

## Neuroblastoma

- Tumor that can arise anywhere in the sympathetic nervous system which consists of:
  - ~ the adrenal glands, located one on top of each kidney
  - ~ the ganglia, collection of nerve cells that lie on both sides of the spine from the neck to the pelvis and along the abdominal aorta
- Most neuroblastomas occur in the abdomen and are often quite large
- Aggressive tumors that in 70% of cases have spread to the bones and bone marrow at the time of diagnosis
- Most common childhood cancer after leukemia and brain tumors
- Average age is two years. 75% of diagnoses are made in the under four year old age group
- Most children under one year of age do well even when many organs are involved. Poor survival when metastatic in patients over one year of age

### Definition:

Neuroblastoma is a tumour of the sympathetic nervous system

### Etiology

Unknown

### Signs and Symptoms

- Systemic Symptoms - Lethargy, anorexia, pallor, weight loss, irritability
- Bone Pain - Due to bony metastases
- Abdominal Mass and Pain
- Easy bruising especially under the eyes, "raccoon eyes"
- Droopy eyelid
- High blood pressure, flushing, and diarrhea
- Subcutaneous nodules

### Diagnostic Evaluation – at BCCH

- Ferritin (may be important for prognosis)
- Bone marrow aspirate and biopsy
- Biopsy of lymph node or mass (measurement of N-Myc antigen important)
- CT scan of abdomen
- Chest x-ray
- MIBG scan or bone scan
- 24 hour urine collection for VMA and HVA
- Echocardiogram pre-treatment

### Staging

Several systems are used but in general they may be divided into:

1. Localized disease, Stage I and II
2. Generalized disease, Stage III and IV

## Treatment and Prognosis

### Stage I and II

Surgery alone is often sufficient. Stage II patients may need chemotherapy  
Prognosis Survival 70-90%

### Stage III and IV Disease

Surgical resection, chemotherapy and radiation therapy used in combination  
Autologous bone marrow transplant has improved survival for Stage IV disease.  
Commonly used drugs: cisplatin, etoposide, doxorubicin, cyclophosphamide.

### Prognosis

Survival Stage III: 30-40%

Stage IV: 10-20%