

| Common Pediatric Cancers | |
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| Germ Cell Tumors | |
| Germinoma | |
| Presentation | Depends on location. Intracranial (increased ICP and cranial nerve compression); suprasellar regions (hypothalamic/pituitary dysfunctions, optic nerve compression) |
| Epidemiology | Median age at diagnosis 10-12 yrs. Germinomas account for 60-65% of all pediatric intracranial GCTs. |
| High-Risk Features | Risk stratification based on histopathology |

| Common Chemotherapies | | | | | | | | |
|---|-------|---|--|---|--|--|--|-------------------------------------|
| Class | Drugs | Mechanism | Used in | Pharma/ Metabolism/ Excretion | Side effects | | Antidote/ Co-treatment | Genomic Bio- marker |
| | | | | | Short-term | Long-term | | |
| Alkylating agents Cyclophosphamide Ifosfamide Melphalan Busulfan Procarbazine Dacarbazine Temozolomide | | Attaches an alkyl group to guanine in DNA; prevents replication and causes damage | NBL Sarcoma WT BTs Lymphoma | Antagonized by MGMT enzymes; cyclophosphos via urine, ifos via liver | N/V/D Mucositis Myelo-suppression Hemorrhagic cystitis SIADH | Secondary malignancy Infertility (high doses) | Mesna and hyper-hydration for cystitis | MGMT promoter methylation (gliomas) |
| Platinum Analogues Cisplatin Carboplatin Oxaliplatin | | "Alkylating-like" (no alkyl group); crosslinks w/ DNA, prevents replication and causes damage | Sarcomas WT BTs GCTs Testicular | Urine excretion | N/V/D Nephro-toxicity Electrolyte wasting (Mag, K) | Sensory neuropathy Ototoxicity | Hyper-hydration for renal protection | - |
| Anti-folate agents Methotrexate Pemetrexed | | Analog of folic acid, impairs DHFR, thus impairs DNA synthesis | ALL Lymphoma | Hepatic metabolism, but urinary excretion. Elimination is person-specific | Myelo-suppression Mucositis Transaminitis Kidney failure Encephalopathy | - | Hyperhydration, urine alkalinization, monitor serum levels, leucovorin | - |
| Anti-metabolites 6-Mercapto-purine Cytarabine (Ara-C) Gemcitabine | | Nucleoside analogue, incorporated into DNA and interrupts replication | Leukemia Lymphoma IT for CNS disease | Kidney (6MP) Liver (cytarabine) | Myelosuppression N/V/D Mucositis Bowel necrosis Fever (AraC) Neurotoxicity Infections (esp strep viridans) | - | - | TPMT genotype (6MP) |
| Topoisomerase inhibitors Topo I inhibitors Topotecan Irinotecan Topo II inhibitors Etoposide (VP16) | | Inhibits Topo I/II during S phase, preventing DNA replication | Solid tumors | Liver (etoposide) Urine (topotecan) | Metallic food taste Myelosuppression Hypotension Diarrhea (irinotecan) | Secondary malignancy | Cefixime for irinotecan-induced diarrhea | UGT1A1 genotype (irinotecan) |

Chemotherapies continued on next page →