

## **Radiation Therapy and Lymphedema**

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I. **Definition:** Radiation Therapy is the use of high energy ionizing rays or particles to treat cancer. Approximately 60% of persons with cancer will be treated with radiation at some point during their illness.

### II. **Types:**

- A. External Beam Radiation - radiation is provided from an external source. Radiation activity is only present while machine is turned on. Most common form of radiation. Will describe in more detail - see below.
- B. Implant/Brachytherapy - radioactive source is implanted into a body cavity to provide radiation at the site needed....such as prostate or cervix.
- C. Other - Ex: Radioactive Iodine Tablets for Thyroid CA  
IV Strontium for Bone Mets from Prostate CA

### III. **Uses:**

- A. Cure Cancer.
- B. Control the growth and spread of cancer.
- C. Prevent Microscopic Disease (ex: treat brain in certain types of lung cancer before the cancer spreads or metastasizes to the brain).
- D. Improve quality of life.  
Ex: 1. Pain control in bone metastasis.  
2. Control bleeding from uncontrolled tumor.  
3. Relieve pressure from tumor on superior vena cava, spinal cord compression or brain metastasis.

### IV. **External Beam Radiation:**

#### A. **Treatment Planning:**

- 1. X-rays/CT-Scans & Measurements to plan treatment specifically for each pt.
- 2. Marks on skin to ensure lines up accurately each time -don't wash them off.
- 3. Blocks - shield areas not to be treated with radiation.

#### B. **Treatment Delivery:**

- 1. Monday thru Friday for 2-8 weeks.  
Ex: Breast CA 25-36 treatments  
Bone Metastasis 10-15 treatments
- 2. Specially trained Radiation Therapy Technicians line up treatment machine based on planning. Actual treatment takes only a few seconds.

## V. Implant / Brachytherapy:

### A. Treatment Planning:

1. X-rays/CT-Scans/Ultrasound & Measurements to plan treatment specifically for each patient.
2. Calculate # of internal sources needed based on size, decay, etc... for prostate cancer or the time to leave the source in for cervical cancer.

### B. Treatment Delivery:

1. Patient may be taken to surgery to have radioactive source implanted directly at the site or may be implanted into the patient while in a hospital room.

## VI. Side Effects and Prevention / Treatment:

### A. Systemic (throughout the whole system):

#### 1. Fatigue

- a. Due to the extra amount of energy required by the body to repair the damage done to the good cells while trying to kill the cancer cells. Gradually gets worse during treatment, then gradually gets better after treatment. May last for several months following treatment. Worse if other treatments (like chemotherapy) given at same time.

#### b. Prevention / Treatment

- 1) Rest when possible.
- 2) Delegate when possible (don't feel like need to do it all).
- 3) Light aerobic exercise -walking, bike riding early in day.
- 4) Eat healthy meals and take supplements (like Ensure or Boost) as needed -see dietician.

#### 2. Anorexia

- a. Can be found if fatigue is a factor. Often due to Cancer alone, not necessarily due to the radiation treatment, unless tx to abdomen.

#### b. Prevention / Treatment

- 1) Eat high protein, high calorie foods (even if not hungry).
- 2) Add extra calories to foods with sauces, butter, gravy, etc...
- 3) See a dietician for further diet tips.
- 4) Treat underlying fatigue.
- 5) Check for and treat depression.
- 6) Take antiemetics for nausea - if ordered.
- 7) Use nutritional supplements like Boost or Ensure if eating is a problem. Check with your dietician to determine your caloric needs.

#### 3. Decreased Bone Marrow Production

- a. Is possible if treating a large bone field, such as pelvis and thigh or pelvis and ribs. Increased risk if getting chemotherapy during or before radiation treatments.

#### b. Prevention / Treatment

- 1) CBC as ordered to monitor.
- 2) May be necessary to hold treatments for a while, to allow CBC to recover.

## B. Local:

### 1. Skin Reaction

#### a. During Treatment

- 1) Redness.
- 2) Dry Desquamation (dryness & flaking).
- 3) Moist Desquamation (open and draining).
- 4) Alopecia (hair loss).
- 5) These changes occur only to skin in the treatment field.
- 6) Don't forget exit dose: ie... check skin on opposite side too.

#### b. Late Effects - occur weeks or months after the treatment

- 1) Fibrosis.
- 2) Telangiectasia.
- 3) Radiation Recall -discussed in detail later.

#### c. Prevention / Treatment

- 1) Don't scratch or rub the skin in the treatment area.
- 2) Bathe using warm water, not hot. No soap inside treatment area.
- 3) Don't wash off the marks!
- 4) No creams, lotions or powders unless OK'd by the radiation oncology department. Examples of things OK to use are AquaPhor, RadiaCare Gel or Constant Care for dry skin. Corn starch is OK to use to feel dry. Hydrocortisone Cream may be used for redness. Always check with the Radiation Department first.
- 5) No shaving cream or shaving in the treatment area, except with an electric razor.
- 6) No heating pad to the skin in the treatment area.
- 7) No sunlight to the area being treated during the treatments. After the treatments are finished, will need to use sunscreen to this area if exposed to sun, for the rest of your life, as the skin remembers that it had radiation treatments and will sunburn more easily and more severely.
- 8) Wear loose comfortable clothing.
- 9) After the treatments are finished, as long as there is no open areas, you may use the lotion of your choice. AquaPhor and RadiaCare Lotion or Eucerin cream or lotion are good for dry skin.

### 2. Site Specific

-For the Site Specific Side Effects, Refer to the Skin Section As Well

#### a. Brain

- 1) Alopecia
  - a) Hair loss due to the effects of radiation on hair follicles.

Begins in about 2-3 weeks after starting radiation. Hair will start to grow back in about 3 months. May come in with different texture or color.

b) Prevention / Treatment

- Do not wash off the marks.
- You may shampoo every 3-4 days using a gentle shampoo. An example is Johnson's Baby Shampoo.
- Avoid rubbing or scratching the area being treated.
- Do not use creams, lotions, or powders on the scalp or ears. Do not apply make-up to the skin.
- Do not apply heating pads to the area receiving treatment.
- Do not use the "HIGH" setting on a blow dryer.
- Avoid sunlight to the skin in the treatment area. After the treatments are finished, use sunscreen to the skin to avoid sunburn.
- If you are interested in a wig or hair piece, we can help you. Good idea to get a wig before you lose your hair, so can choose one that is most like your own. Or you can go wild and choose a different color or style. Some just use a hat or turban. The choice is yours.

2) Cerebral Edema

- a) Due to the pressure from the tumor and surrounding fluid or from radiation treatments. Can cause headaches, nausea, vomiting, visual changes, memory changes or confusion, weakness, gait disturbances and/or seizures.

b) Prevention / Treatment

- Report any unusual side effects to your physician.
- Patients are often placed on decadron (a steroid) during their radiation treatments - take as directed by your physician.
- Antiemetics may be used for nausea, and Dilantin is sometimes used for seizures - take as directed.

b. Head & Neck

1) Xerostomia (dry mouth)

- a) From treatment to the salivary glands.

b) Prevention / Treatment

- Some patients now getting Ethylol 30 min. before radiation treatments to decrease this effect.
- Suck on hard candies or chew gum.
- Frequent sips of water or other beverage - limit

caffeine intake and avoid alcohol.

-Drink at least 2 quarts fluid/day.

-Avoid hot liquids - let cool 1<sup>st</sup> so don't burn mouth and throat.

-Avoid smoking or chewing tobacco - these irritate the throat and mouth.

-No commercial mouth washes - many contain alcohol.

-Artificial saliva products as ordered by physician.

-Brush teeth after each meal and at bedtime with a soft bristled tooth brush.

-Rinse and spit (don't swallow) 4 times a day with the following mixture:

1 quart warm water, 1 tsp baking soda, 1 tsp salt  
may store unused portion in the refrigerator for 72h

-Use lip balm to keep your lips moist.

## 2) Taste Changes

a) Due to the effects of radiation on the taste buds and from dry mouth and throat

b) Prevention / Treatment

-Follow the guidelines for Xerostomia.

## 3) Tooth Decay & Dental Caries

a) Due to the effects of radiation on the teeth and gums

b) Prevention / Treatment

-All patients will see their dentist prior to radiation treatments for fluoride treatments and dental work.

-Good oral hygiene is essential - brushing teeth after each meal and at bedtime with a soft bristled toothbrush, and flossing at bedtime.

-For patients with dentures - brushing dentures after every meal and at bedtime, and rinsing mouth with the baking soda and salt solution above.

## 4) Oral Mucositis

a) Due to the effects of radiation and dry mouth on the oral tissues.

b) Prevention / Treatment

-Follow the guidelines for Xerostomia.

-May need prescription for a "Magic Mouthwash."

-Let your doctor know if having any problems with sores in your mouth.

## c. Breast

### 1) Skin Changes

a) Changes to the skin as discussed above, especially to axilla and under the breast if these areas are in the treatment field.

b) Prevention / Treatment

- Follow skin care guidelines above.
- May use RadiaCare Gel QID (as ordered).
- Don't wear bra if at all possible.
- Don't shave under arm on side being treated, except with electric razor.
- No deodorant on side being treated-corn starch OK
- No make-up below the chin.

2) Mild Esophagitis or Cough

a) These may develop as treatment of entire breast will include treatment to chest wall. Chest wall may also be treated in those with recurrence of the cancer to this area.

b) Prevention / Treatment

- Please refer to next section for "chest" treatments.

d. Chest

1) Esophagitis

a) Inflammation of the esophagus due to the effects of radiation on these tissues. Often presents itself as a feeling like there is a "lump" in the throat or difficulty swallowing.

b) Prevention / Treatment

- Follow the guidelines for Xerostomia above.
- Try to drink at least two quarts of liquid per day.
- Do not drink very hot liquids. Let drinks cool before drinking to avoid irritation to your throat.
- Cut food into small pieces, eat slowly and chew your food well.
- Avoid foods with sharp edges, such as pretzels or taco chips.
- Avoid acid-based drinks, such as orange juice, tomato and grape-fruit juice.
- Avoid spices and salts on food.
- Eat soft foods, or make foods easier to swallow by using a blender.
- Use butter, margarine, gravy, sauces or broth on foods.
- Soften and moisten foods by dunking in a

beverage.

- May need a prescription for "Magic Mouthwash" or sometimes for Viscous Xylocaine before meals.
- Maalox QID before meals and at bedtime may be helpful - check with the Radiation Oncologist first.

## 2) Cough

- a) Due to the inflammation to the lung tissue from the radiation. Leads to increased mucous production as a protective measure, which leads to the cough. May produce some clear or white sputum (if no infection).
- b) Prevention / Treatment
  - Drink at least 2 quarts of fluid/day to keep mucous thin and help prevent infection.
  - Let health care provider know if sputum becomes yellow, green, or brown, or develops an odor.
  - If the cough keeps you awake at night, let your Radiation Oncologist know - you may be able to use a cough suppressant.

## 3) Radiation Pneumonitis / Fibrosis

- a) Permanent changes to the lung tissue from the radiation. Is visible on a Chest X-ray as scar tissue.
- b) Prevention / Treatment
  - Let your doctor know you've had radiation any time you need to have further X-rays.

## e. Abdomen

### 1) Nausea / Vomiting

- a) Due to the effects of radiation on the stomach itself.
- b) Prevention / Treatment
  - Take antiemetics or other medications as ordered by the doctor.
  - Avoid odors or foods that cause nausea.
  - Eat dry crackers before getting out of bed. If possible, remain in bed until feeling subsides.
  - Eat small and frequent meals.
  - Eat dry meals - separate fluids from meals.
  - Drink carbonated beverages.
  - Caution to avoid eating fried or greasy foods, or other offensive foods, especially at bedtime.
  - Maintain good posture - give stomach ample room.
  - Stop or decrease smoking.

- If nausea and/or vomiting persists, talk to your Dr.
- Wear loose, comfortable clothing.

## f. Pelvis

### 1) Diarrhea

- a) Due to the effects of radiation on the intestines. When irritated from the radiation they increase peristalsis and decrease absorption of food and reabsorption of water.
- b) Prevention / Treatment
  - Follow a low fiber, low residue diet during radiation and for two weeks after the completion of your treatment.
  - Drink at least 2 quarts of liquid per day.
  - If diarrhea persists, may take Imodium AD as directed by your doctor.

### 2) Proctitis

- a) Due to the effects of radiation on the rectum. Leads to burning sensation and discomfort of the rectum and may also cause hemorrhoids to flair.
- b) Prevention / Treatment
  - Let your physician know if this is a problem. S/he may prescribe Anusol HC 2.5% Cream or Suppositories. Do not use Preparation H or other products without your radiation physician's OK.
  - Soaking in a warm bathtub or sitz bath may be helpful, but care must be taken not to soak off the marks.
  - AquaPhor Ointment is sometimes helpful for external irritation.
  - Wear loose fitting clothing and cotton underwear.
  - Avoid pantyhose.

### 3) Cystitis

- a) Due to the effects of radiation on the bladder. Often can cause burning, or the feeling of needing to urinate frequently.
- b) Prevention / Treatment
  - Drink at least 2 quarts of liquid per day, limiting caffeine intake to 1-2 cups (8 oz. each).
  - Let your Radiation Oncologist know if having any changes in your urinary symptoms...may need to check for a UTI and treat with antibiotics if present.
  - Pyridium 200mg po TID ac is helpful for this - the

Doctor may order this if your symptoms persist.

-Wear cotton underwear and loose fitting clothing.

-Avoid pantyhose.

#### 4) Vaginal Stenosis

a) Due to the effects of radiation on the vaginal mucosa, causing scar tissue formation and dryness.

b) Prevention / Treatment

-Continue to have sexual relations - if OK with your physician - as this helps prevent scar tissue.

-Use a water-based vaginal lubricant such as Replens or KYJelly for dryness.

-Vaginal dilators are sometimes needed and are available from your physician.

## VII. CDT & Radiation Therapy:

### A. Skin Care:

#### 1. During Radiation Therapy

a. Patient can only use certain lotions on the skin in the treatment area as some contain ingredients that react with the radiation and make the skin side effects worse.

b. Check with the radiation department about skin care products that are usually OK to use.

Examples: AquaPhor

RadiaCare Gel

Constant Care (by Vaseline)

#### 2. After Radiation Therapy

a. After the radiation oncologist gives the OK, can use any ointment, creams or lotions on intact skin.

b. If patient has moist drainage, check with the physician about skin care.

### B. MLD:

#### 1. During Radiation Therapy

a. If MLD area is not in the radiation treatment area, is OK to do MLD.

b. If skin is intact, and is OK with the radiation oncologist, OK to do gentle MLD. Care not to rub off the marks. Use your good judgement.

b. If area is reddened or has moist drainage, DO NOT do MLD.

#### 2. After Radiation Therapy

a. OK if skin is intact. DO NOT do MLD if moist desquamation.

b. Care over fibrotic areas. Best if can avoid all together, but use your good judgement. Often OK if use gentle technique.

### C. Bandaging:

#### 1. During Radiation Therapy

a. OK to bandage if area being bandaged is NOT in the radiation field.

- Still good idea to get OK from radiation oncologist.
- b. If area to be bandaged is in the radiation field, the bandage would act as a bolus, and increase the amount of radiation to the skin, so NEVER BANDAGE IN THE RADIATION FIELD.
2. After Radiation Therapy
    - a. If skin is intact or is healed, is OK to bandage.
    - b. If skin is reddened or has moist desquamation, check with radiation oncologist first - best to let it heal.

### VIII. **Radiation Recall:**

- A. **Definition:** This is a phenomenon found in patients with a history of radiation therapy. This happens in patients who are getting certain chemotherapy drugs (esp. Cisplatin). When the patients get these certain chemotherapy agents, the skin in the old radiation therapy field turns red and becomes irritated. Dry or moist desquamation may develop. In some cases the skin reaction is worse than it was during radiation therapy. This can occur weeks or even years after radiation therapy.
- B. **CDT/MLD:** Care should be taken as described above. Avoid if can. Use good judgement. Contact the physician if any questions about skin care.

### IX. **Summary:**

- A. CDT / MLD during radiation therapy is possible - it is not an outright contraindication.
- B. The key is good communication between you and the Radiation Therapy Staff.
- C. Good idea to make sure your treatment plan is OK with the Radiation Oncologist before doing MLD during Radiation Therapy