesophageal cancer	4·3%	9 Gallbladder and biliary tract cancer	4·3%	9 Liver cancer	4·6%
10 Brain and nervous system cancer	3·5%	10 Pharynx cancer other than nasopharynx	4·3%	10 Brain and nervous system cancer	4·0%
11 Liver cancer	3·5%	11 Oesophageal cancer	3·5%	11 Non-Hodgkin lymphoma	3·7%
12 Non-Hodgkin lymphoma	3·2%	12 Brain and nervous system cancer	2·9%	12 Prostate cancer	2·9%
13 Gallbladder and biliary tract cancer	3·1%	13 Non-Hodgkin lymphoma	2·6%	13 Pancreatic cancer	2·6%
14 Larynx cancer	3·0%	14 Liver cancer	2·3%	14 Gallbladder and biliary tract cancer	2·1%
15 Pancreatic cancer	2·4%	15 Pancreatic cancer	2·2%	15 Bladder cancer	1·5%
16 Ovarian cancer	2·2%	16 Uterine cancer	1·7%	16 Nasopharynx cancer	1·4%
17 Prostate cancer	1·5%	17 Thyroid cancer	1·3%	17 Hodgkin's lymphoma	1·2%
18 Bladder cancer	1·1%	18 Larynx cancer	1·1%	18 Multiple myeloma	1·0%
19 Nasopharynx cancer	1·0%	19 Multiple myeloma	1·0%	19 Kidney cancer	0·9%
20 Thyroid cancer	1·0%	20 Nasopharynx cancer	0·7%	20 Thyroid cancer	0·7%
21 Multiple myeloma	1·0%	21 Hodgkin's lymphoma	0·6%	21 Testicular cancer	0·5%
22 Hodgkin's lymphoma	0·9%	22 Bladder cancer	0·6%	22 Mesothelioma	0·4%
23 Uterine cancer	0·8%	23 Kidney cancer	0·4%	23 Breast cancer	0·3%
24 Kidney cancer	0·7%	24 Malignant skin melanoma	0·2%	24 Non-melanoma skin cancer	0·3%
25 Mesothelioma	0·3%	25 Mesothelioma	0·2%	25 Malignant skin melanoma	0·3%
26 Malignant skin melanoma	0·3%	26 Non-melanoma skin cancer	0·1%		
27 Testicular cancer	0·2%				
28 Non-melanoma skin cancer	0·2%				

Cancer burden by broad anatomical sites of cancer - 2020 and 2025

Broad Anatomical Sites of Cancer	2020		2025	
	No. of Cases	(%)	No. of Cases	(%)
All Sites	1392179	100.0	1569793	100.0
Tobacco Related Cancers	377830	27.1	427273	27.2
Gastro Intestinal Tract	273982	19.7	310142	19.8
Cervix Uteri	75209	5.4	85241	5.4
Breast	205424	14.8	232832	14.8
Corpus Uteri and Ovary	70400	5.1	79765	5.1
Lymphoid & Haematopoietic Malignancies	124931	9.0	138592	8.8
Prostate	41532	3.0	47068	3.0
Central Nervous System	32729	2.4	36258	2.3

The projected cancer burden in India

Number of new cases				
Sex	2020	2025	2030	2035
Male	646030	737425	833747	933453
Female	678383	766492	859221	954694
Both sex	1324413	1503917	1692968	1888147

Risk factors	Cancer type
Tobacco use (smoking and chewing)	Oral cavity, pharynx, esophagus, stomach, liver, pancreas, nasal cavity, larynx, lung, cervix, ovary, uterus, kidney, bladder, myeloid leukemia.
Alcohol	Mouth, nasopharynx, oropharynx, esophagus, colorectum, liver, larynx, female breast.
Chronic infection with human papillomavirus (HPV)	Cervix, oropharynx
Chronic infection with hepatitis B and C virus (HBV, HCV)	Liver
Chronic infection with Helicobacter pylori	Stomach
Obesity and physical activity	Colon, breast (postmenopausal), kidney, endometrium, esophagus (adenocarcinoma), pancreas
Diet	Colon, breast, prostate
Reproductive and hormonal factors	Breast, ovary, endometrium
Occupation (exposure to asbestos, heavy metals, diesel exhaust)	Lung, urinary bladder
Pollution (air and indoor)	Lung, bladder, skin
Genetic susceptibility	All
Chemical compounds Aflotoxin (naturally occurring) Aspirin	Liver Protective effect on colon cancer

Risk factors	Factor prevalent globally	Factor specific to India
Tobacco use	Cigarette smoking	Bidi smoking, various types of smokeless tobacco
Alcohol consumption	Beer, Wine	Country liquor, Taddi
Infection	HPV, HIV	HPV, H. Pylori, S. typhi
Reproductive and hormonal factors	Breast feeding, use of oral and hormonal contraceptives	More number of pregnancies, early age at marriage
Obesity	BMI	Abdominal obesity
Pollution	Air pollution	Indoor air pollution
Diet	High Fat	Spicy food?
Physical activity	Sedentary life style	Sedentary life style

Tobacco & Alcohol Use

Tobacco	Alcohol
• Causes >20% of all cancer deaths worldwide • Risk factor for > 16 types of cancer including lung, oral cavity and esophagus • More than 1.1 billion people worldwide smoke tobacco • >80% live in LMICs • Male smokers > female smokers • Tobacco use is increasing in LMICs, and decreasing in many high-income countries • Important risk factor for CVD, diabetes, chronic respiratory disease	• Causes 5% of cancer deaths in LMICs • Risk factor for cancers of the oral cavity, pharynx, larynx, esophagus, liver, and breast • Moderate alcohol use may reduce risk of CVD • Increases risk for injuries, diabetes, liver disease and other conditions • Effective interventions parallel tobacco control strategies • Increased taxes, reduced access, advertising bans, random breath tests, education/physician advice

Oncogenic Infection

- Cause 23% of cancers in less-developed regions and 7% of cancers in more developed regions
- 90% of all infection-associated cancers caused by:
  - Human papillomavirus
  - Hepatitis B and C viruses
  - Helicobacter pylori
- Other oncogenic infectious agents:
  - Epstein Barr Virus
  - Human Herpes Virus type 8
  - Human T-cell Lymphotrophic virus
  - Schistosoma hemotobium, Opisthorcisviverrini and Clonorchissinensis

Physical Inactivity, Unhealthy Diet

- Together cause 6-9% of cancer deaths in LMICs;
- Interrelated, but individually increase risk for cancer of the esophagus, colon, breast and others;
- Physical activity, dietary fiber and fruit and vegetable intake decrease risk;
- Important causes of Coronary Vascular Disease (CVD) and diabetes.

Environmental Pollution

- 1-4% of all cancers worldwide result from exposure to polluted air, water and soil;
- A significant population effect can result from large numbers of people being exposed despite low risk levels per person;
- Exposure can be widespread (e.g. diesel engine exhaust) or targeted (e.g. silica dust in miners);
- Reducing exposure to pollution requires specific policy actions and regulations

Factors Influencing Cancer Burden In LMICs

- Demographic transition
  - Changes in lifestyle and behaviours
  - Access to cancer prevention and care
  - Incidence of more lethal cancers
  - Competing health priorities
  - Limited surveillance

Cancer Prevention And Control

- Despite challenges, the burden of many cancers can be decreased substantially through effective:
  - Primary prevention: By awareness about risk factors and changing life style;
  - Early detection & Screening for some common cancer sites;
  - Treatment;
  - Palliative care.
- Approximately 1/3 of cancers could be prevented with current knowledge.

Important Steps In Cancer Prevention

- Identification of Cancer Burden in Population;
- Identification of Cancer types frequenting a particular population;
- Identification of individuals at highest risk of developing Cancer (through pidemiological study designs);
- Develop screening and early detection programme;
- Conduct smaller faster clinical intervention trial;
- Cancer care facility close to home.

UNIT 1: MODULE 2

AETIOLOGY AND PATHOGENESIS – RISK FACTORS, PATHOGENESIS, PROGRESSION, PATHOLOGY AND GRADING OF CANCERS

Dr. Poonam K. Panjwani
Professor & Pathologist
Tata Memorial Hospital, Mumbai

In this module, the Risk factors, Pathogenesis, Progression, Pathology and Grading of cancers were discussed.

What is Neoplasia?

"New formation"
An abnormal mass of tissue, the growth of which, exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner after cessation of the stimuli which evoked the change.

- **Progressive, Purposeless, Pathologic, Proliferation** of cells characterized by loss of control over cell division.
- DNA damage at growth control genes is central to development of neoplasm.
- Carcinogens – Chemical, physical & genetic - DNA damage - Neoplasm.

Proliferation is Uncontrolled & Irreversible

- **Benign**
  - Localized, non-invasive.
- **Malignant**
  - Spreading, Invasive.

Malignant neoplasms are

- Fast growing
- Non encapsulated
- Invasive & Infiltrate
- Metastasize
- Poorly differentiated
- Suffix “Carcinoma” or “Sarcoma”

Benign neoplasms are:

- Slow growing
- Capsulated
- Non-invasive
- Do not metastasize
- Well differentiated
- Suffix “oma” eg. Fibroadenoma
- Classification is based on:
- Type of tissue from which the tumour originates OR
- Type of tissue to which the tumour resembles/differentiates into
  AND
- Primary site/location in the body

Grading and Staging of tumours

- Grading- degree of differentiation (mild, moderate, poor) & number of mitosis, presence/ absence of necrosis
- Staging- size, extent of spread to regional lymph nodes and presence or absence of blood borne metastasis.

Standard of Grading

UICC (Union for International Cancer Control)
TNM
AJCC
FNCLCC (for soft tissue sarcomas)

UNIT 1: MODULE 3

WARNING SIGNALS OF CANCER (SIGNS AND SYMPTOMS) MYTHS AND MISCONCEPTIONS

Dr. K. C. Mishra
Assam Cancer Care Foundation,
Assam

Signs and Symptoms vary widely or they may not occur at all.
Signs and symptoms are the ways by which the body lets you know when something is wrong.

- A sign, such as fever or bleeding, can be seen or measured by someone else.
- A symptom, such as pain or fatigue, is felt or noticed by the person who has it.
- Signs and symptoms of cancer depend on where the cancer is, how big it is, and how much it affects nearby organs or tissues. If it has spread (metastasised), signs or symptoms may appear in different parts of the body.

Many Myths and Misconceptions abound and get passed around by well-meaning friends and family members. Such myths often end up causing more stress for patients than they were already experiencing.

Some of the Myths & Misconceptions explained:

- Getting a biopsy makes cancer spread.
- Eating sugar causes cancer to grow.
- You will not need surgery if the tumour is solid.
- Skin cancer is colour blind.
- Chemotherapy always has bad side effects.
- A lump in your breast is always breast cancer.
- Chemotherapy is painful.
- Pregnant women cannot get cancer treatment.
- Hair will never grow back after chemotherapy.
- Cancer will always come back.
- Oncologists do not want patients trying unusual treatment.
- Do artificial sweeteners cause cancer?
- Is cancer contagious?
- Positive or negative attitude?
- Do cell phones cause cancer?
- Do power lines cause cancer?
- Are there herbal products that can cure cancer?
- If someone in my family has cancer, am I likely to get cancer too?
- If no one in my family has had cancer, does that mean I am risk free?
- Can eating burnt foods cause cancer?
- Can stress cause cancer?
- Does using plastic bottles and container cause cancer?
- Do genetically modified foods cause cancer?
- Can pesticide or herbicide cause cancer?
- Do medical scans and air travel cause cancer?
- Can milk and dairy products cause cancer?

UNIT 2: MODULE 1

OVERVIEW OF IMAGING AND NUCLEAR SCANS IN CANCER DIAGNOSIS

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Tata Memorial Hospital

What is nuclear medicine?
In its most basic form, nuclear medicine study involves injecting a compound **RADIOPHARMACEUTICAL)**, labelled with gamma ray emitting or positron emitting compound **(RADIONUCLIDE).**

Advantages of Nuclear Medicine

- Functional imaging
- Sensitive
- Quantitative
- Safe
- Minimally invasive
- Low radiation exposure

Currently performed Nuclear medicine scans

- (Gamma camera & SPECT/CT)
- 99m Technetium labelled MDP bone scan
- 99m Technetium Renal scans (DTPA, DMSA, EC)
- 99m Technetium Pertechnetate Thyroid scan / 131 Iodine scan
- 99m Technetium MIBI scan (Cardiac scan/ MPI)
- 99m Technetium HIDA, Sulphur colloid scan (Hepatobiliary)
- 99m Technetium MAA lung perfusion scan
- 99m Technetium labelled RBC scan (MUGA, GI bleed)
- 99m Technetium ECD/HMPAO brain scan

99m Technetium labelled MDP bone scan

- Bone scan is a functional imaging used for the evaluation of skeletal system with the help of different radiopharmaceutical which localizes to cortical region of skeletal system;
- Radiopharmaceutical used: 99m Tc MDP, HMDP;
- MECHANISM OF ACTION: Chemiadsorption of the tracer to the mineral phase of bone matrix.

Bone Metastases

Multiple randomly distributed foci of tracer uptake of varying intensities. Involves axial skeleton.
Most common malignancies associated:

- Breast
- Prostate
- Lung

Other examples of nuclear medicine scans are:
99m Technetium Pertechnetate Thyroid scan (THYROID SCINTIGRAPHY) RENAL SCINTIGRAPHY
Hepatobiliary scintigraphy and Pulmonary scintigraphy

Cardiac scan/ Myocardial Perfusion Imaging

Non-invasive imaging test for the assessment of cardiac function and perfusion.
Indications

- Diagnosis of coronary artery disease
  - Presence of CAD
  - Location
  - severity
- Distinguish viable myocardium from scar
- Risk stratification for both pre-op & post-op management.
- Monitor treatment effect

Positron Emission Tomography

A Positron Emission Tomography (PET) scan is a type of imaging test. It uses a radioactive substance called a tracer to look for disease in the body. A PET scan shows how organs and tissues are working. This is different than MRI and CT scans. These tests show the structure of, and blood flow to and from organs.

FDG PETCT Indications

Initial staging
Detection & characterization of primary
Assessment of treatment response
Restating (detection of tumor **recurrences**)

Use of Nuclear Medicine

Follow up in select cases

Nuclear medicine imaging modalities should be used as problem-solving tools in difficult clinical decision making.

These modalities should be considered as complimentary imaging tools and not competing with the existing conventional imaging methods.

Inadvertent use of nuclear medicine techniques should be avoided.

UNIT 2: MODULE 2

OVERVIEW OF LAB INVESTIGATIONS IN CANCER DIAGNOSIS – TUMOUR MARKERS, CYTOLOGY, HISTOPATHOLOGY

Dr. Aekta Shah
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Tumor Markers

A tumor marker is anything present in or produced by cancer cells or other cells of the body in response to cancer or they can also be produced by non-cancerous conditions.

Important tools to suspect a diagnosis of cancer:

- Aggressiveness of cancer;
- Making treatment decisions;
- Monitoring therapy;
- Finding recurrent tumor;
- Proteins or other substances that are made at higher amounts by cancer cells than normal cells;
- They are associated with only one or multiple different cancer types.

There are two main types of tumor markers:

- Circulating tumor markers
- Tumor tissue markers

Circulating tumor markers can be found in the blood, urine, stool, or other bodily fluids of some patients with cancer. Circulating tumor markers are used to:

- Estimate prognosis;
- Determine the stage of cancer;
- Detect residual/ recurrent disease;
- Assess response;
- Monitor progression- serial measurement of tumor markers is done;
- **Calcitonin is used** to assess treatment response, screen for recurrence, and estimate prognosis in **medullary thyroid cancer**;
- **CA-125** is used to monitor treatment response and to ascertain if cancer has recurred **in ovarian cancer**;

beta-2-microglobulin (measured in blood, urine, or cerebrospinal fluid), to estimate prognosis and follow response to treatment for multiple myeloma, chronic lymphocytic leukemia, and some lymphomas

Tumor tissue Markers

Found in tumors themselves, typically in a sample of the tumor that is removed during a biopsy. Tumor tissue markers are used to:

- Diagnose, stage, and/or classify cancer;
- Estimate prognosis;
- Select an appropriate treatment (e.g., treatment with a targeted therapy);
- Indicate potential candidates for a particular targeted therapy and are sometimes referred to as biomarkers for cancer treatment;
- Estrogen receptor and Progesterone receptor in breast cancer;
- FGFR3 gene mutation analysis, to help determine treatment for patients with bladder cancer;
- PD-L1 to access candidates for treatment with immune checkpoint inhibitor;

Cytology

Types of Cytology Samples:

- FNAC
- LBC
- Cell blocks
- Exfoliative Cytology
- Gynaecological
- Cervico-Vaginal smears
- Endometrial Aspiration
- Non-gynaecological
- Serous effusions
  - CSF
  - Urine
  - Brushing/Lavage - Gastro-intestinal Tract
  - Bile & Common Bile Duct Brushing
  - Oral Scrape
  - Nipple discharge
  - Sputum
  - Brushing/Lavage - Respiratory Tract

Summary of Smears

- Cervical cytology is a simple, cost-effective technique;
- Detect pre-malignant/malignant lesions & many benign, infective & reactive lesions;
- Cytology has advantage of sampling wide areas and multiple lesions and is more acceptable compared to biopsies;
- Adequate sampling, optimal staining, meticulous screening, accurate interpretation and prompt treatment is necessary;
- Suspicious lesions need to be biopsied

Surgical Pathology
Frozen section, Histology, Immunohistochemistry, Molecular Pathology.

Frozen-Section
Any tissue contains 60-70% water.If frozen, this water is converted into ice making the tissue hard and providing a 'self–embedding' material.

Transportation of samples

- Prompt fixation;
- Small samples should be fixed in a fixative (10% neutral buffered formalin) in 1:20 ratio;
- Big specimens removed late evening can be kept in zip lock bag which is kept in fridge; immediate transport of samples is must to avoid autolysis of specimens.
- For Frozen section- send fresh tissue immediately with frozen and biopsy requisition;
- Send in Ziploc bag or empty plastic bottle for frozen – don't fix;
- When putting core biopsies in fixative - Do not dilute fixative while transferring tissue from needle to bottle, e.g., core biopsies breast.

How to send tissue sample from outside hospitals?

- Have a referring letter addressed to a concerned pathologist;
- Bring slides/block/specimen in appropriate condition;
- Clinical history is required for all patient samples. For neuropathology specimens, bone tumors, the radiology report and films are also requested. Consult material should be accompanied by any associated pathology report(s), including any preliminary report(s), H&E slides, and paraffin blocks where possible.

Processing

Step 1: - Fixation which prevents autolysis.

Step 2: - Dehydration removes water from specimen.

Step 3: - Clearing helps to allow paraffin penetration.

Step 4: - Impregnation prepares the tissue for embedding.

Step 5: - Paraffin embedding gives tissue required rigidity.

Immunohistochemistry

Immunohistochemistry**: what is positive**

- Membrane for – **LCA, CD20, CD138, Cd3**
- Nuclear**- Tdt, cyclin D1, ALK1**
- Membrane for – **LCA, CD20, CD138, Cd3**
- Membrane for – **LCA, CD20, CD138, Cd3**
- Nuclear**- Tdt, cyclin D1, ALK1**
- Diffuse cytoplasmic – **Cd79a**
- CD3- surface – **former +ve in T cell**
- Golgi zone and membranous in RS cells **- Cd30**

Role of IHC

IHC is a powerful tool in surgical pathology practice. The role of IHC is not only to aid in identifying a specific tissue type but also Theranostics.Theranostics is a field of medicine which combines specific targeted therapy based on specific targeted diagnostic tests.

Prognostic markers

Cancer prognostic markers are patient or tumor characteristics that predict outcome (usually survival) independent of the treatment.

Predictive markers

Patient or tumor characteristics that predict benefit from specific treatments (either in terms of tumor shrinkage or survival).

UNIT 2: MODULE 3

OVERVIEW OF RADIATION TREATMENT, COMMON SIDE EFFECTS AND THEIR MANAGEMENT – DO'S AND DON'TS

Dr. Sarbani Ghosh Laskar
Radiation Oncologist
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In 1898, Maria Sklodowska-Curie and her husband Pierre Curie discovered the radium as a source of radiations. Only three years later, Becquerel and Curie reported on the physiologic effects of radium rays.

Role of Radiotherapy

Radical	Palliative
Early cancers: External Beam RT alone External Beam RT with Brachy Radical Brachytherapy	**Advanced loco-regional disease:** Symptom Relief Pain Bleeding Fungation
Advanced Cancers: Concurrent chemoradiotherapy Altered Fractionation RT Adjuvant after Radical Surgery	**Metastatic disease:** Bone, brain, lung
Surgery is morbid Medical contraindications to Surgery Preferred modality for: Nasopharynx, Oropharynx, Early larynx, Uterine cervix	

Radiation Therapy Utilization rate of common cancers in India

Cancer	RT utilization
Cervical Cancer	90-95%
Head and Neck cancers	80-85%
Breast Cancers	75-80%
Lung Cancers	60-65%
Prostate Cancers	60-65%
Colorectal Cancers	55-60%

Conventional fractionation

1.8 - 2 Gy / fr
One fraction per day
5 days a week
10 Gy/ week

Definitive, radical: 33-35#
Adjuvant, radical: 28-30#
Palliative: Short course, higher dose / fraction

Tolerance is the known maximum and safe amount of radiation each organ and area of the body may receive. Tolerances of normal tissue is what limits the total dose and dose per fraction prescribed for treatment.

External Beam Radiation Therapy

- Patient positioning & immobilization
- Accurate delineation of area to be treated – Target Volume
- Accurate delineation of areas/ organs not to be treated – OAR
- Treatment planning & optimization
- Treatment delivery
- Treatment verification
- Storage & retrieval

Side Effects of Radiotherapy

❖ **Acute Side Effects**
- Occurs because of damage to stem cells in rapidly dividing mucosa, eg. Pharynx, small bowel.
- Usually begins 7-10 days after the start, and subsides 2-3 weeks after treatment.

❖ **Chronic Side Effects**
- Occurs because of damage to stem cells in slowly dividing tissues.
- Often permanent, irreversible.
- May need surgical correction – fistulas, strictures.

❖ **Specific Side Effects**

Fatigue	Nausea & Vomitting
Anorexia	Esophagitis & Dysphagia
Mucositis	Diarrhoea
Xerostomia	Cystitis
Alopecia	Bone Marrow Depression
Skin Reaction	

The side effects of radiotherapy for patients can be unpleasant but self-limiting. Factors responsible include:
- Total dose of radiotherapy administered.
- Volume of tissue irradiated.
- Energy or type of radiation given.
- Use of radio-sensitizing drugs.
- Location of the treated area.
- Treatment technique.

Approaches for Protection of Normal Tissues

- Physical Protection – Planning Principles
- Medical Prevention of Mucosal Injury And Xerostomia
- Alternative to Chemotherapy – Targeted Therapy

Physical Protection

- Beam Modifying Devices
- Beam Collimation
- Treatment Technique – Intensity Modulation

Supportive Care

- Provision of nursing care
- Emotional support
- Monitoring/ Coordination
- Health education
- Follow up/ Referral system
- Promotion of quality of life

Multidisciplinary approach

Team effort;
Judicious use as part of combined modality for treatmentof most solid tumors.

General Approach

- Identify: Problem, assessment of severity, structures/ processes involved, risk factors;
- Prevent: Prophylaxis, hygiene, exercises;
- Pre-empt: Regular assessments on treatment, at follow-up;
- Protect: Respect tolerance, optimise doses to OARs during RT planning;
- Treat: Correctable conditions, sequelae;
- Maintain: Persistence of care after completion of treatment.

Mucositis & its sequelae- in Head and Neck Cancer

- Enhance / improve/ maintain loco-regional control
- Theoretical possibility of Dose Escalation
- 2 Most common late sequelae of RT HNC are:
- Xerostomia: resultant sequelae
- Dysphagia: aspiration, pneumonia, death
- IMRT aims to reduce these sequelae
- Reducing these sequelae improves QOL

Mucositis : General measures

Oral care: (Reduces microbial flora, reduces pain, bleeding, prevents infection & decreases risk of dental complications);

- Brush all tooth surfaces for at least 3 minutes, twice daily, using a soft brush;
- Rinse mouth 4-8 times (salt and sodium bicarbonate gargles);
- Avoid alcohol based mouth wash, i.e.Chlorhexidine (Level I);
- Benzyldamine hydrochloride can be used (NSAID Prop);
- Avoid alcohol, tobacco or irritating foods (acidic, hot, rough, spicy);
- Use water-based moisturizer for lips;
- Maintain adequate hydration;
- Pain management: NSAID/Opiods/local Anesthetics.

Skin Toxicity

Factors affecting:

- **Treatment Factors**
  - Dose/Fractionation
  - Volume of skin irradiated
  - Type of portal: Parallel opposed vs non parallel
  - Beam energy: Co 60 vs 6 MV
  - Mask
  - Chemotherapy/biological targeted therapy
- **Patient Factors**
  - Poor nutrition
  - Obesity
  - Genetic predisposition

Xerostomia: Clinical course

- Transient xerostomia: >6 Gy
- Permanent xerostomia: >30 Gy
- Dose>60 Gy: No recovery with time.
- 50-60% reduction of salivary function ~1st week of RT
- At RT conclusion (>60 Gy)- no salivary flow
- Associated with- Oral discomfort, dental caries, infection, speech/swallowing difficulty, weight loss.

Majority of patients treated with bilateral portal have permanent xerostomia

Diarrhoea

- Drink plenty of fluids to avoid dehydration
- Avoid milk or dairy products
- Avoid foods high in fiber
- Avoid high fat, spicy, and gas forming foods
- Electrolyte replacement--potassium

Cystitis

- Urine examination
- Drink plenty of fluid
- Observe infectious signs—fever, difficulty of voiding
- Avoid moisture in the area treated
- Take antibiotic as prescribed

Risk Factors

Patient related

- Extremes of age
- Poor nutritional status.
- Poor oro-dental hygiene
- Neutrophil count before treatment.
- Other non-cancer adjuvant medications causing xerostomia: opiates, phenothiazines, sedatives, antihypertensives.
- Continued smoking, alcohol consumption.

Follow up post RT

- Usually 3 monthly for the first 2 years;
- Usually 3 monthly for the first 2 years;
- 6 monthly from year 3rd to 5th year;
- Annual follow-up thereafter;
- Clinical examination at each follow up;
- PET CT/ CECT/ MRI as indicated.

Conclusions

- Optimal patient selection is mandatory for success of aggressive intensive protocols;
- More attention and Awareness, toxicity documentation are essential;
- Strategies for possible toxicity reduction;
- Attention to supportive care;
- Optimal Radiotherapy techniques, doses, fractionation;
- Avoid unplanned interruptions;
- Quality assurance exercises and audits are essential;
- Verification protocols are as vital;
- Attention to PRO and QOL issues.

UNIT 2: MODULE 4

OVERVIEW OF SYSTEMIC TREATMENT, COMMON SIDE EFFECTS AND THEIR MANAGEMENT – DO'S AND DON'TS

Dr. Venkata Pradeep Babu
Medical Oncologist
Assam Cancer Care Foundation

Cancer is a systemic disease.
- Germline abnormalities: Systemic abnormality, manifested in some organs;
- Breast cancer: BRCA 1 and 2;
- Recently, other cancers;
- Colon Cancer: MMR Genes.

Systemic therapies in Oncology

- Chemotherapy: Drugs that destroy cancer cells.
- Hormonal Therapy: Drugs that change levels of hormones to stop or slow down cancer cell growth.
- Targeted therapy: Drugs that target specific molecules that stop cancer cells from growing and spreading.
- Immunotherapy: Drugs that activate your own immune system to find and destroy cancer cells.

Side effects of chemotherapy

Toxicity

HEMATOLOGICAL	NON-HEMATOLOGIC
Neutropenia	CINV
Anaemia	Alopecia
Thrombocytopenia	Nephrotoxicity
Lymphopenia	Cardiotoxicity
Coagulopathy	Neurotoxicity - Encephalopathy - Peripheral neuropathy
Thrombosis	Hepatotoxicity
Bleeding	Ototoxicity
	Visual Impairment
	Electrolyte Imbalance
	Endocrine toxicity – SIADH, DM
	Mucositis
	Infertility

Patients on Targeted Therapy

- EGFR TKIs in lung Cancer
- Her-2 targeted therapy
- CD20 targeted therapies in lymphomas: Rituximab

Very Important to Note

- Autoimmune like adverse events literally in all organs

ORAL CANCER – RISK FACTORS, SCREENING AND EARLY DETECTION, OVERVIEW OF MANAGEMENT

Dr. Poonam Joshi
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Tata Memorial Centre (actrec), Mumbai

Risk Factors For Oral Cancer

Tobacco - Smoking cigarettes, cigars, or pipes; chewing tobacco; and using snuff.
- Single largest risk factor for head and neck cancer;
- Eighty-five percent (85%) of head and neck cancers are linked to tobacco use, and the amount of tobacco use may affect prognosis.

Alcohol - Frequent and heavy consumption raises the risk of developing cancer in the mouth, pharynx, larynx, and esophagus.

Alcohol and tobacco together increases this risk.
Prolonged sun exposure. This is especially linked to cancer in the lip area, as well as skin cancer of the head and neck.
Human papillomavirus (HPV)
- Sexual activity with infected person.
- There are different types of HPV strains.
- Some HPV strains (HPV 16, HPV 18) are more strongly associated with certain types of cancers.
- No vaccines available to protect from the HPV strains that cause head and neck cancer. There is some data to suggest the role of vaccines for Head and neck cancer.

Gender - Men are 2 to 3 times more likely than women however, incidence rising in women.
Age - Old age.
Poor oral and dental hygiene - Poor care of the mouth and teeth may increase the risk of head and neck cancer.
Environmental or occupational inhalants - Inhaling asbestos, wood dust, paint fumes, and certain chemicals.
Poor nutrition - Diet low in vitamins A and B

Weakened immune system
Inherited Cancer Syndromes
- Xeroderma pigmentosum
- Ataxia telangiectasia
- Bloom syndrome
- Fanconi's anaemia
- Li-Fraumeni syndrome

Precancerous Lesion
- Morphologically altered tissue in which oral cancer is more likely to occur than its apparently normal counterpart;
- Leukoplakia, erythroplakia, and the palatal lesions of reverse smokers.

Precancerous Condition
- Generalized state associated with significantly increased risk of cancer;
- Sub-mucous fibrosis, lichen planus, epidermolysis bullosa, and discoid lupus erythematous.

Signs and Symptoms of Oral Cancer

- Swelling or a sore that does not heal; this is the most common symptom;
- Jaw pain;
- Red or white patch in the mouth;
- Lump, node, or mass in the head or neck area, with or without pain;
- Persistent sore throat;
- Foul mouth odour not explained by hygiene;
- Dentures becoming loose;
- Loosening of teeth;
- Unexplained weight loss.

Screening for Oral Cancer

- There are no HNSCC screening guidelines from the American Cancer Society, the National Comprehensive Cancer Network (NCCN), or the National Cancer Institute.
- There are no known tests of blood or saliva proven to be effective for detection of HNSCC.
- Oral Visual examination.
- Neck examination.
- Larynx/Pharynx examination

Oral Cancer Screening

The process by which a practitioner evaluates an asymptomatic patient to determine if he or she is likely or unlikely to have a potentially-malignant or malignant lesion.

Screening tools.

- Assist in decision to proceed with scalpel biopsy;
- Tools available: Non-invasive diagnostic devices;
- Vital Staining:
  - Toludine Blue
  - Methylene blue staining
  - Rose Bengal staining
  - Lugol's iodine
- Light-based detection systems:
  - Chemiluminescence
  - VELscope
- Optical diagnostic technologies:
  - Raman spectroscopy
  - Elastic scattering spectroscopy
  - Narrow-band imaging

No population-based screening programs for oral cavity squamous cell cancers have been implemented in developed countries.

Types of Screening

- Opportunistic screening has been advocated for the oral cavity.
- Population based screening
- Targeted screening

Early Detection by examination – feasible and easy

- Easily visible
- Easily felt
- Easy access
- Easy diagnosis

Oral visual screening can reduce mortality in high-risk individuals and has the potential of preventing at least 37 000 oral cancer deaths worldwide. (Lancet 2005;365:1927-33).

Management of Head and Neck Cancers

- Surgery
- Radiotherapy
- Chemotherapy
- Targeted Therapy and Immunotherapy

Surgical management of Head and Neck Cancers

- Site of cancer;
- Extent of Surgery;
- Reconstruction

UNIT 3: MODULE 2

LUNG CANCER – RISK FACTORS, SCREENING AND EARLY DETECTION, OVERVIEW OF MANAGEMENT

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Etiology of Lung Cancer

- Passive smoking
- Occupational exposure
- Environmental exposure
- Genetic factors
- Lung diseases

The most **potent carcinogens** in cigarette smoke are the **polycyclic aromatic hydrocarbons** (PAHs) and the **aromatic amines, N-nitrosamines**. It also contains benzene, vinyl chloride, arsenic, chromium, radon, and its decay products, bismuth and polonium.

- Cigarette smoking is the leading cause of lung cancer, accounting for about 85% of lung cancers.
- Risk for lung cancer increases with the duration, intensity and depth of smoke inhalation.
- Pack-year is a clinical quantification of cigarette smoking used to measure a person's exposure to tobacco. It is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years the person has smoked.

Lung Cancer Screening

- Routine lung cancer screening is currently not recommended in INDIA.
- National Lung Screening Test (NLST) was largest landmark study on lung cancer screening which changed the screening guidelines for lung cancer by showing 20% reduction in mortality due to lung cancer using LDCT in comparison to chest radiograph.

Clinical Features (Primary Tumour)

- Persistent cough;
- Chest pain that worsens with deep breathing, coughing or laughing;
- Hemoptysis;
- Hoarseness;
- Weight loss and loss of appetite;
- Shortness of breath;
- Recurring respiratory infections.

Regional Involvement

- Hoarseness (recurrent laryngeal nerve paralysis)
- Dysphagia (oesophageal compression)
- Dyspnea (pleural effusion, tracheal/bronchial obstruction, pericardial effusion, phrenic nerve palsy, SVCO)

Metastatic Involvement

Bone

- Pain exacerbated by weight bearing
- Fracture

Liver

- Right hypochondrial pain
- Icterus

Brain

- Altered mental status
- Seizures

Diagnostic Tools

- CXR
- CT Scans
- MRI
- Sputum cytology
- Bronchoscopy
- Mediastinoscopy
- Patients with central masses and endobronchial involvement should undergo bronchoscopy guided biopsy.
- Patients with peripherally located tumours should undergo radial EBUS or Transthoracic needle aspiration (TTNA).
- Patients with suspected nodal disease should be biopsied by EBUS or mediastinoscopy.
- Patients with pleural effusion should undergo biopsy from primary lung lesion along with thoracentesis and cytology.
- Patients suspected of having metastatic disease should have

Management

- Surgery
- Radiation
- Chemotherapy

Confirmation from One Metastatic Site, If Feasible.

Early Stage Lung Cancer (Stage I & II)

- Account for 25 – 30% of lung cancers
- 5 year survival rates:
    - Stage I ------ 80 – 90%
    - Stage II ------ 56 – 65%
- Surgical resection is the recommended treatment for Stage I and II disease.
- Therapy options for advanced and metastatic disease includes chemotherapy or targeted therapy are shown to improve quality of life and reduce symptoms from disease burden.
- Systemic therapy is only palliative in nature, and not curative.
- Supportive therapy alone maybe chosen if the patient is unable to tolerate systemic treatment due to poor PS or other comorbidities.

UNIT 3: MODULE 3

COLORECTAL CANCER – RISK FACTORS, SCREENING AND EARLY DETECTION, OVERVIEW OF MANAGEMENT

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Ranchi

Risk factors for Colorectal Cancer can be broadly divided into :

I) Environmentalfactors;
ii) Genetic Factors

Etiology of Colon Cancer: Environmental Factor

Increased Incidence	Decreased Incidence
High red meat consumption	High-fiber diet?
High red meat consumption	Antioxidant vitamins
Overcooked red meat?	Fresh fruit/vegetables
High saturated fats	Nonsteroidal anti-inflammatories
Excess alcohol consumption	Coffee
Cigarette smoking	High calcium
Sedentary lifestyle	High magnesium
Obesity	Bisphosphonates
Diabetes	

Familial and Nonfamilial Causes of Colorectal Cancer

Syndromes with Adenomatous Polyps

APC gene mutations (1%):

- Familial adenomatous polyposis
- Attenuated APC
- Turcot syndrome (two-thirds of families)

MMR gene mutations (3%):

- Hereditary nonpolyposis colorectal cancer types I and II
- Muir-Torre syndrome
- Turcot syndrome (one-third of families)

Syndromes with Hamartomatous Polyps (<1°/o)

Peutz-Jeghers (LKB 1)

Juvenile polyposis (SMAD4, PTEN)

Cowden (PTEN)

Bannayan-Ruvalcaba-Riley

Mixed polyposis

Other Familial Causes (up to 20%-25%)

Family history of adenomatous polyps (MYH)

Family history of colon cancer:

- Risk more than three times greater if two first-degree relatives or one first-degree relative <50 y with colon cancer
- Risk two times greater if second-degree relative affected

Familial colon-breast cancer

Nonfamilial Causes

Personal history of adenomatous polyps

Personal history of colorectal cancer
Inflammatory bowel disease (ulcerative colitis, Crohn's colitis)

- Radiation colitis
- Ureterosigmoidostomy
- Acromegaly
- Cronkhite-Canada syndrome

Average Risk Population

Man or Woman above the age of 45 without personal or Family history of adenomatous polyps or CRC & absence of any occult or acute GI bleed.

Management Overview

- Colonoscopy & Biopsy
- MRI Pelvis
- CECT-Thorax+Upper Abdomen
- Sr CEA

Diagnosis & Staging

- Colonoscopy & Biopsy
- MRI Pelvis
- CECT-Thorax+Upper Abdomen
- Sr CEA

Treatment of Colon Cancer

Treatment of Non-Metastatic disease.
Surgery is the cornerstone of treatment.

- Adjuvant Treatment with Chemotherapy for some stage 2(high risk) & all Stage 3 patients.

Adjuvant Treatment

- Usually 6 cycles of CapeOx or FOLFOX regimen.
- Role of Adjuvant Radiotherapy is limited except for gross margin +ve resection pr adjacent organ invasion, in which RT can be considered.

Metastatic Colon Cancers

- Systemic Treatment- Chemotherapy, Targetted Therapy, Immunotherapy
- Surgery or RT for Palliation.

Treatment of Rectal Cancers

Early Rectal Cancers

- Surgery- Endoscopic, Trams-anal procedures or Transabdominal Surgery.
- Usually no adjuvant treatment required if early disease confirmed on HPR except for T3N0 disease which will require Adj CT & RT.

Locally Advanced Rectal Cancers.

- Neo-adjuvant Chemoradiation followed by Surgery followed by Adjuvant Chemotherapy.
- Total six months' treatment.

Metastatic Rectal Cancers

- Systemic Treatment- Chemotherapy, Targeted Therapy, Immunotherapy
- Surgery or RT for Palliation.

UNIT 3: MODULE 4

CERGICAL CANCER – SCREENING AND EARLY DETECTION, OVERVIEW OF MANAGEMENT OF CIN AND CERVICAL CANCER

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Current Status Of Cervix Cancer Screening

- Over 70% of the women reporting for diagnostic and treatment services are at an advanced stage of disease, resulting in poor survival and high mortality rates.
- Majority of Indian women lack awareness about the disease.
- Lack of optimal prevention, screening and treatment facilities.
- Only opportunistic screening in Secondary and tertiary care centers

Cervical Cancer

Risk Factors

- Early onset of sexual activity;
- Early age at marriage;
- First pregnancy before 20 years of age;
- Multiple pregnancies;
- Sexual promiscuity;
- Poor genital hygiene;
- Genital tract infections (HPV);
- Tobacco addiction.

Signs & Symptoms

- Abnormal bleeding
  - Between periods
  - During intercourse
  - After menopause
- Unusual vaginal discharge;
- Other symptoms
  - Leg pain
  - Pelvic pain
  - Weight loss

Some women have no symptoms

Cervical Cancer – Disease Context

- Primarily caused by persistent Human Papilloma Virus (HPV) infections.
- HPV, a DNA virus, has over 100 documented genotypes
  - 40 of which are known to infect the anogenital tract.
  - Between 12 and 14 are “high risk” genotypes, those that can cause progression to cancer.
- Cervical cancer is slow-growing. It’s progression through precancerous changes provides opportunities for:
  - Prevention;
  - Early detection; and,
  - Treatment

  Cervical cancer can be altogether eliminated.

HPV and Cervical Cancer

- Cervical cancer is caused by high-risk types of HPV;
  - HPV 16 and 18: most common high-risk HPV types to cervical cancer
  - Responsible for approximately 70% of cervical cancer cases.
- HPV is currently the most common sexually transmitted infection (STI)
  - 80% of women can be infected at some point in their lifetime;
  - Most of infection clear naturally.

Screening for Cervical Cancers

- Pre cancers: Cervical Intraepithelial Neoplasis [CIN]
- Invasive Cancers

Screening for Cervical Neoplasia

Cytology

- Cervical Cytology (PAP Test)
- Liquid Based Cytology

Non-cytology Methods

- HPV-DNA testing
- VIA (Visual inspection of cervix with Acetic acid)
- VILI (Visual inspection of cervix with Lugol’s Iodine
- Other Molecular Technologies

Screening Tools: Strengths & Limitations

CYTOLOGY	
Strengths	**Limitations**
• High Specificity for CIN2+	• Relatively low sensitivity • Requires laboratory and specialized technicians • Lag in test results can contribute to loss to follow up and delay treatment

VIA	
Strengths	**Limitations**
• Requires less training (5-10 days) than other methods • Cheaper than cytology/HPV testing • Immediate results • Potential for immediate treatment ("screen and treat")	• Variable (low to moderate) sensitivity and specificity for CIN2+ • Possibility for over treatment • Acetic acid must be prepared directly before screen • In appropriate for older women (>50 years) because of change in cervix position

HPV	
Strengths	**Limitations**
• High specificity and sensitivity for HPV infection • Requires minimal training • Woman can self-collect sample	• Has to be followed by a test for dysplasia • Requires laboratory and trained technicians • Lag in test results can contribute to loss to follow up and delay treatment

Who Should Have a Cervical Cancer Screening?

- All women who are above 30 years of age should have screening tests done for detection of cervical pre-cancer and cancer.
- Women below 30 years of age need not have these tests as cervical cancer is rarely seen in this age group.
- Pregnancy is not the ideal time to have screening tests.
- Pregnant women can wait six weeks after childbirth and then go for the tests.
- Women who have their uterus removed due to reasons other than cervical pre-cancer or cancer need not have the screening tests.

Diagnosis

- Cytology
- Histopathology

Terminology For Cervical Abnormalities: A General Comparison

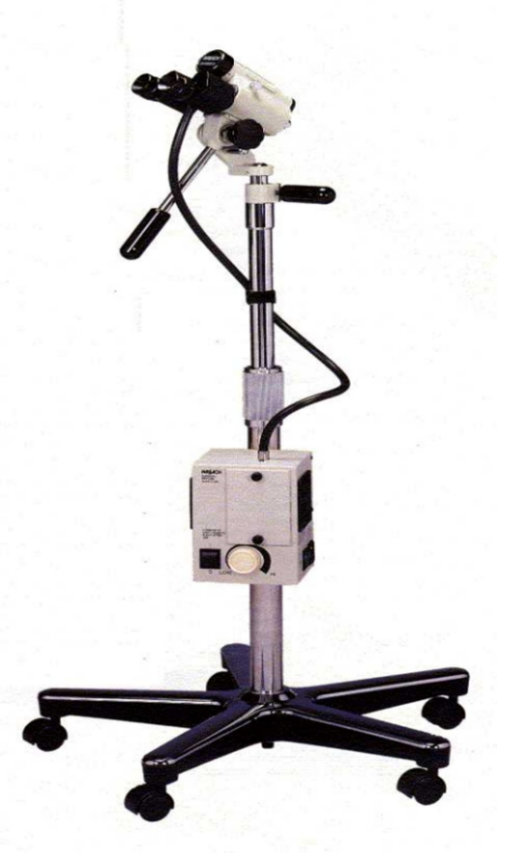
Bethesda System	Cervical Intraepithelial Neoplasia (CIN) system	Common Dysplasia Terminology
Atypical Squamous cell of undetermined significance (ASCUS)	Cellular atypia	Unspecified cellular changes
Low grade Squamous intraepithelial lesions (LSIL)	CIN I	Mild Dysplasia
High grade Squamous intraepithelial (HSIL)	CIN II	Moderate Dysplasia
	CIN III includes carcinoma insitu (CIS)	Severe Dysplasia

Colposcope

A colposcope is an instrument that provides strong light and magnifies a field, allowing specific patterns in the epithelial (surface) layer and surrounding blood vessels to be examined.

Colposcopes are used on patients with positive screening results, to:

- verify the presence, extent, and type of pre-cancer or cancer;
- to guide biopsies of any areas that appear abnormal; and,
- to help determine more appropriate treatment (cryotherapy, LEEP, or TA).
- Colposcopy requires highly trained providers and is not an appropriate screening tool, nor is colposcopy a required step between screening and treatment.
- More recently, colposcopes are being designed as handheld, specialized video or digital camera tools.



Current Barriers of Transition to HPV-based Screening

- Program Challenges
- Test Cost
- Logistics around the test

Pre-cancer Management

Ablative: No tissue is provided for histologic review.

- Rule out micro-invasion.
- Lesion on the ectocervix and seen entirely
- No involvement of endocervical canal.
- Cryotherapy, CO2 laser ablation, electrocautery, cold coagulation.

Excisional procedures:

- Leep (Loop electrosurgical excision procedure)/LEETZ (Large loop excision of transformation zone)
- Laser Conization
- Cold Knife cone

Hysterectomy

- Too radical for the treatment of CIN

Indications:

- Microinvasion;
- +ve Cone margins (when fertility is not desired);
- Adenocarcinoma in situ;
- Associated gynecological problems

UNIT 3: MODULE 5

UPPER GI CANCERS – SYMPTOM APPROACH AND OVERVIEW OF MANAGEMENT

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The Digestive Tract

- Major site of cancer in humans.
- There are great differences in incidence among the component sites from the esophagus to the anus.
- Colorectal cancer – more prevalent in the Western world and gastric cancer in the Eastern world.

Indian Scenario

- Esophageal cancer – north-eastern region of India.
- Gastric cancer - prominent problem in north-eastern and southern states of the Indian subcontinent.
- Gallbladder cancer - Northern India
- Rectal cancer among men is one among the ten leading sites of cancer in the southern India.
- Liver cancer - Male urban populations of western and northern India.
- Pancreatic cancer – relatively lower prevalence in India

Risk Factors and Etiology of GI Cancers

Stomach Cancer	Esophageal Cancer
• A diet high in salty and smoked foods • A diet low in fruits and vegetables • Eating foods contaminated with aflatoxin fungus • Family history of stomach cancer • Infection with Helicobacter pylori • Long-term stomach inflammation • Pernicious anemia • Smoking • Stomach Polyps	• Gastroesophageal reflux disease (GERD), in which contents and acid from the stomach back up into the esophagus, significantly increase the risk of adenocarcinoma of the esophagus. • Smoking or other use of tobacco. • Heavy alcohol use • Barrett's esophagus

Colorectal Cancer

- Obesity and overweight
- Diet high in red meat, processed meat, low in fibre
- Alcohol
- Smoking
- Type 2 DM
- Age
- Inherited syndromes
- Inflammatory bowel diseases

Pancreatic Cancer

- Age
- Smoking
- Overweight
- A family history of pancreatic cancer
- Pancreatitis, and diabetes
- Alcohol
- Red and processed meat

Liver-hepatocellular Cancer

- Alcohol
- Hepatitis B, Hepatitis C (25% of causes globally)
- Aflatoxin
- Cirrhosis of the liver
- Non-alcoholic steatohepatitis (if progression to cirrhosis has occurred)
- Hemochromatosis, Alpha 1-antitrypsin deficiency, Wilson's disease
- Type 2 diabetes
- Obesity

Biliary

- Polyps
- Duct abnormalities
- Stones
- Ethnicity
- Chronic infections
- Obesity

Symptoms

Gastric Cancer

- Fatigue
- Bloating and fullness after eating small amounts of food
- Heartburn that is severe and persistent
- Indigestion that is severe and unrelenting
- Nausea that is persistent and unexplained
- Stomach pain
- Vomiting that is persistent
- Weight loss that is unintentional

Esophageal Cancer

- Difficulty or pain when swallowing
- Weight loss
- Pain in the chest, behind the breastbone
- Coughing
- Hoarseness
- Indigestion and heartburn

Pancreatic & Biliary Cancers

- Weight loss
- Jaundice (yellow skin), Dark urine, light stools, Itching
- Nausea, vomiting
- Abdominal pain, back pain,
- Pancreatic cancer in the body or tail of the pancreas causes belly and/or back pain and weight loss.

Liver Cancer

- Worsening of symptoms or during surveillance that is used to screen patients who are at risk the most.
- Yellow skin, bloating from fluid in the abdomen
- Easy bruising from blood clotting abnormalities
- Loss of appetite, unintentional weight loss, abdominal pain especially in the right upper quadrant, nausea, vomiting, or feeling tired.

Aim of the Investigations

- General Physical Assessment – diagnosis, staging, treatment possibility;
- Diagnosis;
- Staging and Metastatic work-up;
- Operability/Resectability;
- Prognostication.

General Assessment

- General Physical Examination;
- Anemia, Jaundice, Pedal Edema, Nutritional Status, Abdominal Distension;
- Neck Lymph nodes and other lymph node groups.

Biochemistry and Other tests

- CBC
- Liver Function – Albumin, Bilirubin
- Renal Function - Creatinine
- Urine – Sugar, Ketones, Proteins
- Blood Sugar
- Tumor Markers
- X ray Chest/abdomen
- **Cardio - respiratory Evaluation**
- ECG/2 D ECHO
- Pulmonary function Tests
- Other Tests
- Viral Markers

Principles of treatment

- Surgery
- Chemotherapy
- Radiotherapy
- Palliative Care

Management of Gastric Cancer

- The management of Gastric Cancer requires a multidisciplinary approach.
- Potentially, patients with Stage I-III are treated with 'curative' intent, while patients
- with Stage IV disease are considered for 'palliative' treatment.
- **Early Gastric Cancer**
- **Gastric cancer with loco-regional disease**
- **Advanced/metastatic Gastric Cancer**

Early Gastric Cancer

- Uncommon in India
- Defined as cancer which is confined to the mucosa and submucosa regardless of lymph nodes status.

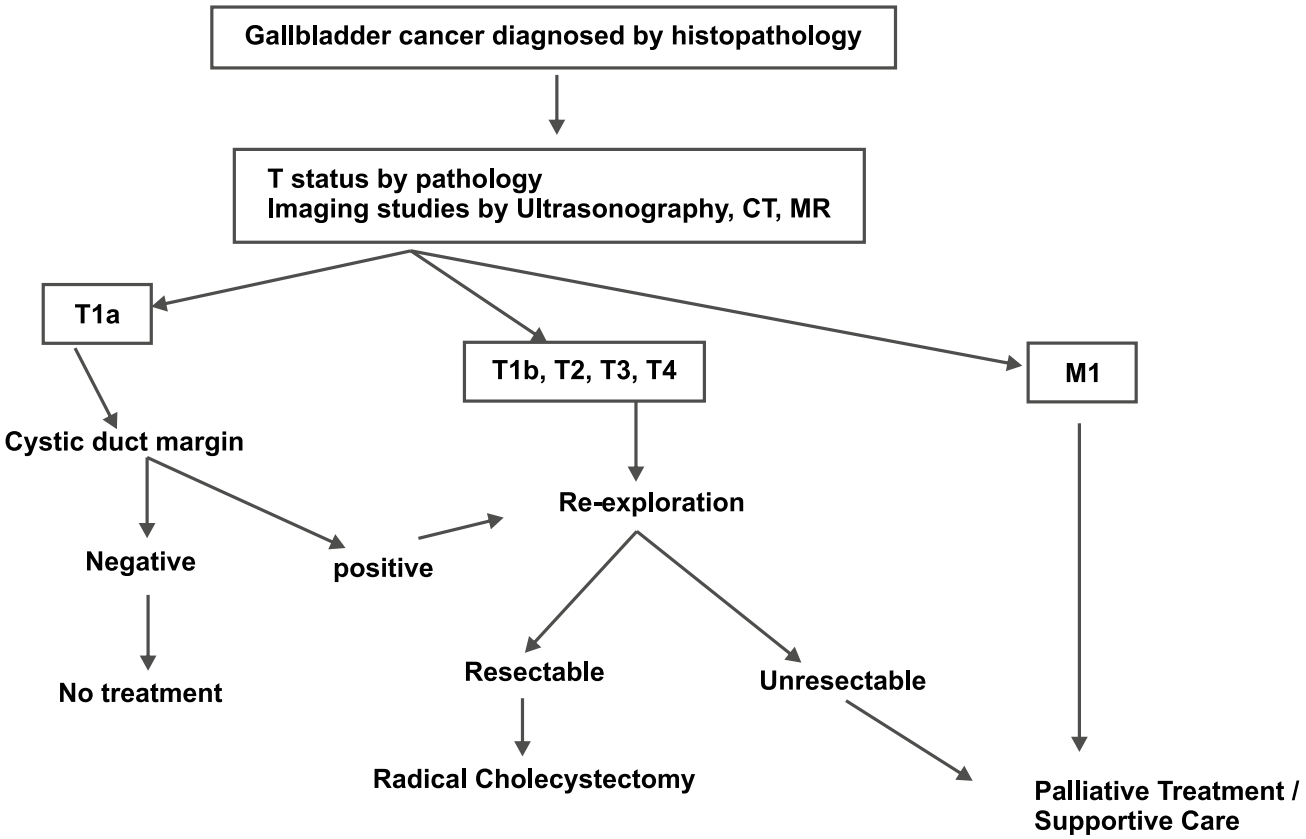
Treatment :

- Endoscopic resection
- Surgery
- Antibiotic treatment for eradication of Helicobacter pylori, and adjuvant therapies

Gastric Cancer with loco regional disease

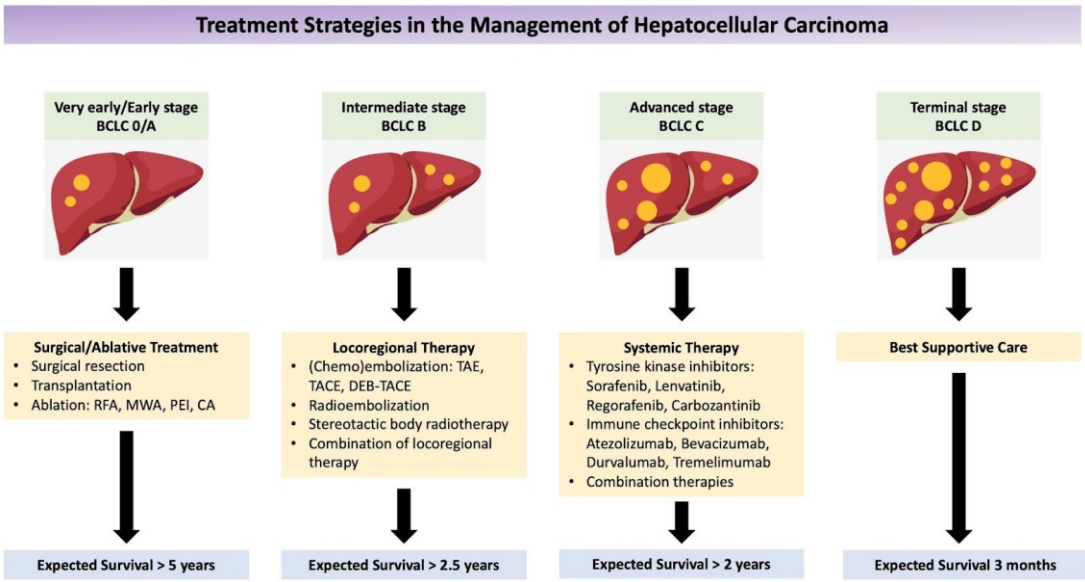
Peri-operative chemotherapy is currently the standard of care for gastric cancer with T3/T4 or N+ disease.

Gall Bladder & Biliary Cancers

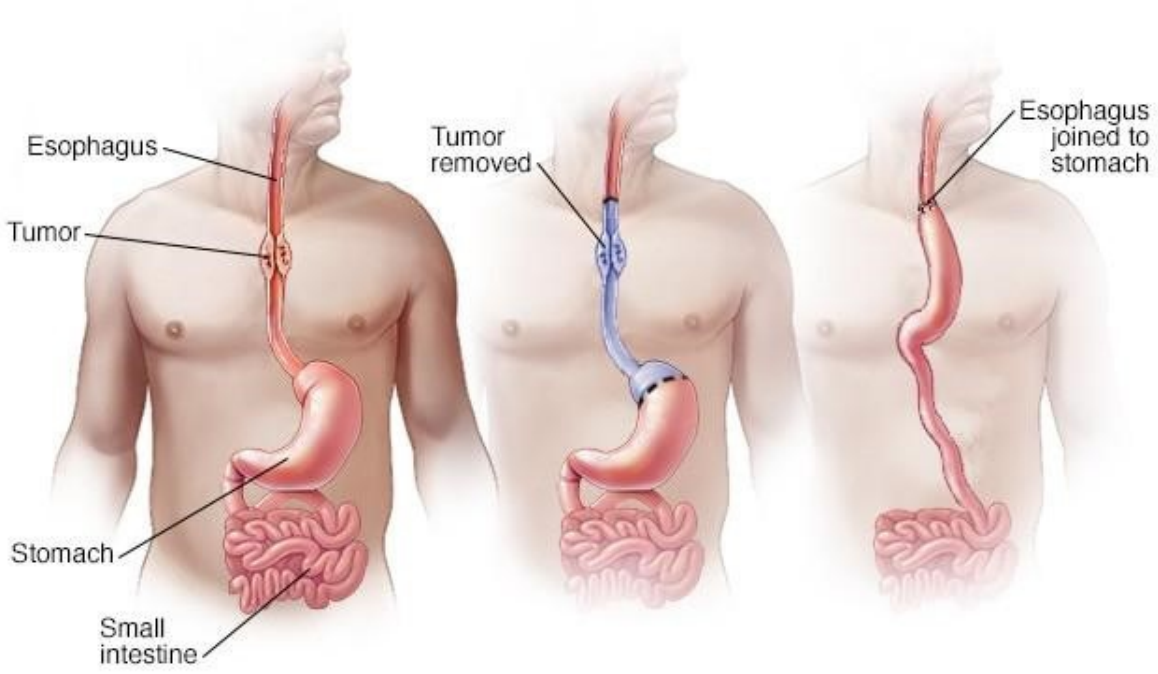


Liver Cancer

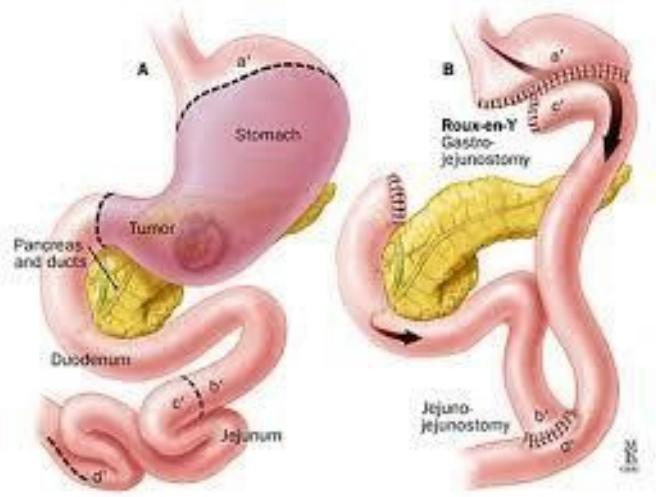
- Hepatocellular carcinoma (HCC)
- Cholangiocarcinoma
  - Intrahepatic
  - Peri-hilar
  - Bile duct
- Metastatic disease – Colorectal/Neuroendocrine

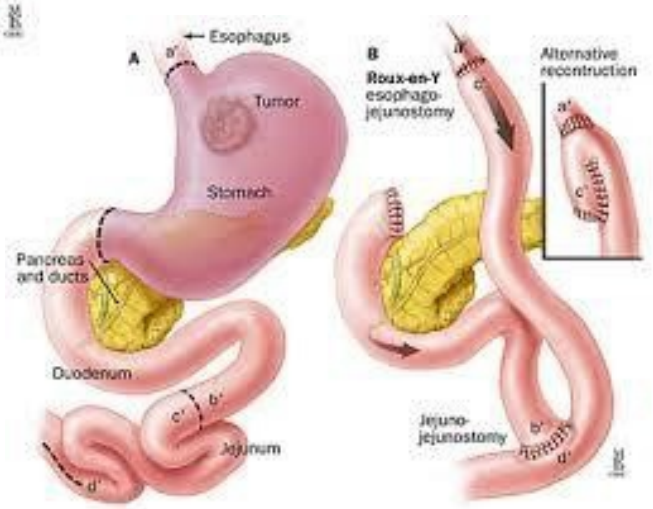


Surgery for Esophageal Cancer

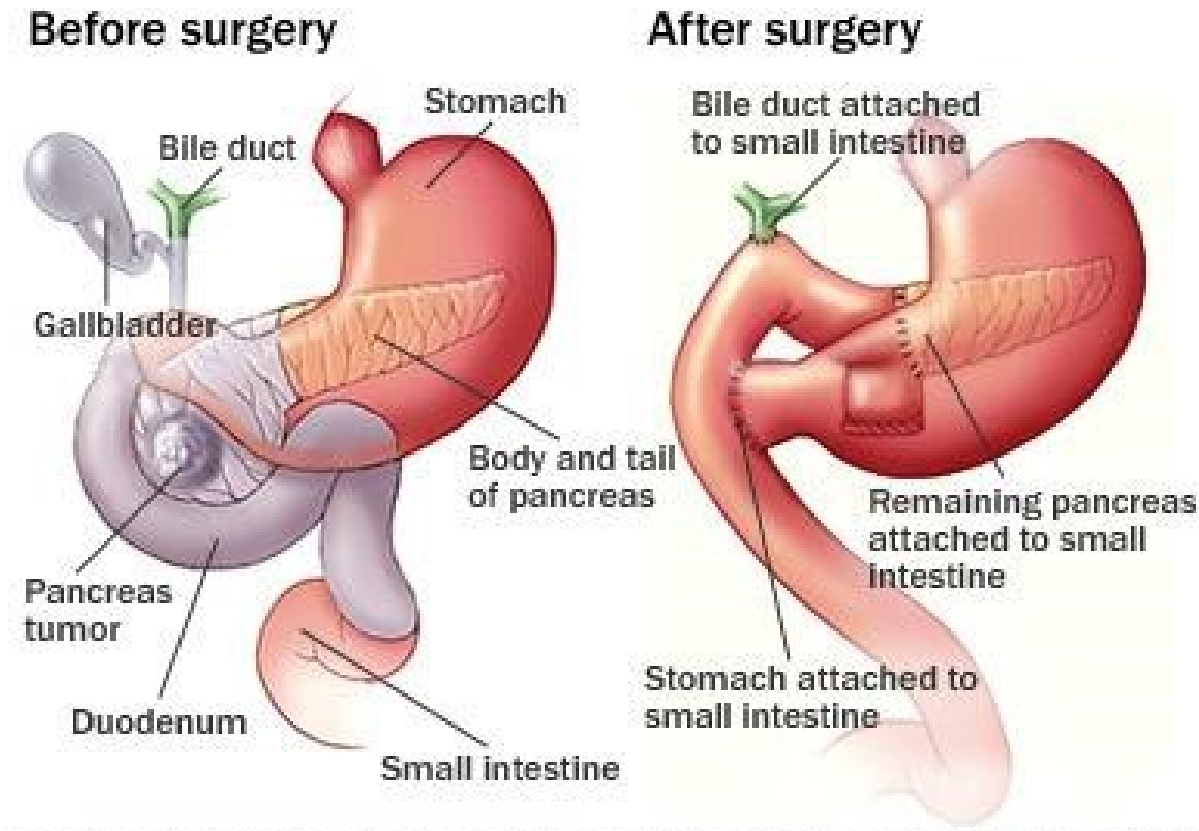


Surgery for Gastric Cancer

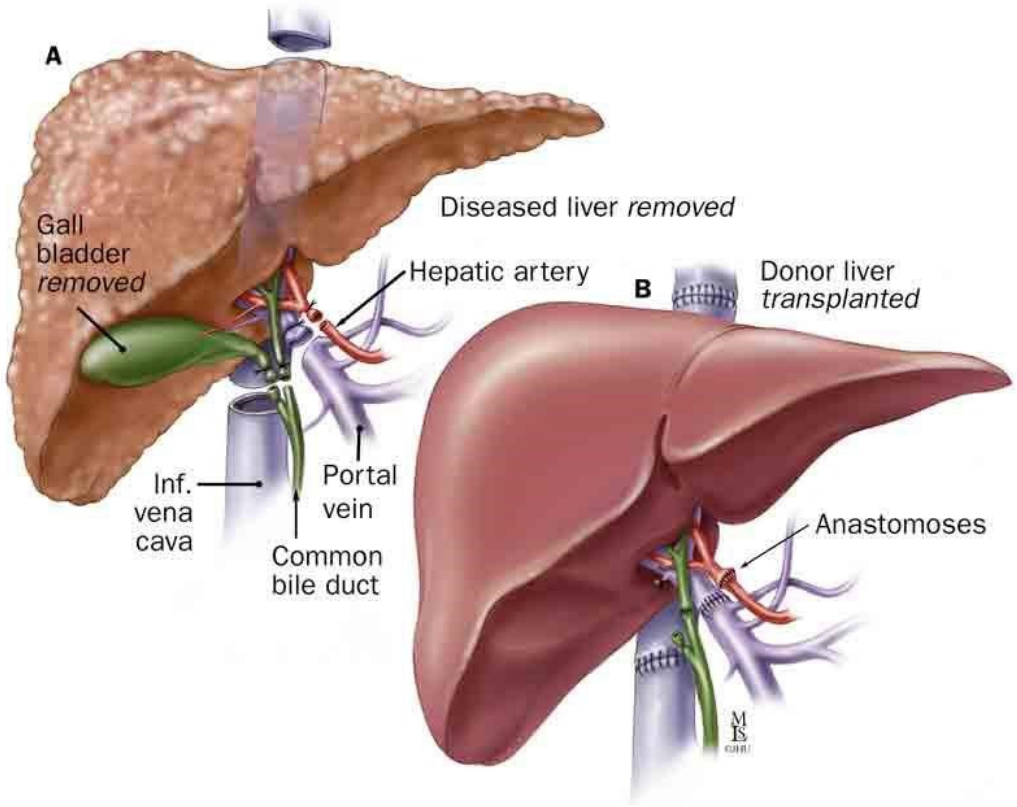




Surgery for Pancreatic Cancer



Hepatectomy & Liver Transer



Role of Chemotherapy and Radiotherapy in GI Cancers

- Definite use in GI cancers;
- Improved Local Control, Survival;
- Results of Chemotherapy improving;
- Biologic treatments – e.g. Imatinib – GIST;
- Radiation in Rectal cancer- Recurrence reduction;
- Specialized centers, MDT – Toxicity management, use for proper indications

UNIT 4: MODULE 1

PAIN AND SYMPTOM MANAGEMENT IN CANCER

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Cancer Pain: the Disease Trajectory

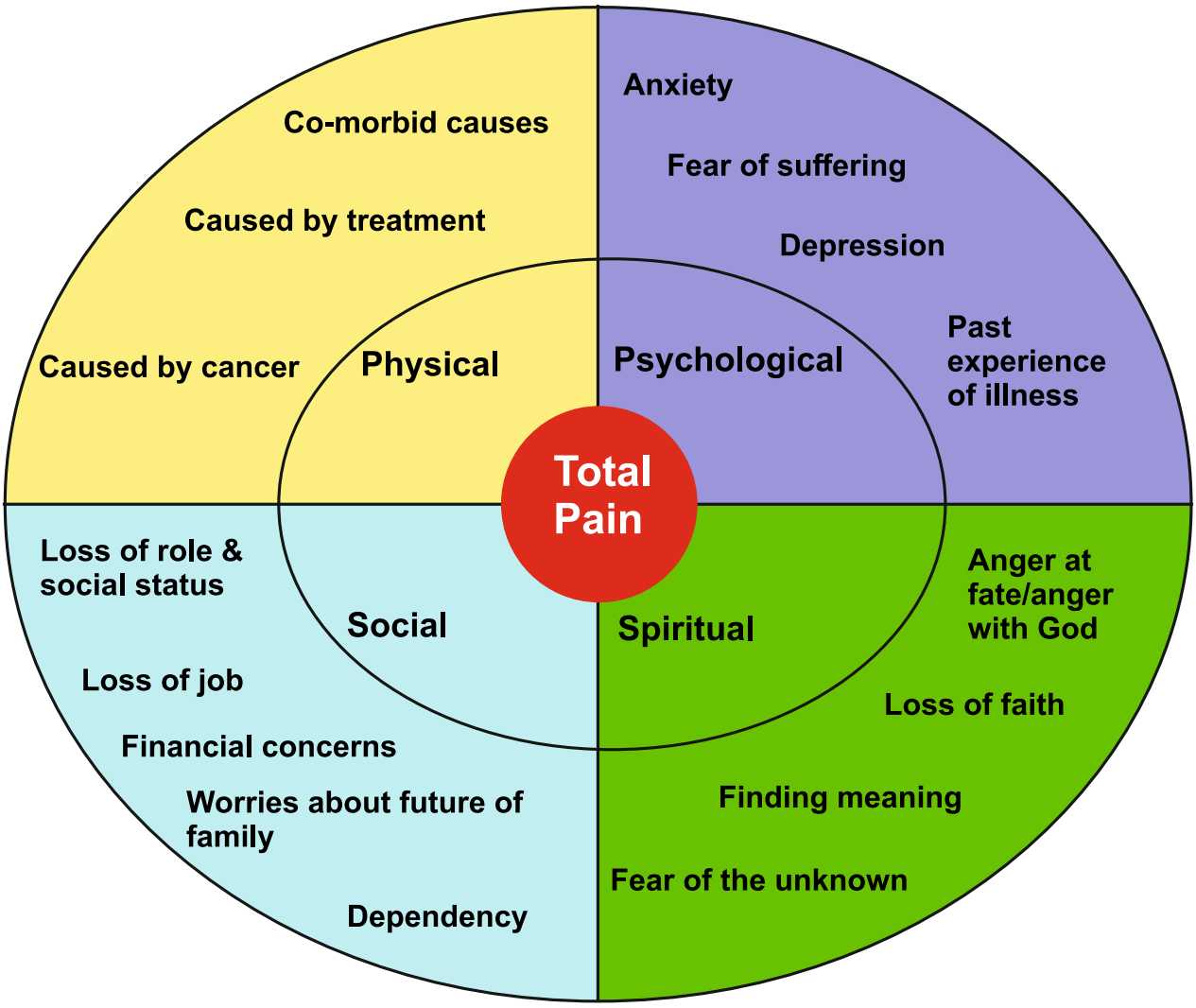
- Solid tumors present as asymptomatic masses.
- < 15% patients with non-metastatic ds have pain.
- When pain is the first symptom, cancer is probably more advanced.
- Hence, pain can be an independent predictor of poor survival.

Cancer Narrative in India

- Poor die miserably in neglect
- The middle class die in misery of ignorance
- The rich die in ICU in misery on ventilators
- No one gets a pain free and dignified death

Aspects of Care

- Physical symptoms (severe pain)
- Psychosocial issues (loneliness, Depression)
- Spiritual Issues (why me !!)
- Financial Issues
- Communication
- Anticipation
- Decision-making, Goals of care & Advance Care planning
- Palliative Rehabilitation
- End of Life Care
- Bereavement



Types of Cancer Pain

- Nociceptive, Neuropathic, Breakthrough
- Cancer Pain is typically a 'Mixed Pain'
- Pain due to tumor (Advanced, Recurrence, Residual)
- Pain due to treatment
- Unrelated to Cancer

Table 1. Cancer pain may be classified according to neural mechanisms

TYPE		NEURAL MECHANISM	EXAMPLE
Nociceptive	Visceral	Stimulation of pain receptors on normal sensory nerve endings	Hepatic capsule stretch
	Somatic		Bone metastases

Table 1. Cancer pain may be classified according to neural mechanisms

TYPE			NEURAL MECHANISM	EXAMPLE
Neuropathic	Nerve Compression		Stimulation of nervi nervorum	Sciatica due to vertebral metastasis with compression of L4, L5 or S1 nerve root
	Nerve injury	Peripheral	Lower firing threshold of sensory nerve (deafferentiation pain)	Tumour infiltration or destruction of brachial plexux
		Central	Injury to central nervous system	Spinal cord compression by tumour
		Mixed	Peripheral and central injury	Central sensitization due to unrelieved peripheral neuropathic pain
	Sympathetically maintained		Dysfunction of sympathetic system	Chronic regional pain syndrome following fracture or other trauma

Paracetamol & Liver Disease

- Safest analgesic
- Even in chronic liver disease (dose of 2-3 gms /day)
- NSAIDs are best avoided because of risk of renal impairment, Hepatorenal syndrome, and GI hemorrhage.
- Most opioids can have deleterious effects in patients with cirrhosis.
- **Dyspnea**
- **Upto 70% patients experience dyspnea in last 6 weeks of life (Ben-Aharon et al, 2008; Kamal et al, 2012)**
- **Non-pharmacological methods**
- **Fan (air blowing on the face); Positioning of the patient can be tried**
- **Relaxation and breathing techniques: considerably difficult to add in terminal phases.**
- **Oxygen therapy - useful only in those with hypoxia**
- **Use of bronchodilators if indicated**

Management of Dyspnea

Pharmacological

- Opioids - Morphine or equivalent opioid SC/IV injection 1–2.5 mg q 4 h SC for breathlessness in the opioid naïve, 24 hour total dose in SD
- With anxiety: Lorazepam Tablet SL 0.25–1 mg tds
- Refractory breathlessness with distress: Midazolam IV or SC 1–5 mg q 4 h
- Muscle relaxants may be used if patient is on ventilator
- Non-invasive ventilation may be considered

Agitation/ delirium

- 88% of patients have been found to have agitation/delirium when screened properly
- Hypoactive/hyperactive delirium
- Refractory delirium itself is a poor prognostic factor and precedes terminal phase (Maltoni et al, 2012)
- Rule out correctable causes before diagnosis as terminal delirium
- Environmental changes + correcting correctable

Antipsychotics

1. Haloperidol SC or IV 1.5–5 mg tds SC 3–15 mg/day;
2. Levomepromazine SC 25–50 mg qid Up to 200 mg/day;
3. Olanzapine wafers PO 2.5–10 mg bd;
4. Chlorpromazine HCL PR 50–100 mg bd;
    - Benzodiazepine if required;
    - Midazolam SC/IV 2.5–5 mg q 4 h Up to 60 mg/day;
    - Clonazepam SL/SC 0.5–1 mg bd SC

Nausea and vomiting

- Metoclopramide (prokinetic drug for gastroparesis) SC/10–20 mg tds–qid
- Haloperidol (central action) SC or IV 0.5–1.5 mg bd–tds
- Primarily central Cyclizine SC 25–50mg 300 mg/24 h via SD. Compatibility issues in GI obstruction
- Colicky abdominal pain - Buscopan (hyoscine butylbromide) IV or SC 20–40 mg qid
- With refractory vomiting - Octreotide IV or SC 100–300 micrograms tds

Terminal secretions/Death rattle

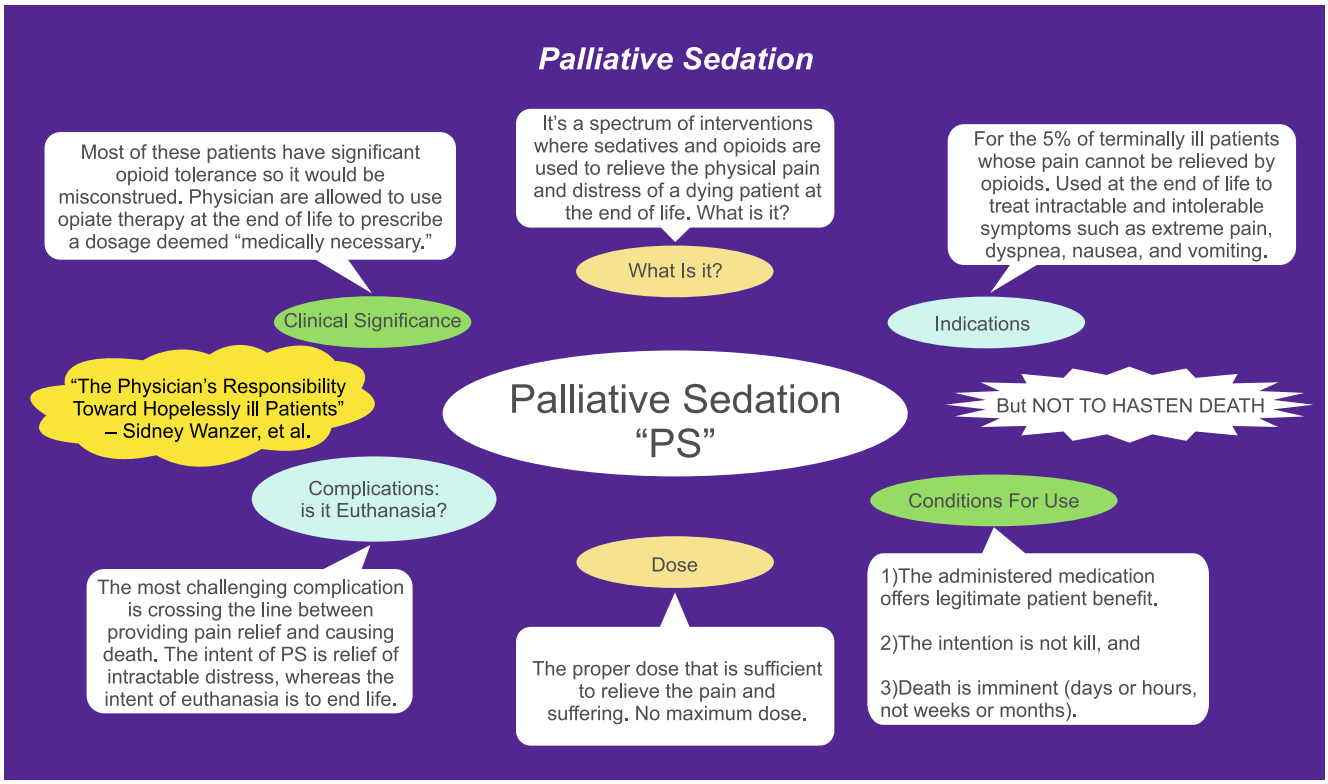
- Prevalence: 44% of dying patients (Morito and hyodo, 2004)
- Type 1/ true death rattle - Mechanisms uncertain, maybe due to pooling of saliva and secretions in the upper airways + reduced swallowing reflexes, dysphagia and inability to expectorate.
- Type 2/pseudo death rattle - Due to pooling of secretions, may occur over days and not respond as well to antimuscarinic/anticholinergic medications.
- Eg. bronchorrhea from primary lung tumour, infection, dysphagia, bleeding, airway obstruction, pulmonary edema or TE Fistula
- No significant association between hydration status and development of death rattle (Ellershaw et al, 1995; Morito and hyodo,2004)
- RCT of 3 anticholinergic drugs in 333 patients (Wildiers et al, 2009) showed beneficial responses in 76% patients.
- **Anticholinergics -**

  When unconscious Hyoscine SC 0.4 mg q2–q4 h

  When conscious Glycopyrrolate SC 0.2–0.4 mg q2–4 h
- Reassure the family that terminal secretions are rarely distressing to the patients, although maybe distressing to family

Nursing Interventions

- Skin care: Positioning, comfort beds, pressure point care
- Mouth care: Hydrate with unflavored sponge tipped swab every 2-4 h. Avoid commercial mouthwash, lemon glycerin, artificial saliva
- Eye care: Methylcellulose eye
- Terminal Emergencies
- Prefer nasal prongs if on O2
- Avoid restraints
- Avoid excessive monitoring
- Permit family members to stay
- Acute stridor requires immediate sedation with IV midazolam 5 mg (the dose being dependent on whether the patient recently had a dose and in what amount).
- Massive hemorrhage is a catastrophic event. A dark towel should be readily available to make blood loss less obvious. Midazolam, 5 mg, should be available for immediate sedation.
- Myoclonic Jerks: Patients are often so ill or unconscious that they are unaware.
- Drug induced: dopamine antagonists, neuroleptics, high-dose opioids, or withdrawal of such drugs as benzodiazepines, barbiturates, anticonvulsants, and alcohol.
- Seizure: Acute and maintenance: Midazolam SC/IV/buccal, 2.5-5 mg stat Clonazepam SL drops/SC 0.5–1 mg stat, bd 1–2 mg.



Palliative sedation

Medication-induced sedation that is administered, without intending to cause death, utilizing a non-opioid drug to control intolerable symptoms that are refractory in patients with advanced and incurable disease whose death is imminent (death expected in hours or days).

Intolerable symptoms are those symptoms that are intolerable as defined by the patient. In a non-communicative patient, symptoms may be assessed by the health care providers, with input from the family and caregivers.

Refractory symptoms are those symptoms that remain uncontrolled after aggressive palliative treatments have been tried, for which treatment side effects are or are expected to be intolerable or for which available treatments are unlikely to provide adequate relief in an acceptable time frame, considering the patient's prognosis, life expectancy, and level of distress.

Principle of Double Effect

1. **The good effects are intended (symptom control and comfort);**
2. **The potential, foreseeable bad effects are not intended (decreased oral intake, potential hypotension and respiratory depression);**
3. **The good effects equal or outweigh the bad effects (rule of proportionality);**
4. **There are no other treatments that would achieve the desired good effects without potential, foreseeable bad effects.**

Respite Sedation

Time-limited sedation to unconsciousness or respite sedation may be used for terminally ill patients with severe refractory suffering in a variety of situations:

- Incident pain: Severe pain or other symptoms due to therapeutic or diagnostic procedures or to necessary movement for other clinical care (Del Rosario et al., 2001).
- Severe refractory social or 'existential' suffering: one or more trials of respite sedation may 'break a cycle of anxiety and distress' that has evoked a request for palliative sedation (Cherny, 1998; Rousseau, 2001).

Informed consent

- Explain the following points to the patient:
- Should include documentation of discussions about Palliative Sedation with the patient and/or surrogate and ideally should cover, at a minimum, the following points:
- Presence of refractory symptoms requiring sedation
- Primary goal (intent) being patient comfort
- Patient death imminent (weeks or less)
- No other therapeutic options
- Notation of any professional consultations to **confirm that patient is near death with refractory symptoms**
- **Planned discontinuance of interventions not focused on comfort**
- **Plan for hydration and nutrition during PS (clearly noting that it is a separate decision from the use of PS)**
- **Anticipated risks or burdens of PS (i.e., sedation, decreased ability to communicate and take oral nourishment)**

Patient-Centered Care in Silver Hour Interventions

	Dying	Death	Dead
Biopsychosocial perspective - going beyond the illness to address other issues holistically. Patient as a person - knowing the patient beyond the illness	Offering additional support, e.g. a comfort cart, and obtaining additional support staff. Referring to patient by name. Sharing stories of patient. Encouraging family participation/observation in care.	Acknowledging the extent of the patient's condition prior to death. Leaving the face uncovered, continuing to refer to patient by name.	Addressing family issues, such as obtaining coverage for medical costs, burial finances, or other concerns. Offering context for the death – “everything was done,” <name> is peaceful, "I know <name> felt your presence”
Sharing power and responsibility - mutual participation in decision making.	Seeking to understand the patient and family wishes regarding life-sustaining treatment or withdrawal. Mediating conflicts promptly in a positive manner.	Coordinating death-related rituals. Devising a mutually agreed upon place and time to say good-bye.	Adapting policies and procedures to meet family needs. Allowing time with patient after death.
Therapeutic alliance: empathetic, positive regard and perception of care givers as caring.	Listening to concerns. Helping patient/family understand treatments and organizational procedures. Assuring environment of care is quiet and respectful. Participating in meaningful rituals with patient and family.	Providing evidenced-based approach to death notification. Coordinating care with additional professionals, such as coroners, law enforcement, and organ procurement organizations.	Offering mementos, locks of hair, medical supplies used by patient, and photographs. Walking family to the car after death.
Doctor/(clinician) as a person: being treated as an individual with warmth and sufficient information.	Focusing person-specific information on status changes.	Completing death notification with opportunities for questions. Sharing of patient's story.	Giving name and contact phone number to family in case there are questions later.

UNIT 4: MODULE 2

PSYCHOSOCIAL COUNSELLING, COMMUNICATING WITH PATIENTS

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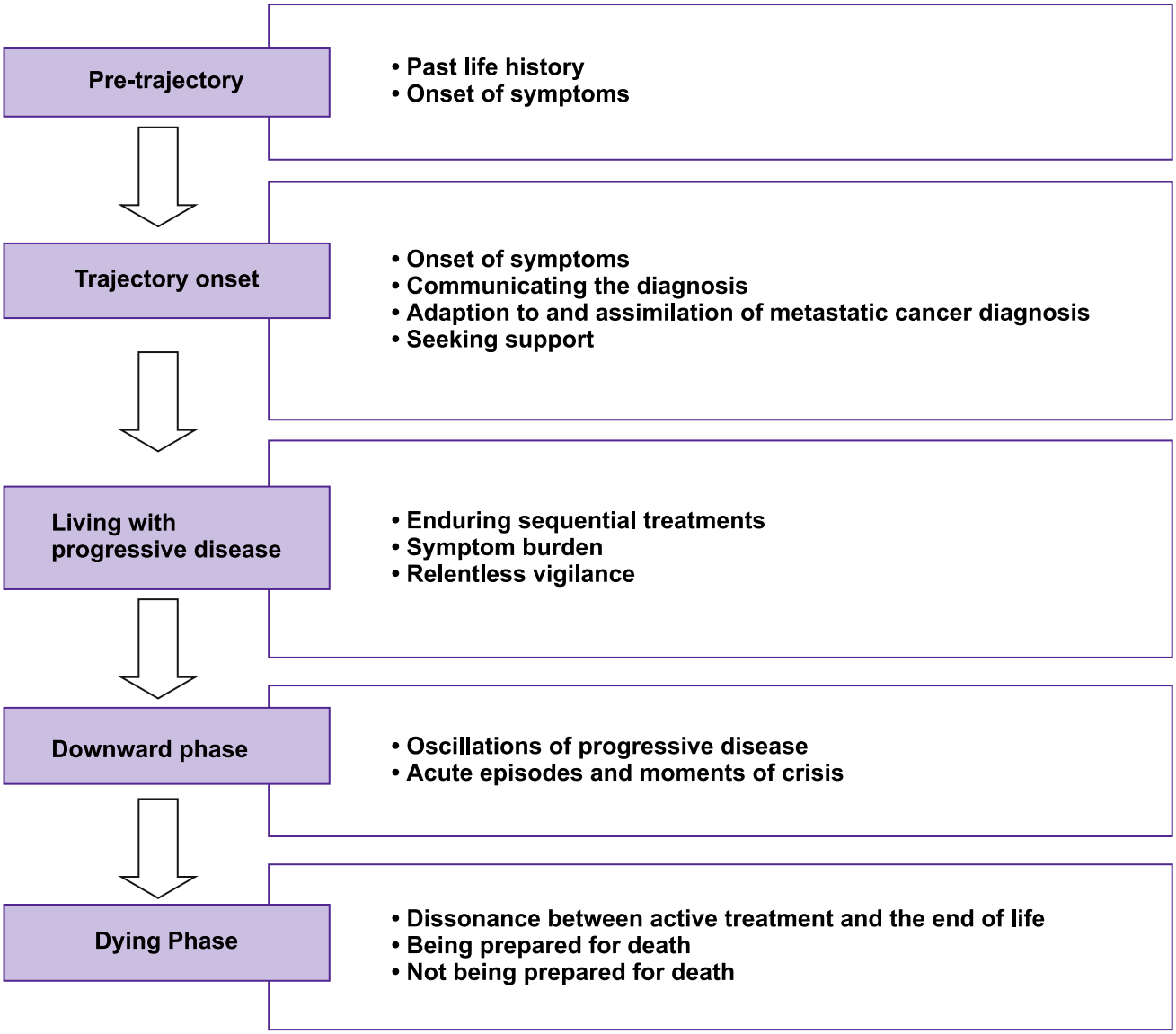
What is Psycho-oncology?
This area deals with the psychological and emotional reaction to “cancer illness” at all stages of disease for the patient, family, and the staff who have their own burden in taking care of the patient.

Dr. Jimmie Holland-Founder of the field of Psycho-Oncology



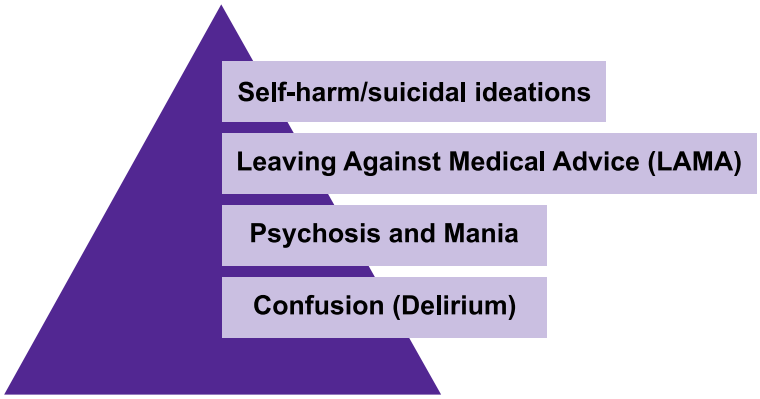
Psychological Reactions

- "No, not me" **(denial)**
- "Why me?" **(anger)**
- "Yes me, but... **(bargaining)**
- "Yes me" **(depression)**
- "I know it's cancer but I can't do much about it, so there is no point getting upset." **(acceptance)**

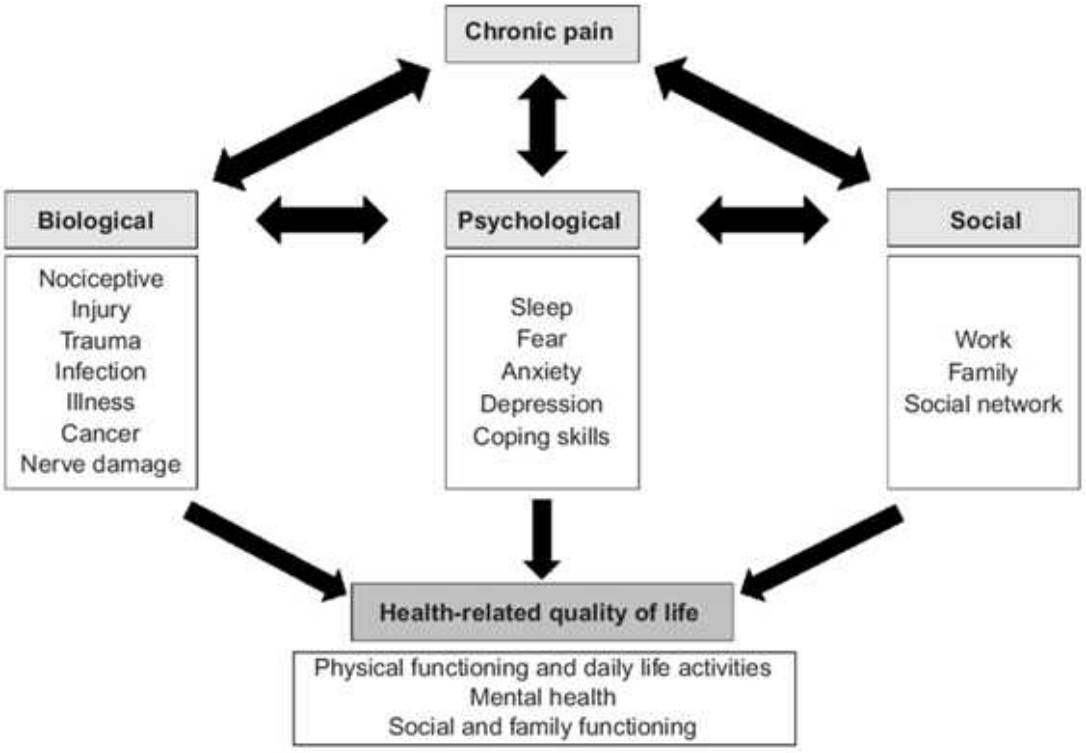
MAJOR PSYCHIATRIC ISSUES

- Adjustment disorders
- Depression/Suicide
- Anxiety Disorder (Panic disorder, PTSD, OCD)
- Personality Disorders
- Psychosis/Mood disorders
- Substance Use disorder
- Cognitive disorder
- Delirium (Hypoactive, Hyperactive or Mixed)

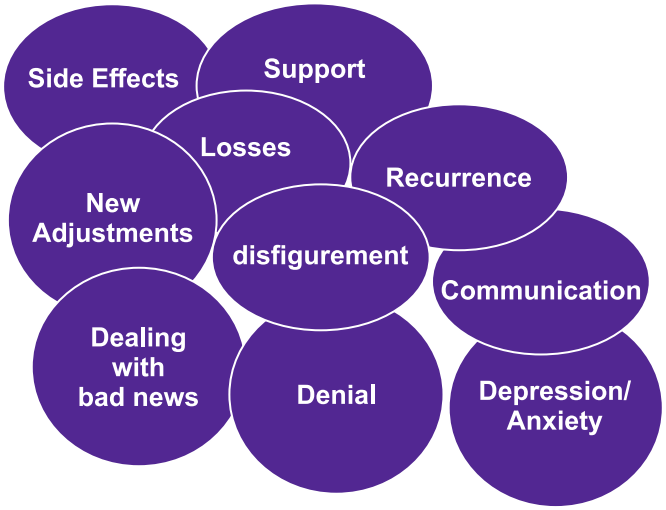
Psychiatric Emergencies



Bio-psycho-social Model



Major Issues in Coping



Barriers – Professional

- Experience
- Fear
- Avoidance
- Personal limitations
- Dealing only with positive
- Lack of acceptance

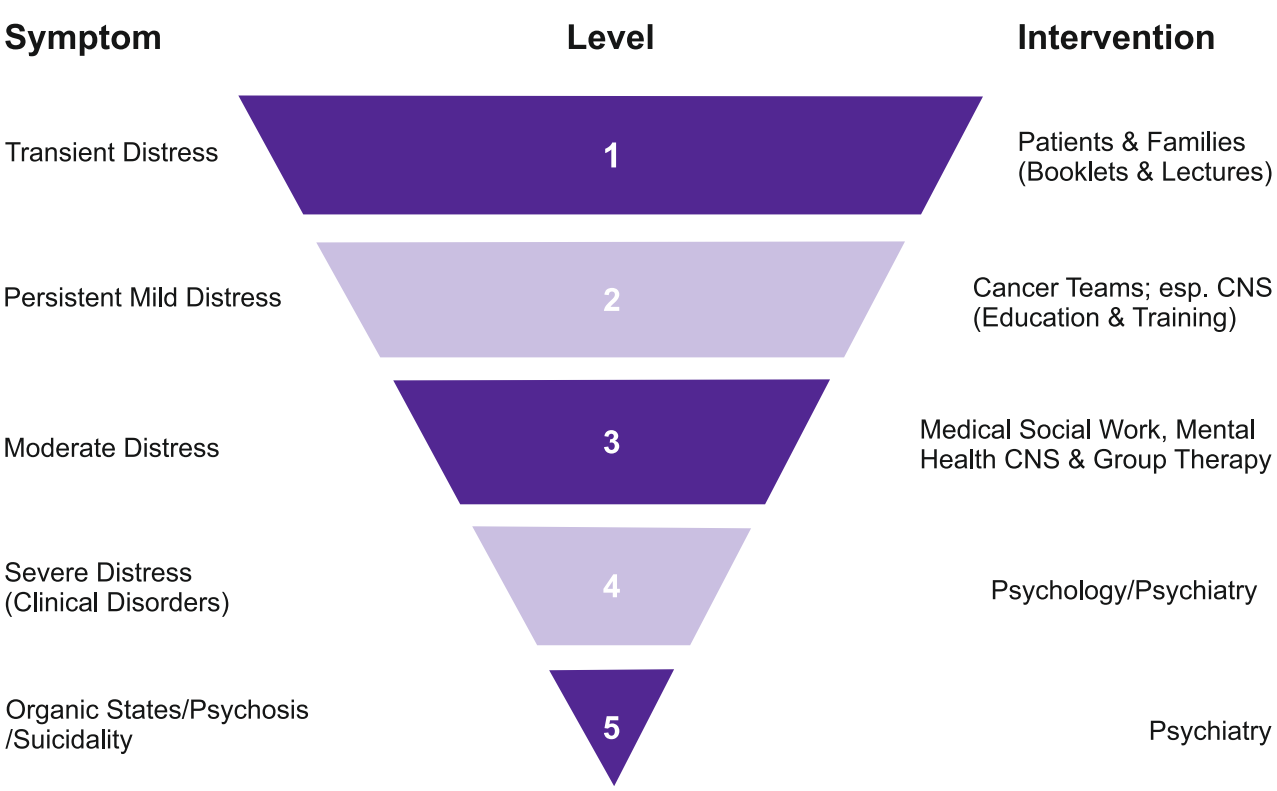
Palliative Care

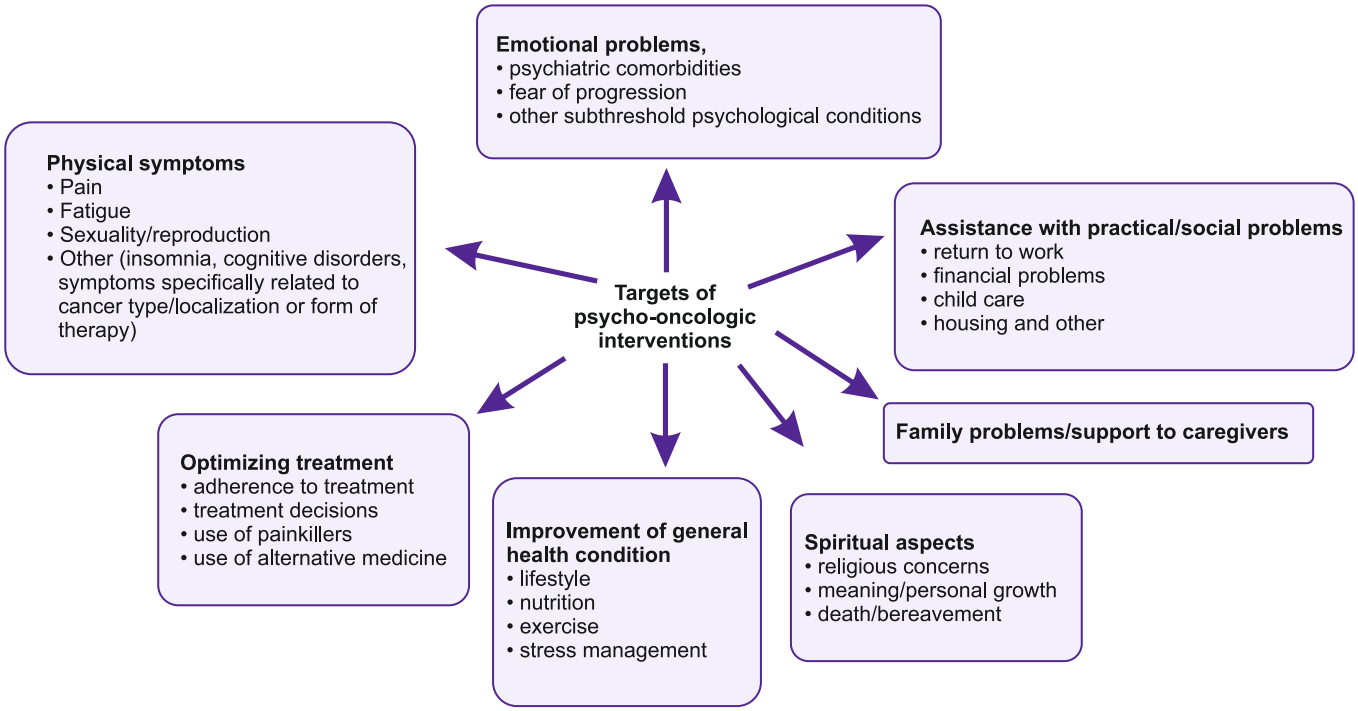
- Talking about death & place of death
- Handling uncertainty, collusion and denial
- Anticipatory grief
- Bereavement Support
- Spiritual concerns
- Consolidation of a sense of self

Survivorship Care

- Late Effects
- Management
- Support Group
- Motivation to maintain regular follow up
- Exercise, Diet & Safety
- Family Support
- Psychological support to move on in life
- Risky Health Behaviour

Proposed Model of Hospital-Community Psycho-oncology and Psycho-social Care





Psychotherapy Interpersonal Therapy

- Supportive; Psycho education
- Cognitive Behaviorally-Oriented
- Meaning Centered Psychotherapy
- Dignity therapy
- Family Focused Grief Therapy

Group Therapy

- Supportive
- CBT
- MCP

UNIT 4: MODULE 3A

LYMPHOEDEMA AND OSTOMY CARE

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Occupational Therapist & Lymphoedema Therapist
Tata Memorial Hospital,
Mumbai

Lymphoedema
Is excess accumulation of fluid in the tissue causing inadequate drainage due to damage or blockage in the lymphatic system.

Types

Primary: Congenital, genetic syndromes such as Turners syndromes.

Secondary: Surgical removal or radiation of lymph nodes, cancer related treatment for gynecological malignancies, sarcomas and melanoma.

Symptoms

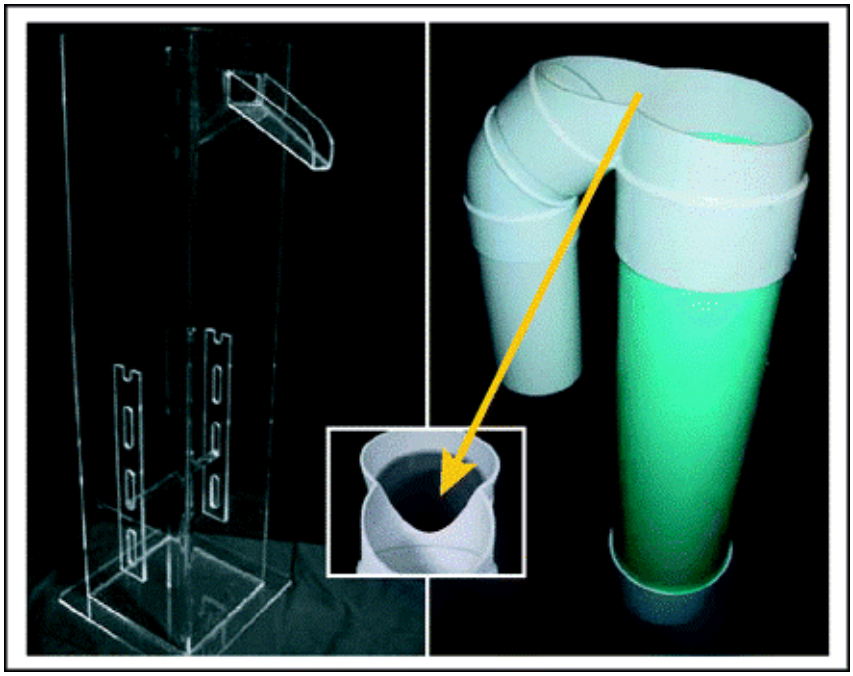
- Sudden difficulty in fitting clothes, tightness ofrings, watch or bracelet;
- Infection that won't go away or keeps comingback in the same area;
- Restricted limb movements, and difficulty inday today activities;
- Feeling of fullness or discomfort in arm.

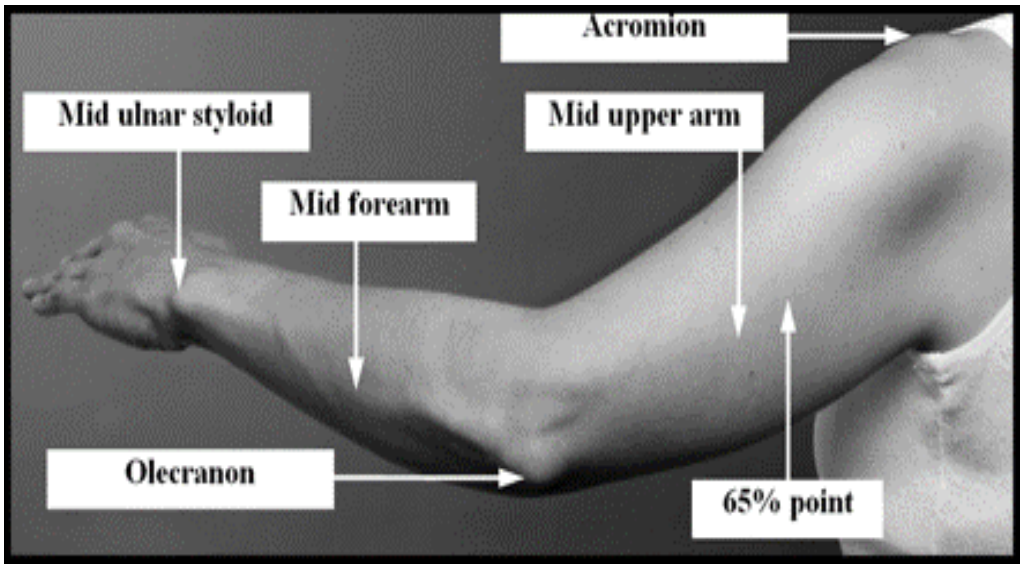
Staging

Stage : 0-4

0 – sub-clinical
1 – Limb elevation, pitting
2 – May or may not have pitting
3 – Lymphostatic elephantiasis

Volumetric





Circumferential

Delay in the Treatment

- Lack of awareness.
- Poor socioeconomic condition.
- Ignorance.
- Delay reference for the management.

Management

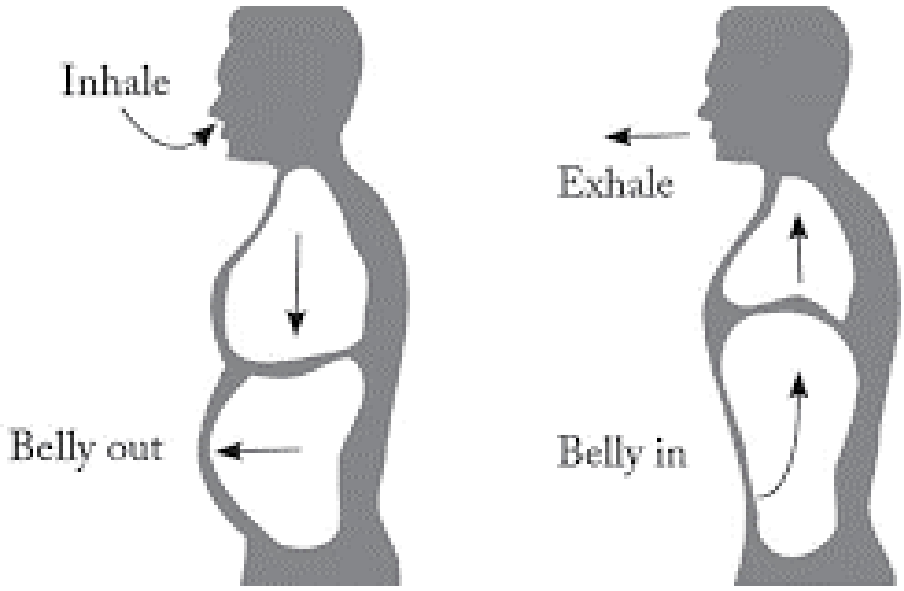
Complete Decongestion Therapy (CDT)

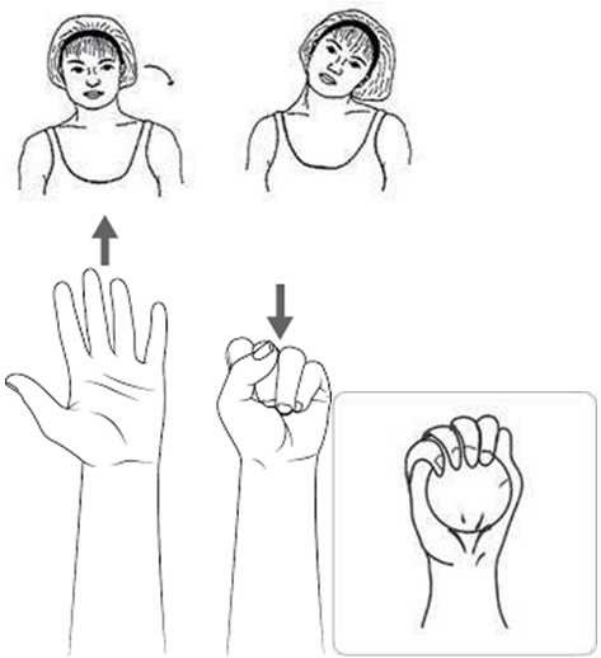
- Elevation
- Skin care
- Exercises
- Manual lymphatic drainage (MLD)
- Multi-layered bandaging (MLB)
- Compression pressure garments

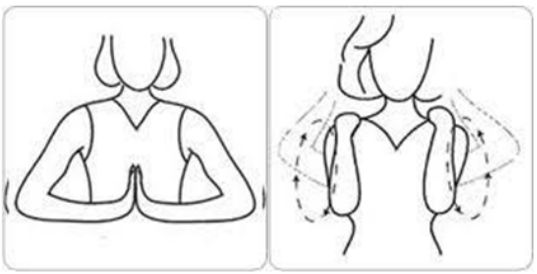
Skin Care

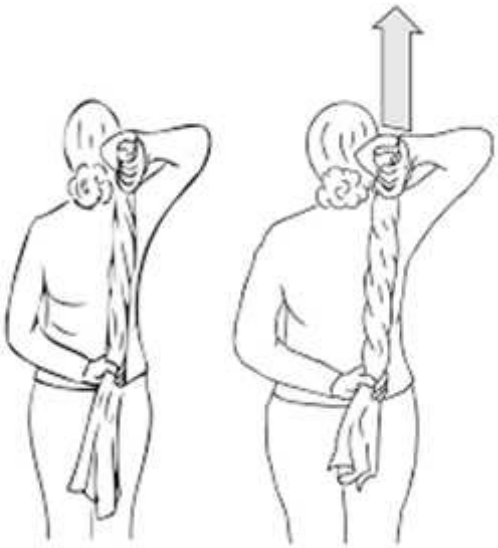
- Avoid extreme hot or cold temperatures on the affected limb, such as heating pads or ice packs;
- Take proper care of the nails and avoid cutting cuticles;
- Clean the skin of the affected limb daily and apply lotion. When drying the limb, be gentle, but thorough;
- Keep the limb elevated when possible;
- Clean all cuts with soap and water, and then apply anti-bacterial ointment and a sterile dressing;
- Avoid vigorous, repetitive movements against resistance;
- Consult the physician immediately of any signs of infection, such as redness, pain, heat, increased swelling, or fever;
- Do exercises regularly to improve drainage;
- Eat a well-balanced, low-sodium diet.

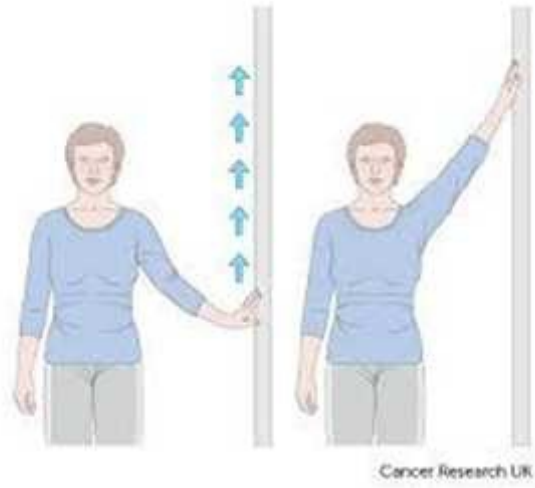
Exercises

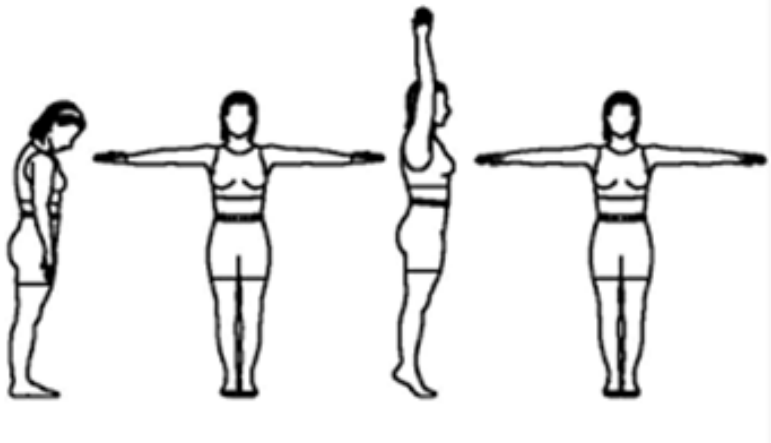


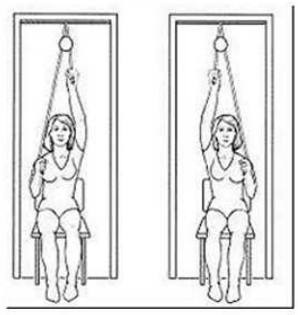


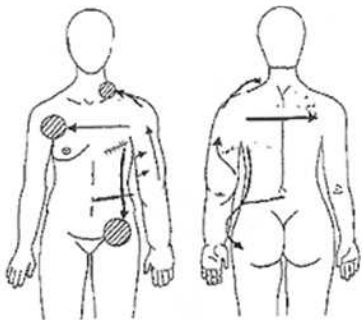




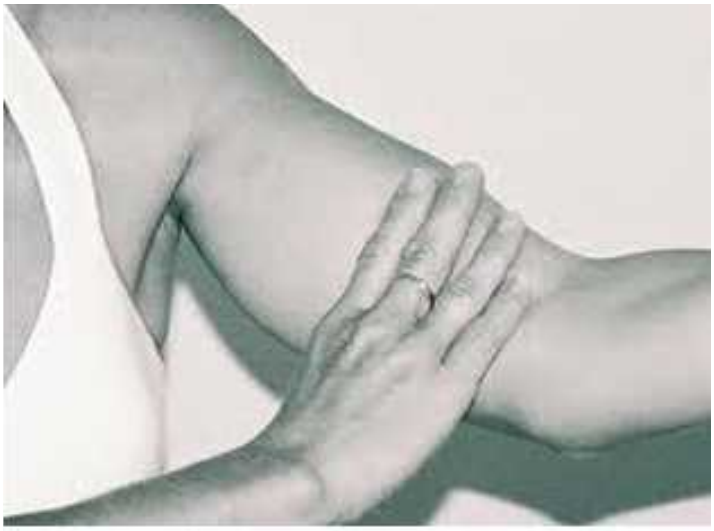


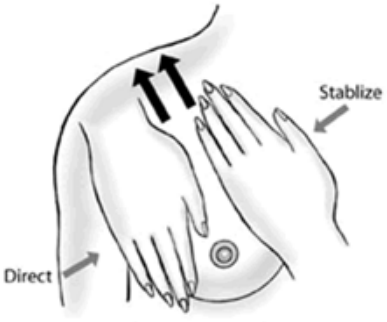




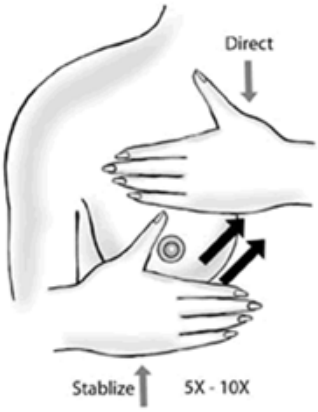


Manual Lymphatic Drainage (MLD)

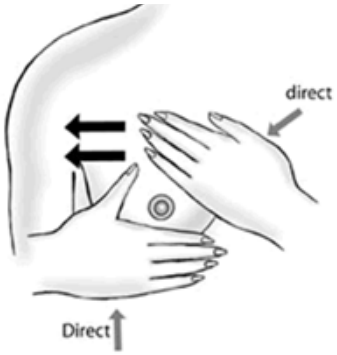




Pull-release 7X - 20X



5X - 10X



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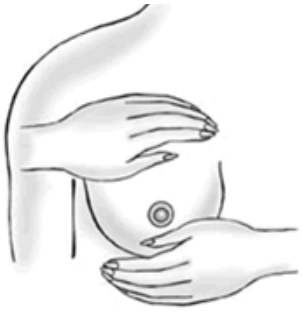
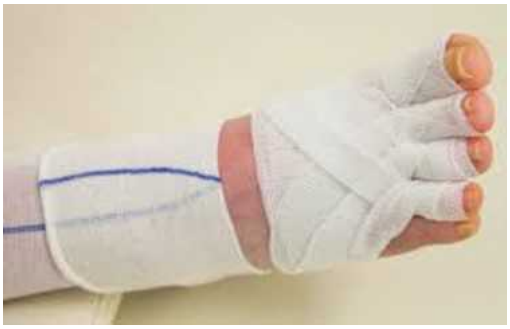


Hold entire breast
Pump in ward
5X - 10X

Multi Layer Bandaging

Pressure Sleeve



It is advisable to prevent Lymphedema or treat it at an early stage before it becomes chronic.
Instead of telling the patients:

“Don’t worry it will Settle”

A different attitude should be adapted. They should be informed:

“This is a Warning from your Lymphatic System, Pay Attention without Delay”.

Complete Decongestion Therapy (CDT)

- Skin care education
- Exercises
- Manual lymphatic drainage (MLD) per anterior and posterior pathways (dependent on the presentation of the head and neck congested areas) Skilled techniques to decrease fibrosis, decrease pain, and increase range of motion.
- Compression Bandaging
- Compression garment.

UNIT 4: MODULE 3B

BASIC CARE OF STOMA

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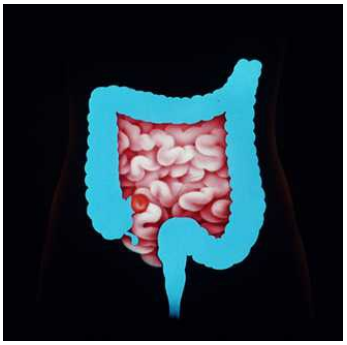
BASIC CARE OF STOMA

- Stoma is Greek word which means “A mouth or mouth-like opening”.
- Ostomy is a surgically performed opening in the intestine or urinary tract to excrete waste from the body.
- Temporary or Permanent.
- Loop, double barrel or divided.

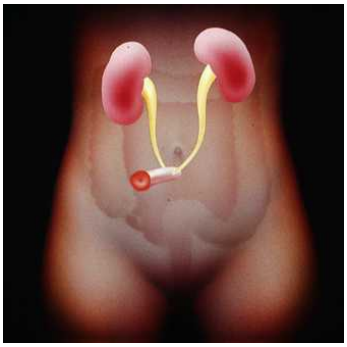
Causes

- Cancer
- Diverticulitis
- Inflammatory Bowel Disease
- Familial polyposis.
- Trauma (stab wound/gunshot/accidental injury).
- Neurological damage
- Incontinence
- Congenital disorder
- Intestinal obstruction

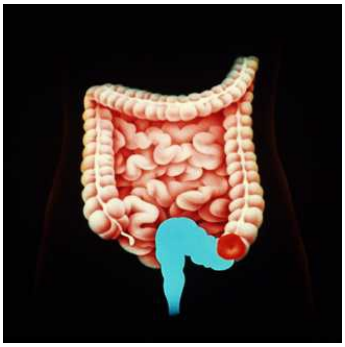
Types of Stoma
Ileostomy



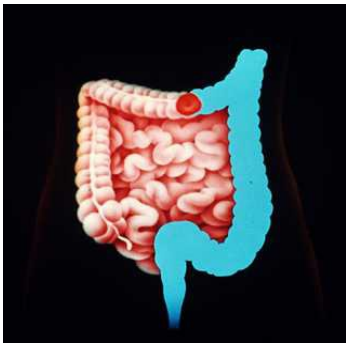
Urostomy



Sigmoid Colostomy



Transverse Colostomy



Common Stoma Sites

- Loop Colostomy
- L or R Upper Quadrant

- Ileostomy
- Ileal Conduit
- Right Lower Quadrant

- Colostomy
- Left Lower Quadrant

Types of Colostomies

- Loop colostomy
- Double barrel colostomy
- Divided colostomy
- End Colostomy

Types of Ileostomies

- End ileostomy
- Loop ileostomy
- Double barrel ileostomy
- Divided ileostomy

Five Landmark Phases of Ostomy Care
There are Five Landmark Phases of Stoma Care:

1) Pre-Operative
2) Crisis
3) Recuperative
4) Transitional
5) Post Hospital

Pre- Operative Counselling

- It is important to provide information about what the patient should expect after the surgery.
- Helping the patients psychologically adapt to changes that occur to lift body image and help post-operative adaption.
- Encourage the patient to express feelings and fear about the surgery and ostomy.
- Provide information about the surgery through literature and photos.
- Appearance of stoma.
- Show different appliances.
- Discuss about self-care after surgery.
- Include family in teaching.

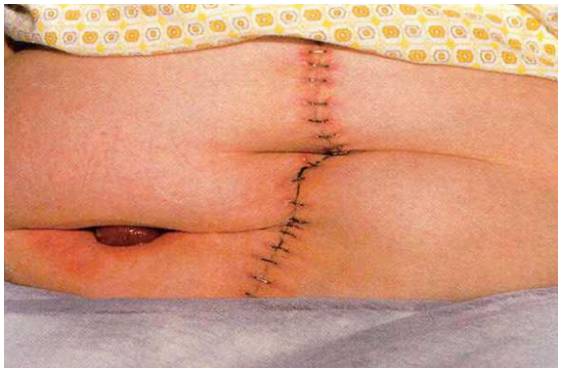
Stoma Marking

- Stoma site marking should be performed by an E.T. Nurse or health care professional who has been trained in the principle of stoma site marking and aware of the implication of ostomy care and poor stoma site marking. Stoma marking should be done for all before surgery. It reduces the stomal and peristomal complications. Hence, early stoma acceptance by ostomate.
- Need to explain the importance of stoma marking and the procedure to gain the patient's co-operation. Patient should understand the reasons why the site is chosen pre-operatively.

Stoma Site Selection

Objective:

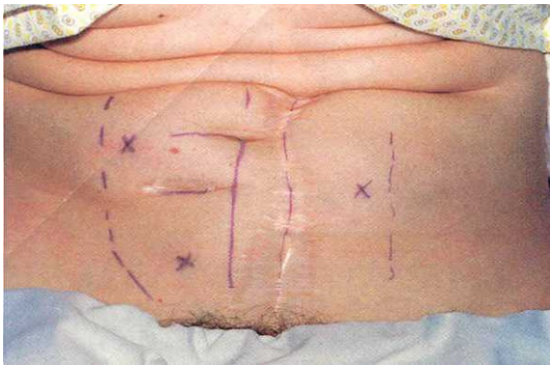
- Create a stoma that is easy for the patient to manage and does not place undue changes on the patient's desired lifestyle.
- Correct siting is essential.
- Involve the patient.



Stoma Site Selection

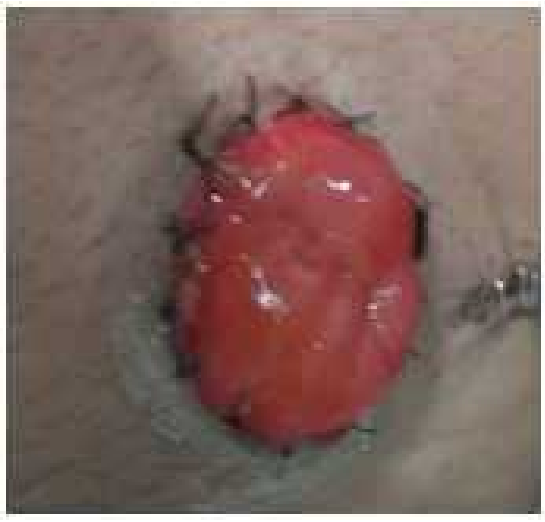
Avoidance of:

- Skin Folds
- Scars
- Umbilicus
- Belt Line
- Bony Prominences
- Pendulous breasts
- Two stoma should not be at the same horizon



Pre-operative Preparation

- Physical preparation
- Routine investigation
- Bowel preparation
- Stoma marking
- 2 days before operation, nourishing fluid
- After 12 mid night-NBM
- Written and information consent



Immediate post op care

Stomal observation

- Colour
- output
- Rod in place
- Site and size
- Peristomal suture
- Peristomal skin condition
- Warmth

Procedure of application

- Clean the peristomal area with lukewarm water;
- Pat dry;
- Shave area, if necessary;
- Measure the stoma carefully;
- Cut the pouch according to the shape & size of the stoma; 1/8" larger than stoma size;
- No oil-based ointments under the adhesive appliance;
- Charcoal filter & deodorant for ostomies;
- Dietary Modifications.

Ileostomy special consideration

- Protection of the skin is imperative;
- A properly fitted, carefully applied drainable collection pouch with skin barrier must be worn at all times;
- Electrolyte imbalance may result from loss of fluids, 'B'complex supplement;
- Low residual diet for six weeks.

To REMEMBER in urostomy management:

Urostomy pouch with:

- Anti - reflux valve
- Night drainage
- Plenty of liquids
- Intake of Vitamin "C"
- Collection of urine specimen by sterile technique (infection)

Follow Up

- Complete stoma check-up for shrinkage & re-evaluation of appliance.
- Reinforcement of what was learnt in the hospital.
- Frequency of pouch change & for leakage, evaluate the stoma in sitting and bending position also.
- Problems in daily living activities.

Complications of Stoma

- Stomal necrosis
- Skin excoriation
- Stomal retraction
- Stomal Prolapse
- Stenosis
- Parastomal hernia

Colostomy Irrigation

Defined as the instillation of water in to the Colon via the stoma to wash out or evacuate the stored material in the bowel.

Indication

- Sigmoid end colostomy (A.P.R.)
- Loop sigmoid colostomy & Tr. Colostomy

If Constipation:

- Before & after Ba. enema
- Before colonoscopy
- Before surgery

NUTRITION AND DIET IN CANCER

Dr. Shivshankar Timmanpyati
Chief Clinical Nutrionist
Tata Memorial Hospital,
Mumbai.

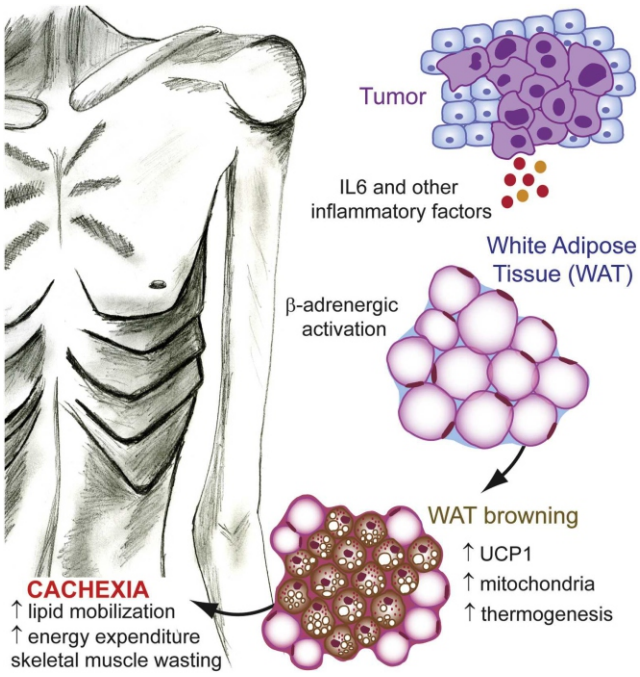
"Cancer cells are more metabolically active than other cells as they use more energy (sugar)"
Malignant tumours often have an increase in glycolysis associated with an increase in lactic dehydrogenase activity (LDH) which converts Pyruvate to Lactate. Therefore, there is increased serum LDH & lactate in patients with cancer.

Cori's cycle
The lactic acid produced here is recycled through liver to produce energy.

"High Lactate levels often have worse prognosis because it promotes angiogenesis"

"Elevated tumor lactate concentrations predict for an increased risk of metastases in head-neck cancer".Brizel DM, Schroeder T, Scher RL, Walenta S, Clough RW, Dewhirst MW, Mueller-Klieser W Int J Radiat Oncol Biol Phys. 2001 Oct 1; 51(2):349-53.

Pathophysiology of Cancer Anorexia Cachexia

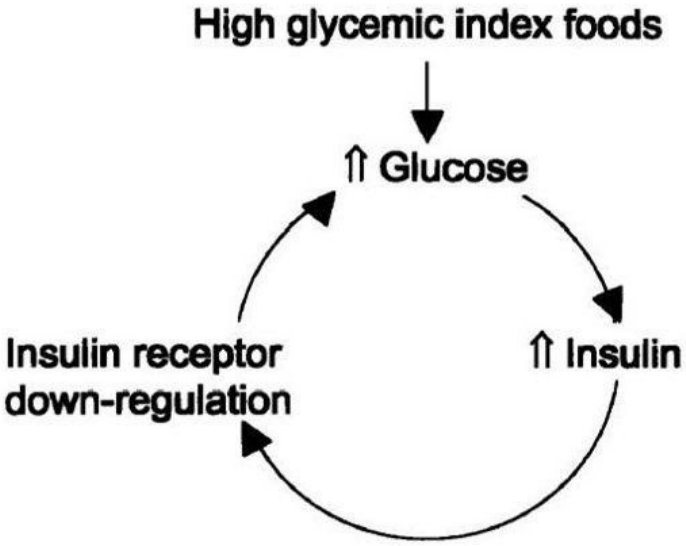


Properties of Sugar

- Bad carbohydrate
- Increases lactase -acidic medium
- Induces dysbiosis
- Reduces macrophage activity
- Easy fuel for tumor
- Increases inflammation by increasing cytokine production
- Increases serotonin induces anorexia
- Increases hyperglycaemia
- Increases recurrence rate
- Risking mitochondria health

Potential mechanism for the relationship between high-GI foods and insulin resistance

FDIN June 2005



(Augustin *et al. Eur J Clin Nut* 2002;56:1049-71)

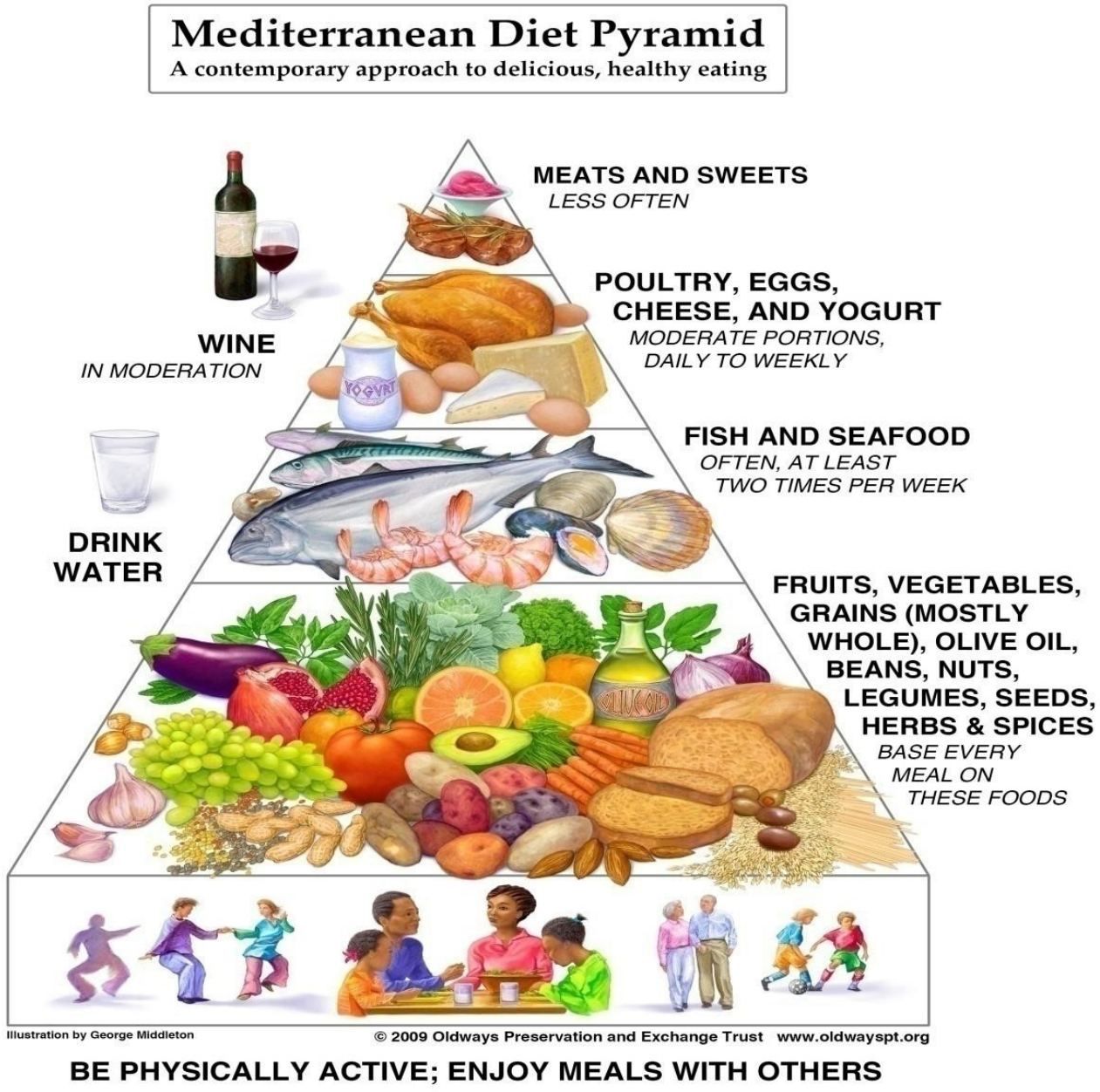
OXFORD BROOKES UNIVERSITY School of Biological and Molecular Sciences

Evidence

- A retrospective study of newly diagnosed patients with Grade 4 Glioblastoma showed a direct correlation between shorter survival time & higher blood glucose levels (3).
- An epidemiological cohort study with over 60,000 Swedish women found that women consuming high GL diets were more likely to develop BC; particularly ER +ve (4).
- In this same cohort study, those with the highest intake of sugar, >35 gm per week, had a statistically significant increased risk of endometrial cancer (5).
- Similarly, In a study of >1000 stage-3 colon cancer patients. Those with diets with the highest GL & total carb ntake had a statistically significant increased risk of both recurrence & mortality, with worse disease-free survival among overweight/ obese patients (6).
- In this same cohort of patients, those with an intake of 2 or > 12 oz. servings of sugar-sweetened beverages per day had a significantly increased risk of both recurrence & mortality (7).
- A case-controlled Malaysian population study, with 382 BC patients & 382 controls showed a 2-fold increased risk of BC among both pre & post-menopausal women who had the highest intake of sugar (> 61 gm, or 15 tsp, per day) (8).

Higher dietary GI -GL are associated with an increased risk of certain digestive & hormone related cancers: colorectal, endometrial, breast, and pancreatic in particular

Mediterranean Diet Pyramid
A contemporary approach to delicious, healthy eating



Dietary Approach

- Inflammation
- Weight trend
- Symptoms
- Lab values
- Endoscopy reports
- Speech swallowing therapist evaluation reports
- Multidisciplinary approach
- Phase of the treatment
- Organ involved

Diet for Cancer Patients During Chemotherapy

- Plain or Fruit yogurt.
- Fresh fruit and cottage cheese.
- Poached egg and toast.
- Toasted bagel with a small amount of peanut butter.
- Cereal and milk (try Lactaid milk, or Soy milk, if lactose intolerant)
- Chicken rice soup with saltine crackers.

What are good foods for cancer treatment?

Foods to add to your diet during cancer treatment

- Bananas.
- Lentils.
- Oatmeal.
- Olive oil.
- Salmon.
- Sweet potatoes.
- Whole eggs.
- Yogurt (whole milk is preferable)

UNIT 5: MODULE 1

NATIONAL PROGRAMME FOR PREVENTION AND CONTROL OF CANCER, DIABETES, CARDIOVASCULAR DISEASES AND STROKE (NPCDCS) AND TATA TRUSTS CANCER CARE INITIATIVE

Dr. Vikram Sahane
Manager - Public Health
Tata Cancer Care Foundation (TCCF)

Cancer scenario in India

- New cancer patients registered: **13.24 lakhs/year**
- Cancer related deaths: **8.52 lakhs/year**
- Cancer prevalence (Estimated number of people living with cancer): **27.20 lakhs**

Common Cancers in India

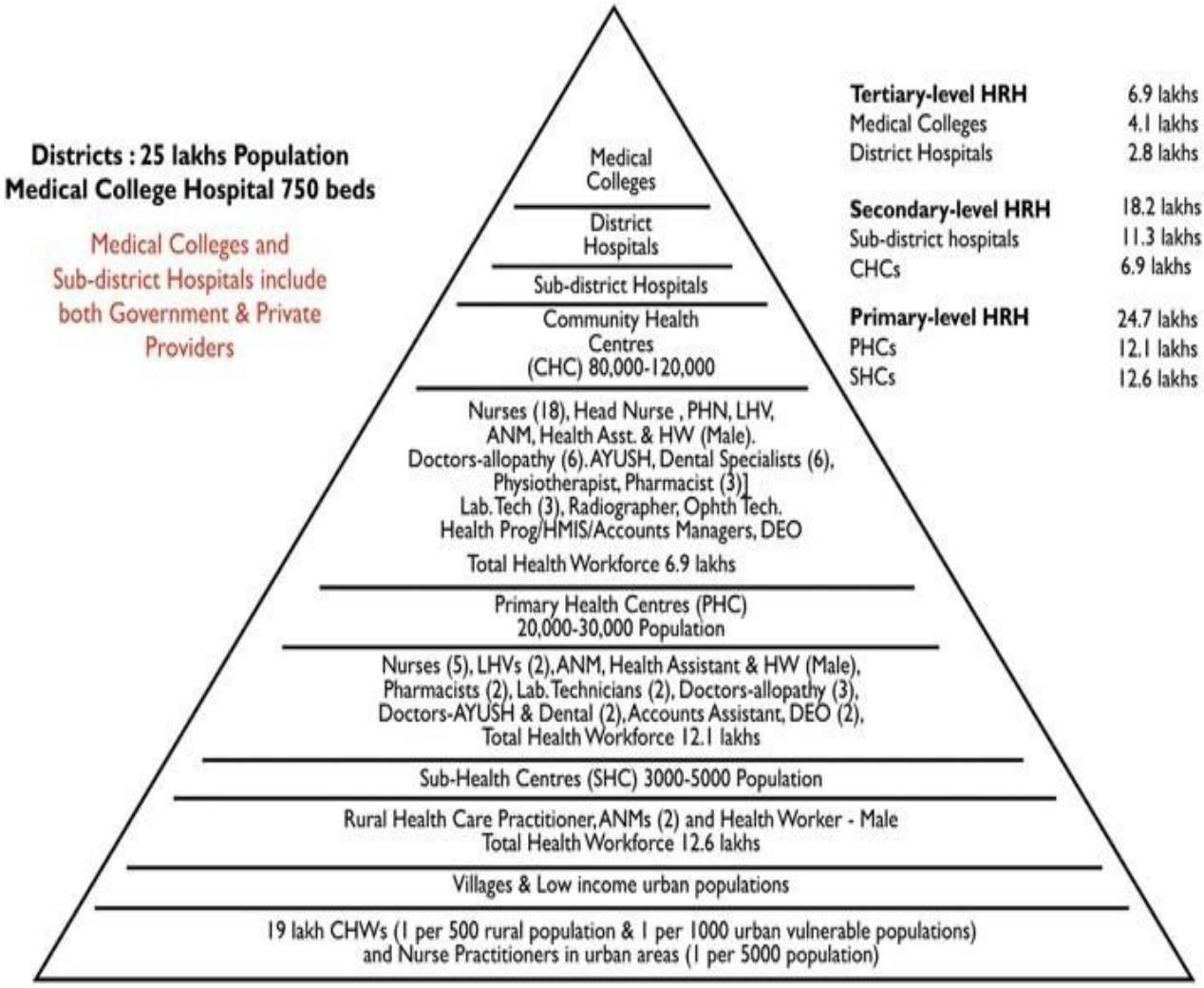
No.	Male	Female
1.	Oral Cavity	Breast
2.	Lung	Cervix
3.	Stomach	Ovary
4.	Colorectum	Oral Cavity
5.	Oesophagus	Colorectum

- Top 5 cancers in both men & women account for 47% of all cancers.
- Among these, only oral, breast & cervix cancers can be detected early by screening.
- Oral, breast & cervix cancers account for 39% of all cancers

Challenges in the Management of NCDs

- High burden.
- Late diagnosis.
- Poor survival and high mortality.
- Lack of awareness and poor access to good quality affordable care result in late diagnosis and high mortality.
- Creating awareness, screening and improving access to diagnosis and good quality treatment and improving access to diagnosis and treatment would result in down-staging of cancer and a reduction in mortality.

Overview of the Indian Health System



National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)

Objectives if NPCDCS

1. **Health promotion through behavior change** with the involvement of the community, civil society, community-based organizations, media etc.
2. **Population-based screening and Opportunistic screening** at all levels in the health care delivery system from sub-center and above, for early detection of diabetes, hypertension, and common cancers
3. To **prevent and control** chronic Non-Communicable Diseases, especially common Cancer, Diabetes, and Hypertension
4. To **build capacity** at various levels of health care for prevention, early diagnosis, treatment, rehabilitation, IEC/BCC
5. To support diagnosis and **cost-effective treatment** at primary, secondary, and tertiary levels of healthcare

To support for the development of a database of NCDs through a **Surveillance System** and to monitor NCD morbidity and mortality and risk factors.

Shortcomings in Implementation & Scope for Improvement

1. District NCD Cells are not completely functional.
2. FLHWs lack practical clinical training in conducting screening
3. Availability of logistics at HWCs
4. The program lacks operational commitments & strategic planning at the ground level.
5. Irregularities and incompleteness of the community assessment and screening data
6. Failure of community-based patient navigation/referral pathway
7. Coverage of screening is suboptimal (less than 2% for common cancers)

Tata Trusts Cancer Care Initiative

- Vision: To transform Cancer Care in India
- Mission: Improve the quality of life for cancer patients and kin by providing affordable, accessible and high quality care

Outcome (aligned with objectives of Cancer Care Program)

1. **Prevention and awareness**
    1. 50% of population have knowledge and adopted healthy lifestyle for cancer prevention (Mid-line survey-5 years).
2. **Screening and Early detection**
    1. 50% of the eligible population (30 – 65 years)have been screened once in the last 5 years.
    2. 70% cancers detected in target population (30 – 65 years) in the early stages. (End-line assessment-10 years).
3. **Referrals and Follow-ups**
    1. 80% reduction in direct cost related to cancer treatment (Mid-line survey-5 years)
    2. 50% reduction in lost to follow up of cancer patients in 5 years.

Learnings So Far…

1. The initial results from our pilot implementation clearly demonstrates ways for effective implementation of cancer care program in India through:

- Possibility of further decentralizing cancer screening up to the community–level to ensure early detection by ensuring capacity building of frontline healthcare providers and generating demand through community awareness.
- Ensuring a continuum of care through timely referrals and regular follow-ups.

2. The scope for involving multiple stakeholders, both governmental and non -governmental, to increase the reach of various activities towards cancer control in India.

Screening and Awareness activities during outreach camps

Dentist hand holding CHO for oral examination

Community awareness in village during camp

CHO doing awareness activity

Support Activities to Complement the Government System

Area	SCOPE
Liaising and Partnering	1. Facilitating different existing national programs (Health System Strengthening)- NPCDCS, NOHP, NTCP, ABP-HWC. 2. Liaising with different departments of govt- NHM, Health, Tobacco Control Cell at district and state levels, Police, Education, NSS, Faith based organizations.
Prevention and Awareness	1. Developing IECs and Behavioural Change Communication(BCC) strategy 2. Involvement of schools, students, NSS, etc. 3. Working on compliance of COTPA, 2003. 4. Operationalization of Tobacco Free Educational Institutions (ToFEI)
Screening and Early detection	1. Training on screening and early detection of NCDs 2. Ensuring procurement of essential equipment, consumables, IT support to team
Follow-ups and Referral	1. Common IT application for DiNC and outreach activities.

Awareness session for local SHGs

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