# Care of the Patient with Myelosuppression and Fatigue

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## Objectives

- Identify causes, risk factors, signs & symptoms of myelosuppression and fatigue
- Discuss medical & nursing management as well as patient education for patients with myelosuppression and fatigue

### Myelosuppression

**Definition:**
- Reduction in production & maturation of all blood cell lines
- Resulting in leukopenia, thrombocytopenia, & anemia in peripheral blood

- One of most common & potentially life-threatening clinical complications experienced by patients with cancer

### CIRCUITING BLOOD CELLS LIFE SPAN

<table>
<thead>
<tr>
<th>Blood Cell</th>
<th>Life Span in Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythrocyte</td>
<td>120 Days</td>
</tr>
<tr>
<td>Platelets</td>
<td>7-8 Days</td>
</tr>
<tr>
<td>Neutrophil</td>
<td>7-12 Hours</td>
</tr>
<tr>
<td>Eosinophil</td>
<td>3-8 Hours</td>
</tr>
<tr>
<td>Basophil/mast cell</td>
<td>7-12 Hours</td>
</tr>
<tr>
<td>Monocyte/macrophage</td>
<td>3 Days</td>
</tr>
<tr>
<td>B Lymphocyte</td>
<td>Type depend</td>
</tr>
<tr>
<td>T Lymphocyte</td>
<td>Type depend</td>
</tr>
</tbody>
</table>

Causes of Myelosuppression in Cancer Patients

- Cancer-induced
- Chemotherapy-induced
- Radiation therapy-induced

White Blood Cell (WBC) Count & Differential

<table>
<thead>
<tr>
<th>WBC Type</th>
<th>Relative Value</th>
<th>Absolute Value uL (mm$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophils (total)</td>
<td>50-70%</td>
<td>2,500 – 7,000</td>
</tr>
<tr>
<td></td>
<td>segmented (polys)</td>
<td>50-65%</td>
</tr>
<tr>
<td></td>
<td>bands</td>
<td>0-5%</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>1-3%</td>
<td>100 - 300</td>
</tr>
<tr>
<td>Basophils</td>
<td>0.4-1.0%</td>
<td>40-100</td>
</tr>
<tr>
<td>Monocytes</td>
<td>4-6%</td>
<td>200-600</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>25-35%</td>
<td>1,700-3,500</td>
</tr>
</tbody>
</table>


Neutropenia

- Decreased number of circulating neutrophils
  - Neutrophils 1st line of defense against bacterial infection (localize & neutralize bacteria)
  - Normal range: 2,500 to 6,000 cells/mm$^3$
  - 50% to 60% of total number of WBC’s

Risk Factors for Neutropenia in Patients with Cancer

- Patient-related
  - Older clients
  - Comorbid diseases (diabetes, COPD, etc)
  - Poor nutritional status
- Disease-related
  - Myeloproliferative disorders
  - Invasion of marrow by metastasis
- Treatment-related
  - Myelosuppressive chemotherapy
  - Radiotherapy
  - Corticosteroids

Potential Consequences of Neutropenia

- Infection
- Sepsis and septic shock
- Death
- Delay in administering treatment on time or dose delay; dose reductions

Examples of Chemo Regimens with High Risk of Febrile Neutropenia (>20%)

- Bladder: MVAC
- Breast: Doc+Herceptin, dose dense AC-T, ATaxotere, TAC
- Esoph/Gastric: DOC/Cisp/SFU
- Hodgkins: BEACOPP
- Kidney: Adria/Gem
- NHL: CFAR, ICE, RICE, MINE, CHOP, HyperCVAD, DHAP, ESHAP, HyperCVAD + R
- Melanoma: DTIC/Cis/Vinblas, DTIC + IL2, IFN + chemo
- MM: Modified HyperCVAD
- MDS: ATG, Decitabine
- Ovarian: Topotecan, Taxol, Taxotere
- Sarcoma: MAID
- Small Cell Lung: Topotecan
- Testicular: VeIP, VIP, BEP, TIP

(And there are more Regimens for the 10-20% risk)


The ANC Predicts the Risk for Infection

<table>
<thead>
<tr>
<th>Absolute Neutrophil Count</th>
<th>Grade</th>
<th>Risk of Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within normal limits</td>
<td>0</td>
<td>No Risk</td>
</tr>
<tr>
<td>≥ 1,500 to &lt;2,000</td>
<td>1</td>
<td>No significant risk</td>
</tr>
<tr>
<td>≥ 1,000 to &lt;1,500</td>
<td>2</td>
<td>Minimal risk</td>
</tr>
<tr>
<td>&gt; 500 to &lt;1,000</td>
<td>3</td>
<td>Moderate risk</td>
</tr>
<tr>
<td>&lt; 500</td>
<td>4</td>
<td>Severe risk</td>
</tr>
</tbody>
</table>

Assessing Neutrophils: The Absolute Neutrophil Count (ANC)

\[ \text{ANC} = \text{Total WBC} \times \% \text{ of neutrophils (bands + segs)} \]

**Example:**

\[
\begin{align*}
\text{WBC} & = 2,000/mm^3 \\
\text{Segmented neutrophils} & = 55\% \\
\text{Band neutrophils} & = 1\%
\end{align*}
\]

\[ \text{ANC} = 2,000 \times .56 = 1,120/mm^3 \]
Absolute Neutrophil Count Calculation

<table>
<thead>
<tr>
<th>WBC = 3,000/mm³</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Segmented neutrophils = 20%</td>
<td></td>
</tr>
<tr>
<td>• Band neutrophils = 5%</td>
<td></td>
</tr>
<tr>
<td>• Eosinophils = 3%</td>
<td></td>
</tr>
<tr>
<td>• Basophils = 1%</td>
<td></td>
</tr>
<tr>
<td>• Lymphocytes = 71%</td>
<td></td>
</tr>
</tbody>
</table>

What is the ANC?

WBC = 3,000/mm³

• Segmented neutrophils = 20%
• Band neutrophils = 5%
• Eosinophils = 3%
• Basophils = 1%
• Lymphocytes = 71%

ANC = 3,000/mm³ X .25 = 750

What is the risk for infection?

My vision of the CBC:

⇒ Total WBC’s= All of the Armed Forces
⇒ Army= Neutrophils
⇒ Navy = Lymphocytes
⇒ Marines = Monocytes
Case Study:

<table>
<thead>
<tr>
<th>WBC</th>
<th>3.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE%</td>
<td>42.9</td>
</tr>
<tr>
<td>LY%</td>
<td>37.1</td>
</tr>
<tr>
<td>MO%</td>
<td>12.8</td>
</tr>
<tr>
<td>EO%</td>
<td>5.9</td>
</tr>
<tr>
<td>BA%</td>
<td>1.3</td>
</tr>
<tr>
<td>NE#</td>
<td>1.5</td>
</tr>
<tr>
<td>LY#</td>
<td>1.2</td>
</tr>
<tr>
<td>MO#</td>
<td>0.4</td>
</tr>
<tr>
<td>EO#</td>
<td>0.2</td>
</tr>
<tr>
<td>BA#</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Looking at this CBC, do you expect the Neutrophils to increase or decrease?

What will happen if you give a Neupogen injection?

Hint: Normal mono’s 0-12

Nursing Management of Neutropenia

- Identify patients at risk for neutropenia
- Infection prevention strategies
- Frequent assessment for infection
- Education patients & caregivers about neutropenia precautions
- Management of neutropenic fever

Nursing Management:

If an immunosuppressed patient is developing an infection, what would you expect to find on nursing assessment?

- Signs of infection MAY NOT be present
- Redness, inflammation, and drainage may be minimal or absent

Nursing Management: Continual Assessment for Infection

- Physical Assessment & review of labs
- Attention to common sites of infection
  - Respiratory tract, GI tract, GU tract, perineum, anus, & skin
- Access devices
  - Swelling, drainage, erythema, or redness
- Vital signs
  - Fever may be only response to infection
  - Fever is most common & important sign of infection
  - Temp. of 100.5°F is significant in client with ANC < 500/mm³
  - HR >100 & ↓BP, may be developing sepsis

Detecting Signs of Infection in Patients with Neutropenia

- Neutropenia: the often silent disorder
- ONLY sign of an infection may be FEVER:
  - Take temperature every 4 hours (inpatient)
  - Instruct patient to take temperature QD or BID (home)
  - Report temperature > 100.4°F (38.0°C) (or institution standard)

ONS Putting Evidence Into Practice (PEP) Resource

- Green = GO!
  - Evidence supports the consideration of these interventions in practice
- Yellow = CAUTION!
  - Not sufficient evidence to say whether these interventions are effective or not
- Red = STOP!
  - Evidence indicates these interventions are ineffective or harmful

Recommended for Practice

- Hand Hygiene
  - Soap & water
  - Antiseptic hand rub
- Colony-stimulating factors
  - Chemotherapy with > 20% risk of febrile neutropenia
- Influenza vaccine annually for all cancer patients
  - 2 weeks prior to or 3 months after immunosuppressive therapy
  - Do not allow visitors with symptoms of respiratory infections
- Environmental interventions
  - Windows closed
  - Contact precautions for known resistant organisms (MRSA, VRE)
**Recommended for Practice**

- Pneumococcal vaccine for all cancer patients
  - At least 2 wks prior to chemo, if possible
- Antifungal prophylaxis with quinolones for patients at high risk for infection
  - Hematologic malignancies
  - HSCT recipients
  - Expected neutropenia > 7 days
- Antifungal prophylaxis in high-risk patients
  - Acute leukemia, MDS
  - HSCT, patients with GVHD

**Likely to Be Effective**

- Private rooms to ↓ transmission of infection
- Flower & plant guidelines
  - Avoid fresh or dried flowers & plants due to risk of aspergillus
  - Plant care by staff NOT caring for patient
  - Change vase water Q 2 days, empty water outside patient room
- Animal encounters
  - Avoid contact with animal feces, saliva, urine, or solid litter box materials
  - Avoid direct & indirect contact with reptiles

**Effectiveness Not Established**

- Protective isolation
- Gowns, gloves, and/or masks are not indicated for healthcare worker or visitor routine entry into room
  - Should be used according to standard precautions (e.g. contact precautions)

**Effectiveness Unlikely**

- Low microbial diet for neutropenic patients
  - Basic food safety principles are prudent – avoiding uncooked or unwashed foods
- Laminar air flow
- Routine donning of gowns in high-risk units (e.g. HSCT unit)
Not Recommended For Practice

- Live attenuated vaccines
  - Flumist (intranasal attenuated influenza vaccine)
  - Varicella (chicken pox) vaccine, oral polio vaccine, & MMR vaccine
- Antifungal prophylaxis for neutropenic patients with solid tumors
- Gram + prophylaxis and fluoroquinolone in combination for antibacterial prophylaxis in afebrile neutropenic patients

Educate Patients & Caregivers to Recognize & Minimize Infection

- List measures to prevent infection
  - Managing environment, hygiene, diet, activity
- Identify signs & symptoms of infection
- Emphasize when to report
  - Fever or other signs/symptoms of infection
  - Be specific about whom and when to call
- Give specific oral & written instructions

Febrile Neutropenia

- ALWAYS A MEDICAL EMERGENCY
- Left untreated, may be fatal
- Sepsis is lethal in 47% of infected patients with neutrophil count <1000

Febrile Neutropenia: Definition

- Febrile neutropenia
  - Single temperature $\geq 38.3^\circ C$ orally or $\geq 38.0^\circ C$ over 1 hr
- Neutropenia
  - $< 500$ neutrophils/mcL or $< 1,000$ neutrophils/mcL and a predicted decline to $< 500$mcL over the next 48 hrs
Who’s at Risk?
- Older patients, 65 and over
- Previous Chemotherapy, Radiation
- Pre-existing neutropenia or bone marrow involvement with tumor
- Pre-existing conditions
  - Neutropenia, infection/open wounds, recent surgery
- Poor performance status
- Poor renal function
- Liver dysfunction, elevated bilirubin

Medical Management
Neutropenic Patients with Fever
- Obtain blood cultures
- Culture suspected sites of infection
  - Urine, sputum, stool, IV catheter sites, wounds
- Chest x-ray
- Growth Factor Support
- Immediate institution of broad spectrum antibiotics
  - Initiate after blood cultures obtained
  - If unable to obtain other cultures (sputum, stool, urine) DO NOT hold antibiotics pending cultures
- Admission to hospital (ANC<1000)

Preventing Infection
- The single most important measure to prevent infection when caring for the neutropenic patient is HANDWASHING!!!
- Frequent hand washing
- Daily bathing
- Frequent mouth care
- Limit invasive procedures
  - Rectal temps, catheters, etc.
- Inspect IV sites
- Visitor hygiene
Thrombocytopenia

- Decrease in circulation platelets below 100,000/mm$^3$
- Normal platelet count 150,000 – 400,000/mm$^3$
- Life span of platelets – 8 to 10 days

<table>
<thead>
<tr>
<th>Platelet Count</th>
<th>Grade</th>
<th>Risk of Bleeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within normal limits</td>
<td>0</td>
<td>No Risk</td>
</tr>
<tr>
<td>&lt; LLN – 75,000/mm$^3$</td>
<td>1</td>
<td>No significant risk</td>
</tr>
<tr>
<td>&lt;75,000 – 50,000/mm$^3$</td>
<td>2</td>
<td>Minimal risk</td>
</tr>
<tr>
<td>&lt; 50,000 – 25,000/mm$^3$</td>
<td>3</td>
<td>Moderate risk</td>
</tr>
<tr>
<td>&lt; 25,000/mm$^3$</td>
<td>4</td>
<td>Severe risk</td>
</tr>
</tbody>
</table>

Causes of Thrombocytopenia in Cancer Patients

- **Disease-related**
  - Myeloproliferative disorders
  - Invasion of marrow by metastasis
  - Coagulation disorders
    - Liver disease
    - DIC
    - ITP or TTP

- **Treatment-related**
  - Chemotherapy
  - Radiation therapy
  - Infection – endotoxin release
  - Medications
    - Aspirin
    - Heparin
    - Phenytoin (dilantin)
    - Sulfonamides (Bactrim)

Clinical Consequences of Thrombocytopenia

- **Bleeding** – Internal or External
- Refractory to platelet transfusions

Nursing Assessment: Physical Exam

- Assess for Bleeding - rectum, nose, ears, oral cavity, menstrual
- Skin
  - Petechiae – lower extremities & pressure points
  - Ecchymosis
- HEENT
  - Gingival bleeding
  - Conjunctival hemorrhage & sclera injection
- Neurological
  - Changes in LOC
  - Restlessness, headache, seizures, pupil changes
Medical Management

- Platelet transfusion
- Platelet growth factor – IL-11 (Neumega)
- Hormonal agents (menstrual bleeding)

Recommended for Practice

- Platelet thresholds: keep at
  - 10,000: majority of patients
  - 20,000
    - minor procedures
  - bladder tumors, necrotic tumors, or highly vascular tumors likely to bleed
  - 40,000 – 50,000: patients undergoing invasive procedures
- Platelet transfusions
  - Active bleeding with thrombocytopenia
- Mesna for prevention of hemorrhagic cystitis

Platelet Transfusions

- Effectiveness of platelet transfusion variable, depends on:
  - Fever & infection: ↑ consumption platelets
  - Hypersplenism
    - Spleen: filters old and damaged cells from your bloodstream; overactive, removes blood cells too early and too quickly
  - Alloimmunization
    - Formation of antibodies to human leukocyte antigen (HLA) on platelet cells surface from contamination of white cells in platelet concentrate
  - Refractory to platelet transfusions

Effectiveness Not Established

- Platelet growth factors
  - Recombinant Interleukin-11 (Neumega)
- Menstrual bleeding:
  - interventions to prevent or attenuate
    - Oral contraceptives, progesterone, etc.
Effectiveness Unlikely or Not Recommended For Practice

- No interventions as of May 2008
- Beware of herbal remedies

Prevention of Bleeding

What interventions are available to prevent and manage bleeding in patients with cancer?

Nursing Interventions: Minimize Bleeding

- Avoid invasive procedures (enemas, rectal temperatures, suppositories)
- Environment to avoid trauma
- Firm pressure to venipuncture sites for 5 minutes
- Avoid use of sharp objects (straight-edge razor)
- Implement bowel regimen to prevent constipation
- Discourage heavy lifting or valsalva maneuver
- Soft toothbrushes
- Monitor pad count (menstrual bleeding) and amount of saturation

Patient/Caregiver Teaching

- Avoid drugs that increase risk of bleeding
- Report to health care team bruising or bleeding
- Measures to decrease occurrence of bleeding
  - Wear shoes when ambulating
  - Use electric razor rather than straight-edge
  - Blow nose gently
  - High-fiber diet with fluids
ITP: Idiopathic thrombocytopenic purpura

- is a bleeding disorder in which the immune system destroys platelets and patients with the disease have too few platelets in the blood.
- ITP occurs when certain immune system cells produce antibodies against platelets.
- The antibodies attach to the platelets. The spleen destroys the platelets that carry the antibodies.
- Treatment: Prednisone, splenectomy, Promacta, NPlate

Anemia

- Symptom of abnormally low red blood cells (RBC’s), quality of hemoglobin (Hgb), and/or volume of packed cells

<table>
<thead>
<tr>
<th>Hemoglobin (g/dl)</th>
<th>Grade</th>
<th>Severity of Anemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within normal limits</td>
<td>0</td>
<td>Normal</td>
</tr>
<tr>
<td>10 - normal</td>
<td>1</td>
<td>Mild</td>
</tr>
<tr>
<td>8 - &lt;10</td>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>6.5 - &lt; 8</td>
<td>3</td>
<td>Severe</td>
</tr>
<tr>
<td>&lt; 6.5</td>
<td>4</td>
<td>Life threatening</td>
</tr>
</tbody>
</table>

Adapted from the Common Toxicity Criteria for adverse events. Available at: http://ctep.cancer.gov/protocolDevelopment/electronic_applications/docs/ctcaev4.pdf

Causes of Anemia in Cancer Patients

- Disease-related
  - Slow or persistent blood loss
  - Malignancy of bone marrow
  - Tumor invasion of bone marrow
  - Impaired absorption, intake, or utilization of iron, folic acid, B12
  - Autoimmune disorders
  - Renal disease

- Treatment-related
  - Chemotherapy
  - Radiotherapy
  - Pharmacologic agents
    - Oral contraceptives (folate and B12)
    - Phenytoin (Dilantin)
    - Phenobarbital (Luminal)

Incidence of Anemia Associated with Chemotherapy Agents

<table>
<thead>
<tr>
<th>Agent</th>
<th>Grade 1/2 (%)</th>
<th>Grade 3/4 (%)</th>
<th>Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisplatin</td>
<td>Not reported</td>
<td>11%</td>
<td>H &amp; N</td>
</tr>
<tr>
<td>Docetaxel</td>
<td>73-85</td>
<td>2-10</td>
<td>NSCLC Ovarian</td>
</tr>
<tr>
<td></td>
<td>58-60</td>
<td>27-42</td>
<td></td>
</tr>
<tr>
<td>5-FU</td>
<td>Not reported</td>
<td>11</td>
<td>H &amp; N Colorectal</td>
</tr>
<tr>
<td></td>
<td>50-54</td>
<td>5-8</td>
<td></td>
</tr>
<tr>
<td>Paclitaxel</td>
<td>93</td>
<td>7</td>
<td>Breast</td>
</tr>
<tr>
<td>Topotecan</td>
<td>Not reported</td>
<td>32</td>
<td>SCLC Ovarian</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Vinorelbine</td>
<td>67-71</td>
<td>5-14</td>
<td>Breast &amp; Lung</td>
</tr>
</tbody>
</table>

Incidence of Anemia Associated with Chemotherapy Regimens

<table>
<thead>
<tr>
<th>Agent</th>
<th>Grade 1/2 (%)</th>
<th>Grade 3/4 (%)</th>
<th>Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisplatin - cyclophosphamide</td>
<td>43</td>
<td>9</td>
<td>Ovarian</td>
</tr>
<tr>
<td>CDDP-etoposide</td>
<td>59</td>
<td>16-55</td>
<td>SCLC</td>
</tr>
<tr>
<td>VIP</td>
<td>Not reported</td>
<td>52</td>
<td>SCLC</td>
</tr>
<tr>
<td>SFU-carboplatin</td>
<td>42</td>
<td>14</td>
<td>H &amp; N</td>
</tr>
<tr>
<td>CHOP</td>
<td>49</td>
<td>17</td>
<td>NHL</td>
</tr>
<tr>
<td>Paclitaxel-doxorubicin</td>
<td>78-84</td>
<td>8-11</td>
<td>Breast</td>
</tr>
<tr>
<td>Paclitaxel/Carbo</td>
<td>10-59</td>
<td>5-34</td>
<td>NSCLC</td>
</tr>
</tbody>
</table>

Assessment of Anemia

Central nervous system
- Debilitating fatigue
- Dizziness, vertigo
- Depression
- Impaired Cognitive Dysfunction

GI Symptoms
- Anorexia
- Nausea

Vascular System
- Low skin temperature
- Pallid skin, mucosa

Immune system
- Impaired T-Cell and macrophage function

Cardiorespiratory system
- Exertional dyspnea
- Tachycardia, palpitations
- Cardiac enlargement
- Increased pulse pressure, systolic ejection murmur

Genital tract
- Menstrual problems
- Loss of libido

Nursing Assessment: Subjective Symptoms

- Vary depending on the rapidity of onset, patient age, degree of anemia, & co-morbid illnesses

- Subjective symptoms include:
  - Weakness, dizziness, fatigue, decreased sexual desire
  - Dyspnea on exertion
  - Anorexia, headache
  - Difficulty concentrating, drowsiness in the elderly

Nursing Assessment

- Monitor for complications related to anemia
  - Evidence of inadequate oxygenation
    - Pallor, ↓ capillary refill, prolonged redness
  - Postural BP’s
  - Constipation or diarrhea related to iron supplements

Medical Management

- Identify underlying cause & correct, if possible
- Supplements
  - Iron, vitamins, folic acid, B12
  - RBC transfusions indicated for
    - Symptomatic anemia (dyspnea, tachycardia) regardless of hematocrit
    - Active bleeding
    - Hemoglobin <8 g/dl
- Erythropoietin administration

Nursing Management

Patient/Caregiver Education

- Signs & symptoms to report
- Avoid sudden changes in position
- Assist with ambulation & self-care as needed
- Instruct to avoid hazardous activities, if syncopal episodes (e.g. driving)
- Balanced diet and/or supplements
- Energy conservation

How do you describe fatigue?
Fatigue: A symptom, reported by the patient versus a sign, that is observed by others
- Exhaustion
- Lethargy
- Listlessness/weariness
- Tiredness
- Apathy
- Mental Fatigue

Cancer-related fatigue
“a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning”

National Comprehensive Cancer Network (NCCN), 2008, p. FT-1

Cancer related fatigue
- Generally more severe
- Is disproportionate to the level of exertion
- Not relieved by rest or sleep
- Impacts quality of life
- Consequences affect both physical and psychosocial functioning

Mechanisms of Fatigue
- Poorly understood
- Several hypothesis
  - Serotonin dysregulation
  - HPA-Axis Dysfunction
  - Circadian Rhythm Disruption
  - Muscle Metabolism and ATP Dysregulation
  - Vagal Afferent Nerve Activation
  - Cytokine Dysregulation
Risk and Contributing Factors

- Anemia
- Hypothyroidism
- Hypogonadism
- Adrenal insufficiency
- Cardiomyopathy
- Pulmonary dysfunction
- Nausea
- Pain
- Fluid & Electrolyte imbalances
- Depressed mood
- Emotional distress
- Sleep disturbances
- Sedation secondary to medications

What causes Fatigue in Survivors?

- Anemia is NOT common in survivors
- Hypothyroidism, endocrine changes
- Most medical problems increase fatigue (pain, infection)
- Medications can increase fatigue
- Cardiac, pulmonary and vascular problems
- Poor nutrition
- Sleep disturbances
- Lack of physical activity
- Mental Health (56% depression; 46% anxiety)

Fatigue- Assessment

- Most common symptom, 80-100%
  - 20-53% long term survivors
  - 81% of long term survivors report at 6 months +
  - 75% w/ metastatic disease
- Commonly occurs w/ other symptoms: pain, distress, anemia, sleep disturbances
- Physical Symptoms:
  - Shortness of breath, heart palpitations, general lack of energy/stamina, muscle weakness

- Fatigue and Depression are not the same,
  but they can be hard to tell apart and one can lead to the other
Clinical measurement tools

**Fatigue Scale**
Select the number that best describes how you feel today.

- **No Fatigue**: 0
- **Mild Fatigue**: 1
- **Moderate Fatigue**: 2
- **Extreme Fatigue**: 8
- **The Worst Fatigue**: 10

**Numeric Rating Scale**

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**Recommended for Practice**

- **Exercise!**
  - 3-5 hrs/week
  - Moderate intensity
  - Weight resistance better for fatigue
  - Unclear what is best for prevention

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**Likely to Be Effective**

- Energy conservation and activity management
- Education
- Optimizing sleep quality
- Relaxation

**Benefits balances with harms**

- Correction of Anemia with ESA's

- Massage, healing touch, polarity therapy and haptotherapy
- Methylphenidate (Ritalin)
- Modafinil (Provigil)
What I tell my patients:

- Fatigue is the best indicator that you need to MOVE
- Rebuild muscles to re-energize the body
- Eat!! If you don’t put gas in your car, it isn’t going to move. Think of your body as your (sports) car

Patient Education

- Exercise daily!!!! (PT referral prn)
- Rest when you need to
- Sleep well, eat well
- Labor saving devices (wheelchair/commodes)
- Discuss with provider
Summary: Myelosuppression and Fatigue

Did we?

- Identify causes, risk factors, signs & symptoms
- Discuss medical & nursing management as well as patient education for patients

Thank You