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What's New in the Patient Safety World

April 2021

Anticonvulsants High Risk: How Did We Miss That?

The Pennsylvania Patient Safety Authority recently sent an email Safety Alert to subscribers regarding errors with anticonvulsants during admission and transitions of care. They had noted several serious events involving omitted or incorrect dosages of anticonvulsants when the patient is admitted and during transitions of care, noting that omissions or errors in dosages related to anticonvulsants can result in seizures or other adverse conditions. PPSA was aware of a least one recent death potentially related to this type of error.

The PPSA had recently published a study on serious events related to failures in the medication reconciliation process (Harper 2021). The usual suspects that we refer to as "high-risk" medications were, of course, frequently involved. But, most surprising was that the most frequent drug class involved was not one typically considered as "high-risk". It was not insulins, anticoagulants, benzodiazepines, or opioids. Rather, it was anticonvulsants! These accounted for 16.4% of the serious events reported in the study. Errors in dosing of anticonvulsants most often resulted in seizures.

The transition point of care at which the errors occurred was most often admission or triage, with discharge as the second most common point. **Order entry or transcription** was the most common process during which errors occurred. Such events included missed orders, decimal place errors, orders where the total daily dosage was confused for individual dosages, orders for the wrong type or formulation of a drug, and entry of duplicate orders for the same medication. These resulted in wrong dose errors, dose omissions, wrong medications, duplicate therapy, and wrong formulation errors.

Source of information contributed to 19.4% of the events. Those errors involved incorrect, outdated, or illegible information provided by patients, family members, transferring facilities, old electronic records from a previous admission, or using the wrong patient's information.

The PPSA study does not specifically detail the factors leading to the anticonvulsant errors. One of the problems we can foresee as contributing to the errors with anticonvulsants is the fact that we often need to adjust a patient's anticonvulsant regimen to achieve a "therapeutic blood level" of that drug. For example, we might start a patient on 300 mg. of phenytoin daily but find that his/her serum levels are "subtherapeutic" and that at 400 mg. per day the levels are in the "toxic" range. So, we end up recommending 300 mg. one day alternating with 400 mg. every other day. But the problem is that such a regimen is **often not reflected accurately in either the pharmacy records or the electronic medical record (EMR)**. So, if someone is doing medication reconciliation using either of those sources as the sole sources of information (for example, when a patient cannot give a history and no family or caregiver is available), errors will ensue.

But, in fact, many of the anticonvulsants most often implicated in the PPSA study were ones for which we do not routinely aim for a therapeutic serum level. So, there must be other contributing factors. We think another factor likely to contribute is relative unfamiliarity with some of the drugs. For example, if a patient is admitted to a surgical or general medical service, the clinicians may not be as familiar with the anticonvulsants as they would be with many of the patient's other medications.

The PPSA email alert to subscribers included the following key points:

- Consider additional triggers for alerts, monitoring, or laboratory testing when anticonvulsants are ordered.
- Review facility lists and processes for high-alert medications. Consider adding anticonvulsants to your facility high-alert medication list and incorporating high-leverage error reduction strategies into management of these medications.
- Develop standardized processes to ensure clinicians follow consistent procedures (including medication reconciliation) throughout the continuum of care, including admission and discharge procedures.
- Include the medication indication on the home medication list and all documentation systems for medication orders, care planning, and discharge planning.
- Consider a dedicated pharmacy role to assist with various medication reconciliation processes.
- Develop technology for shared electronic medication lists and processes.

Also, keep in mind that sometimes drugs in the anticonvulsant class are actually being used for indications other than seizures (for example, gabapentin and carbamazepine may be used for management of certain forms of pain). That is a reminder that it is crucial we always include an indication when prescribing or ordering a medication.

Some of our previous columns on medication reconciliation:

October 23, 2007 "Medication Reconciliation Tools"
December 30, 2008 "Unintended Consequences: Is Medication Reconciliation Next?"
May 13, 2008 "Medication Reconciliation: Topical and Compounded Medications"

September 8, 2009 "Barriers to Medication Reconciliation"
August 2011 "The Amazon.com Approach to Medication Reconciliation"
January 2012 "AHRQ's New Medication Reconciliation Tool Kit"
September 2012 "Good News on Medication Reconciliation"
October 1, 2019 "Electronic Medication Reconciliation: Glass Half Full or Half Empty?"
July 2020 "Not Following Medication Changes after Hospitalization?"

References:

Harper A, Kukielka E, Jones R. Medication Reconciliation Process Failures: A Study of Serious Events Reported by Pennsylvania Hospitals. Patient Safety Journal 2021; 3(1): 10-21
https://patientsafetyj.com/index.php/patientsaf/article/view/medication-reconciliation-process-failures/medication-reconciliation-process-failures
(Harper 2021)