

# Taking Care Of The Chemotherapy Patient

August, 2009

# INFECTIONS

- Infections cause:
- Increased hospitalizations
- Increased complications
- Higher death rate

# INFECTIONS

- 1) Infections acquired in the hospital are called: nosocomial infections
- 2) Many of these bacteria/fungi are also now in the COMMUNITY ( “community acquired”)
- Both types are becoming antibiotic resistant

# INFECTION FREE

- GOOD HANDWASHING prevents infections
- IT TAKES 15 SECONDS MINIMUM TO WASH YOUR HANDS PROPERLY
- (Sing “Happy Birthday to You”)

# INFECTION FREE

- Hands need to be washed:
  - Before any contact with the patient
- By ALL medical personnel – ASK THEM TO WASH THEIR HANDS
  - Before and after any procedure
  - After coughing, sneezing, using restroom, touching things outside or touching and animal/pet

# Stethoscope



# Fingerprints – unwashed hand



# Handprint without washing



# Handprint after soap/water- poorly done



# Handprint after alcohol-based sanitizer



# Infections

- Gram positive bacteria: MRSA, MSSA, coagulase neg. Staphylococcus (ICU, PICU) – lots of bloodstream infections, VRE, C-diff
- Gram negative bacteria: E. coli, Klebsiella (solid organ transplants), Pseudomonas, Enterobacters

# MRSA (Methicillin-resistant Staphylococcus aureus

- Leads to more active infections than any other multi-drug resistant organisms
- HA-MRSA is worse than CA-MRSA
- Risk factors: hospitalization, antibiotic use in the last 6 months, prior hx of MRSA skin or soft tissue, open wounds, compromised immune systems, elderly, infants, invasive procedures, HIV-positive

# Infections

- Viruses:
  - 1) RSV, Rotavirus, Adenovirus
  - 2) Other viruses CMV, EBV, herpes
- Fungus:
  - 1) Candida – “invasive candidiasis”
  - 2) Aspergillus

# Prophylactic antibiotics

- Antibiotic “Bactrim” is also given during the chemotherapy regimen.
- Bactrim prevents PCP (pneumocystis pneumonia) - an aggressive, fast-moving and hard to detect pneumonia.
- Bactrim is combo drug: Sulfamethorazole and trimethoprim

# INFECTION

- The host (the patient on chemo) is:
  - 1) already fighting a disease
  - 2) may have a Central Line
  - 3) may be malnourished
  - 4) possibly neutropenic (low WBC's)

# How to help the patient stay healthy

- 1) Excellent Hand-washing
- 2) Optimum Nutrition
- 3) Adequate Rest
- 4) Maintain Central Lines as directed
- 5) Good mouth hygiene
- 6) Watch for the subtle signs of illness
- 7) Monitor for signs of infection

# The person on chemo should:

- Stay away from ill people
- Stay away from large, indoor crowds (malls, restaurants, theaters, etc.)
- Wash hands before touching food
- Do not share food utensils
- Wash hands after toileting

# The person on chemo should:

- Avoid constructions sites and dirty, musty places
- Wash hands after playing outside
- Not sit on a public toilet seat (use a paper cover)
- Use new make-up; avoid sharing make-up
- Not wear artificial nails

# Chemotherapy

- All cells that divide in the body will take up chemotherapy medications
- Healthy cells fix the damage caused by the chemo, but when healthy cells take up chemotherapy, there are side effects.
- Chemotherapy may be held if the WBC's, H/H, or platelets are low

## When blood takes up chemo:

- Thrombocytopenia (low platelets) - risk for bleeding, bruising
- Neutropenia: low neutrophils in the blood. Neutrophils are the main infection-fighting white blood cells
- Anemia (or low H/H) – paleness, weakness, shortness of breath, dizziness, etc.

# If Platelets are low:

- Do not blow nose hard
- Use toothettes for mouthcare
- Do not take aspirin or ibuprofen (NSAIDS)
- Avoid razors, sharp items and R temperatures
- Avoid contact sports (football, roller skating, wrestling, etc.)
- Wear seatbelt in vehicles

# Mouthcare on Chemotherapy

- Should do excellent mouthcare
- Brush teeth twice a day, use soft toothbrush (if platelets are above 50,000).
- If platelets are low, they use a toothette to brush
- Rinse mouth following meals & snacks, and before bed
- If platelets are low, avoid abrasive food or hot foods

# WHEN HAIR TAKES UP CHEMO:

- Hair thins, or falls out (alopecia)
- 
- WHEN THE LINING OF THE MOUTH/GUT TAKES UP CHEMO:
- Nausea/vomiting, feeling sick to the stomach, constipation
- Mouth sores/anal sores

# Chemotherapy Medications:

- Websites:
- [www.stjude.org/patient-information](http://www.stjude.org/patient-information)
- [www.curesearch.org/for\\_parents\\_and\\_families/drugs/index.aspx](http://www.curesearch.org/for_parents_and_families/drugs/index.aspx)

# ANC Example

- WBC 8.9
- Neutrophils 93
- No bands
  
- $(93 + 0) \times 8.9 = 8277$
- ANC = 8277

# Chemotherapy Drugs

- Antimetabolites
- Alkylating agents
- Anti-tumor antibiotics
- Plant derivatives
- Antiangiogenic agents
- Corticosteroids
- Asparaginase
- IVIG
- Purine Analogs
- Immunosuppressives
- “Targeted therapy”

# Chemotherapy

- Most chemotherapy is utilized by the cells, then broken by the liver and excreted by the kidneys.
- With both HLH and LCH the liver may be diseased - chemo regimen difficult to tolerate
- Both HLH and LCH may already cause blood counts to be low (liver, spleen, or bone marrow involvement)

- For children, note the following:
- Is child fully active?
- Tiring easily?
- Decrease in playing?
- Gets dressed, but lies around most of day?
- Staying in bed?
- In bed and needing assistance for activities – play?
- Sleeping all the time?
- Not playing? Not getting out of bed?
- Not responsive?????

# Call the doctor: S/S Infection

- Fever at 100.5-101 degrees F or HIGHER
- Shaking chills
- Sweating
- Headache, stiff neck
- Rashes, blisters, sores, Drainage from sores
- Cough, rapid breathing
- Sore throat or earache
- Stomach/abdominal pain
- Swelling/firmness of the abdomen
- Loose stools/diarrhea
- Lack of energy
- Drainage from sores
- Vaginal odor or discharge
- Pain with urination/blood in urine

# Call the doctor: S/S Bleeding

- Bleeding/bruising
- petecheaie
- Nosebleeds
- Gum bleeding
- Paleness
- Lack of energy
- Blood in vomit
- Tarry or bloody stools
- Trouble seeing
- Change in mental status
- Severe headaches
- Convulsions/
- Seizures
- Blood in urine
- Stomach/abdominal pain

# Call the doctor cont:

- Lack of appetite
- Excessive thirst or urination
- Skin or finger infections
- Decreased thirst
- Dry, hard stools
- Yellowish color to eyes or skin
- Exposure to chicken pox, measles, or infectious diseases
- Before any dental work (cleanings, etc.)
- Before vaccinations

# WHAT YOU SHOULD KNOW:

- Names of all the medications
- Side-effects of these medications
- Any **MEDICATION ALLERGIES** of the child/adult – medic alert bracelet
- Action to take for an adverse reaction: who to call
- Action to take if child runs a fever or is not feeling well

# WHAT YOU SHOULD KNOW:

- Care of the Central Line
- The treatment plan (the chemotherapy protocol, appointments, consults, etc.)
- The 24 hour contact numbers
- Emergency contact numbers for entire family (in case of unplanned ER visit)

# Chemotherapy can be given by the following routes:

- Topical - on the skin
- Oral – by mouth
- Intramuscular
- Subcutaneous
- Intravenous
- Intrathecal/intraventricular

# Intravenous Route

- 1) Peripheral route: IV in the hand or arms (avoid dominant hand)
- 2) Central Lines: Ports, PICC's, Tunneled Catheters – Broviacs, Hickman, Groshong (may be called TAC lines)
- Central Lines may be called Central Venous Catheters

# Central Lines (CVC's)

- Why do we need them? To give:
- 1) IV “irritants”
- 2) continuous infusions of vesicants
- 3) intravenous fluids
- 4) parenteral nutrition (TPN/PPN)
- 5) blood products
- 6) antibiotics
- 7) analgesics (pain medications)

# Intravenous Risks:

- Delayed Extravasation: extravasation symptoms occur 48 or more hours after the drug was given
- Flare: local allergic reaction, painless, usually with red blotches along the vein. Symptoms usually subside within 30 minutes

# Hints for Oral Chemo for infants

- Infants:
  - can suck oral medications through a nipple, or a special bottle (Medibottle)
  - Mix/shake liquids meds well
  - Use a calibrated syringe to measure amounts carefully!
  - raise the head to prevent “aspiration” (inhaling the drug into the lungs).

# Hints for Chemo cont.

- For young children:
- Always use simple explanations, and reward positive responses
- If child is frustrated, re-direct the child to fun activities - going to playroom, getting to watch a program, a “special” activity

# Hints for Chemo cont.

- Have special bandaides or stickers available (even for home care issues) as rewards
- Let CHILD assist with their care (hold something, place a bandage here, etc).
- Allow “play-acting” – let child do procedure for a doll, etc.
  - Ex: let them bandage a doll, change a line dressing, etc.

# Hints for Chemo cont.

- ALLOW THEM TO EXPRESS HOW THEY FEEL ABOUT TREATMENT
- Children may “talk” about this at a later time, even years later from the time chemotherapy was given.

# Oral Medications

- NEVER CRUSH A SUSTAINED- RELEASE TABLET
- Only “scored” tablets should be broken in half.  
Ask pharmacist if tablet can be broken.
- KEEP MEDICATIONS AWAY FROM CHILDREN’S REACH
- Children with diabetes insipidus will drink ANY liquid

# Oral Medications

- If a tablet can be crushed (check with pharmacist) - mix with sweet flavored syrup, fruit, applesauce, jello, ice cream
- Try foods like peanut butter, chocolate or strawberry syrup - mask bitter taste
- Trial and error with finding what works for you child

# Oral Medications

- Milk/milk products may interfere with absorption of meds (such as 6MP).
- Some meds need to be taken on empty stomach
- Some meds need to be taken with food (prednisone).

# Oral Meds. cont.

- For swallowing pills or bitter liquids:
- Focus on swallowing a type of food substance (applesauce, etc.) or a liquid chaser (a sip of juice, etc.) instead of the pill or bitter liquid
- Have child pinch his nose and drink through a straw (our “taste” may be smell- related)

# Injectable Medications

- YOU WILL NEED INSTRUCTIONS FROM THE HOSPITAL/CLINIC TEAM
- For any injectables into skin/muscle/SQ, remember that the PLATELET COUNT WILL NEED TO BE MONITORED.
- Make sure all tubings are secured.
- You should be given guidelines for this!

# Nutrition during Chemotherapy

- Be aware if a neutropenic diet is indicated if the ANC is  $<500$ .
- If instructed, follow neutropenic diet.
- Ask medical team for neutropenic recommendation

# Nutrition during Chemotherapy

- Wash all vegetables and fruits well
- NO food from salad bars
- If taking prednisone or dexamethasone, may need to limit salt intake
- Vincristine can cause hard stools - increase water intake, add fruits, vegetables, whole grains

# Nutrition during Chemotherapy

- Fatigue fighting foods: complex carbohydrates (fruits, vegetables, and whole grains) offer long-lasting energy.
- Simple carbohydrates (sugars, sweets) give quick energy but are followed by fatigue
- Protein is necessary to re- build damaged cells and body tissue. People fighting diseases often lack protein reserves in their muscles

# Nutrition

- For older children and adults, try cooked eggs (no runny eggs), cooked lean meats, fish, soy, beans.
- Try peanut butter on crackers, soups, hard-boiled eggs, when the patient is tired or not hungry for a full meal
- With nausea and vomiting, need to try 5-7 small meals/day. May need to pre-medicate for nausea before the meal

# Nutrition - Healthy Snacks

- Milk (pasteurized only) with fruit (canned) smoothies
- Canned fruit in light syrup
- Cheese-sticks, whole grain crackers
- Grain tortillas, with turkey and cream cheese, rolled up.
- Fruit with cottage cheese

Steroids (prednisone, dexamethasone)

can cause:

- 1) osteonecrosis in adolescents
- 2) altered bone density causing fractures

3) osteoporosis

# Long Term Disease Effects:

- LCH:
- Orthopedic disabilities
- Hearing loss
- Scarring of skin
- DI
- Poor growth
- Lung fibrosis
- LCH:
- Neuro problems: ataxia, psych issues, poor learning, memory deficits, poor swallowing
- Liver fibrosis
- Later malignancies

# Long Term Disease Effects – HLH/FHLH

- Cerebral involvement
- CNS dysfunction
- Seizures
- Blindness from ocular infiltrates or hemorrhage
- Inability to play
- Poor learning ability
- If no BMT donor:  
bacterial or fungal  
infections/Pneumonia/  
Bleeding

# Histiocytosis versus chemo

- It may be difficult to know if symptoms are caused by disease OR the treatment of the disease
- But people with Histiocytosis need **LONG TERM FOLLOW-UP CARE**