CLASSIFICATION TOOL

for health service organisations

A medicine incident classification system\*

The Australian Commission on Safety and Quality in Health Care (the Commission) is an Australian Government agency that leads and coordinates national improvements in the safety and quality of health care based on the best available evidence. By working in partnership with patients, carers, clinicians, the Australian, state and territory health systems, the private sector, managers and healthcare organisations, the Commission aims to ensure that the health system is better informed, supported and organised to deliver safe and high-quality care.

The development of standardised taxonomies to describe clinical incidents related to EMM systems continues to be a challenge in Australia and internationally with a multitude of classifications available for implementation.

Australia required a standardised health IT-related incident classification system that provides a unified and consensus-based approach that can be readily applied during the EMM implementation process. This led to the development of [Guidance for hospitals: Classifying EMM-related adverse events and incidents](https://www.safetyandquality.gov.au/our-work/e-health-safety#guidance-for-hospitals:-emm-incident-classification) (the Guidance).

## Classification of prescribing and medicine administration adverse events and incidents

This is a classification system that describes adverse events and incidents in both prescribing and administration of medicines. The classification is based on a system developed by Westbrook and colleagues.1,2

The classification is grouped into categories of error or incident type (clinical and procedural). These are defined in Tables 1 and 2 and have been adapted and consolidated within Table 3. Table 3 covers the two stages of the classification system:

1. Prescribing
2. Medicine administration.

The classification includes procedural incident/failure categories designed to be customised to reflect the procedures to be followed, underpinning local policies and protocols, and the potential focus for incident investigation.

The classification also includes some additional categories to facilitate incident classification (in contrast to error identification from chart review).3

Definitions for prescribing and medicine administration are included in a glossary contained within the Fact sheet: *[Guidance for hospitals: Classifying EMM-related adverse events and incidents](https://www.safetyandquality.gov.au/publications-and-resources/resource-library/guidance-hospitals-classifying-emm-related-adverse-events-and-incidents-fact-sheet)*.

**Background**: Two major teaching hospitals have used this classification system to determine the impact of EMM system introduction on the number and type of prescribing errors that occurred, and whether interruptions during medicine administration increased the likelihood of errors.1, 2

\*based on Westbrook et al.

Table 1: Prescribing errors or incidents and definitions

| Clinical | Definition (including some examples) |
| --- | --- |
| Duplicated therapy | Occurs when two orders have been prescribed for one medicine and both orders are active; there are two active orders for the same medicine on two different charts; or the same medicine is prescribed twice, as a single agent and as a combination product  May also occur when two medicines are prescribed for the same indication when only one is necessary |
| Wrong strength | Occurs when the prescribed strength is incorrect; the concentration of an intravenous (IV) infusion is prescribed incorrectly; or a dose is prescribed that does not exist or would not be able to be obtained easily from the current dose forms |
| Wrong dose, volume or concentration | Occurs when the prescribed dose or fluid volume is higher or lower (including an incorrect infusion concentration) than that recommended for the condition, taking into account the patient’s age, weight, renal and liver function  May also occur when a dose is not altered in response to abnormal drug serum levels or laboratory tests |
| Wrong rate/frequency | Occurs when the prescribed frequency of administration of a drug or an IV rate falls outside the recommended range |
| Wrong route/site | Occurs when a medicine is prescribed via an incorrect route or site of administration  E.g. the medicine is prescribed intrathecal (IT) rather than IV |
| Wrong medicine/fluid | Occurs when an inappropriate medicine or parenteral fluid is prescribed  E.g. the medicine prescribed is not indicated (or contraindicated) for the patient’s condition; the patient is prescribed a medicine ‘off label’; the medicine or parenteral fluid is contraindicated for a coexisting condition; or an IV medicine is prescribed with an incompatible diluent  Note: Excludes generic substitution |
| Medicine not prescribed | Occurs when a medicine which is clinically indicated for the patient, is not prescribed; or the medicine is omitted when a patient is initially admitted; or the medicine is not reordered when the patient’s medicines are recharted |
| Drug–drug interaction | Occurs if two of the medicines prescribed for a patient are known to have a clinically significant interaction and this interaction is not acknowledged and monitored |
| Not indicated | Occurs when a medicine which is not indicated is prescribed for the patient; a medicine is continued following a clinically significant allergy or adverse drug reaction (ADR); a medicine which is no longer indicated is reordered; or a medicine which should have been discontinued has not been ceased (and has not been assigned as a ‘wrong duration’)  May also occur when a prescriber fails to cease/withhold a medicine in response to abnormal drug serum levels or laboratory tests |
| Wrong duration | Occurs when a medication order is not assigned a ‘stop order’ or the medicine is prescribed to continue for a length of time that is not in accordance with hospital guidelines  E.g. antibiotics prescribed beyond 48 hours |
| Wrong timing | Occurs when a medicine is prescribed at the wrong time of day |
| Wrong formulation | Occurs when the wrong dosage form of a medicine is ordered |
| Inadequate monitoring | Occurs when the prescriber fails to order appropriate and timely clinical or laboratory tests to assess the patient’s response to prescribed therapy  Note: if adequate lab tests are ordered, but the results are not acted upon accordingly, resulting in potential or actual compromised patient care, this may be classed as wrong dose/volume error |
| Allergy/ADR | Occurs when a medicine is prescribed for a patient with a known and documented clinically significant allergy (or ADR) to that medicine or class of medicines |
| Wrong patient | Occurs when a medicine is prescribed for the wrong patient  E.g. the prescriber writes a medication order intended for patient A on the medication chart belonging to patient B |
| **Procedural** | |
| Legal/procedural | Occurs when an aspect related to the prescription does not comply with the law, state or territory regulations/policy, or hospital policy (and has not been assigned as an ‘unclear order’)  E.g. the allergy/ADR information has not been completed; or the strength, dose, route or frequency of an existing handwritten medication order has been altered (such a change legally requires the entire order to be recharted); medicine ordered on wrong section of the medication chart |
| Incomplete order | Occurs when the prescription or medication order does not include all the necessary information i.e. name; strength (if appropriate); formulation (if appropriate); dose; site or route of administration; frequency; the diluent for injectable; duration of time and/or rate of infusion (IV infusions); duration of time (IV fluids) |
| Unclear order | Occurs when the prescription or medication order is unclear or ambiguous  E.g. the writing is illegible; or the order contains additional comments which appear to contradict or conflict with the medication order |

Table 2: Medicine administration errors or incidents and definitions

| Clinical | Definition (including some examples) |
| --- | --- |
| Wrong timing | Time of administration occurs more than 60 minutes after or before documented time on the medication chart  If the medicine is ordered with meals:   * Time of administration occurs more than 30 minutes after or before documented time on the medication chart |
| Wrong IV administration rate | Administration of the IV medicine at a faster rate than that recommended in hospital guidelines or manufacturers’ instruction |
| Wrong dose | The medicine dose prepared or administered is different from that prescribed |
| Wrong formulation | Administration of the correct medicine but in a different formulation from that prescribed |
| Wrong additive, solvent or diluent | Use of an additive, solvent or diluent that was not ordered or correct according to hospital guidelines or manufacturers’ instruction |
| Wrong volume of additive, solvent or diluent | Using a volume of additive, solvent or diluent to prepare an injectable medicine that differs from hospital guidelines or manufacturers’ instructions |
| Wrong route/site | The route or site of administration differs from the prescribed route or site of administration  E.g. the medicine is administered intrathecal rather than IV |
| Wrong medicine | Administration of a medicine, which was not prescribed for that patient but is similar to the ordered medicine  E.g. a medicine is incorrectly selected or mistaken for the ordered medicine  Note: If a medicine is given that is not ordered for a patient it is an ‘unordered medicine’ |
| Wrong strength | The strength administered is not equivalent to the strength specified in the medication order or in any instructions documented by a pharmacist |
| Wrong patient | Occurs when a medicine is prescribed for one patient and given to another patient  E.g. a medicine intended for patient A is administered to patient B (procedurally a ‘failure to check patient identification’) |
| Omitted dose | A dose of a prescribed medicine is not administered |
| Extra dose given | The administration of an additional dose of a prescribed medicine |
| Allergy/ADR | Occurs when a medicine is administered to a patient with a known and documented clinically significant allergy (or ADR) to that medicine or class of medicines |
| Unordered medicine | Medicine is given but not prescribed on the patient’s medication chart (paper-based or electronic) |
| Incompatible additive, solvent or diluent | One medicine administered or mixed with another medicine or solution via the same IV, or same infusion bag, which is not documented to be compatible |

Table 3. Revised Westbrook et al’s classification of medicine adverse events and incidents

| Stage | Error or incident type | |
| --- | --- | --- |
| Clinical | Procedural |
| Prescribing | Duplicated therapy | Legal/procedural |
| Wrong strength | Incomplete order |
| Wrong dose, volume or concentration | Unclear order |
| Wrong rate/frequency |  |
| Wrong route/site |  |
| Wrong medicine/fluid |  |
| Medicine not prescribed |  |
| Medicine interaction |  |
| Not indicated |  |
| Wrong duration |  |
| Wrong timing |  |
| Wrong formulation |  |
| Inadequate monitoring |  |
| Allergy/ADR |  |
| Wrong patient |  |
| Administration | Wrong timing | Failure to read medication label |
| Wrong IV administration rate | Failure to check patient identification |
| Wrong dose | Failure to store a medicine in a secure environment at all times |
| Wrong formulation | Failure to record medicine administration on medication chart |
| Wrong additive, solvent or diluent | Failure to use aseptic technique |
| Wrong volume of additive, solvent or diluent | Failure to check pulse/blood pressure before administration (when applicable) |
| Wrong route/site | Failure to check blood glucose level prior to administering insulin |
| Wrong medicine | Failure to follow procedures for IV administration and ‘accountable/recordable drugs’ (Failure of 2 nurses to check preparation, witness administration, check infusion pump settings, sign accountable/recordable drug register or sign medication chart) |
| Wrong strength | Failure to apply appropriate techniques for administration of a medicine (administering an IV medicine too quickly and not according to hospital guidelines or manufacturers’ instructions causing extravasation at injection site; modified release tablet is crushed and administered) |
| Wrong patient | Failure to check if a medicine is expired before administration |
| Omitted dose | Failure to apply labelling according to national, local or hospital procedures  E.g. subcutaneous label affixed to medicine/fluid |
| Extra dose given |  |
| Unordered medicine |  |
| Allergy/ADR |  |
| Incompatible additive, solvent or diluent |  |

## References

1. Westbrook JI, Reckmann M, Li L, Runciman WB, Burke R, Lo C, Baysari MT, Braithwaite J, Day RO. Effects of two commercial electronic prescribing systems on prescribing error rates in hospital in-patients: a before and after study. PLoS Med 2012;9(1):e1001164.
2. Westbrook JI, Woods A, Rob MI, Dunsmuir WT, Day RO. Association of interruptions with an increased risk and severity of medication administration errors. Arch Intern Med 2010;170(8):683–90.
3. Victorian Therapeutics Advisory Group. Victorian Medication Incident Taxonomy. Melbourne. 2018.

## Questions?

For more information, please visit: [safetyandquality.gov.au/electronic-medication-management](https://www.safetyandquality.gov.au/electronic-medication-management)

You can also contact the eHealth and Medication Safety team at: [mail@safetyandquality.gov.au](mailto:mail@safetyandquality.gov.au)

[safetyandquality.gov.au](http://www.safetyandquality.gov.au)

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