



Drug Safety Review

Medication errors associated with preprinted orders

Preprinted orders are often used in hospitals and health systems to deal with common, recurring clinical situations and offer many advantages over handwritten orders.

From a human-factors perspective, a preprinted order is standardized, thereby minimizing the risk of misinterpreting handwriting. From a practice perspective, preprinted orders can easily provide the clinical parameters of therapeutic products and save time. From a quality perspective, such orders are likely to be more complete, leading to improvements in patient care and safety by minimizing errors associated with illegible handwriting. One study reported that 15% of medical reports contain illegible handwriting, and that it was particularly frequent in records from surgical departments.

While a general consensus exists that preprinted orders are beneficial and should be routinely used, they have also been associated with medication errors. A review of MEDMARX data (September 1998 through August 2003) found 4,437 case reports for which “preprinted orders” was listed as a cause of error. Of those, 110 (about 2.5%) resulted in harm to the patient. Overall, errors involving preprinted order sheets were reported in 35 different locations from the MEDMARX pick list. Those that resulted in harm were reported in only 16 locations.

Many of the errors reported that had to do with preprinted orders involved high-alert medications, such as opioid analgesics, antimicrobials, anticoagulants, and insulin. Errors originating from the use of the preprinted orders resulted in both omissions of medications as well as excessive doses of medications.

Common findings also indicated that some of the errors originated when the provider varied from the preprinted order sheet. For exam-

ple, one provider, using a patient-controlled analgesia order form that was preprinted with “meperidine,” crossed out the drug name and wrote “hydromorphone” in its place, without changing the basal rate, loading dose, and lock-out dose, which caused the patient to become unresponsive requiring antidote reversal.

In another case, the provider scratched through an order calling for an antibiotic to be given every 12 hours. The provider then wrote the exact same order at the bottom of the form where it was overlooked by the clinical staff.

Incomplete preprinted forms were also associated with errors. In one case, the incomplete form led to a postoperative omission of antibiotics.

Preprinted orders must match the clinical condition. In one case, an outpatient was scheduled to undergo eye surgery but the wrong set of orders was placed on the chart. That caused the patient to be incorrectly medicated prior to the procedure.

Several cases also involved verbal orders being recorded on preprinted order forms. In these cases, there was conflict between the intent of the verbal order and what the form could accommodate. An example of this scenario involved the drug heparin. A physician gave a verbal order for heparin that specified to omit the bolus dose and simply initiate an infusion. However, the preprinted form called for a bolus based on the patient’s weight, and it was subsequently administered.

Recommendations

Preprinted orders should be used when possible, provided that:

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- The order form is being designed with input from all disciplines (who will be using the form) and approved by the appropriate institutional committees (such as P&T, nursing, medical staff).

- Each form has a unique form number and revision date associated with it. Forms should be periodically reviewed by the appropriate institutional committees (such as P&T, nursing, medical staff).

- Each form clearly identifies the indication for the product to facilitate compliance with JCAHO’s medication management standards.

- Product names are displayed in accordance with institutional guidelines (i.e., generic names are listed if required by the facility).

- Dosage forms are clearly expressed and in a style consistent with safe practices (such as avoiding abbreviations, leading or trailing zeros, etc.)

Other patient safety measures include:

- Felt-tip or fountain pens should not be used when writing on multicarbon forms

- Providers should *not* substitute product names or routinely change the concentration of products ordered on preprinted forms.

- When constructing a Failure Mode and Effects Analysis (FMEA), include the possibility that the error is the result of a poorly designed or confusing form.

- Be alert to possible allergies when automatic product substitution is allowed by institutional policy.

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