ONCOLOGY EMERGENCY ESSENTIALS:
Addressing Tumor Lysis Syndrome in Your Practice

Risk Factors

- Malignancies with large, rapidly growing cells (bulky tumors; high proliferation rate)
- Tumors that are chemosensitive; novel/effective cancer treatments
- High tumor burden (↑ stage, WBC counts, LDH levels)
- Patients with pre-existing renal dysfunction/involvement

1 **Measure serum uric acid, potassium, phosphate, and calcium**
If ≤1 abnormal value

2 **TLS Risk Stratification According to Malignancy**

LOW RISK	INTERMEDIATE RISK	HIGH RISK
Most solid tumors	Bulky or advanced solid tumors sensitive to chemotherapy, such as neuroblastomas, germ-cell tumors, and small-cell lung cancer	
Myelomas		
CML	CLL treated with targeted and/or biological therapies and/or those with WBC ≥50 x 10^9/L	
CLL treated with alkylating agents		
AML with WBC <25 X 10^9/L and LDH <2 X ULN	AML with WBC <25 X 10^9/L and LDH ≥2 X ULN, or WBC 25–100 X 10^9/L	AML with WBC ≥100 X 10^9/L
	ALL with WBC <100 X 10^9/L and LDH <2 X ULN	ALL with WBC <100 X 10^9/L and LDH ≥2 X ULN, or WBC ≥100 X 10^9/L
		B-ALL
Hodgkin lymphoma Indolent NHL	Stage I/II BL and LBL with LDH <2 X ULN	Stage III/IV BL and LBL, or Stage I/II with LDH ≥2 X ULN
Adult ALCL; Child stage I/II ALCL	Child stage III/IV ALCL	
Adult ATL, DLBCL, PTCL, transformed, and mantle cell (blastoid variants) lymphomas with LDH WNL; Child stage I/II	Adult ATL, DLBCL, PTCL, transformed, and mantle cell (blastoid variants) lymphomas with LDH >ULN and non-bulky; Child stage III/IV with LDH <2 X ULN	Adult ATL, DLBCL, PTCL, transformed, and mantle cell (blastoid variants) lymphomas with LDH >ULN and bulky; Child stage III/IV with LDH ≥2 X ULN

3 **Renal Function Adjustment**

Low-risk lymphoma/leukemia with **renal dysfunction/involvement**

Intermediate-risk disease with **renal dysfunction/involvement** or with uric acid, potassium, and/or phosphate >ULN

ALCL, anaplastic large cell lymphoma; ALL, acute lymphocytic leukemia; AML, acute myeloid leukemia; ATL, adult T-cell lymphoma; BL, Burkitt lymphoma/leukemia; CLL, chronic lymphocytic leukemia; CML, chronic myeloid leukemia; DLBCL, diffuse large B-cell lymphoma; LBL, lymphoblastic lymphoma; LDH, lactate dehydrogenase; NHL, non-Hodgkin lymphoma; PTCL, peripheral T-cell lymphoma; ULN, upper limit of normal; WBC, white blood cells; WNL, within normal limits.

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If ≥2 abnormal values of serum uric acid, potassium, phosphate, or calcium

Element	Value
Uric acid	≥476 µmol/L (8.0 mg/dL)
Potassium	≥6.0 mmol/L (6.0 mEq/L)
Phosphorous	≥2.1 mmol/L (6.5 mg/dL) for children ≥1.45 mmol/L (4.5 mg/dL) for adults
Calcium	≤1.75 mmol/L (7.0 mg/dL)

+ ≥1 of acute kidney injury, cardiac dysrhythmia, or seizure

Laboratory TLS

Clinical TLS

Prophylaxis Recommendations

LOW RISK	INTERMEDIATE RISK	HIGH RISK
Monitor TLS parameters, including uric acid, potassium, phosphate, calcium, creatinine, and LDH, as well as urine output		
+ Normal hydration	+ Increased hydration (3L/m^2/day)	+ Increased hydration (3L/m^2/day)
No prophylaxis for hyperuricemia	+ Allopurinol 100–300 mg, po, q8h, daily (can consider rasburicase)	+ Rasburicase one dose, 0.1–0.2 mg/kg IV

Management of Established Clinical TLS

Admission to intensive care unit
Cardiac monitoring
Monitoring TLS laboratory abnormalities every 2–4 hours

+ Vigorous hydration

+ Correction of electrolyte abnormalities
(management of hyperkalemia and/or hyperphosphatemia)

+ Rasburicase

References:

Coiffier B, Altman A, Pui CH, Younes A, Cairo MS. Guidelines for the management of pediatric and adult tumor lysis syndrome: an evidence-based review. *J Clin Oncol.* 2008;26(16):2767-2778.

Cairo MS, Coiffier B, Reiter A, Younes A, TLS Expert Panel. Recommendations for the evaluation of risk and prophylaxis of TLS in adults and children with malignant diseases: an expert TLS panel consensus. *Br J Haematol.* 2010;149(4):578-586.