Tumor Lysis Syndrome (TLS)

Tumor lysis syndrome is caused by the **release of intracellular components** into the blood stream when **cancer cells break down**. The resulting electrolyte abnormalities can cause multiorgan consequences. This can occur spontaneously or after initiation of chemotherapy or radiation therapy.

It is an oncologic emergency!

RISK FACTORS

Cancer type
- Burkitt lymphoma/leukemia
- Diffuse large B-cell lymphoma with LDH >2x the upper limit of normal (ULN)
- Acute lymphoblastic leukemia and acute myeloid leukemia with WBC >100x10^9/L)

Advanced cancer stage

Pre-existing impaired renal function

It is important to maintain a high index of suspicion for patients with a higher risk of developing TLS, and use prophylactic therapies to prevent laboratory and clinical manifestations. Any patient presenting with a new malignancy should get bloodwork to measure serum uric acid, potassium, phosphorus, calcium, and creatinine.

DIAGNOSIS

TLS is diagnosed when there are **2 or more laboratory abnormalities** within a 24-hour period from 3 days before to 7 days after initiation of chemotherapy.

	↑ Uric acid	↑ Potassium	↑ Phosphate	↓ Calcium
Lab values	> the ULN for the patient's age	≥ 6.0 mmol/L	≥ 2.1 mmol/L	≤ 1.75 mmol/L

MANAGEMENT

Hyperhydration with IV fluids to optimize kidney function. Monitor for fluid overload.

- Prophylactic allopurinol for normal or mildly elevated serum uric acid levels.
- Rasburicase for high serum uric acid levels.

- Stop potassium supplementation.
- Review medications to limit impairment of potassium secretion.
- Monitor for arrhythmias. If identified, calcium gluconate and potassium lowering interventions (insulin and glucose, beta agonists, loop diuretics, sodium polystyrene sulfonate).

- Dietary restriction of phosphorus.
- Phosphate binders (calcium acetate or sevelamer).

- Calcium gluconate, however, when given to a patient with elevated phosphate, it can worsen kidney injury.

Monitoring:
- Serial measurements of serum uric acid, potassium, phosphorus, calcium and creatinine.
- High risk disease: every 4 to 8 hours
- Intermediate risk disease: every 8 to 12 hours
- Low risk disease: once or twice daily

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