What to Know About Glacial Acetic Acid: Stop Using It

Multiple events involving patient harm from the use of undiluted glacial acetic acid have been reported to the Pennsylvania Patient Safety Reporting System (PA-PSRS). Glacial acetic acid is anhydrous pure acetic acid available in concentrations between 99.5% and 100%. Unlike acetic acid solutions which have various medical uses when diluted to different concentrations (e.g., 0.25% for irrigation, 2% for otic use), glacial acetic acid is highly corrosive; has no medical purpose; and has been associated with serious patient harm, such as severe tissue damage and third-degree burns. Because glacial acetic acid is not considered to be a drug, it is not regulated by the U.S. Food and Drug Administration (FDA) to have standardized labeling on its containers to prominently display the strength of acetic acid and warnings against medical use. Despite our previous publication describing two cases involving unintended applications of glacial acetic acid and several strategies to prevent error, we have recently received PA-PSRS reports of additional patient injuries due to the use of glacial acetic acid. Therefore, we advise facilities to review and implement the Action Items listed below.

Action Items

1. Completely eliminate the use and storage of glacial acetic acid from the facility.

2. Purchasing and acquisition:
   - Purchase commercially available premixed acetic solutions at the lowest concentrations deemed medically effective at the facility.
   - Assign a specific individual or department to be in charge of purchasing acetic acid solutions for all procedural areas.
   - Purchase 4% or 5% acetic acid as vinegar to reduce the potential for confusion with glacial acetic acid.
   - Obtain premade acetic acid solutions of desired concentrations from a reputable compounding pharmacy to minimize in-house dilutions.
   - Remove glacial acetic acid from the available purchasing options.
   - Manually examine any product that does not have a National Drug Code (NDC) or a scannable barcode upon delivery.

3. Prescribing and ordering:
   - Require prescribers to indicate the specific strength of acetic acid and indication for use in the order.
   - Require orders for acetic acid to be sent to the pharmacy at least one day in advance to allow sufficient time for verification, compounding, and dispensing.
   - Remove the term “glacial” from all orders for acetic acid solution.
   - Prescribe and dispense acetic acid on a patient-specific basis rather than making it available as a batch in patient care areas.
   - If continuing the use of acetic acid solution from home, perform an accurate medication reconciliation using the patient as a historian.

4. Dispensing and administration:
   - Develop a standard formula for in-house compounding of diluted acetic acid solutions by the pharmacy.
   - Implement an independent double check and/or an observation process to ensure the accuracy of the acetic acid dilution before dispensing or administering the product.
   - Minimize distractions and interruptions in the compounding area.
   - Apply a barcoded label on all compounded acetic acid solutions that must be scanned prior to patient administration.

5. Education and training:
• Educate staff members that undiluted glacial acetic acid has no medical use and should not be confused for diluted acetic acid solutions.  
  
• Instruct staff members to not use acetic acid if it smells stronger or different than usual.  
  
• Confirm the availability of up-to-date drug information references containing clinical and compounding information for acetic acid.  

• Instruct staff to neutralize acetic acid with baking soda should any exposure occur.  
Stock baking soda in all areas where acetic acid solutions are used.


Healthcare Serial Murders: Patterns and Challenges

April 4
12 – 1 p.m.

LAST CHANCE

While it is rare, intentional harm of a patient by a healthcare provider can happen. Does your facility have a process to identify patterns of possible murder by healthcare providers? Join us this Thursday, April 4, 2024, from 12 to 1 p.m. EST, for “Healthcare Serial Murders: Patterns and Challenges,” with Zane Robinson Wolf, PhD, RN, dean emerita and professor at the School of Nursing and Health Sciences, La Salle University. For completion of this course, 1.0 continuing education hours will be awarded to Pennsylvania registered nurses only.

Register for this free webinar

Event Reporting Case Study: Pulmonary Embolism Following C-Section

This case study is an example of how to report an event into PA-PSRS.

Narrative: Patient presented to the emergency department four days post C-section with chest pain, headaches, and shortness of breath. Lab work showed an elevated D-Dimer and CT angiogram was consistent with a pulmonary embolism. The Emergency Department (ED) physician prescribed Eliquis, and the patient was discharged after the first dose was given in the ED.
Not Settling for Empty Promises From Gas Cylinder Vendors

In a gastroenterology procedural center, a cart is used to integrate equipment for endoscopies and colonoscopies, including large (size E) carbon dioxide cylinders used for insufflation to reduce pain and discomfort during colonoscopies. The tanks are switched out when empty and are often changed between cases, but sometimes they must be replaced during a case. Each CO2 tank is delivered in a plastic bag with a rubber band closure, a tag that reads “full,” and a seal over the valve.

In June 2022, a gastrointestinal (GI) tech grabbed a CO2 tank from the full rack that was both bagged and tagged, but when the tank was hooked up to the insufflator equipment, they discovered it was empty. Had this tank needed to be changed during a procedure, it would have put the patient at risk. The center reported the event to the vendor and returned the tank for investigation. One month later, the vendor reported they could not determine whether the tank was leaking but had replaced the valve.

On four more occasions over the next six months, a tank packaged as full was empty when brought into the procedure room. The vendor questioned whether the staff was comingling tanks and offered more signage.

In January 2023, the nurse manager reported the empty tank issues to the center’s patient safety committee. The committee asked for investigative reports. In March 2023, the facility management company, a separate entity that orders and manages tanks at the center, found tanks in the full rack that had been delivered in open bags with no seal. When tested, the tanks were full, although the open bags and lack of a seal suggested they were empty.

The vendor created a new process in which tanks would be filled, sealed, and tagged as full in an obvious manner, and drivers were to ensure full tanks remained wrapped on delivery. Despite these efforts, in July 2023 a tank marked full was empty when hooked up in the procedure room. On two other occasions in August 2023, tanks that should have been full were empty when staff attempted to use them. These tanks were sent to the vendor for evaluation.

In mid-September 2023, the nurse manager again reached out for vendor feedback and an improvement plan. The vendor reported a new companywide mandate where size E medical gas cylinders would no longer be shipped in bags, would be inspected after filling, and would be equipped with a built-in seal and washer to ensure proper connection. This new process was implemented to segregate full and empty cylinders on delivery.

The steadfast persistence of the nurse manager to hold the vendor accountable produced a safer process to fill, mark, and deliver CO2 tanks, and make it easy to discern with a glance whether a tank is full or used when it is brought into the procedure room.