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Medication Errors

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Mini Review

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Medication Errors in US Hospitals

These results relied on data voluntary provided to American Hospital Association. It is likely that substantial number of medication errors go undetected or unreported to the hospital medication error reporting system. So, it seems more likely that substantially more patients are harmed each year by medication errors than these figures suggest. As the total medication errors and medication errors that adversely affect patient care outcomes increase, hospital mortality rate, drug cost/occupied bed, length of stay and total cost/occupied bed increase [1].

Medication Error Reporting System

Is ongoing, systematic program for reporting, monitoring and reviewing medication errors in hospitals. Cost associated with a single medication error has been reported to range between $2162 and $2595. In 1999 report, drugs most frequently associated with medication errors were warfarin, insulin, heparin, cefazolin, vancomycin, lorazepam, kcl, meperidine, furosemide, digoxin, famotidine, morphine and theophylline [2].

Identification of Medication Prescribing Errors

All medication orders are reviewed by staff pharmacists and entered into pharmacy computer. Patient-specific information (age, attending service, admitting diagnosis, allergies to medications, medication profile for the present hospitalization….etc) should be routinely available to reviewing pharmacist. A computerized reporting system enables pharmacists to access patient laboratory results. Pharmacy computer system has standard automatic dose range checking, allergy checking, drug interaction checking [3].

Potential Prescribing Problems

- Wrong patient.
- Wrong drug.
- Wrong dose.
- Wrong dosing frequency.
- Drugs were not given.
- Wrong route.
- Wrong dosage form.
- Calculations, decimal points, unit of measure, dose rate expression.
- Inappropriate indication for use.
- Inappropriate combination of drugs.
- Failure to account for patient characteristics in making drug therapy decision.
- Documented allergies to ordered medications [4].

Other Potential Medical Problems

- Designed menus that contain food that is prohibited for patient's condition.
- Unresponsive staff to change I.V. bags before they are empty.
- The risk of having wrong surgery.

What Happens Next

The medication order (s) in question is either:

- Confirmed as written.
- Clarified.
- Changed.
- Discontinued following the discussion between the pharmacist and the physician.

Confirmed Prescribing Error

➢ For each confirmed prescribing error, the following data are collected:

- Patient medical record number
- Date
- Time of day order is written
- Prescribing physician
- Attending service
- Medication involved
- Error description
- Pertinent patient-specific characteristics or other factors related to the error [5].

Factors Associated with Increase Medication Errors

- Lack of pharmacy teaching staff.
- Centralized pharmacists.
- Increased number of registered pharmacists / occupied bed.
- Increased number of registered nurses / occupied bed.
- Increased pharmacy administrator staffing / occupied bed.
- Size of hospital (more errors in smaller hospitals).
- Work load (20-25 prescription order / h).
- Insufficient knowledge of patient therapy.
- Lack of awareness of patient conditions.
- Inaccurate calculations and unit or rate expression factors.
- Presence of a drug information service (18%).
- Decentralized pharmacists to patient care areas (45%).
- Pharmacist - provided adverse drug reaction management (13%).
- Pharmacist - provided drug protocol management (38%).
- Pharmacist participation in medical rounds (29%).
- Pharmacist - provided admission histories (51%)
- Increased staffing of clinical pharmacists/ occupied bed.
- Affiliation with a pharmacy teaching program (72%).
- Clinical research.
- Drug use evaluation program [6].

Recommendations for Reducing Pharmacists Errors

- Increasing number of pharmacists by improving education opportunities and produce more graduates.
- Use adequate trained technicians.
- Use robo-druggist (robotics).
- Encourage women pharmacists to come back to work after marriage.
- Shift of 5-year bachelor degree of pharmacy to 6-year doctor of pharmacy degree.
- Pharmacists fill no more than 15 prescriptions / hour.
- Encourage patients to have and use smart card.
- Doctors should type prescriptions directly into pharmacy linked computer (computerized physician order entry).
- Doctors and pharmacists can use a database which can be downloaded from the internet to a hand-held computer that could be carried in rounds.
- Develop preprinted order forms that improve standardization and give guidance for calculating doses.
- Use of bar coding for medications, blood products, devices and patients.
- Use of medication-dispensing machines.
- Use of reliable method to verify patient identity.
- Use of metric system.
- Elimination of abbreviations and acronyms.
- Minimize and eliminating verbal drug orders.
- Provision of up-to-date information at point of care.
- Partnering with patients for safety.
- Work place illumination and organization [7].

What Patient Can Do

- Ask question about his care.
- If he thinks there may be a problem, ask before it is a problem.
- Have his complete medical history in hand.
- Have a paper to record questions about his care and discuss with his doctor.
- Make alliance with his nurse.
- Identify the point provider (primary attending physician).
- Notify staff before he needs them.
- Make sure he is identified.
- Bring along a family member or close friend.
- Know his options.

Final Advice: To Survive in a Hospital Never Take Anything for Granted.

- Communicate before Medicate.

Pharmacist Participation in Medical Rounds

- Reduces medication errors.
- 66% reduction in adverse events related to preventable errors.

• This helps in preventing medication errors at time of prescribing and from continuing once they are identified.
• Investigate allergy information.
• Monitoring trends in laboratory test values.

Role of Pharmacist Participated In Medical Rounds

Closely reviewing drug interactions, patient age, weight and organ function, medication administration record and provision of patient education.

Record all medication errors as they discovered and file appropriate medication error report.
Identify and monitoring patients receiving high risk medications.

Screening for drug-drug interaction.

Evaluating the appropriateness of each dose on basis of patient specific values.

➢ Medication errors can be classified as and (reduced because):

• Prescribing (pharmacist gaining a more through clinical picture of patient related to medication prescribing after participation in rounds).
• Administration (pharmacist had the opportunity on daily rounds to review the medication administration records for errors and educate nursing staff on appropriate administration of the medication).
• Pharmacy (pharmacy errors can be reduced as a result of clinical interventions on basis of application of the principles of therapeutic drug monitoring).
• Discharge errors (reduced by previewing discharge summary written and ensuring that discharge medication order is appropriate and complete) [8,9].

Reported Medication Errors Associated with Methotrexate

➢ Indications of use: Rheumatoid arthritis (dose 2.5 mg), Cancer (dose 15 g/m^2), also in psoriasis and ectopic pregnancy.
➢ Out of 106 cases: 25 death (24%) &48 serious outcomes (45%).
➢ Errors were attributed to:

• Prescriber: 39 (37%, contraindications, labeled interactions, dosage errors, wrong drug).
• Patient: 21 (20%, misunderstood directions for use).
• Dispensing: 20 (19% daily instead of weekly dosage).
• Administration by health care professionals: 18 (17%, wrong route of adm.e.g. intrathecal instead of intravenous).

➢ Solutions:

• Talk to the patients and be sure they have written information that explains dosage schedule.
• Clinicians should encourage feedback to ensure that patients understand the dosage schedule and the medication should not be used as needed for symptoms control.
• Dispensing methotrexate in the weekly dosage pack.
• Electronic alerts in prescriber order entry system and pharmacy computer systems can signal clinicians to check for potential errors [10].

Conclusions

1. Total elimination of medical errors is probably unrealistic (people care for patients and people make mistakes).
2. Comprehensive error programs are critical steps in the implementation of effective error prevention processes.
3. Improve hospital pharmacy staffing procedures for recruiting and training, decentralize pharmacists and implement clinical pharmacy services can reduce medication errors and improve safety and care of patients.
4. The best organizations have high number of errors detected and documented because that is what they learn from.

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