

Neuroblastoma Follow Up

History

General Health (appetite, level of energy, any new health problems etc.)

Lifestyle (e.g. smoking, illicit drugs, ethanol)

Current Medications

List of physicians/HCPs involved in patient's care

After abdominal &/ pelvic RT, check for:

- GI symptoms:
 - Abdominal pain and cramping, diarrhea/constipation, change in bowel habit, rectal bleeding
- Bladder symptoms:
 - Dysuria, hematuria, frequency and any bladder infections
- Women: Menstrual cycle, menopausal symptoms, sexual function
- Men: Sexual function
- Problems with fertility: Inability to conceive
- Spinal symptoms:
 - Back pain, history of fractures

After chemotherapy, check for:

- Hearing loss (Cisplatin exposure)
- Symptoms of cardiac dysfunction (Adriamycin exposure)
 - Shortness of breath on exertion & Orthopnoea
- Problems with fertility
- Symptoms of peripheral neuropathy (Vincristine & Cisplatin exposure)
 - Numbness/pins & needles in hands & feet
 - Foot drop

After chest RT, check for:

- Does the patient smoke? (tobacco or marijuana)
- Respiratory symptoms:
 - Cough, shortness of breath, chest pain
- Energy level (at risk for hypothyroidism)

Examination

Always Check:

- Blood pressure
- Weight & height (BMI)
- Skin within previous RT field for skin cancer
- **Chemotherapy related signs:**
 - Cardiac dysfunction/failure
 - Peripheral neuropathy
- **Previous chest RT:**
 - Examine neck to exclude thyroid nodules
 - Check for spinal scoliosis
 - Respiratory examination
 - Cardiac examination
 - In females check for palpable breast abnormalities

Previous abdominal &/ pelvic RT:

- Check for scoliosis as spinal growth may have been affected by RT
- Abdominal and pelvic examination
- In previous right sided tumors check for signs of liver/veno-occlusive disease

DISCLAIMER: This document gives examples of the way in which patients previously treated for neuroblastoma might be followed for educational purposes only. These examples are NOT guidelines for patient care.

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Testing and Screening

Previous chest RT:

- Ultrasound scan of the thyroid every 3 years to exclude carcinoma
- If survivor smokes, then increased risk of lung cancer in long term and intermittent Chest X-ray and CT scanning appropriate (no firm guidelines exist about timing of these investigations).
- Early screening for breast cancer in women
- Pulmonary function tests to look for restrictive defect
- If Adriamycin was also given, increased risk of cardiac dysfunction - echocardiogram every 2 - 3 years

Blood Work

- Routine blood work (CBC, lytes, creatinine, BUN & LFTs)
- Thyroid function tests (at least free T4 & TSH) if there was previous chest RT

General:

- Any Adriamycin exposure:
 - Echocardiogram every 3 years or so
- Routine urinalysis (e.g. to rule out proteinuria)
- Bone density should be checked roughly 10 years before one would normally worry about osteoporosis

Previous abdominal and pelvic RT:

- Screening for infertility (hypogonadism & early menopause in women)
- Screening for malabsorption may be important if there is a history of chronic diarrhea (unusual complication in neuroblastoma as the RT doses are generally low)
- Ultrasound of the abdomen & pelvis every year or so may be helpful to exclude new masses & hydronephrosis of remaining kidney
- **Early screening for colon cancer:** Abdominal RT (30 Gy or higher) to the abdomen, pelvis, or spine: Colonoscopy should be performed beginning at age 35 years or 10 years following RT (whichever occurs last).
- If the spleen was in or very close to RT fields, patient may have splenic dysfunction or be asplenic and require specific vaccines. **Medic Alert bracelet** important if patient has splenic dysfunction

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Specialist Follow-up

General:

- May need to have other specialist physicians involved in follow up (e.g. nephrology)
- Audiology assessment for hearing loss
- Any long term survivor of neuroblastoma who has had intensive chemotherapy is at risk for early onset osteoporosis and should be seen in consultation by a specialist with expertise in this area when more than 10 years off therapy
- Supportive care:
 - Family counseling, psychology, psychiatry

Previous thoracic/abdominal/pelvic RT:

- Gastroenterologist for chronic diarrhea and malabsorption after abdominal RT
- Orthopedic/spinal service for management of scoliosis
- Endocrinologist for hypogonadism after pelvic RT
- Immunologist may be important if there is splenic dysfunction after abdominal RT
- **PREGNANCY:** Pregnant survivors of neuroblastoma should be referred to an obstetrician who specializes in high risk pregnancy management (increased risk of premature birth after pelvic RT)

Advice

General:

- Advise about exercise & lifestyle choices (such as smoking) which further increase the risk of second cancers & vascular disease
- Diet should be rich in Vitamin D, calcium & dairy servings to reduce risk of osteoporosis
- Skin previously in the RT field should be protected from the sun (more vulnerable to damage)
- Avoid lifting heavy weights after flank or abdominal RT (spine more vulnerable to damage)
- After nephrectomy avoid activities that might damage the remaining kidney (e.g. contact sports)
- Urinary tract infections should be treated very promptly (single kidney more vulnerable to damage)
- **Seek immediate medical help if a new swelling (painless or painful) appears within the previous RT field as this may be due to a second malignant neoplasm.**

Visit the COG guidelines website for more information:

<http://www.survivorshipguidelines.org>

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