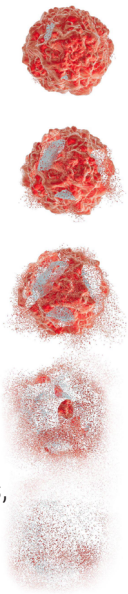
Tumour lysis syndrome (TLS)

Tumour lysis syndrome (TLS) is a life-threatening oncological emergency. It is caused by the death, or lysis of large numbers of cancer cells. TLS can occur spontaneously to high turnover of the tumour itself, and/or after systemic anticancer treatment or radiotherapy.

Risk factors for developing TLS:

- high white cell count, i.e. acute lymphoblastic leukaemia
- increased lactate dehydrogenase (LDH)
- high tumour cell proliferation rate, i.e. diffuse large B-cell lymphoma
- bulky disease, i.e. Burkitt lymphoma/leukaemia and lymphoblastic lymphoma
- chemo-sensitive malignancies
- high intensity or highly potent therapy
- novel or targeted therapy used alone or in conjunction with conventional cytotoxic agents, even in patients with low-grade disease.



Additional conditions that may predispose patients to developing TLS:

- renal impairment
- dehydration
- decreased urinary flow
- pre-existing uraemia or hyperuricaemia
- hyperphosphataemia.

Signs and symptoms of TLS

Onset of symptoms is most common within 12 to 72 hrs of initiating systemic anticancer treatment, however, can occur before commencing treatment.

Metabolic disturbances	Signs	Symptoms
Potassium	Cardiac arrhythmias	Abnormal pulse rate, irregular pulse, abnormal blood pressure
	Neuromuscular irritability	Tetany, paresthesia, muscle twitching
	Gastrointestinal disturbance	Nausea and vomiting, diarrhoea, anorexia
Uric acid and phosphate	Renal failure	Oliguric, haematuria, fluid overload
Phosphate	Neurological complications	Seizures, syncope, delirium, hallucination

Diagnosis

Diagnosis classifications of TLS can be divided into laboratory TLS and clinical TLS.

Cairo and Bishop's definition of laboratory TLS (LTLS):

Uric acid	≥ 0.476 mmol/L	OR	25% ↑ increase from baseline
Potassium	≥ 6.0 mmol/L		
Phosphate	≥ 1.45 mmol/L		
Corrected calcium	≤ 1.75 mmol/L	OR	25% ↓ decrease from baseline

Cairo and Bishop's definition of clinical TLS (CTLS):

The presence of LTLS PLUS:

- One or more of the following clinical complications (not directly or probably attributable to a therapeutic agent):
  - renal insufficiency defined by increase in serum creatinine greater than or equal to 1.5 x ULN (institution, age and gender defined)
  - cardiac arrhythmia/sudden death
  - seizure

Assessment and monitoring

- Blood chemistry
- Cardiac monitoring
- Imaging studies
- Nursing monitoring

Treatment and management

TLS is potentially fatal. The main principles of management are:

1. identification of high-risk patients with initiation of preventive therapy
2. early recognition of metabolic and renal complications and the prompt commencing supportive care, including haemodialysis.

TLS is best managed if it is anticipated and treatment is started before initiation of chemotherapy. Treatment centres on the following:

- rigorous hydration
- management of hyperuricemia
- frequent monitoring of electrolytes and aggressive correction of abnormalities.

Cancer Institute NSW | cancer.nsw.gov.au
t +61 (0)2 8374 5600 f +61 (0)2 8374 3600 e cinsw-information@health.nsw.gov.au