

Simplify IV N-Acetylcysteine for Acetaminophen Overdoses

Recent FDA approval for 2-step IV dosing is opening a bag of questions around using **N-acetylcysteine (NAC) for acetaminophen overdose**.

Acetaminophen poisonings are common. Poison control centers handled over 80,000 US cases in 2023.

NAC is the antidote...and has been used for decades. It deactivates a toxic acetaminophen metabolite that can cause deadly liver failure.

Many dosing strategies exist. NAC is classically given IV as a 3-bag regimen over 21 hours. But FDA approved an alternative 2-bag approach in late 2024...which many hospitals have used off-label for years.

Compare IV NAC options. The original FDA-approved 3-bag regimen is given as 150 mg/kg infused over 1 hour...then 50 mg/kg over 4 hours...followed by 100 mg/kg over 16 hours.

On the other hand, the simpler 2-bag version is given as 200 mg/kg over 4 hours...then 100 mg/kg over 16 hours.

Generally cap these weight-based doses at 100 kg for either method.

Still confirm NAC is needed using the Rumack-Matthew nomogram...and consult a poison center (800-222-1222) or toxicologist...regardless of the regimen.

Emphasize that liver damage outcomes are the same for both regimens.

But share that the 2-bag method lowers side effects (anaphylactoid reactions, etc)...conserves fluids...and reduces mix-ups and delays.

Watch for exceptions when 3 bags are still needed to give more NAC up front. This includes when acetaminophen levels are 300 mcg/mL or more at 4 hours after an overdose.

In general, also continue to recommend the 3-bag option for patients 40 kg or less. The 2-bag labeling only applies to 41 kg and up.

Safely implement new NAC regimens. Work with IT colleagues to create or revise EHR order sets to standardize NAC dosing, infusion times, and preparation.

Confirm if the EHR can use "linked" or sequential orders to require admin of one bag before starting the next.

Then differentiate multiple infusion options...such as "N-acetylcysteine (2-bag regimen; 300 mg/kg)"...in e-Rx AND pump menus.

Educate nurses and prescribers about NAC administration changes BEFORE they are implemented...to ensure safe practice transitions.

Explore how to dose other antidotes using our chart, Drugs for Selected Medication Overdoses and Poisonings.

Key References:

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-ISMP Canada. When the Antidote Causes Harm: Preventing Errors with Intravenous Acetylcysteine. August 24, 2023. <https://ismpcanada.ca/wp-content/uploads/ISMPCSB2023-i7-Acetylcysteine.pdf> (Accessed Dec 26, 2024).

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