Pediatric Osteosarcoma (High Grade)

Note: Consider Clinical Trials as treatment options for eligible patients. Referral to a center with both pediatric oncology and orthopedic surgery is essential.

**CLINICAL EVALUATION**

- History and Physical
- CBC, differential, platelets, total protein, albumin, calcium, total bilirubin, phosphorus, magnesium, BUN, creatinine, alkaline phosphatase, LDH, AST, sodium, potassium, chloride, CO₂, and coagulation battery.
- Plain films of primary
- MRI of primary
- Bone Scan
- Chest x-ray
- CT chest
- Consider PET scan
- Biopsy (open vs. needle)
- Histology review by Bone Tumor Pathologist
- EKG/ECHO
- CVC
- Urine pregnancy test if clinically indicated
- Discuss fertility
- Audiogram
- Consult Physical Therapy/Occupational Therapy/Childlife

**NEOADJUVANT TREATMENT**

- Metastasis?
  - Yes → See Page 3
  - No → Neoadjuvant chemotherapy¹ for 2 cycles

Assess treatment response:
- Clinical exam of primary tumor
- Reimage
  - X-ray of primary
  - CT chest
  - Bone Scan
  - MRI of primary

**ADJUVANT TREATMENT**

- Progressive disease of primary site?
  - Yes → See Page 2
  - No → Is primary tumor resectable?
    - Yes → Surgery: limb salvage vs. amputation
      - Approximately 4 additional cycles of adjuvant chemotherapy beginning 2 weeks² after surgery
    - No → Consider definitive radiation therapy
      - Continue adjuvant chemotherapy and consider high-dose ifosfamide with or without etoposide

¹ Doxorubicin and dexrazoxane for cardioprotection plus cisplatin and high-dose methotrexate
² After surgical clearance

Department of Clinical Effectiveness V4
Approved by Executive Committee of the Medical Staff 09/26/2017

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Pediatric Osteosarcoma (High Grade)

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### ADJUVANT TREATMENT

1. Surgery is the primary modality of local therapy

1. Consider local treatment options for primary disease

2. Is primary tumor resectable?
   - Yes: Consider definitive radiotherapy
   - No: Consider local treatment options for primary disease

3. Pulmonary metastases?
   - Yes: Surgery: limb salvage vs. amputation
   - No: Consider local treatment options for primary disease

4. Is there disease progression?
   - Yes: Consider one or two cycles of chemotherapy
     - Assess histological response of resected tumor
     - Consider adding or changing to high dose ifosfamide with or without etoposide
   - No: Consider palliative local therapies to primary and metastatic sites
     - Consider gemcitabine/docetaxel, sorafenib
     - Consider phase I or II trials
     - Consider local therapies for pulmonary metastasis and other metastatic sites
     - Complete post-op chemotherapy

See Page 4 for Surveillance
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### PRIMARY TREATMENT

**Metastasis**

- **Doxorubicin**, cisplatin, high dose methotrexate for 2 cycles

  Restage to assess for progression

  Is there disease progression?

  Yes

  No

  **High-dose ifosfamide with or without etoposide for 2 cycles**

  Reassess for treatment response

  Is there disease progression?

  Yes

  No

  **Local control of primary tumor**

  **Continue chemotherapy (consider adding high-dose ifosfamide with or without etoposide)**

  **Consider local therapies** to metastatic sites

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### ADJUVANT TREATMENT

**Is there disease progression?**

Yes

- Consider gemcitabine/docetaxel, sorafenib
- Consider phase I or II trials
- Consider palliative local therapies to primary and metastatic sites

No

- Local control of primary tumor
- Continue chemotherapy
- Consider local therapies to metastatic sites

**Is there disease progression?**

Yes

- See Page 4 for Surveillance

No

---

1. With dexrazoxane for cardioprotection
2. Surgery is the primary modality of local therapy
## Pediatric Osteosarcoma Surveillance

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<tr>
<th>Total Years for Surveillance</th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
<th>Yr 4</th>
<th>Yr 5</th>
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<td></td>
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1 Consider PET CT in patients with metastatic disease, those who underwent surgery for resection of lung nodules, or at relapse

2 May omit if concurrent with PET CT

**Note:** Functional assessments post-limb salvage and cardiac surveillance should continue for life
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SUGGESTED READINGS


Children’s Oncology Group Protocols: CCG7921 and COG AOST 0331


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DEVELOPMENT CREDITS

This practice consensus algorithm is based on majority expert opinion of the Pediatric Osteosarcoma Workgroup at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

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