CANCER AND CANCER REHABILITATION:

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THANKS TO

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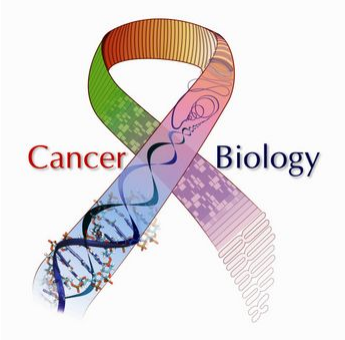
OBJECTIVES

- To gain a basic understanding of what cancer is and how it occurs.
- To identify causes, risk factors and strategies for prevention of cancer.
- To understand the major approaches to cancer treatment and their effects including common impairments treated by occupational therapy practitioners.
- To appreciate the role of the occupational therapy practitioner in cancer rehabilitation.

WHAT IS CANCER?

- According the American Cancer Society:
  - Group of diseases characterized by uncontrolled growth and spread of abnormal cells.



TYPES OF CANCER

Carcinoma
- Skin or tissues that line or cover internal organs

Sarcoma
- Bone, cartilage, fat, muscle, blood vessels, connective/ supportive tissues

Leukemia
- Blood-forming tissues (bone marrow)

Lymphoma and Multiple Myeloma
- Cells of the immune system

Central Nervous System
- Tissues of the brain, spinal cord

RISK FACTORS

Modifiable
- Tobacco
- Alcohol
- Diet
- Physical activity
- Obesity
- Environmental exposure
  - Chemicals
  - Pesticides
  - Sun exposure

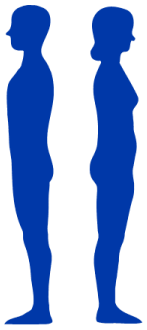
Un-modifiable
- Genetics
- Age
- Ionizing Radiation

Cancer Statistics **2017**

A Presentation from the
American Cancer Society

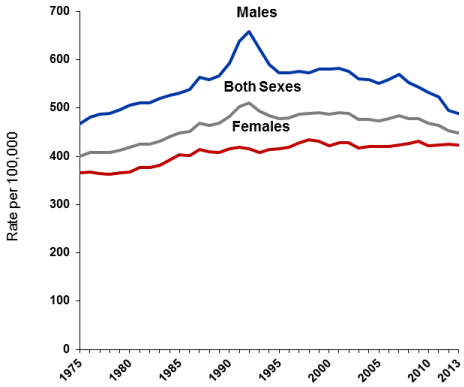
Estimated New Cancer Cases* in the US in 2017

Males 836,150		Females 852,630	
Prostate	19%	30%	Breast
Lung & bronchus	14%	12%	Lung & bronchus
Colon & rectum	9%	8%	Colon & rectum
Urinary bladder	7%	7%	Uterine corpus
Melanoma of skin	6%	5%	Thyroid
Kidney & renal pelvis	5%	4%	Melanoma of skin
Non-Hodgkin lymphoma	5%	4%	Non-Hodgkin lymphoma
Leukemia	4%	3%	Leukemia
Oral cavity & pharynx	4%	3%	Pancreas
Liver & intrahepatic bile duct	3%	3%	Kidney & renal pelvis
All other sites	23%	22%	All other sites



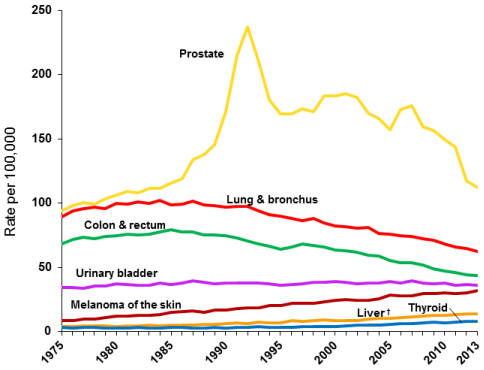
*Excludes basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

Trends in Cancer Incidence Rates*, US, 1975-2013



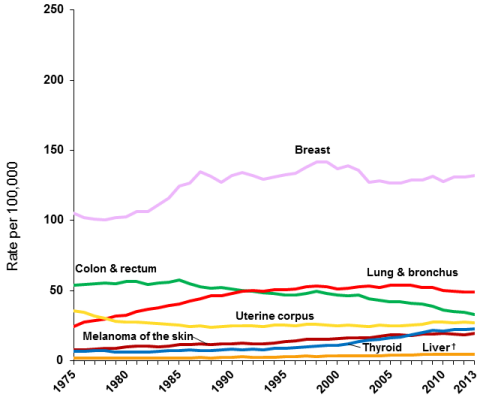
*Age-adjusted to the 2000 US standard population and adjusted for delays in reporting.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

Trends in Cancer Incidence Rates* Among Males, US, 1975-2013



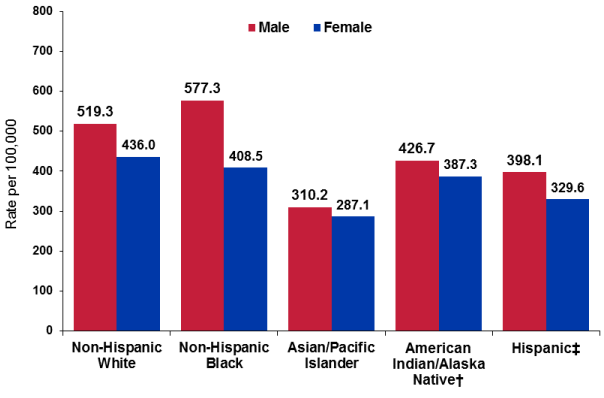
*Age-adjusted to the 2000 US standard population and adjusted for delays in reporting. †Includes the intrahepatic bile duct.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

Trends in Cancer Incidence Rates* Among Females, US, 1975-2013



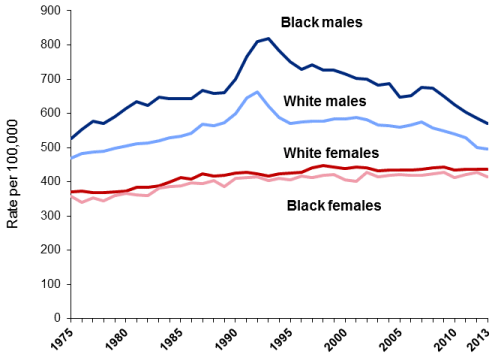
*Age-adjusted to the 2000 US standard population and adjusted for delays in reporting. †Includes the intrahepatic bile duct.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

Cancer Incidence Rates* by Race and Ethnicity, 2009-2013



*Age-adjusted to the 2000 US standard population. †Data based on Indian Health Service Contract Health Service Delivery Area counties. Rates exclude data from Kansas. ‡Persons of Hispanic origin may be of any race.
Source: National American Association of Central Caner Registries, 2016.

Trends in Cancer Incidence Rates* by Sex and Race, US, 1975-2013



*Age-adjusted to the 2000 US standard population. Incidence rates are adjusted for delays in reporting.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

The Lifetime Probability of Developing Cancer for Males, 2011-2013

Site	Risk
All sites*	1 in 2
Prostate	1 in 8
Lung & bronchus	1 in 14
Colon & rectum	1 in 22
Urinary bladder†	1 in 26
Melanoma of the skin‡	1 in 28
Non-Hodgkin lymphoma	1 in 42
Kidney & renal pelvis	1 in 48
Leukemia	1 in 57
Oral cavity & pharynx	1 in 63
Pancreas	1 in 64

*All sites exclude basal cell and squamous cell skin cancers and in situ cancers except urinary bladder. †Includes invasive and in situ cancer cases
‡Statistic for non-Hispanic whites.
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.7.4 Statistical Research and Applications Branch, National Cancer Institute, 2016.

The Lifetime Probability of Developing Cancer for Females, 2011-2013

Site	Risk
All sites*	1 in 3
Breast	1 in 8
Lung & bronchus	1 in 17
Colon & rectum	1 in 24
Uterine corpus	1 in 36
Melanoma of the skin†	1 in 44
Non-Hodgkin lymphoma	1 in 54
Thyroid	1 in 57
Pancreas	1 in 66
Ovary	1 in 78
Leukemia	1 in 81

*All sites exclude basal cell and squamous cell skin cancers and in situ cancers except urinary bladder. †Statistic for non-Hispanic whites.
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.7.4 Statistical Research and Applications Branch, National Cancer Institute, 2016.

Trends in Five-year Relative Survival Rates (%), 1975-2012

Site	1975-1977	1987-1989	2006-2012
All sites	49	55	69
Breast (female)	75	84	91
Colorectum	50	60	66
Leukemia	34	43	63
Lung & bronchus	12	13	19
Melanoma of the skin	82	88	93
Non-Hodgkin lymphoma	47	51	73
Ovary	36	38	46
Pancreas	3	4	9
Prostate	68	83	99
Urinary bladder	72	79	79

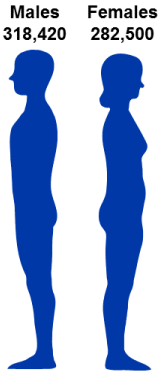
5-year relative survival rates based on patients diagnosed in the 9 oldest SEER registries from 1975-1977, 1987-1989, and 2006-2012, all followed through 2013.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

Five-year Relative Survival Rates (%) by Race, 2006-2012

Site	White	Black	Absolute Difference
All Sites	70	63	7
Breast (female)	92	82	10
Colorectum	67	59	8
Esophagus	22	13	9
Non-Hodgkin lymphoma	74	65	9
Oral cavity & pharynx	69	47	22
Ovary	46	38	8
Prostate	>99	97	3
Urinary bladder	79	66	13
Uterine cervix	71	58	13
Uterine corpus	86	66	20

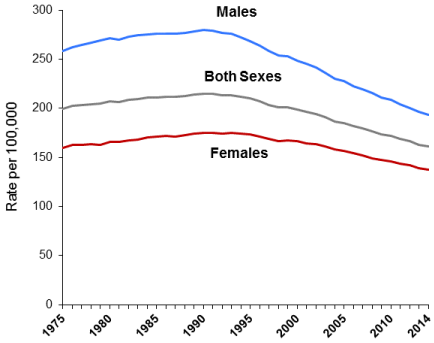
5-year relative survival rates based on patients diagnosed in the 9 oldest SEER registries from 2006 to 2012, all followed through 2013.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

Estimated Cancer Deaths in the US in 2017



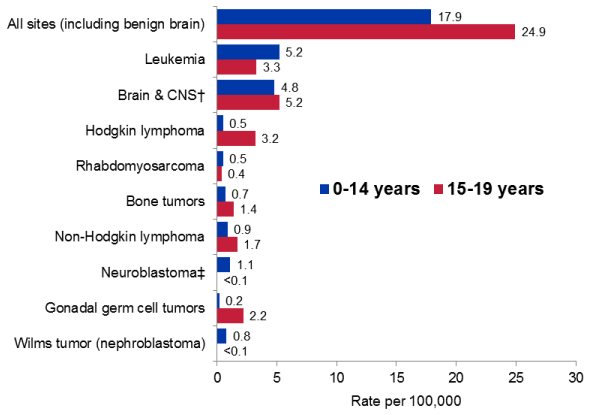
Males		Females	
Lung & bronchus	27%	25%	Lung & bronchus
Colon & rectum	9%	14%	Breast
Prostate	8%	8%	Colon & rectum
Pancreas	7%	7%	Pancreas
Liver & intrahepatic bile duct	6%	5%	Ovary
Leukemia	4%	4%	Uterine corpus
Esophagus	4%	4%	Leukemia
Urinary bladder	4%	3%	Liver & intrahepatic bile duct
Non-Hodgkin lymphoma	4%	3%	Non-Hodgkin lymphoma
Brain & other nervous system	3%	3%	Brain & other nervous system
All other sites	24%	24%	All other sites

Trends in Cancer Death Rates* by Sex, US, 1975-2014



*Age-adjusted to the 2000 US standard population.
Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2016.

Cancer Incidence Rates* Among Children (0-14 years) and Adolescents (15-19 years), 2009-2013



CNS = central nervous system.
*Rates are age-adjusted to the 2000 US standard population. †Includes benign brain and CNS tumors. ‡Includes other peripheral nervous system tumors.
Source: North American Association of Central Cancer Registries, 2016.

Top Three Causes of Cancer Death in Children and Adolescents, 2010-2014

Children (0-14 years)

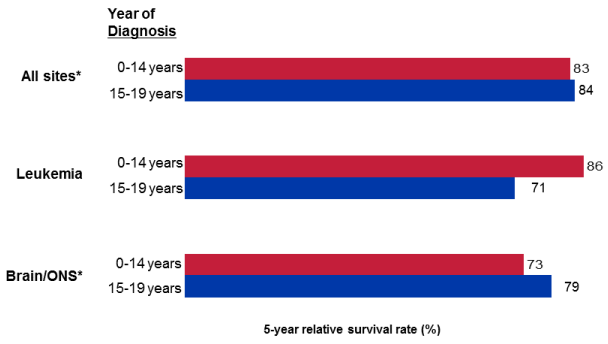
Site	Rate
All sites	**2.1**
Brain/ONS	0.7
Leukemia	0.6
Soft tissue (including heart)	0.1

Adolescents (15-19 years)

All sites	**2.9**
Leukemia	0.8
Brain/ONS	0.5
Bone & joints	0.5

ONS = other nervous system.
Per 100,000, age-adjusted to the 2000 US standard population. Brain/ONS excludes benign brain tumors.
Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2016.

5-year Relative Survival Rates (%) in Children and Adolescents by Age, 2006-2012



ONS=other nervous system. Based on follow up of patients through 2013.
*Excludes benign brain tumors.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2016.

MODIFIABLE RISKS/ PREVENTION

Cigarette Smoking/Tobacco Use

- Links between cigarette smoking and lung, oral cavity, esophagus, bladder, kidney, pancreas, stomach, cervix, and acute myelogenous leukemia
- Estimated causes ~30% of all cancer-related deaths in the US

Infections

- Estimated causes ~18% of cancer cases
- HPV, Hepatitis B and C, Epstein-Barr , Helicobacter pylori, HIV

MODIFIABLE RISKS/ PREVENTION

- **Alcohol**
  - In men: increase risk of cancer to mouth, esophagus, breast, colorectum
  - In women: increase risk of cancer to liver, colorectal
- **Diet**
  - Avoid sugary drinks and limit high-calorie foods
  - Limit consumption of red meats to 18 ounces of cooked meat per week. Red meet includes beef, pork and lamb.
  - Avoid processed foods like ham, bacon, sausage, hot dogs and deli meat
  - Limit salt, salty foods and foods processed with salt (sodium)

MODIFIABLE RISKS/ PREVENTION

- **Obesity**
  - Link to postmenopausal breast cancer, as well as esophagus, pancreatic, colorectal, endometrial, and kidney cancers
- **Physical Activity**
  - Aim for 150 minutes of moderate exercise each week (walking, yoga, mowing the lawn) or 75 minutes of more vigorous exercise (running, jogging, fast bicycling and swimming
- **Environmental Exposures and Pollutants**
  - Links to mesothelioma, skin, bladder, lung cancers

SCREENINGS

Breast

- Age 20 to 39
  - Clinical breast exam every one to three years (A health care provider checks for lumps or other changes.)
- Age 40 and older
  - Clinical breast exam every year
  - Mammogram every year

Colon

- Colonoscopy at age 50 and every 10 years if no problems (virtual every 5, Fecal Occult Blood Test)

https://www.mdanderson.org/prevention-screening.html

SCREENINGS

Prostate (more aggressive if at high risk)

- **Age 50 to 75**
  - Discuss screening risks and benefits with a health care provider
  - Digital rectal exam every year, if you choose to be screened
  - Prostate-specific antigen (PSA) blood test every year, if you choose to be screened
- **Age 76 or older**
  - Your doctor can help you decide if you still need prostate screening
  - MD Anderson doesn't recommend cancer screening for men age 85 or older

https://www.mdanderson.org/prevention-screening.html

SCREENINGS WOMEN

Ages 21-29

- Clinical breast exam every one to three years to check for breast cancer
- Liquid-based Pap test every three years to check for cervical cancer

Ages 30-39

- Clinical breast exam every one to three years to check for breast cancer
- Liquid-based Pap test and HPV test every five years to check for cervical cancer and HPV

Ages 40-49

- Mammogram and clinical breast exam every year to check for breast cancer
- Liquid-based Pap test and HPV test every five years to check for cervical cancer and HPV

Ages 50 and older

- Mammogram and clinical breast exam every year to check for breast cancer
- Liquid-based Pap test and HPV tests every five years to check for cervical cancer and HPV. Starting at age 65, speak with your doctor about whether you should continue screening.

Colonoscopy every 10 years or virtual colonoscopy every five years to check for colorectal cancer. If you're age 76 to 85, your doctor can help you decide if you should continue screening.

https://www.mdanderson.org/prevention-screening.html

SCREENINGS MEN

Ages 40-49

- Beginning at age 40, you should speak with your health care provider about the benefits and limitations of prostate screening. If you choose prostate cancer screening, you should get a digital rectal exam and PSA test every year beginning at age 45 to check for prostate cancer if you are African-American or have a family history (father, brother, son) of prostate cancer.

Ages 50 and older

- If you choose prostate cancer screening, you should get a digital rectal exam and PSA test every year to check for prostate cancer.

Colonoscopy every 10 years or virtual colonoscopy every five years to check for colorectal cancer. If you're age 76 to 85, your doctor can help you decide if you should continue screening. MD Anderson does not recommend screening after age 85.

https://www.mdanderson.org/prevention-screening.html

SKIN SAFETY

Risk factors for skin cancer include:

- A history of frequent or intense sun exposure
- A history of tanning bed use
- One or more blistering sunburns
- Red or blond hair, fair skin, freckles and blue or light-colored eyes
- More than 50 moles
- A family history of melanoma
- A personal history of melanoma
- A personal history of basal cell or squamous cell skin cancers

https://www.mdanderson.org/prevention-screening.html

CLINICAL STAGING OF CANCER

Describes:

- Primary tumor size
- Location
- Extent of metastasis

Guides treatment

Gives indication of prognosis

Facilitates exchange of information and research

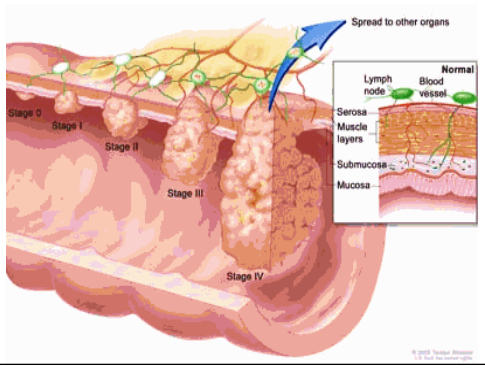
TUMOR CLASSIFICATION AND STAGING

TNM classification (universal system)

- T (T1-T4): Tumor size
- N (N0-N3): Lymph node involvement
- M (M0-M1): Absence or Presence of Metastasis

Staging Groups

- Stage I: T1 N0 M0
- Stage II: T2 N1 M0
- Stage III: T3 N2 M0
- Stage IV: T4 N3 M1



TREATMENT OPTIONS

Surgical removal of cancer cells/tumors

Radiation therapy

Chemotherapy

Immunotherapy

Hormone therapy

Stem cell transplants

THE CANCER CARE CONTINUUM

- Pretreatment
  - Newly diagnosed, no treatment initiated
- Active Treatment
  - Presently receiving treatment with a curative goal
- Maintenance
  - Long-term therapy to maintain remission
- Post treatment
  - Medical treatment is complete with no evidence of disease
- Palliative care
  - Palliative treatment for incurable cancer
  - Optimize comfort
  - Decrease caregiver burden
  - Patient-centered goals

Stubblefield, M. D., & O'Dell, M. W. (Eds.). (2010). *Synopsis of Clinical Oncology*. Demos Medical Publishing

REHABILITATION ACROSS THE CANCER CARE CONTINUUM

Stage of Care	Example of Rehabilitation Interventions
Prevention	Lifestyle redesign, healthy behaviors, exercise and weight loss
Early Detection and Screening	Primary and secondary prevention of functional deficits
Diagnosis	Early intervention to maintain function and promote positive psychological health. Prepare clients for intervention. Pre-habilitation.
Treatment	Fatigue, cognition, ADL, IADL, mobility etc., symptom management, medication management, falls reduction.
Survivorship	Lifestyle redesign, healthy behaviors, exercise and weight loss
End of Life Care	Full range of interventions promoting function and self-determination, goal attainment

SIDE EFFECTS OF SURGERY

Pain

Fatigue/Poor Endurance

Risk for Infection

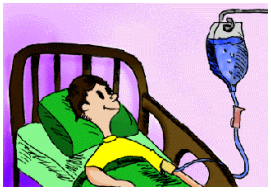
Edema

Blood Clots/Pulmonary Embolisms

Cosmetic changes

Change in functional status

SIDE EFFECTS OF CHEMOTHERAPY



Short Term:

- Hair loss, neuropathy, nausea,

Swelling, and fatigue

Long Term:

- Increased risk of developing a second cancer, peripheral neuropathies, high risk for infections, fatigue.

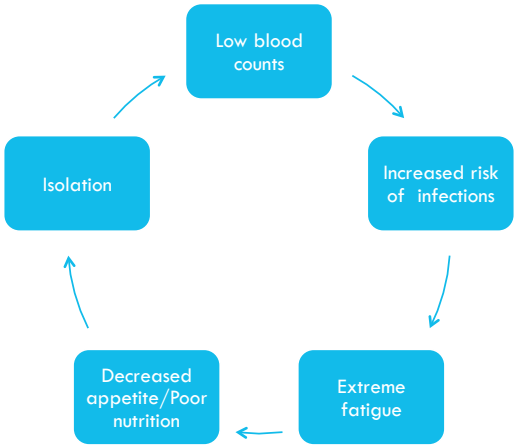
Risk for developing these long term side effects increases when chemo is combined with other treatments such as radiation therapy

SIDE EFFECTS OF RADIATION THERAPY

Long Term Effects

- May cause learning and coordination problems especially in very young children
- Brain Radiation
- Fatigue
- Skin changes/fragility
- Nausea
- May cause second cancer to form in treated area years after treatment

SIDE EFFECTS OF BMT & SCT



CANCER REHAB

PRINCIPLES

- Understand the disease process
- Return/restore quality of life
- Provide care along the cancer continuum
- Provide a collaborative/whole person approach

OPPORTUNITIES FOR OT INTERVENTIONS

Body structure and function impairments of varying severity to include:

- Impaired ROM and muscle strength
- Impaired GMC/FMC
- Impaired standing and sitting balance
- Neuropathy
- Pain
- Visual/auditory deficits

ADL/IADL

Cancer related fatigue

Cognitive Impairments

Rest and Sleep

Body Image Impairments

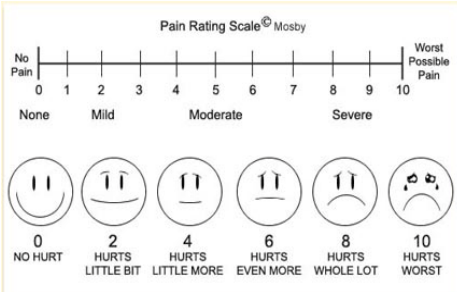
Sexuality

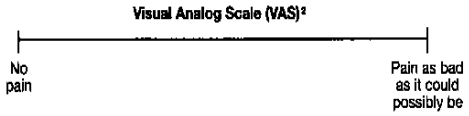
Depression/Anxiety

Return to Work/Return to School

End of Life Transitioning

PAIN SCALES





CANCER RELATED FATIGUE

Major debilitating factor

Associated with

- Compounding feelings of physical dependency, Poor sleep, Depression/anxiety, Persistency throughout continuum of care, and Social isolation

Treatment Interventions:

- Consistency of sleep wake cycles, sleep preparation (dimming lights, shutting off computers/phones/tv), working with staff to enable DND hours, out of bed during day hours to allow energy expenditure.
- Energy conservation techniques, AE to ease tasks, use of journaling to monitor fatigue levels associated with specific tasks, engagement in leisure in social situations as able.

BODY IMAGE

A complex construct that extends well beyond how one views his or her physical appearance. It has most consistently been defined as a multifaceted construct that involves perceptions, thoughts, feelings, and behaviors related to the entire body and its functioning.

TREATMENT OPTIONS

Ask the hard but appropriate questions

Mirror viewing in prep for ADL completion

Gradual exposure to strangers during functional mobility changes
- Bring treatment sessions out of the room

Facilitate objectivity when completing a task or discussing appearance

Discussion on coping strategies for exposure to family/friends
- Allowing the patient to feel more in control of a situation at a time of full loss of control
- Plan ahead for facilitation of reaction to kind/unkind remarks

COGNITIVE IMPAIRMENTS

Those at highest risk:

- Brain tumor patients who receive high dose cranial radiation therapy and/or intrathecal chemotherapy.
  - Attention/concentration
  - Processing speed
  - Memory (S/LTM)
  - Visual-motor integration
  - Executive functions

Deficits that impact new learning can affect social learning and reduced social competence resulting in:

- Poor peer acceptance
- Fewer friendships
- Greater social isolation

TREATMENT INTERVENTION

General problem solving skills

Behavioral study skills

- Focus on sustained attention (homework completion/work task completion)
- Use of associating new information with previously learned information
- Use of visual imagery
- Repetition
- Use of mnemonics

Task preparation skills

- Organize materials for a task
- Prioritizing steps to execute task completion
- How to schedule appropriate breaks

Self-monitor Techniques

- Checking their work
- Ensuring directions of task are understood

Self-motivation

Self-reinforcement

- Praise for achieved goals

SEXUALITY

- Sexual function has both psychological as well as physical and social components.
- When compared to age matched controls or older survivors, AYAs reported poorer sexual function.
- As high as 60% of AYA survivors report a negative body image which may in turn impact sexual function.
- Females report more problems with sexual function, compared to males who report their sexual problems as more distressing.

IMPACTS OF TREATMENT ON SEXUALITY

Consequences of oncology treatment

- Poor body image
- Post-operative positional restrictions
- Vaginal pain/dryness, erectile dysfunction
- Fatigue, impaired energy – linked to sexual desire
- Genital tissue changes
- Hormone deficiencies (can include estrogen, testosterone, hypothalamic and pituitary hormones)
- Prematurely postmenopausal
- Infertility

TREATMENT INTERVENTIONS

Address concerns and interventions in a comfortable environment for the AYA

- If and when appropriate asking parents/family to leave to allow open communication between therapist and client

Modification - assisting with problem solving to modify environment or routine to allow for sexual activity, use of lubricants and sexual devices

Muscle weakness – addressing appropriate pelvic floor exercises

Dating concerns – physical changes, lack of experience in social situations, fear of being made fun of, cognitive impairments

END OF LIFE CARE

HOSPICE VS PALLIATION

Palliative care is an outgrowth of hospice philosophy

Palliative care → diagnosis of life-threatening illness

Hospice care → curative treatment stops

HOSPICE CARE

Prognosis of 6 months or less

No active treatments

Skilled symptom management- supportive services

PALLIATIVE CARE

Positioning

Pain control

Optimize function

Adaptive equipment

Caregiver training

SHIFT FROM REHAB→PALLIATIVE APPROACH->END OF LIFE

Constant re-evaluation and development of new goals

Begin with rehabilitation approach and shift to palliative approach as patient declines

What does the patient want to do?

OVERALL GOALS OF REHAB AT END-OF-LIFE

- Give the patient a sense of **self** and **dignity**
- Provide meaning-QOL
- Prepare for death-QOD
- Alleviate anxiety and concern
- Relief of pain
- Empower caregivers with effective care
- Save time and money

REWARDS OF WORKING IN END-OF-LIFE CARE

- Personal growth
- Family's appreciation and gratitude
- Live with greater awareness
- Moments of incomparable humanity
- Reach a higher level of empathy
- Learn to value the uniqueness of each individual

QUESTIONS?

CONTACT

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