CISplatin (sis-pla-tin)

**Field**
Therapeutic: antineoplastics  
Pharmacologic: alkylating agents

**Pregnancy Category** D

**Indications**

**Action**
Inhibits DNA synthesis by producing cross-linking of parent DNA strands (cell-cycle phase–nonspecific). 

**Therapeutic Effects:** Death of rapidly replicating cells, particularly malignant ones.

**Pharmacokinetics**
- **Absorption:** IV administration results in complete bioavailability. 
- **Distribution:** Widely distributed; accumulates for months; enters breast milk. 
- **Metabolism and Excretion:** Excreted mainly by the kidneys. 
- **Half-life:** 30–100 hr.

**TIME/ACTION PROFILE (effects on blood counts)**
- **ROUTE** ONSET PEAK DURATION  
- IV unknown 18–23 days 39 days

**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity; OB, Lactation: Pregnancy or lactation.
- **Use Cautiously in:** Hearing loss; Renal impairment (dosage reduction); HF; Electrolyte abnormalities; Active infections; Bone marrow depression; Geri: q risk of nephrotoxicity and peripheral neuropathy; Chronic debilitating illnesses; Patients with childbearing potential.

**Adverse Reactions/Side Effects**
- **CNS:** REVERSIBLE POSTERIOR LEUKOENCEPHALOPATHY SYNDROME, SEIZURES, malaise, weakness.
- **EENT:** ototoxicity, tinnitus.
- **GI:** severe nausea, vomiting, diarrhea, hepatotoxicity.
- **GU:** nephrotoxicity, sterility.
- **Derm:** alopecia.
- **F and E:** hypocalcemia, hypokalemia, hypomagnesemia.
- **Hemat:** leukopenia, thrombocytopenia, anemia.
- **Local:** phlebitis at IV site.
- **Metab:** hyperuricemia.
- **Neuro:** peripheral neuropathy.
- **Misc:** anaphylactoid reactions.

**Interactions**
- **Drug-Drug:** Risk of nephrotoxicity and ototoxicity with other nephrotoxic and ototoxic drugs (aminoglycosides, loop diuretics). Risk of hypokalemia and hypomagnesemia with loop diuretics and amphotericin B. May q bone marrow depression with other antineoplastics or radiation therapy. May q antibody response to live-virus vaccines and adverse reactions.

**Route/Dosage**
- **Other regimens are used.**
  - IV (Adults): 
    - Metastatic testicular tumors—20 mg/m² daily for 5 days repeated q 3–4 wk. 
    - Metastatic ovarian cancer—75–100 mg/m², repeat q 4 wk in combination with cyclophosphamide or 100 mg/m² q 3 wk if used as a single agent. Advanced bladder cancer—50–70 mg/m² q 3–4 wk as a single agent.

**NURSING IMPLICATIONS**

**Assessment**
- Monitor vital signs frequently during administration. Report significant changes.
- Monitor intake and output and specific gravity frequently during therapy. Report discrepancies immediately. To reduce the risk of nephrotoxicity, maintain a urinary output of at least 100 mL/hr for 4 hr before initiating and for at least 24 hr after administration.
- Encourage patient to drink 2000–3000 mL/day to promote excretion of free acid. Allopurinol and alkalinization of the urine may be used to help prevent uric acid nephropathy.
- Assess patency of IV site frequently during therapy. Cisplatin may cause severe irritation and necrosis of tissue if extravasation occurs. If a large amount of highly concentrated cisplatin solution extravasates, mix 1 mL of 10% sodium thiosulfate with 1 mL of sterile water or 1.6 mL of 25% sodium thiosulfate with 8.4 mL of sterile water and inject 1–4 mL (1 mL for each mL extravasated) through existing line or cannula. Inject subcut if needle has been removed. Sodium thiosulfate inactivates cisplatin.
- Severe and protracted nausea and vomiting usually occur 1–4 hr after a dose. Vomiting may last for 24 hr. Administer parenteral antiemetic agents 30–60 min before therapy.

**OVERDOSAGE**

-/general impairment: q, q = general implication; CPTDR indicates 30-discussing solutions indicate most frequent
Monitor BUN, serum creatinine, and CCr before initiation of therapy and before subsequent doses. 

<table>
<thead>
<tr>
<th>Lab Test Considerations</th>
<th>Monitor for signs of anaphylaxis (facial edema, wheezing, diaphoresis, tachycardia, hypotension)</th>
<th>Monitor for inadvertent cisplatin overdose. Doses are calculated from total dose/cycle.</th>
<th>Monitor CBC with differential and platelet count for signs of infection.</th>
<th>Monitor for increased fatigue, dyspnea, and orthostatic hypotension.</th>
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<tr>
<td>Medication may cause ototoxicity and neurotoxicity. Assess patient frequently for hearing loss and tingling of extremities; may be irreversible.</td>
<td>Monitor for signs of RPLS (headache, seizure, lethargy, confusion, blindness). Hydrate patient with at least 1–2 L of IV fluid 8–12 hr before initiating therapy and before subsequent doses. Hearing loss is more frequent with children and usually occurs first with high frequencies and may be unilateral or bilateral.</td>
<td>Monitor for signs of myopathy associated with advanced stages of peripheral neuropathy.</td>
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Implementation

- **High Alert:** Fatalities have occurred with chemotherapeutic agents. Before administering, check all handwritten orders, double-check single doses, and check dose regimen limits; have second practitioner independently double-check original order, calculations, and infusion pump settings.
- **Risk for infection (Adverse Reactions):** To prevent confusion, orders should include generic and brand names. Administration under the supervision of a physician experienced in the use of cancer chemotherapeutic agents.
- **Potential Nursing Diagnoses:** May cause positive Coombs’ test result. May cause neutropenia, thrombocytopenia, and anemia occurs within 18–23 days and re-occurs 39 days after a dose. Do not administer additional doses until BUN is <25 mg/100 mL and serum creatinine is <1.5 mg/100 mL. May cause transfusion-related acute lung injury (TRALI) and disseminated intravascular coagulation (DIC). May cause severe hyperkalemia and hypercalcemia. May cause positive Coombs’ test result. May cause neutropenia, thrombocytopenia, and anemia. May cause allergic reactions.
CONTINUOUS INFUSION

- Continuous Infusion: Has been administered as continuous infusion over 24 hr to 5 days with resultant decrease in nausea and vomiting. 

- **High Alert:** Clarify dose to ensure cumulative dosage is not confused with daily dose; errors may be fatal.

Y-SITE COMPATIBILITY:

- acyclovir, alfentanil, allopurinol, amikacin, amphotericin B, ampicillin, ampicillin/sulbactam, anidulafungin, argatroban, atracurium, azithromycin, aztreonam, bivalirudin, bleomycin, bumetanide, busulfan, calcium chloride, calcium gluconate, captopril, ceftazidime, cephalosporins, chlorpromazine, cisatracurium, clindamycin, clorazepate, clobazam, cyclophosphamide, cyclosporine, cyclosporine A, doxorubicin, docetaxel, dopamine, dobutamine, doxapram, dopamine, dopamine tartrate, doxorubicin, dexamethasone, dexmedetomidine, diazepam, diethylketone, diltiazem, diphenhydramine, dipyridamole, dexamethasone, dexamethasone sodium phosphate, dexamethasone sodium succinate, dexamethasone valerate, docosate sodium, eflornithine, ependoxan, enalapril, enalaprilat, erythromycin, etoposide, etoposide phosphate, famotidine, fenoldopam, fentanyl, filgrastim, fluconazole, fludarabine, fluorouracil, foscarnet, fosphenytoin, furosemide, ganciclovir, gemcitabine, gentamicin, glycopyrrolate, granisetron, haloperidol, heparin, hetastarch, hydrocortisone, hydromorphone, idarubicin, ifosfamide, imipenem/cilastatin, indomethacin, irinotecan, isoproterenol, ketorolac, labetalol, leucovorin calcium, levofloxacin, levorphanol, lidocaine, linezolid, lorazepam, magnesium sulfate, mannitol, melphalan, meperidine, meropenem, methohexital, methotrexate, methylprednisolone, metoclopramide, metoprolol, metronidazole, milrinone, mitomycin, mitoxantrone, nafcillin, naloxone, nesiritide, nicardipine, nitroglycerin, nitroprusside, norepinephrine, octreotide, ondansetron, oxaliplatin, paclitaxel, palonosetron, pamidronate, pancuronium, pemetrexed, pentamidine, pentazocine, pentobarbital, phenobarbital, phenylephrine, phenytoin, potassium acetate, potassium chloride, potassium chloride, potassium phosphate, procainamide, propofol, promethazine, propofol, quinupristin/dalfopristin, ranitidine, remifentanil, rituximab, sargramostim, sodium acetate, sodium bicarbonate, sodium phosphate, succinylcholine, tafamidis, tafamidis melilol, theophylline, thiopental, ticarcillin/clavulanate, tigecycline, tirofiban, tobramycin, topotecan, trastuzumab, vancomycin, vasopressin, vecuronium, verapamil, vinblastine, vincristine, vinorelbine, voriconazole, zidovudine, zoledronic acid.

Y-SITE INCOMPATIBILITY:

- amifostine, amphotericin B cholesteryl sulfate, amphotericin B colloidal, amphotericin B lipid complex, amphotericin B liposome, amsacrine, amsacrine, amphotericin B colloidal, amphotericin B lipid complex, amphotericin B liposome, cyclosporine, cyclosporine A, doxorubicin, doxorubicin liposome, doxapram, dopamine, dobutamine, doxapram, dopamine, dopamine tartrate, doxorubicin, dexamethasone, dexmedetomidine, diazepam, diethylketone, diltiazem, diphenhydramine, dipyridamole, dexamethasone, dexamethasone sodium phosphate, dexamethasone sodium succinate, dexamethasone valerate, docosate sodium, eflornithine, ependoxan, enalapril, enalaprilat, erythromycin, etoposide, etoposide phosphate, famotidine, fenoldopam, fentanyl, filgrastim, fluconazole, fludarabine, fluorouracil, foscarnet, fosphenytoin, furosemide, ganciclovir, gemcitabine, gentamicin, glycopyrrolate, granisetron, haloperidol, heparin, hetastarch, hydrocortisone, hydromorphone, idarubicin, ifosfamide, imipenem/cilastatin, indomethacin, irinotecan, isoproterenol, ketorolac, labetalol, leucovorin calcium, levofloxacin, levorphanol, lidocaine, linezolid, lorazepam, magnesium sulfate, mannitol, melphalan, meperidine, meropenem, methohexital, methotrexate, methylprednisolone, metoclopramide, metoprolol, metronidazole, milrinone, mitomycin, mitoxantrone, nafcillin, naloxone, nesiritide, nicardipine, nitroglycerin, nitroprusside, norepinephrine, octreotide, ondansetron, oxaliplatin, paclitaxel, palonosetron, pamidronate, pancuronium, pemetrexed, pentamidine, pentazocine, pentobarbital, phenobarbital, phenylephrine, phenytoin, potassium acetate, potassium chloride, potassium phosphate, procainamide, propofol, promethazine, propofol, quinupristin/dalfopristin, ranitidine, remifentanil, rituximab, sargramostim, sodium acetate, sodium bicarbonate, sodium phosphate, succinylcholine, tafamidis, tafamidis melilol, theophylline, thiopental, ticarcillin/clavulanate, tigecycline, tirofiban, tobramycin, topotecan, trastuzumab, vancomycin, vasopressin, vecuronium, verapamil, vinblastine, vincristine, vinorelbine, voriconazole, zidovudine, zoledronic acid.

PATIENT/FAMILY TEACHING:

- Instruct patient to report symptoms such as chills, cough, hoarseness, sore throat, signs of infection; lower back or side pain; painful or difficult urination; blood in stools, urine, or emesis; increased fatigue; fever; or headache immediately.

- Instruct patient to receive any vaccinations without advice of health care professional.

- Instruct patient to use soft toothbrush and electric razor and to avoid falls.

- Instruct patient to avoid crowds and persons with known infections.

- Instruct patient to avoid alcohol and nicotine and to avoid falls.

- Instruct patient not to drink alcoholic beverages or take medication containing aspirin or NSAIDs; may precipitate gastric bleeding.

- Patient to report promptly any numbness or tingling in extremities or face, difficulty with hearing or vision, unusual bloody stools or urine, or joint pain.

- Instruct patient to notify health care professional promptly if fever, chills, cough, hoarseness; sore throat; signs of infection; lower back or side pain; painful or difficult urination; bleeding gums; bruising; petechiae; blood in stools, urine, or emesis; increased fatigue; fever; or headache occurs. Caution patient to avoid crowds and persons with known infections.

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PRACTICE MAKES PERFECT

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