

Preventable Adverse Drug Reactions: A Focus on Drug Interactions

Drug Interactions & Labeling

Drug Development and Drug Interactions

Drug Development and Drug Interactions: Possible Models for Decision-Making

Drug Development and Drug Interactions: Table of Substrates, Inhibitors and Inducers

Drug Development and Drug Interactions: Advisory Committee Meetings

Drug Interaction Presentations

This learning module was developed based on a needs survey sent to all third year medicine clerkship directors and all medicine residency program directors in the United States. This module was developed by the [Center for Education and Research on Therapeutics](#) (CERT) while at Georgetown University (CERT now located at the University of Arizona Health Sciences Center) in collaboration with the Center for Drug Evaluation and Research at the Food and Drug Administration. The work was sponsored by the [Agency for Healthcare Research and Quality](#) (AHRQ). We encourage you to complete the Module Evaluation Form, as it will provide feedback for the development of future learning modules.

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ADRs: Prevalence and Incidence

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Why Learn about Adverse Drug Reactions (ADR)?

- Over 2 MILLION serious ADRs yearly
- 100,000 DEATHS yearly
- ADRs 4th leading cause of death ahead of pulmonary disease, diabetes, AIDS, pneumonia, accidents and automobile deaths
- Ambulatory patients ADR rate - unknown
- Nursing home patients ADR rate - 350,000 yearly

Institute of Medicine, National Academy Press, 2000
Lazarou J et al, JAMA 198;279(15): 1200-1205
Gurwitz JH et al, Am J Med 2000;109(2): 87-94

The first question healthcare providers should ask themselves is "why is it important to learn about ADRs?" The answer is because ADRs are one of the leading causes of morbidity and mortality in health care. The Institute of Medicine reported in January of 2000 that from 44,000 to 98,000 deaths occur annually from medical errors.¹ Of this total, an estimated 7,000 deaths occur due to ADRs. To put this in perspective, consider that 6,000 Americans die each year from workplace injuries.

However, other studies conducted on hospitalized patient populations have placed much higher estimates on the overall incidence of serious ADRs. These studies estimate that 6.7% of hospitalized patients have a serious adverse drug reaction with a fatality rate of 0.32%.² If these estimates are correct, then there are more than 2,216,000 serious ADRs in hospitalized patients, causing over 106,000 deaths annually. If true, then ADRs are the 4th leading cause of death—ahead of pulmonary disease, diabetes, AIDS, pneumonia, accidents, and automobile deaths.

These statistics do not include the number of ADRs that occur in ambulatory settings. Also, it is estimated that over 350,000 ADRs occur in U.S. nursing homes each year.³ The exact number of ADRs is not certain and is limited by methodological considerations. However, whatever the true number is, ADRs represent a significant public health problem that is, for the most part, preventable.

¹Committee on Quality of Health Care in America: Institute of Medicine. To err is human: building a safer health system. Washington, D.C.: National Academy Press; 2000. ²Lazarou J, Pomeranz B, Corey PN. Incidence of adverse drug reactions in hospitalized patients: A meta-analysis of prospective studies. JAMA 1998;279:1200–1205. ³Gurwitz JH, Field TS, Avorn J, McCormick D, Jain S, Eckler M, et al. Incidence and preventability of adverse drug events in nursing homes. Am J Med 2000;109(2):87–94.