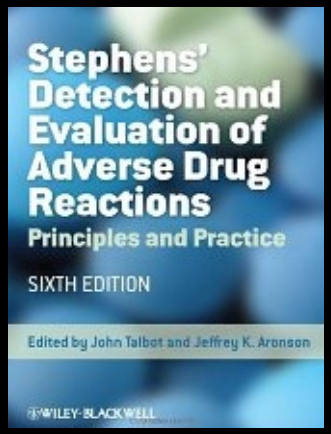
Do we have a common understanding of medication errors?

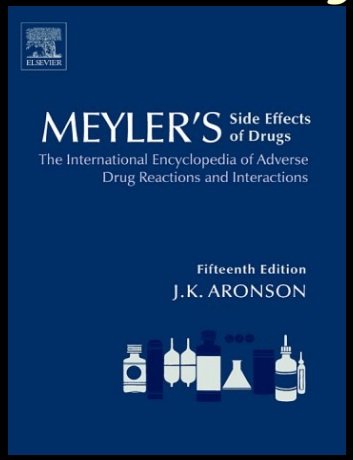
Jeffrey Aronson

Co-editor: Stephens' Detection and Evaluation of Adverse Drug Reactions



Editor

Meyler's Side Effects of Drugs



Side Effects of Drugs Annuals

West Midlands Centre for ADRs

Robin Ferner

LEADING ARTICLE

Drug Safety 2006; 29 (11): 1011-1022
0114-5916/06/0011-1011/$39.95/0

Clarification of Terminology in Medication Errors

Definitions and Classification

Robin E. Ferner[1] and *Jeffrey K. Aronson*[2]

1 West Midlands Centre for Adverse Drug Reactions, City Hospital, Birmingham, UK
2 Department of Clinical Pharmacology, Radcliffe Infirmary, Oxford, UK

Abstract

We have previously described and analysed some terms that are used in drug safety and have proposed definitions. Here we discuss and define terms that are used in the field of medication errors, particularly terms that are sometimes misunderstood or misused. We also discuss the classification of medication errors. A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient. Errors can be classified according to whether they are mistakes, slips or lapses. Mistakes are errors in the planning of an action. They can be knowledge based or rule based. Slips and lapses are errors in carrying out an action – a slip through an erroneous performance and a lapse through an erroneous memory. Classification of medication errors is important because the probabilities of errors of different classes are different, as are the potential remedies.

American Journal of Hospital Pharmacy, Vol 39, Issue 6, 987-991

Articles

Medication errors in nursing homes and small hospitals

KN Barker, RL Mikeal, RE Pearson, NA Illig, and ML Morse

A dose administered to the patient that deviates from the physician's orders, such as an omission, wrong dosage, or unauthorized drug

An example would be when one patient was given one of the doses intended for another

[The act of administering] a dose ~~administered~~ to the patient that deviates from the physician's orders, such as an omission, wrong dosage, or unauthorized drug

Examines only the part of the process that is subsequent to the writing of the prescription

Doctor prescribes digoxin 250 mg
Nurse gives 250 mg = no error [!]

Nurse gives digoxin 250 micrograms = error [!!]

Implications:
Include all medication processes

ASHP Guidelines on Preventing Medication Errors in Hospitals

The goal of drug therapy is the achievement of defined therapeutic outcomes that improve a patient's quality of life while minimizing patient risk.[1] There are inherent risks, both known and unknown, associated with the therapeutic use of drugs (prescription and nonprescription) and drug administration devices. The incidents or hazards that result from such risk have been defined as drug misadventuring, which includes both adverse drug reactions (ADRs) and medication errors.[2] This document addresses medication errors—episodes in drug misadventuring

injectable products, radiopharmaceuticals, radiopaque contrast media, anesthetic gases, blood-fraction drugs, dialysis fluids, respiratory therapy agents, investigational drugs, drug samples, drugs brought into the hospital setting by patients, and other chemical or biological substances administered to patients to evoke a pharmacological response.[6]

Through a systems-oriented approach, the pharmacist should lead collaborative, multidisciplinary efforts to prevent, detect, and resolve drug-related problems that can result in

Episodes in drug misadventuring that should be preventable through effective systems controls involving pharmacists, physicians and other prescribers, nurses, risk management personnel, legal counsel, administrators, patients, and others in the organisational setting, as well as regulatory agencies and the pharmaceutical industry

Episodes in drug misadventuring that should be preventable through effective systems controls involving pharmacists, physicians and other prescribers, nurses, risk management personnel, legal counsel, administrators, patients, and others in the organisational setting, as well as regulatory agencies and the pharmaceutical industry

Misadventure (OED): bad luck or misfortune; an ill-conceived, misguided, or regrettable enterprise

So, "episodes in misadventuring" could refer, for example, to the misuse of recreational drugs

Implications:
Need to define "error" carefully
Preventability is not relevant
The individual(s) involved should not be part of the definition

J Gen Intern Med 1995; 10(4): 199-205

Relationship between Medication Errors and Adverse Drug Events

David W. Bates, MD, MSc, Deborah L. Boyle, BA, Martha B. Vander Vliet, RN, James Schneider, RPh, Lucian Leape, MD

OBJECTIVE: **To evaluate the frequency of medication errors using a multidisciplinary approach, to classify these errors by type, and to determine how often medication errors are associated with adverse drug events (ADEs) and potential ADEs.**

DESIGN: **Medication errors were detected using self-report by pharmacists, nurse review of all patient charts, and review**

Injuries due to drugs were the most frequent cause of adverse events in the Harvard Medical Practice Study, in which about 1% of all hospitalized patients suffered a disabling injury related to medications.[1] Other studies have also suggested that drugs are a major mediator of iatrogenic illness.[2, 3]

Any error occurring in the medication process (ordering, transcribing, dispensing, administering, and monitoring)

Circular definition

One that uses as a part of the definition a term or terms being defined

Formally: a description of the meaning of a lexeme that is constructed using one or more synonymous lexemes that are all defined in terms of each other

Circular definitions

HIND ... The she to a stag
STAG ... The male of the hind

A medication error =
an error in medication

J Gen Intern Med 1995; 10(4): 199-205

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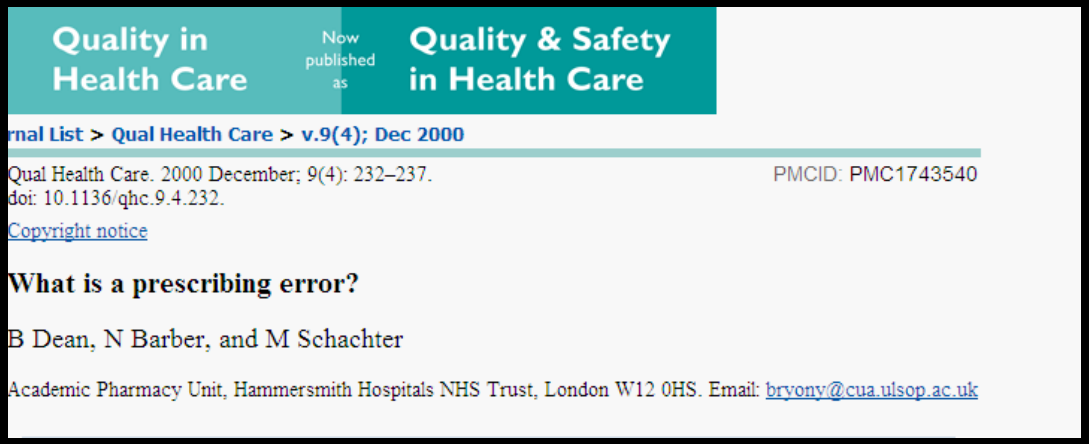
Any error occurring in the medication process (ordering, transcribing, dispensing, administering, and monitoring)

Implication:
Avoid circularity



Quality in Health Care

Now published as

Quality & Safety in Health Care

rnal List > Qual Health Care > v.9(4); Dec 2000

Qual Health Care. 2000 December; 9(4): 232–237.
doi: 10.1136/qhc.9.4.232.

PMCID: PMC1743540

Copyright notice

What is a prescribing error?

B Dean, N Barber, and M Schachter

Academic Pharmacy Unit, Hammersmith Hospitals NHS Trust, London W12 0HS. Email: bryony@cua.ulsop.ac.uk

A clinically meaningful prescribing error occurs when, as a result of a prescribing decision or prescription writing process, there is an unintentional significant (1) reduction in the probability of treatment being timely and effective or (2) increase in the risk of harm when compared with generally accepted practice

An act of prescribing that results in an unintentional significant (1) reduction in the probability of treatment being timely and effective or (2) increase in the risk of harm when compared with generally accepted practice, as a result of a prescribing decision or prescription writing process

Diagnostic errors with appropriate treatment

Only "clinically meaningful" outcomes are of interest; but it is desirable to detect and examine all errors, even if not of clinical importance (they will will draw attention to weaknesses in the system, which might on a future occasion lead to errors of clinical relevance)

Covers only prescribing decisions and prescription writing

Implications:
The clinical outcome is not relevant
Should include all processes

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Vol. 285 No. 16, April 25, 2001

Original Contribution

Medication Errors and Adverse Drug Events in Pediatric Inpatients

Rainu Kaushal, MD,MPH; David W. Bates, MD,MSc; Christopher Landrigan, MD,MPH; Kathryn J. McKenna, MS,RN; Margaret D. Clapp, RPh; Frank Federico, RPh; Donald A. Goldmann, MD

Errors in drug ordering, transcribing, dispensing, administering, or monitoring

Distinguished between errors (which are preventable), rule violations (also preventable), and other adverse events that are not preventable

Quality & Safety in Health Care

Full text from 1998 online at QSHC Online

Journal List > Qual Saf Health Care > v.12(5); Oct 2003

Qual Saf Health Care. 2003 October; 12(5): 343–347. PMCID: PMC1743768
doi: 10.1136/qhc.12.5.343.

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Causes of intravenous medication errors: an ethnographic study

K Taxis and N Barber

Department of Practice and Policy, The School of Pharmacy, University of London, London WC1N 1AX, UK.
Email: katja.taxis@uni-tuebingen.de

[An intravenous drug error is] a deviation in preparation or administration of a drug from a doctor's prescription, the hospital's intravenous policy, or the manufacturer's instructions

The hospital's policy may be wrong
The manufacturer's instructions may be wrong

So: deviation may not be an error
or no deviation may be an error

Implication:
Standard or recommended practice or advice is not a touchstone

Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of health professional, patient or consumer

Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use

Implies that all preventable events are errors

Scandinavian Journal of Public Health, 2012; 40: 203–210

ORIGINAL ARTICLE

How should medication errors be defined? Development and test of a definition

M. LISBY[1,2], L.P. NIELSEN[1,3], B. BROCK[1,3] & J. MAINZ[4,5]

An error in the stages of the medication process - ordering, dispensing, administering and monitoring the effect - causing harm or implying a risk of harming the patient

Defining "medication" and "error"

Medication:

A drug or drugs prescribed or given as medical treatment; a medicine (i.e. a medication)

The action of treating medically; treatment with a medicinal substance [product] (i.e. the process of medication)

Error:

The failure of planned actions to achieve their desired ends without the intervention of some unforeseeable event [James Reason]

Defining a medication error

Things to define or include

Define "error" carefully and particularly indicate how an error can be recognized

Include (or imply) all parts of the medication process

Include (or imply) all outcomes (harmful or otherwise)

Defining a medication error

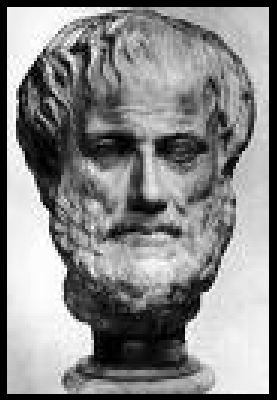
Things not to include

Preventability — not relevant
The individual responsible — not relevant
Standard or recommended practice or advice — not a touchstone
- hospital policies
- national guidelines
- manufacturers' instructions

Defining a medication error

Principles of definition

Encompass all possible cases (de-fine)
Use commonly understood language
Avoid circularity
Use positive attributes, not negative ones
Specify the essence of the thing (τό τί ἦν εἶναι)



A proposed definition

(Ferner & Aronson
Lancet 2000: 355(9208): 947-8)

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient

Notes on the proposed definition

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient

'failure' signifies that the process has fallen below some attainable benchmark

It is the criterion whereby an error is recognized

Notes on the proposed definition

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient

- The "treatment process" starts after the decision:
  - to adopt drug treatment for symptoms or their causes
  - or to investigate or prevent disease or physiological changes
- It includes not only therapeutic drugs but also oral contraceptives, hormones used in replacement therapy, radiographic contrast media
- It includes the manufacturing or compounding, prescribing, transcribing (when relevant), dispensing, and administration of a drug, and the monitoring of therapy

Notes on the proposed definition

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient

"without the intervention of some unforeseeable event"

Notes on the proposed definition

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient

The definition does not specify who makes the error; it could be a doctor, a nurse, a pharmacist, a carer, or another

It does not specify who is responsible for preventing errors or include any notion of preventability

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

"Failure in the (drug) treatment process that leads to, or has the potential to lead to, harm to the patient and includes an act of omission or commission"

ORIGINAL ARTICLE

Multiplicity of medication safety terms, definitions and functional meanings: when is enough enough?

K H Yu, R L Nation, M J Dooley

Qual Saf Health Care 2005;**14**:358–363. doi: 10.1136/qshc.2005.014159

See end of article for authors' affiliations

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Accepted for publication 30 July 2005

Objectives: To identify the terms and definitions used by organisations involved in medication safety and to examine differences in functional meaning using a novel scenario assignment method.

Methods: Medication safety related terms and definitions were sought from websites of organisations associated with medication safety. The functional meanings of terms and definitions were analysed and compared using a scenario assignment method where each definition found was assessed against four scenarios with a central theme.

Main outcome measures: Medication safety related terms and definitions currently in use, similarities and differences in their functional meanings, and practical implications of the use of these terms and definitions.

Results: Thirty three of 160 websites searched were found to have one or more definitions for medication safety related terms. Twenty five different terms with 119 definitions were found. The most frequently defined groups of terms were "adverse event" (8 different definitions), "error" (n = 9), "near miss" (n = 12), "adverse reaction" (n = 8), and "incident" (n = 4). Substantial diversity of functional meanings of definitions was demonstrated using the scenario-assignment method. Of the five groups of frequently defined terms, definitions within the "adverse event", "near miss", and "incident" groups resulted in three functional meanings each, while two functional meanings resulted for "error" and "adverse reaction".

Conclusion: The multiplicity of terms, definitions and, most importantly, functional meanings demonstrates the urgent need for agreement on standardisation of nomenclature describing medication related occurrences. This is an essential prerequisite to enable meaningful analysis of incidence data and development of medication safety improvement strategies.

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10.1093/intqhc/mzq059

How are medication errors defined? A systematic literature review of definitions and characteristics

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Accepted for publication 18 September 2010

Abstract

Objective. Multiplicity in terminology has been suggested as a possible explanation for the variation in the prevalence of medication errors. So far, few empirical studies have challenged this assertion. The objective of this review was, therefore, to describe the extent and characteristics of medication error definitions in hospitals and to consider the consequences for measuring the prevalence of medication errors.

Data sources, study selection and data extraction. Studies were searched for in PubMed, PsychINFO, Embase and CINAHL employing primary search terms such as 'medication errors' and 'adverse drug events'. Peer-reviewed articles containing these terms as primary end-points were included. Study country, year, aim, design, data-collection methods, sample-

17 "A preventable event …"

16 Variants of "an error/mistake in the medication process"

5 Variants of "failure in the treatment process" or "failure in a planned action"

3 Variants of "a deviation from the physician's order"

1 Any discrepancy between the order and what was administered

1 "Under-dose, overdose, no frequency specified, no dose given"

1 "The completion of the entire cycle"

1 "An act or omission with potential or actual negative consequences"

"It appears that definitions of medication errors and methods of detection, rather than being reproducible and reliable methods, are subject to individual researcher's preferences"

BJCP British Journal of Clinical Pharmacology

DOI:10.1111/j.1365-2125.2008.03330.x

What is the scale of prescribing errors committed by junior doctors? A systematic review

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Keywords
drug prescription, medication error, physicians

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Range of errors = 4 to 82%

"It is vital that future research is well constructed and generalizable using standard definitions and methods."

A proposed definition of a medication error

A failure in the drug treatment process, whether through omission or commission, that leads to, or has the potential to lead to, harm to the patient

Notes:
Based on a systematic review
Takes into account expert opinion on errors