Oncologic Emergencies

Neutropenic fever, tumor lysis, hypercalcemia, cord and SVC compression, leukemic crises, CAR-T and checkpoint toxicity

NEUTROPENIC FEVER

- Fever ≥38.3 °C once or ≥38.0 °C for 1 h, with ANC <500 or expected <500 in 48 h (IDSA 2010)
- Cultures from each line lumen and a vein; never delay the antibiotic
- Antipseudomonal β-lactam within 60 min of triage (ASCO/IDSA 2018): cefepime, piperacillin-tazobactam or meropenem
- Vancomycin only for shock, pneumonia, line or skin infection, MRSA or gram-positive cultures
- Fever after 4–7 days, neutropenia expected >7 days: fungal work-up, antifungal
- MASCC ≥21 is low risk; ANC ≤100 expected >7 days is high risk
- No rectal temperatures or suppositories; inspect mouth, skin, lines, perineum

HYPERCALCEMIA OF MALIGNANCY

Severe (>14 mg/dL): calcitonin plus zoledronic acid or denosumab (Endocrine Society 2023). Loop diuretic only for overload after fluids.

DRUG	ADULT DOSE	NOTE
Isotonic saline	Bolus, then brisk urine	First; tailor to the heart
Calcitonin	4 units/kg SC or IM every 12 h	Works in hours; fades by 48–72 h
Zoledronic acid	4 mg IV over ≥15 min	Onset 2–3 days; check creatinine
Denosumab	120 mg SC	Favored over zoledronic acid (Endocrine Society 2023); low Ca if CrCl <30
Prednisone	40–60 mg/day	Calcitriol-driven (lymphoma)
Hemodialysis	Low-calcium bath	Kidney failure or refractory

EXAM TIP Exams: TLS is high K, phosphate and uric acid with low Ca; hypercalcemia is short QT, polyuria and confusion.

TUMOR LYSIS SYNDROME (TLS)

Lab TLS (Cairo-Bishop): 2 or more of uric acid ≥8 mg/dL, K ≥6 mEq/L, phosphate ≥4.5 mg/dL, Ca ≤7 mg/dL, from 3 days before to 7 days after therapy. Clinical TLS adds creatinine ≥1.5× upper limit, arrhythmia or seizure.

- Highest risk: Burkitt, leukemia with WBC ≥100,000, bulky high-LDH lymphoma; onset 12–72 h after therapy
- Fluid 2.5–3 L/m²/day for urine ≥2 mL/kg/h (Howard 2011); no K, no bicarbonate
- Allopurinol blocks new uric acid; rasburicase 0.2 mg/kg IV destroys it (high risk); uric acid sample on ice
- Treat K early (Electrolytes); calcium only for symptoms or ECG changes: it precipitates with phosphate
- Dialysis: oliguria, overload, refractory K or phosphate, Ca × phos ≥70

SAFETY Test G6PD before rasburicase: deficiency causes hemolysis and methemoglobinemia, and methylene blue is then unsafe.

LEUKEMIA AND PARAPROTEIN CRISES

CRISIS	RECOGNIZE	ACT
Hyperviscosity (IgM, myeloma)	Mucosal bleeding, blurred vision, confusion	Plasma exchange now; no RBCs before it
Leukostasis (AML, WBC >100,000)	Hypoxemia, infiltrates, confusion, brain bleed	Hydroxyurea or chemo now; avoid RBCs
APL coagulopathy	Bleeding, low fibrinogen, high D-dimer	ATRA on suspicion; fibrinogen >100–150, platelets >30–50K (ELN 2019)
Differentiation syndrome	Fever, dyspnea, effusions, weight gain, AKI	Dexamethasone 10 mg IV every 12 h; hold arsenic

CAR-T AND CHECKPOINT TOXICITY

CRS GRADE (ASTCT)	FEVER ≥38 °C PLUS
1	Nothing else
2	Hypotension without pressors, or O_2 ≤6 L/min
3	One pressor, or high-flow, face mask or nonrebreather
4	Several pressors, or CPAP, BiPAP or ventilator

- Tocilizumab 8 mg/kg IV over 1 h (max 800 mg); repeat every 8 h, max 3 in 24 h, 4 total
- Add dexamethasone 10 mg IV; methylprednisolone 1 g/day for grade 4 (Yescarta label)
- ICANS: ICE score 0–10; 7–9 grade 1, 3–6 grade 2, 0–2 grade 3
- ICANS alone: steroids, not tocilizumab; seizure and aspiration precautions
- CAR-T fever may be infection: culture, give antibiotics
- Checkpoint inhibitors: myocarditis (troponin, AV block), methylprednisolone 500–1,000 mg/day (ESC 2022); adrenal crisis, hydrocortisone; DKA, insulin

CORD COMPRESSION AND SVC SYNDROME

	SPINAL CORD COMPRESSION	SVC SYNDROME
Clue	New back pain, then weakness, numbness, retention	Face, neck and arm swelling; dyspnea; chest veins
Image	Whole-spine MRI within 24 h (NICE 2023)	Contrast CT chest; biopsy first if stable
Now	Deficits: dexamethasone 16 mg/day, often after 10 mg IV	Head up, oxygen; watch airway and mentation
Definitive	Radiation within 24 h, or surgery then radiation	Stent for stridor, confusion or shock; chemo or radiation
Nursing	Flat and log roll if unstable; bladder scans	Avoid IVs in an obstructed arm

EXTRAVASATION AND SAFE HANDLING

- Vesicant leak (pain, swelling, no blood return): stop, aspirate, remove the catheter, mark, elevate
- Anthracyclines: cold; dexrazoxane within 6 h in another limb, daily for 3 days (label)
- Vinca alkaloids: warm and hyaluronidase; never cold
- Two pairs of chemo gloves (ASTM D6978), resistant gown, closed-system transfer devices (ASHP 2018)
- Body fluids: gloves and gown, usually for 48 h
- Vincristine in a minibag, never a syringe: intrathecal vinca is fatal (ISMP)

Sources (25) are listed with links at icubasics.com/sheets/oncologic-emergencies.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.