National Patient Safety Alert

NHS England

Harm from delayed administration of rasburicase for tumour lysis syndrome

Date of issue:	09 September 2025	Reference no:	NatPSA/2025/005/NHSPS

This alert is for action by: organisations providing an Emergency Department and/or cancer services

This is a safety critical and complex National Patient Safety Alert. Implementation should be co-ordinated by an executive lead (or equivalent role in organisations without executive boards) and supported by clinical leaders in pharmacy, emergency care and haematology/oncology.

Explanation of identified safety issue:

Tumour lysis syndrome (TLS) is a life-threatening complication of cancer or its treatment. It is caused by the large-scale destruction of malignant cells, either spontaneously in malignancies with a high proliferation rate (eg Burkitt's lymphoma) or, more commonly, after the administration of systemic anti-cancer therapy (SACT). The release of intracellular contents and electrolytes into the bloodstream overwhelms the normal physiological mechanisms of clearance. [1, NOTE A]

Rasburicase is indicated for the treatment and prophylaxis of acute hyperuricaemia in adults, children and adolescents (aged 0 to 17 years) with haematological malignancy, a high tumour burden and at risk of a rapid tumour lysis or shrinkage at initiation of chemotherapy.[2] It is recommended as prophylaxis for patients at high risk of TLS, those at intermediate risk who cannot take alternative therapy, and those who need immediate therapy and pre-existing urate levels are high.[1]

A review of the National Reporting and Learning System in 2021 identified 82 incidents associated with delays and omissions in treatment with rasburicase. A subsequent review in 2024 identified a further 41 incidents including a report of a patient with lymphoma and deteriorating renal function, who was not prescribed rasburicase for potential TLS on admission to hospital and had a cardiac arrest and sadly died the following day.

In total, of the 123 reported incidents of omitted or delayed doses of rasburicase:

- five patients with suspected TLS, or at high risk of developing TLS, died,
- six patients at risk of TLS, went on to develop TLS, two of whom required transfer to ITU
- three patients at risk of TLS deteriorated significantly, one of whom required transfer to ITU.

Actions required

Actions to be completed by 09 March 2026

To align with the updated British Society for Haematology (BSH) guidelines,[1] review and update local clinical procedures (or equivalent documents) to ensure:

1. Prior to initiation of new treatment, every patient with a haematological malignancy has a documented, personalised risk assessment for TLS and, depending on the assessed risk, has appropriate prophylaxis prescribed. [3, NOTE B]
2. Indication, appropriate dose and monitoring requirements for rasburicase are clearly documented to avoid the need for further validation outside of the immediate specialist clinical team. NOTE C
3. **Routine** use of rasburicase is limited to clinical areas where clinical staff have the competency to initiate treatment, understand the time critical nature of administration, the risk of delays in treatment and when to escalate concerns.[4, NOTE D]
4. If **by exception** rasburicase needs to be initiated in, or a patient receiving treatment needs to be transferred to, any clinical area where it is not routinely used, specialist clinical staff ensure:
   - rasburicase is prescribed on the medication chart/electronic prescribing system used in the receiving setting.
   - sufficient stock of rasburicase is available to ensure completion of the treatment course.
   - relevant, documented clinical information is available in the clinical area. NOTE D
5. Both strengths of rasburicase (1.5mg/ml and 7.5mg/ml) are available and accessible in sufficient quantities in the fridge in all relevant clinical settings for administration of prophylactic or treatment doses within 1 hour of prescribing. NOTE E

For further detail, resources and supporting materials see: NHS England webpage

Additional information:

Notes:

A. TLS can develop rapidly and once established is difficult to treat. Acute kidney injury, cardiac arrhythmias, seizures and sudden death are associated with TLS. Delays in administering rasburicase puts patients with suspected TLS or who are at high risk of developing TLS at greater risk of harm.

B. BSH guidance states: "*Cases of TLS have been reported across a range of solid and haematological malignancies … and thus measures to reduce risk and incorporate monitoring strategies should always be considered*".[1]

C. Rasburicase may be used for both the treatment and prophylaxis of TLS. The decision to treat with rasburicase and at what dose is complex. Practice may vary within and between organisations. Refer to the BSH clinical guidelines for recommendations regarding prophylactic and treatment doses, monitoring and G6DP deficiency testing.[1] BSH Guidance states: "*In very unwell, acutely presenting patients, consideration may be made to give rasburicase without waiting for a G6PD result. This decision should be made by the consultant with overall patient responsibility and following thorough evaluation of the risks and benefits"*.

D. BSH guidelines recommend patients at high risk of TLS are managed on specialist wards with experience in managing TLS eg haematology, critical care and renal wards. Clear communication to out of hours/on call teams regarding patients who are at risk of TLS or are being treated for TLS is key. This is particularly important when patients are being treated in clinical areas which are less familiar with the management of haematological malignancies and TLS.[1]

E. Stock in appropriate clinical areas should be maintained as determined by local policy and clinical workload. Consider use of EPMA functionality to highlight that rasburicase is stored in the refrigerator.

Patient safety incident data:

National reporting systems were searched in 2021 and 2024 using a combination of keywords (ref: 6371) to identify relevant incidents and these were subsequently thematically reviewed. Together the combined searches identified 123 incidents, fourteen of which had indications that delays in rasburicase administration may have contributed to the death or significant deterioration of patients with suspected or at high risk of developing TLS. Identified concerns/themes included:

a. Lack of clarity regarding the indication, dose and monitoring requirements for rasburicase.
b. Lack of awareness of the time critical nature of rasburicase administration resulting in a failure to communicate and escalate concerns about treatment delays.
c. Lack of availability/insufficient stock of rasburicase for timely administration as well as omission or delays in of treatment because staff were unaware that rasburicase is stored in the refrigerator.
d. Operational concerns in clinical areas where rasburicase was not routinely used, such as
    i. lack of awareness of the requirement for rasburicase, as it was prescribed on a designated oncology system, not the in-patient prescribing system.
    ii. delays in treatment due to a requirement to seek further validation from senior colleagues outside the immediate specialist clinical team.

References:

1. British Society for Haematology. Guidelines for the diagnosis and management of tumour lysis syndrome in adults and children with haematological malignancies: A focus on patient safety. 03 Sept 2025
2. SPC Fasturtec - Therapeutic indications. Datapharm emc. Accessed online 12 August 2024.
3. Cairo MS et al TLS Expert Panel. Recommendations for the evaluation of risk and prophylaxis of TLS in adults and children with malignant diseases. 25 April 2010
4. Specialist Pharmacy Service (April 2024). Ensuring time critical use of rasburicase

Stakeholder engagement:

- The British Society for Haematology
- Specialist Pharmacy Service
- National Patient Safety Response Advisory Panel
- British Oncology Pharmacy Association

Advice for Central Alerting System (CAS) officers and risk managers

This is a safety critical and complex National Patient Safety Alert. In response to CHT/2019/001 and CHT/2023/002 your organisation should have developed new processes to ensure appropriate oversight and co-ordination of all National Patient Safety Alerts. CAS officers should send this Alert to executive lead nominated in their new process to coordinate implementation of safety critical and complex National Patient Safety Alerts, copying in the leads identified on page 1.