Efficacy and Safety of Asparaginase-containing Treatment Regimens in ALL/LBL and Beyond

Interactive Review for Oncology Nurses and Nurse Practitioners

Asparaginase plays a critical role in pediatric-inspired multi-agent regimens used to treat ALL and LBL.

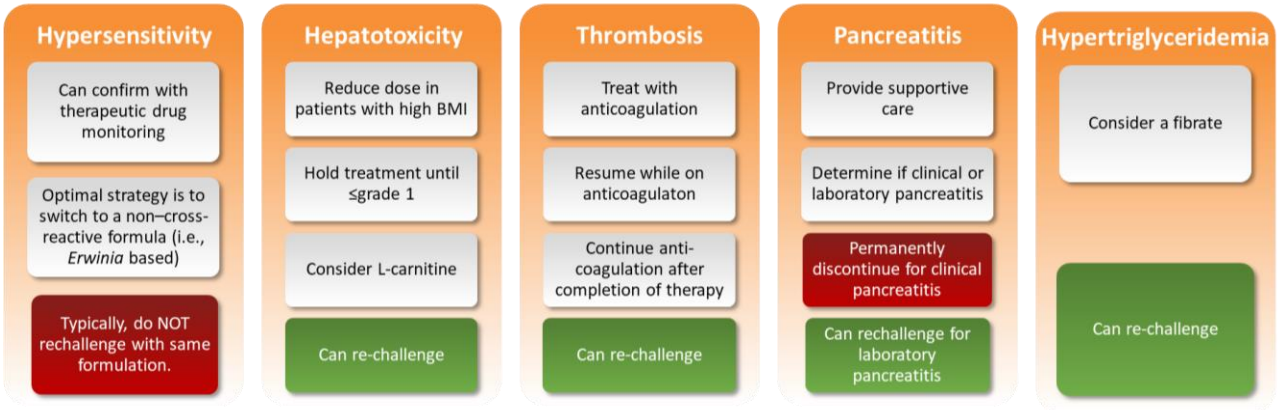
cec TOPLINE TAKEAWAYS

- The use of asparaginase in pediatric acute lymphocytic leukemia (ALL) treatment regimens is a medical success story. Many of these regimens have shown efficacy in adolescent/young adult (AYA) populations as well. In the United States, an AYA classification includes those age 15–39 years.
- Risk stratification for AYA and adult patients with ALL helps guide treatment choices and includes characteristics related to minimum residual disease (MRD) following induction and other high-risk features.
- AYA patients with Philadelphia chromosome-positive (Ph+) ALL are grouped with fit, adult patients age <65 years, and relies on the addition of tyrosine kinase inhibitors (TKIs) that target BCR-ABL.
- Ph-negative ALL in AYA/adult patients relies on multiagent pediatric regimens with a multiphase approach (i.e., induction, consolidation/intensification, CNS treatment/prophylaxis, maintenance).

Although associated with unique toxicities, the majority of asparaginase-associated adverse events are nonfatal, manageable, and reversible.

- Asparaginase is a critical component of pediatric-inspired multiagent ALL regimens, which have shown efficacy in AYA and some adult populations. However, incomplete therapy (<26 consecutive weeks of asparaginase) is associated with inferior treatment outcomes.
- Risk factors for asparaginase hypersensitivity include formulation, route of administration, treatment history, and younger age.

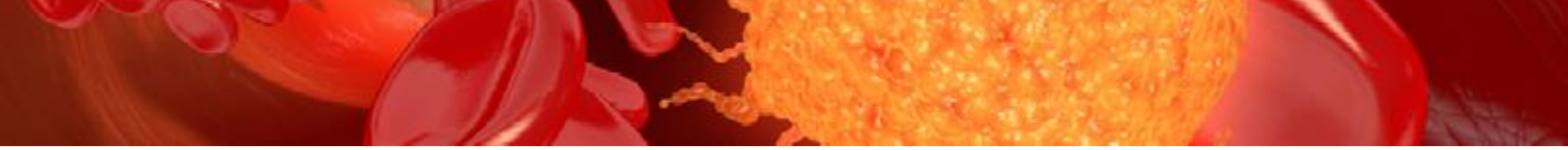
Pegylated-asparaginase Toxicity in Adults



Newer formulations of asparaginase offer alternatives to continuing asparaginase treatment and familiarity with each formulation and consideration of prevention and management strategies is essential to optimizing therapy.

Formulation	Derived from *E. coli*	FDA-approved Indication	Half-life	Administration
Pegylated asparaginase (pegaspargase)	Yes	As a component of a multi-agent chemotherapeutic regimen for the treatment of pediatric and adult patients with: • First-line ALL • ALL and hypersensitivity to native forms of L-asparaginase	IM: 5.8 days IV: 5.3 days	**Dose:** 2,000–2,500 IU/m^2 **Route:** IM or IV **Frequency:** every 2 weeks
Erwinia asparaginase (native)*	No	Treatment of patients with ALL as part of a multi-agent chemotherapeutic regimen	IM: 16 hours IV: 7.5 hours	**Dose:** 25,000 IU/m^2 **Route:** IM or IV **Frequency:** 3 × a week
Calaspargase pegol-mknl	Yes	As a component of a multi-agent chemotherapeutic regimen for the treatment of ALL in pediatric and young adult patients ages 1 month–21 years	16.2 days	**Dose:** 2,500 IU/m^2 **Route:** IV **Frequency:** every 3 weeks
Erwinia chrysanthemi asparaginase-rywn (recombinant)	No	As a component of a multi-agent chemotherapeutic regimen given by intramuscular injection for the treatment of ALL and LBL in adult and pediatric patients 1 month or older who have developed hypersensitivity to *E coli*-derived asparaginase	18.2 hours	**Dose:** 25 mg/m^2 **Route:** IM **Frequency:** every 48 hours **Route:** IM **Frequency:** 25 mg/m^2 Monday/Wednesday morning; then 50 mg/m^2 Friday afternoon

*Non-recombinant asparaginase erwinia chrysanthemi is no longer available in the United States.



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