Paralyzed by Mistakes, Part 2
Preventing Errors with Neuromuscular Blocking Agents

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In the September 2009 issue of P&T, I discussed the types of medication errors that can occur with the use of neuromuscular blocking agents, including breakdowns with look-alike packaging and labeling, look-alike drug names, administering the drug after a patient was extubated, unlabeled syringes, and unsafe storage. Part 2 of this two-part series presents recommendations to prevent mistakes associated with the use of these medications.

SAFE PRACTICE RECOMMENDATIONS: Neuromuscular blocking agents are considered high-alert drugs because their misuse can lead to catastrophic injuries or death. Just as with cancer chemotherapy agents, these drugs deserve our highest attention. Here are some recommendations designed to reduce the risk of harm when these drugs are given.

1. Limiting access. When possible, neuromuscular blocking agents should be dispensed from the pharmacy as prescribed. The floor stock of these agents should be allowed only in the operating room (OR), the emergency department (ED), and the critical-care unit (CCU), where appropriate ventilation and monitoring can take place.

2. Segregation and storage. When these agents must be available as floor stock, the pharmacy should assemble the vials in a sealed box with warnings affixed (see No. 4). The boxes should be sequestered in both refrigerated and non-refrigerated locations.

3. Adding warning labels. Fluorescent red labels should be affixed to these agents to read as follows: “WARNING: PARALYZING AGENT—CAUSES RESPIRATORY ARREST.” The labels should be added to each vial, syringe, bag, and storage box containing the medication. Incidentally, neuromuscular blocking agents were available as floor stock outside the OR in 80% of hospitals that responded to the 2004 Institute for Safe Medication Practices (ISMP) Medication Safety Self-Assessment. When these drugs were available outside the OR, they were not separated from other floor stock items or labeled with auxiliary warnings by 59% of respondents.

4. Safeguarding storage in the pharmacy. Warning labels should be affixed to sequestered vials of neuromuscular blocking agents stocked in the pharmacy. The labels should not obscure the label on the vial label in any way.

5. Manufacturer warnings. Staff members should use brands of neuromuscular blockers that clearly differentiate the vials from other products, via warnings on the package label, vial cap, and metal ferrule around the rubber stopper. In 2005, all manufacturers of these agents were required to provide this cautionary labeling.

6. Standardized prescribing. Orders for neuromuscular blocking agents to be used “as needed for agitation” should not be accepted. Order sets should be established to prevent misinterpretation of handwritten orders. The need for ventilation support during and after administration, as well as a protocol stipulating the automatic discontinuation of these agents after extubation and removal from a ventilator, should be included. Orders to “resume the same medications” upon patient transfer should never be accepted.

7. Computer reminders. Alerts should be built into the pharmacy computer to verify the patient’s location when neuromuscular blockers are entered. If the patient is not in a CCU, an ED, an OR, or an area for invasive procedures, the order should be questioned and ventilatory assistance should be verified before the drug is dispensed. If possible, the staff should institute computerized checking of the patient’s location when entering neuromuscular blocking agents as well as other drugs limited to administration on a specific unit. Cautionary messages should also appear on automated dispensing cabinet screens when applicable. It may also be helpful to develop a pop-up box that asks, “Is the patient being ventilated?”

8. Redundancies. Before neuromuscular blockers are dispensed and administered, an independent double-check of the drug against the actual order should be required.

9. Supervision during initial administration. A licensed practitioner who has experience with intubation and airway management during the initial administration of a neuromuscular blocking agent should be present at the patient’s bedside.

10. Drug verification. Point-of-care bar coding should be implemented to verify drugs, doses, routes of administration, and the right patient before medications are given.

11. Prompt removal of discontinued products. Vials, bags, and syringes of neuromuscular blocking medications should be placed in a sequestered bin for immediate pharmacy pickup after patient extubation or after the drug has been discontinued.

12. Increasing awareness. All staff members should be instructed about the risk of serious errors with these high-alert drugs. They should be given a list of both generic and brand names for all neuromuscular blocking agents available at the facility, and the information should be used to assess the facility’s safety practices.

The reports described in this column were received through the ISMP Medication Errors Reporting Program (MERP). Errors, close calls, or hazardous conditions may be reported on the ISMP Web site (www.ismp.org) or communicated directly to ISMP by calling 1-800-FAILSAFE or via e-mail at ismpinfo@ismp.org.