



Drug Safety Review

The dangers associated with vaccinations

It's flu season and Americans will flock to their healthcare providers over the next several weeks for a flu shot. Vaccinations for other illnesses such as tetanus, diphtheria, and rubella, to name a few, are commonplace. But for all the health benefits they provide, vaccines are volatile agents that can have serious consequences if improperly administered or given in the wrong dose.

Data reported to USP's MEDMARX program revealed that most errors associated with vaccination products occurred in the administering phase (see table). The data are based on 1,837 records submitted to USP between August 1998 and December 2002.

The top five vaccine products associated with these reported errors are: pneumococcal vaccine polyvalent; hepatitis B vaccine, recombinant; influenza virus vaccine; tetanus and diphtheria toxoids absorbed for adult use; and rubella virus vaccine live. The most commonly reported causes for vaccine errors include *Procedure/protocol not followed*, *Knowledge deficit*, *Transcription inaccurate/omitted*, and *Documentation*.

Regarding the influenza virus vaccine, errors of *omission* occurred most often (34.7%) followed by *unauthorized/wrong drug errors* (28.5%), *extra dose* (10.4%), and *improper dose/quantity* (9%).

Omission errors

Case #1: Influenza and pneumococcal vaccines were ordered and were to be given to the patient upon discharge. Pharmacy recorded the order on the medication administration record with a note for nursing to call the pharmacy for the dose before discharge. Nursing never called the pharmacy before the patient left

the hospital, and, therefore, the patient never received the vaccine.

Case #2: Consent forms were to be signed by the patient (or designee) prior to vaccine administration. An order was written for influenza and pneumococcal vaccines and sent to the pharmacy but was not accompanied by the

Where errors occur	Percentage
Administering phase	49.5%
Transcribing/documenting phase	20.2
Dispensing phase	14.8
Prescribing phase	7.0
Monitoring phase	0.4
*Other	8.1
*Does not apply – data not provided	

required consent form, and patient did not receive either vaccine.

Unauthorized/wrong drug errors

Case #3: A physician ordered "H-flu" (intended to mean *Haemophilus b* Conjugate vaccine), but the order was interpreted by pharmacy as Influenza Virus vaccine. Pharmacy dispensed the wrong product, and nursing administered the wrong drug to the patient.

Case #4: As part of new employee orientation, Tuberculin purified protein derivative (PPD) 0.1 ml was to be administered intradermally. Influenza vaccine (FluShield) was stored in the employee health clinic refrigerator along with PPD and inadvertently retrieved. More than two dozen new employees were administered influenza vaccine intradermally (instead of the PPD). Many of the new employees experienced redness/erythema and tenderness that resolved in three days.

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Improper dose errors

Case #5: An immunization technician administered a 0.5-ml dose of flu vaccine to an 18-month-old rather than the appropriate 0.25 ml. In this case, the technician was providing 0.5-ml dose shots to older siblings of the patient at the same time and did not realize that the infant was to receive a lower dose.

USP provides the following suggestions to healthcare practitioners to help minimize the opportunity for errors involving vaccinations:

- Conduct a review of the vaccinations currently on the facility's formulary and

evaluate if changes, deletions, and/or additions need to be made.

- Review the manner in which vaccinations are prescribed, including the use of unapproved abbreviations. Establish clear protocols on the prescribing, dispensing, and administering of these products.

- Use an adequate number of clearly labeled storage bins in the refrigerator to separate different products and different strengths (e.g., pediatric versus adult dosage forms).

- Incorporate educational/training sessions into physician, pharmacy, and nursing staff meetings regarding the facility's protocols for vaccinations. At the end of such sessions, staff should be familiar with the types of vaccinations on formulary, the basic differences among the various vaccinations, and the appropriate procedure for prescribing, dispensing, and administering these products.

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