

# Clinical Pearls for the New Advance Provider

Jessica McMillan, DNP, ARNP  
Mayo Clinic Florida  
Division of Hematology/Oncology



# Disclosure Statement

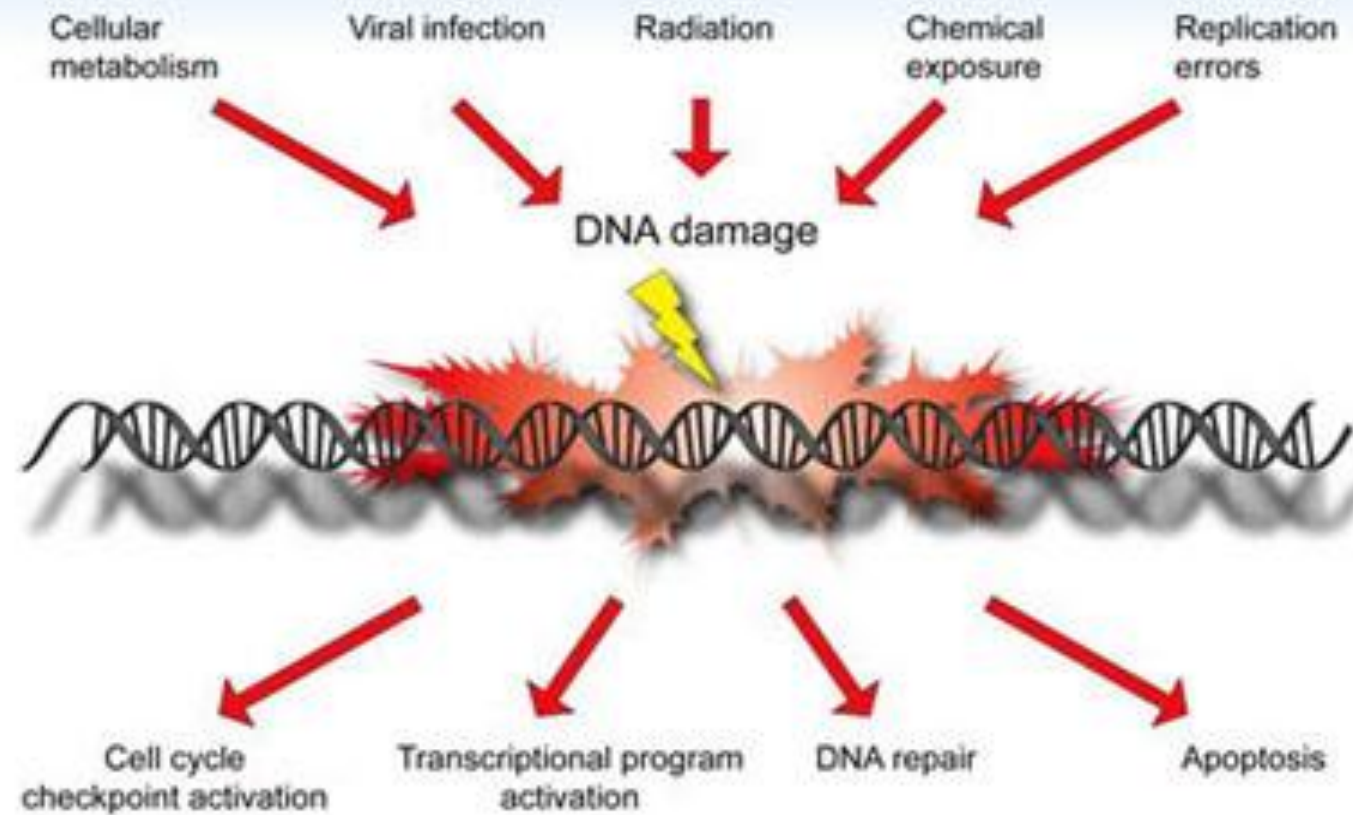
- I have no actual or potential conflict of interest in relation to this program/presentation.



# Objectives

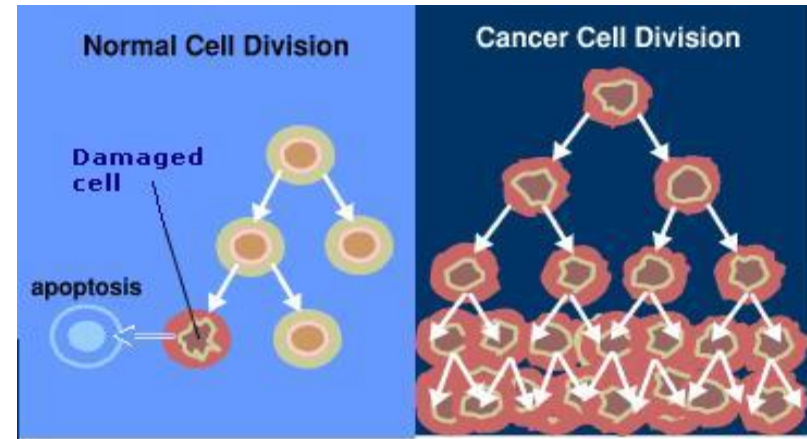
- Review the biology and pathology of neoplastic diseases
- Discuss cancer therapies
- Correlate review of systems and implications to physical examination
- Review potential side effects/toxicities of treatment therapies and effects

## DNA damage response



# Cancer Basics

- Series of DNA alterations
  - Divide constantly
  - Divide indefinitely
  - Ignore signals to stop growing
  - Resist cell death
  - Invade spread to other sites
  - Recruit blood vessels



# Etiologic Agents in Cancer

- Tobacco
- Infectious
- Inflammation
- Chemical
- Physical
- Lifestyle



# Tobacco

- More than 30% of cancer deaths in the United States are caused by smoking
  - Lung
  - Larynx
  - Nasal
  - Oral cavity
  - Esophagus
  - Liver
  - Pancreas
  - Cervix
  - Bladder
  - Leukemia
  - Colorectal



# Chemical

Chemical Factors	Affected Organ
Asbestos, silica	Lung, mesothelioma
Radon, nickel dust, arsenic, chromium	Lung
EtOH	Oral cavity, esophagus, liver
Aromatic amines	Bladder
Cadmium	Prostate
Benzene	Leukemia
Smokes, salted, pickled foods	Stomach
Aflatoxin	Liver
Estrogen – hormone replacement therapy (HRT)	Breast, endometrial
Androgen	Prostate
Immunosuppressant	NHL





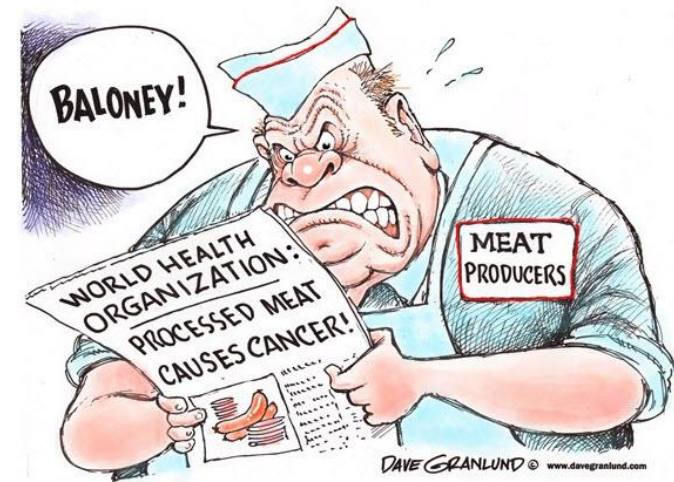
# Infectious

Infectious Agent	Affected Organ
Hepatitis C Virus	Liver
Hepatitis B Virus	Liver
Epstein Barr Virus	Burkitt lymphoma, nasopharynx, Hodgkin lymphoma
Herpes Simplex Virus	Kaposi sarcoma, pulmonary effusion lymphoma, Castleman disease
Human Papillomavirus (HPV)	Anogenital & Oral cavity
Polyomavirus	Merkel cell carcinoma
John Cunningham (JC) virus	Progressive multifocal leukoencephalopathy
Human T-cell lymphotropic virus (HTLV-1)	Adult T-cell leukemia/lymphoma
HIV-associated	Kaposi sarcoma, cervix, various NHL
H. Pylori	Stomach
Schistosomiasis	Bladder (squamous cell)



# Inflammation – Physical – Lifestyle

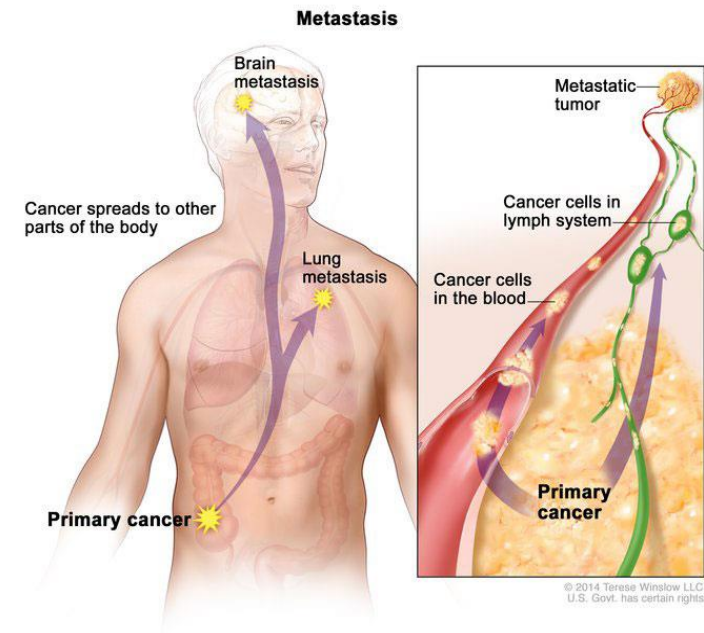
Inflammation	Affected Organ
Acute & chronic inflammation contributes to multiple cancers	Reflux esophagitis→ Barrett's esophagitis → esophageal cancer
	Liver cirrhosis→ Liver cancer, chronic pancreatitis: Pancreas cancer
	Chronic pancreatitis → pancreas cancer
Physical	Affected Organ
UV Light	Skin cancers
Lifestyle	Affected Organ
Obesity	Breast, endometrial, prostate, esophagus
Diet	Complex exposure



Whiteman D, Wilson L. Review: The fractions of cancer attributable to modifiable factors: A global review. *Cancer Epidemiology* [serial online]. June 28, 2016; Available from: ScienceDirect, Ipswich, MA. Accessed August 10, 2016.

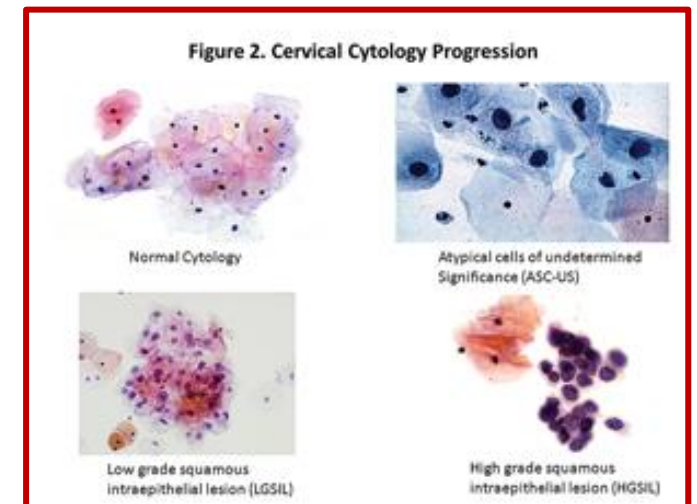
# How cancer spreads...

- Local invasion
  - Invades nearby
- Intravasation
  - Walls of nearby lymph or blood vessels
- Circulation
  - Lymphatic system and blood stream
- Arrest and extravasation
  - Stop in capillaries in distant locations and migrate
- Proliferation
  - Multiply to form micrometastases
- Angiogenesis
  - Micrometastases form new blood supply



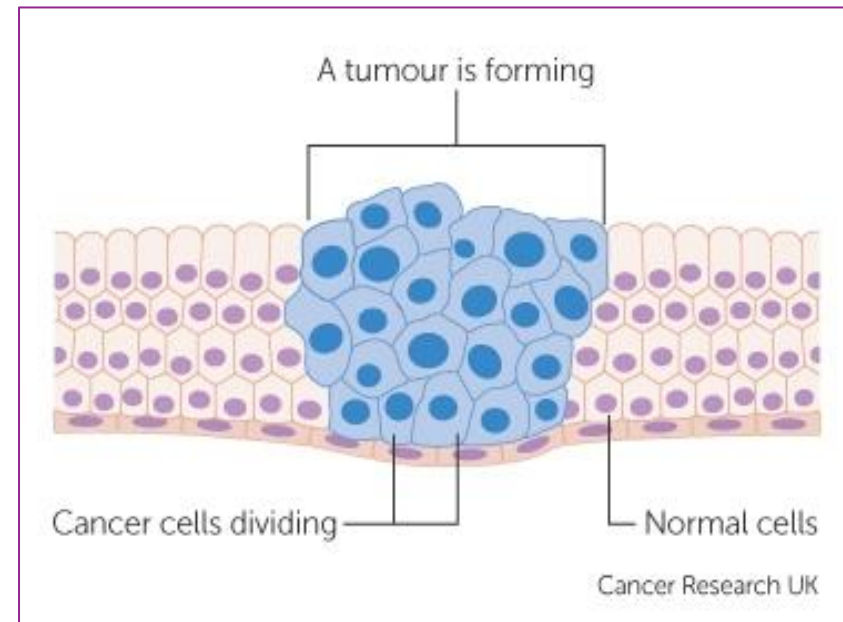
# Cancer Diagnosis

- Tissue or Blood
  - Routine histo-pathologic examination
  - Immuno-histo-chemistry for classification
  - Histologic diagnosis and classification of cancer
  - Cytogenetics and flow cytometry
  - Targeted genomic testing
  - Tumor markers
  - Imaging



# Treatment

- Diagnosis
  - Liquid
  - Solid
- Stage
  - Surgery?
  - Radiation?
  - Chemotherapy
  - Combined?
  - Targeted
  - Immunotherapy
  - Hormonal



# Cancer is so much more than cancer!

- What kind?
- Treatment?
- Side effects?
- Management?
- Scans or reassess?







**You hear the word 'cancer,' and you think it is a death sentence. In fact, the shock is the biggest thing about a diagnosis of cancer.**

**- Clare Balding -**

**quoteparrot.com**

# Denial

- This is not real
- There has been a mistake





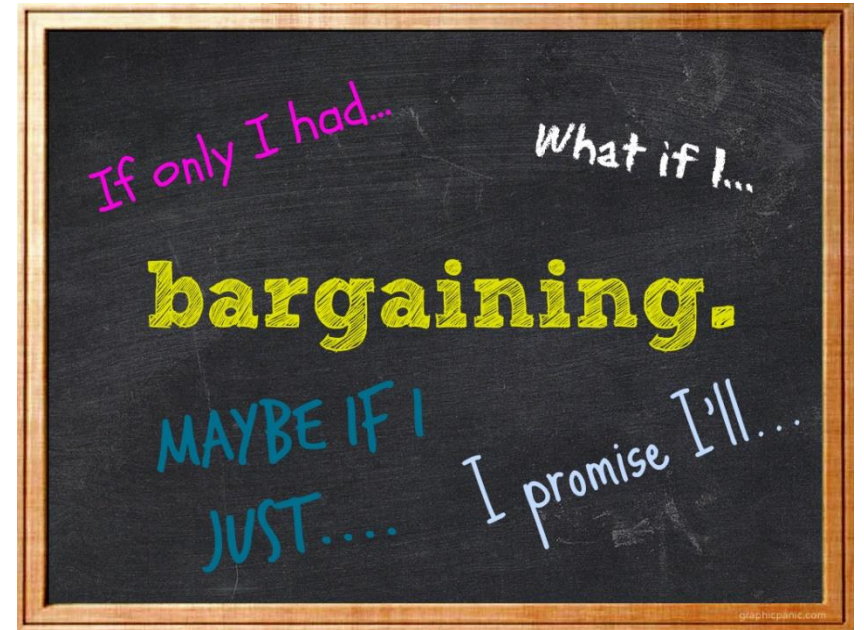
# Anger

- Manifest in different ways
  - Mad at self
  - At situation



# Bargaining

- If only I had
- What if It
- Maybe if I just
- I promise I will



(Based on the Grief Cycle model first published in On Death & Dying, Elisabeth Kübler-Ross, 1969. Interpretation by Alan Chapman 2006-2013.)

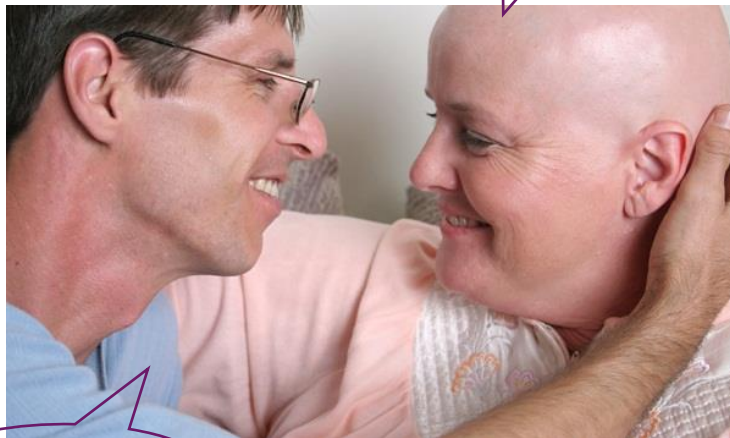
# Depression

- Preparatory grieving
- Acceptance with emotional attachment – starting to accept reality of the diagnosis
- Symptoms
  - Sadness
  - Regret
  - Fear
  - Lack of appetite or changes in appetite
  - Weight loss/Weight gain
  - Insomnia
  - Crying
  - Inability to concentrate



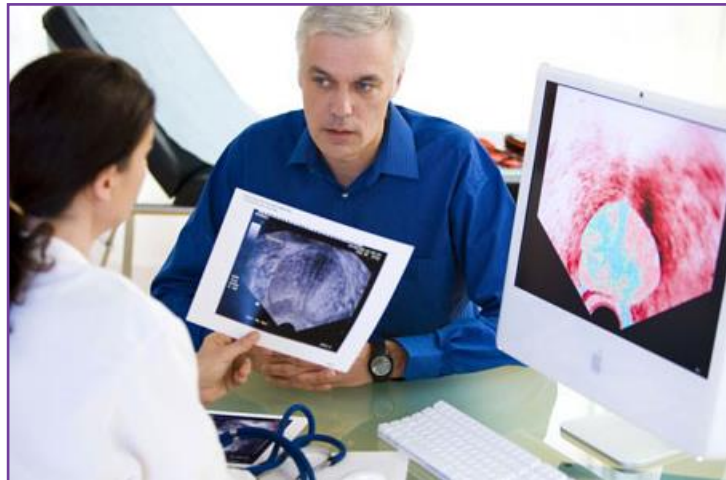
# Acceptance

- Varies according to the situation
- May notice emotional detachment and objectivity



I know, I love you!

You can do this!



Until next scan?



How long?

# Why is this important?



- Insight into the patient
- Knowledge about the disease
- Understanding of the stages of grief
- Review of systems
  - Cancer treatment affects all areas of life
- History physical
- Symptom management

# History and Physical

- Demonstrate confidence
  - Foam or wash hands
  - Shake hands
  - Introduce yourself
- Identify patient
  - Have patient identify anyone else in room
  - Document (helps identify at next visit)
  - Why are you here?
- Commonality



# Labs

- CBC w/diff
- Chemistry

11.4      12.2      242  
            35.6

Differential: Neutrophils 93%  
Lymphs 4.7 %  
Mono 2.3%

135      98      12      205  
4.0      25      0.7

ALT 56  
AST 48  
Alk phos 117  
T. Bili 0.3  
T. Protein 6.9  
ETOH 1

CK 94  
Trop I: 0.0  
PTT 23.5  
PT 10.5  
INR 1.0

# Constitution

- Fever
- Chills
- Appetite
- Weight loss/gain
- Fatigue

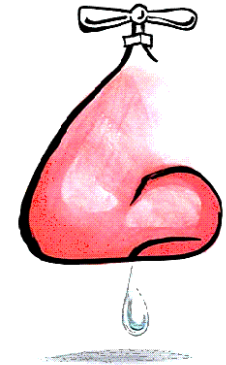


# HEENT

- Eyes
  - Watery
  - Blurring
  - Red
  - Itching
- Ears
  - Ringing
  - HOH
  - Fullness



- Nose
  - Running
  - Itching
  - Bleeding
- Mouth
  - Sores
  - Dentures/teeth
  - Tender
  - Candidiasis



The Mouth

# Respiratory

- Shortness of breath
- Exertion
- Oxygen



# Cardiac

- Abnormal heartbeats
- Pain
- Edema (where?)



# Gastrointestinal

- Nausea
  - When
  - Antiemetic's
- Emesis
  - When
  - Treatment
- Abdominal pain
  - Where
  - Anything better or worse



- Constipation
  - Last bowel movement
  - Frequency
- Diarrhea
  - Number of stools daily
  - Consistency
  - Treatment

# Genitourinary

- Urinary pain
- Frequency
- Color
- Burning
- Nocturia
- Changes in stream



# Neurological

- Alert and oriented
- Dizziness
- Balance
- Numbing
- Tingling
- Fine motor



# Musculoskeletal

- ADL's
- ROM
- Muscle pain
- Joint pain



# Integumentary

- Skin overall
  - Rash
  - Texture
  - Hair distribution
  - Hands
  - Feet
  - Nails
  - Hyper/hypo pigmentation

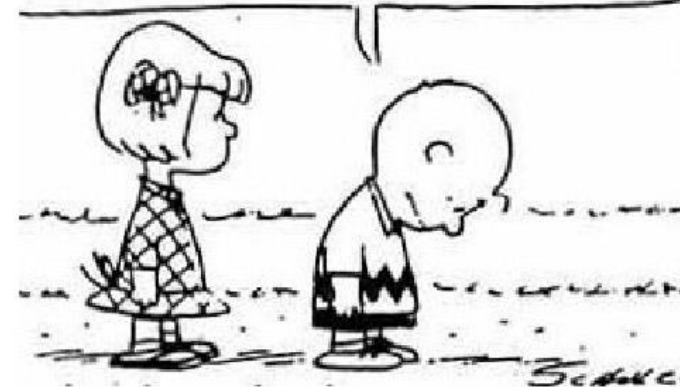




# Psychological

- Anxiety
- Nervousness
- Depressed
- Changes in life style
  - Social interaction
  - Working schedule
  - Insomnia

IF YOU'RE GOING TO GET ANY  
JOY OUT OF BEING DEPRESSED,  
YOU'VE GOT TO STAND LIKE THIS..



# Examination - Constitutional

- What do you see?
  - Alert
  - Oriented
  - Distress
  - Distracted
  - Affect
- Vital signs



# Examination - HEENT

- Scalp
  - Hair
  - Symmetric
- Eyes
  - PERRLA
  - Sclera
  - EMOI
- Neck
  - Lymphadenopathy
- Mouth
  - Teeth
  - Dentures
  - Gums
  - Lesions



# Examination - Respiratory

- Lung fields
- Breathing
- Drains/tubes



# Examination - Cardiovascular

- Regular or irregular
  - Murmurs
  - Gallops
  - Rubs
- Hydration



# Examination - Gastrointestinal

- Bowel sounds
- Soft
- Tender/non-tender
- Nodularity
- Pain
- Distention
- Organomegaly
- Wounds/drains

Snapshots at [jasonlove.com](http://jasonlove.com)



"I'm afraid that your irritable bowel syndrome has progressed. You now have furious and vindictive bowel syndrome."

# Examination - Genitourinary

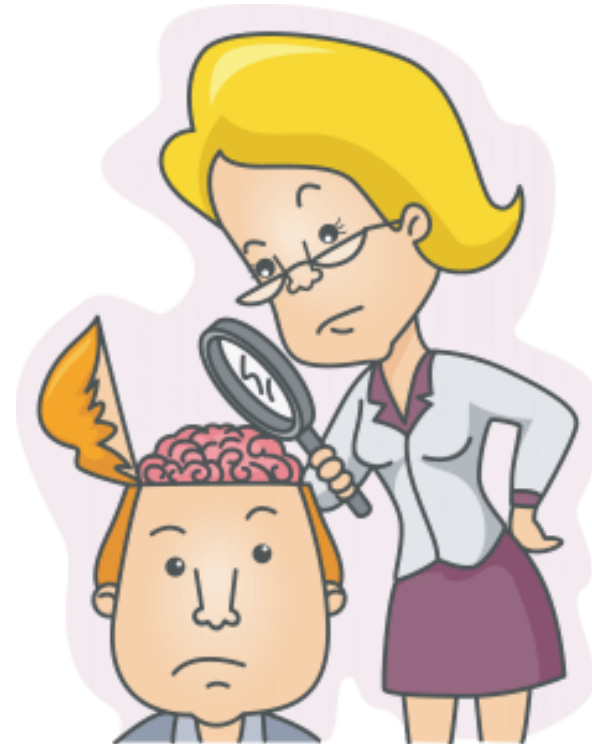
- Bladder distention
- Foley catheter
  - Color
- CVA tenderness

Percussion of the costovertebral angle for kidney tenderness



# Examination – Neurological/psychological

- Mood
- Alert and oriented
- Understanding of situation
- Coping strategies
- Judgement
- Affect
- Tremors





# Examination - Musculoskeletal

- Ambulation
- Movement
- Strength
  - Equal



# Examination - Integumentary

- Face
- Scalp
- Torso
- Hands
- Feet



Figure 4: Maculo-papular rash during treatment with the multikinase inhibitor sorafenib



# Pearls



World's Largest  
Natural Pearl  
75 lbs



# Implications and Considerations for the Cancer Patient!

- Blood counts will vary
  - CBC w/differential
    - Nadir
    - Stem cell activators
  - Chemistry
  - Liver function tests
  - Tumor markers
    - PSA, CA125, CA15-3, CEA, CA19-9, LD, Calcium

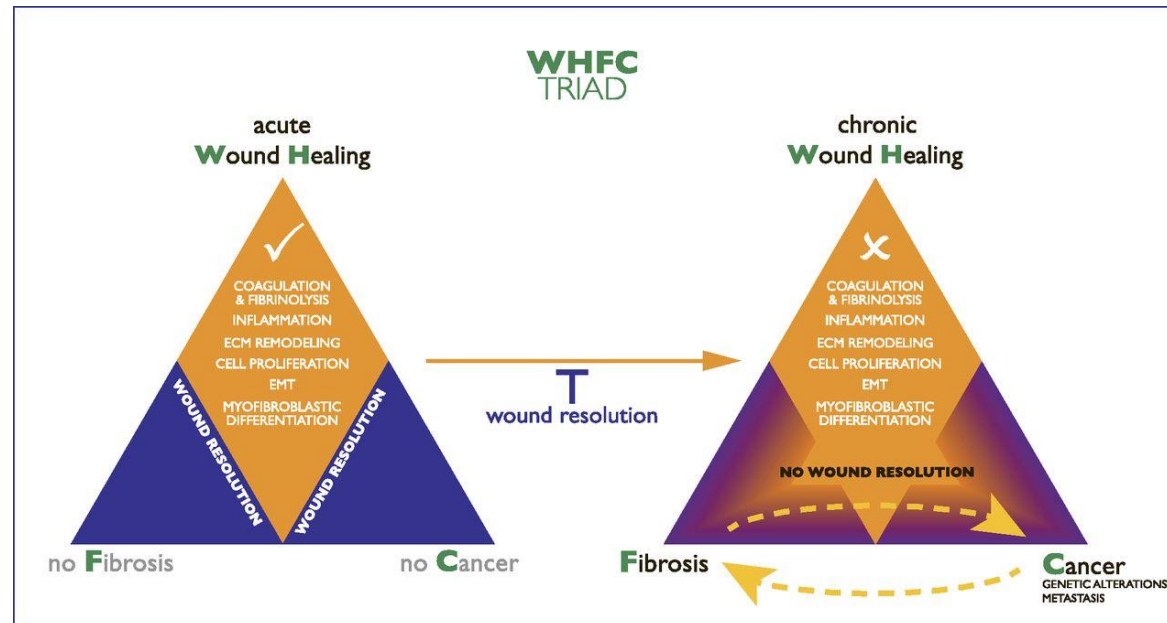
# Neutropenia

- Immune system is compromised
  - Neutropenic
  - Sepsis
    - Pneumonia
    - Bladder infections
    - Catheter infections



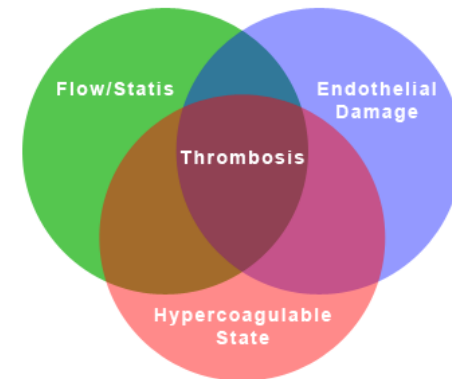
# Wound healing

- Treatment dependent
  - Chemotherapy
  - Endothelial growth inhibitors
  - Biphosphates



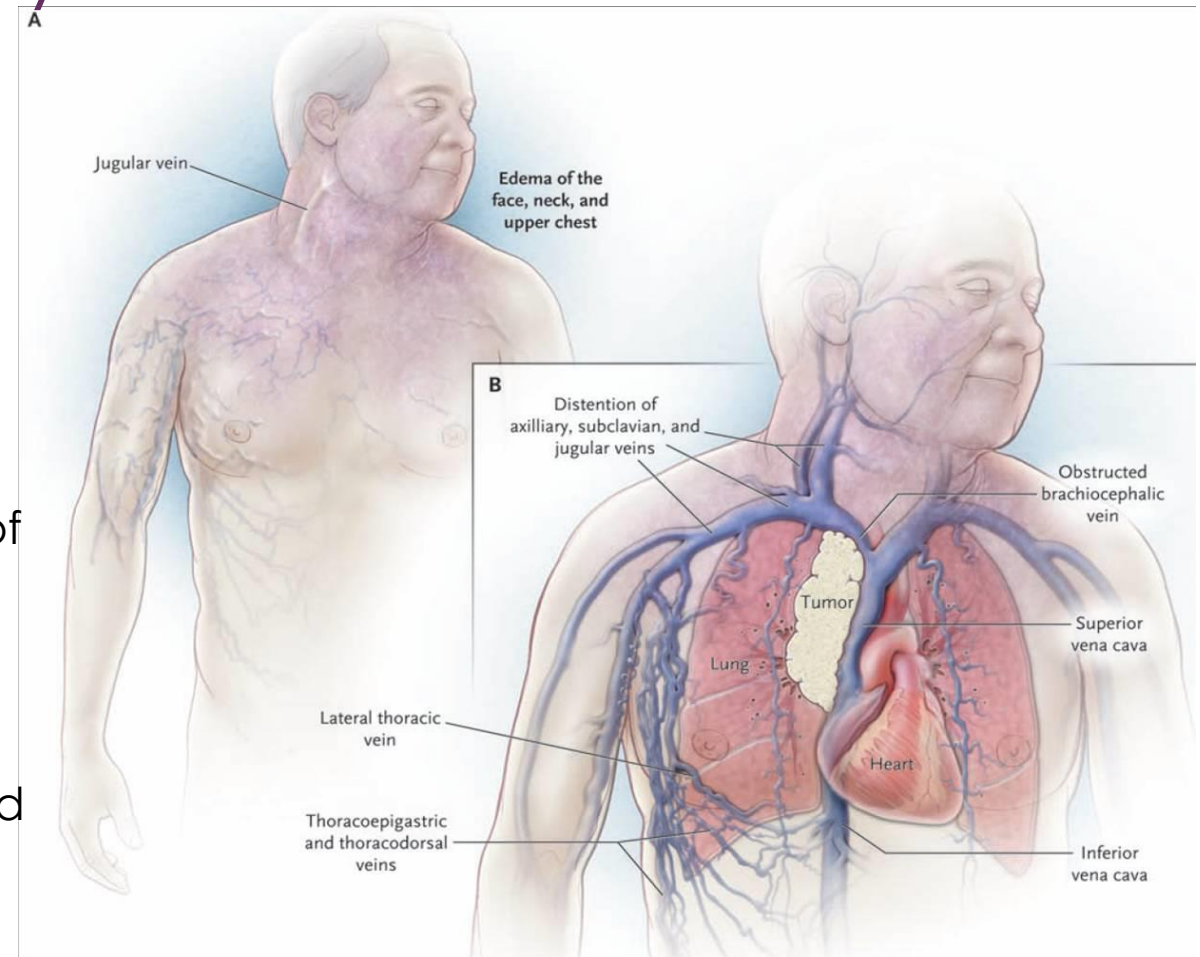
# Venous Thromboembolism

- Virchow triad
  - Venous stasis
    - Immobility
  - Hypercoagulability
    - Interleukins and tumor necrosis – produced when monocytes or macrophages interact with malignant cells – causing damage to endothelium – causing thrombogenic surface
  - Endothelial injury
    - Catheters
    - Direct tumor invasion
    - Antiangiogenic agents



# Superior Vena Cava Syndrome

- SVC
  - Blocked
  - Partially compressed
- Symptoms
  - Difficulty breathing
  - Headaches
  - Facial swelling
  - Venous neck and distended veins of the upper arms and chest
  - Upper limb edema
  - Lightheadedness
  - Cough
  - Edema (swelling) of the neck, called Collar of Stokes
  - Pemberton's sign





# Mucositis

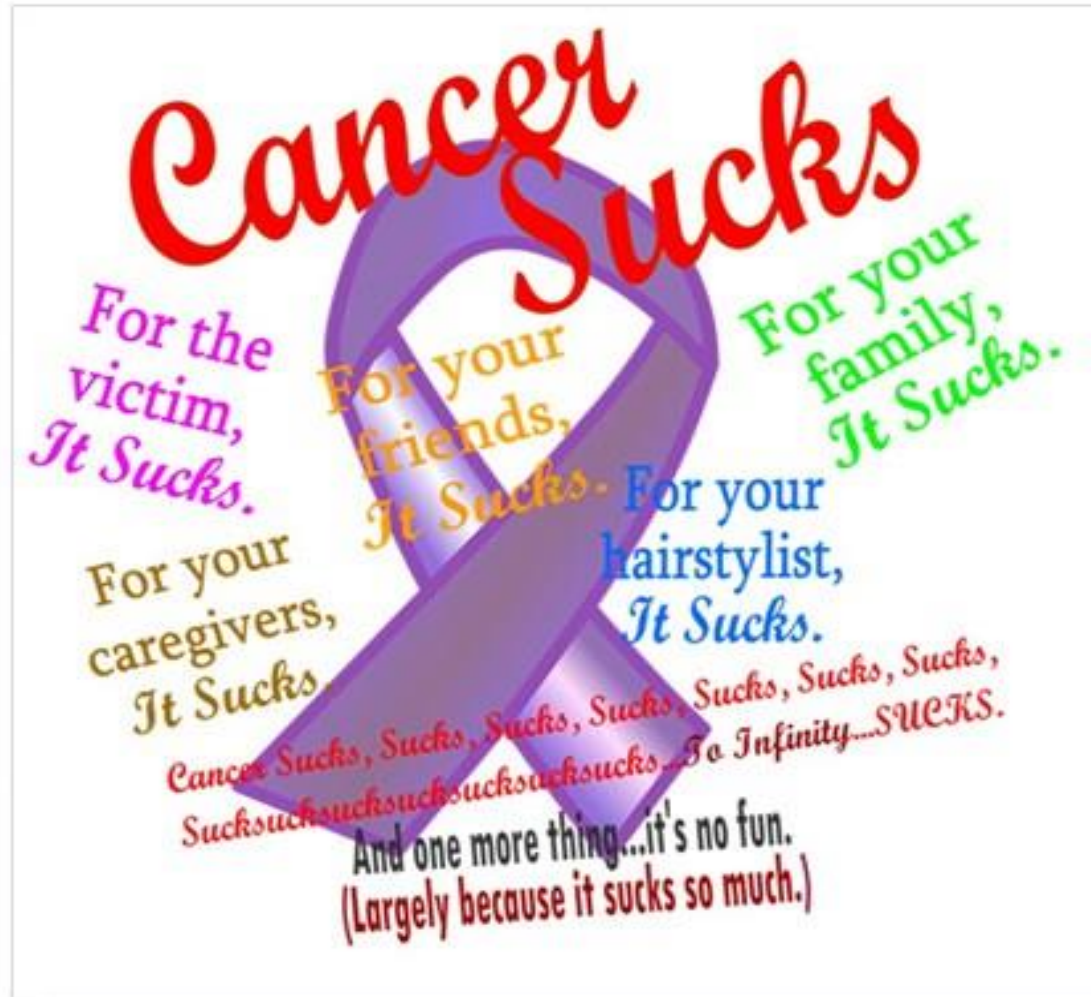
- Baking soda rinses
- Saline rinses
- Magic mouthwash
- Biotene

# Hand-Foot Syndrome (HFS) or Palmar-Plantar Erythrodysesthesia (PPE)

- Symptoms include:
  - Numbness
  - Tingling, burning, or itching sensation
  - Redness (resembling a sunburn)
  - Swelling
  - Discomfort
  - Tenderness
  - Rash
- In severe cases:
  - Cracked, flaking, or peeling skin
  - blisters, ulcers, or sores appearing on your skin
  - Intense pain
  - Difficulty walking or using your hands
  -

# Summary

- The reality is...



# References

- Abraham, J., O'Donnell, A., & Moment, A. (2014). *A Physician's Guide to Pain and Symptom Management in Cancer Patients*. Baltimore: Johns Hopkins University Press. Brugnoli, Maria Paola. *Clinical Hypnosis in Pain Therapy and Palliative Care: A Handbook of Techniques for Improving the Patient's Physical and Psychological Well-being*. Springfield, Illinois, U.S.A.: Charles C Thomas, 2014. eBook Collection (EBSCOhost), EBSCOhost (accessed January 14, 2016).
- Burchill Brassil, E. (2014). *The Washington Manual of Medical Therapeutics*, 34th ed., by Hemant Godara and Department of Medicine, Washington University School of Medicine. *Medical Reference Services Quarterly*, 33(2), 236-238 3p. doi:10.1080/02763869.2014.897528
- Carr D. *Management of Cancer Symptoms [Electronic Resource]: Pain, Depression, And Fatigue / Prepared for Agency For Healthcare Research And Quality, U.S. Department Of Health And Human Services; Prepared By New England Medical Center EPC; Investigators, Daniel Carr ... [Et Al.]* [e-book]. [Rockville, Md.]: U.S. Dept. of Health and Human Services, Public Health Service, Agency for Healthcare Research and Quality, [2002]; 2002. Available from: Government Printing Office Catalog, Ipswich, MA. Accessed February 14, 2016.
- Compton, Carolyn C. *AJCC cancer staging atlas*. [electronic resource]: a companion to the seventh editions of the AJCC cancer staging manual and handbook. n.p.: New York, NY: Springer, ©2012., 2012. UNF eBook Collection, EBSCOhost (accessed December 27, 2015).
- Connor, S. R. (2009). *Hospice and palliative care: The essential guide*. New York: New York. Routledge Taylor & Francis Group.
- Estes, M. Z. (2009). *Health assessment & physical examination*. Clifton Park, NY: Delmar, Cengage Learning. [2009] c2010.
- Munroe, B., Curtis, K., Considine, J., & Buckley, T. (2013). The impact structured patient assessment frameworks have on patient care: an integrative review. *Journal of Clinical Nursing*, 22(21/22), 2991-3005 15p. doi:10.1111/jocn.12226
- U.S. Department of Health and Human Services. National Institutes of Health. (2010). *Radiation therapy for cancer*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/radiation-therapy/radiation-fact-sheet#q9>.
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Chemotherapy*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/chemotherapy>
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Immunotherapy*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/immunotherapy>.
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Targeted Therapy*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/targeted-therapies>.
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Hormone Therapy*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/hormone-therapy>.
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Stem Cell Transplants*. Retrieved from <http://www.cancer.gov/about-cancer/treatment/types/stem-cell-transplant>.
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Advanced Cancer*. Retrieved from <http://www.cancer.gov/about-cancer/advanced-cancer>
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Diagnosis and Staging*. Retrieved from <http://www.cancer.gov/about-cancer/diagnosis-staging/staging>
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Melanoma Treatment*. Retrieved from <http://www.cancer.gov/types/skin/patient/melanoma-treatment-pdq>
- U.S. Department of Health and Human Services. National Institutes of Health. (2015). *Metastatic Cancer*. Retrieved from <http://www.cancer.gov/about-cancer/what-is-cancer/metastatic-fact-sheet>
- Whiteman D, Wilson L. Review: The fractions of cancer attributable to modifiable factors: A global review. *Cancer Epidemiology* [serial online]. June 28, 2016; Available from: ScienceDirect, Ipswich, MA. Accessed August 10, 2016.
- Yarbrow, C. H., Frogge, M. H., & Goodman, M. (1999). *Cancer symptom management*. Sudbury, Mass.: Jones and Bartlett, c1999.