Critical Missed Doses: Education and Audit Package

Linda Graudins, Senior Pharmacist, Medication Safety, Alfred Health on behalf of the Missed Meds Working Group
June 2013
Background

- Dose omissions can contribute to patient harm
- Rapid Response Report NPSA 2010: Reducing harm from omitted and delayed medicines in hospital
  - Second largest contributor to reported medication incidents
- Dose omissions are often *preventable*
  - 38% unavailable
  - 19% no recorded reason for dose omission

1. Barker K et al. Medication errors observed in 36 healthcare facilities. Arch Int Med 2002
Recent Australian interest

MissedMeds Project Overview

- VicTAG funding request granted
- Project steering group formed
- Several iterations of audit tool + instructions
- Final audit

Outcomes
1. Audit tool
2. Critical medication list
3. Educational package (Powerpoint + User Guide)
VicTAGQUM project steering group

The Alfred: Linda Graudins, Senior Pharmacist, Medication Safety Project Officer: Cathy Ingram, Senior Ward-based Pharmacy Technician; Timothy Bayles, Clinical Pharmacist

Caulfield Hospital:
Joanne Canty, Nurse Unit Manager; Tim O’Shea, Senior Pharmacist

Eastern Health:
Melita Van de Vreede, Associate Director Pharmacy (QUM)

Peninsula Health:
Jan–Marie deClifford, Senior Pharmacist, Med Safety

Monash (Southern) Health:
Wendy Ewing, Senior Pharmacist QUM; Brodie Smith, Pharmacist QUM
By definition errors are preventable

1. Medication “not available”
   - After-hours
   - Route not available, IV tissued
   - Formulation not available

2. Documentation
   - Administered? forgot to sign
   - Standard NIMC codes not used? poor documentation ✓ W/H ?
   - Not administered? wrong times entered
MissedMeds Project Aim:

Develop and test an audit tool which hospitals/wards/units can use to determine the rate of preventable missed dose incidents

1. Patients
   ■ Decrease harm events from missing *critical* meds

2. Staff
   ■ Decrease time wasted clarifying poor documentation
   ■ Promote correct NIMC codes
   ■ Prioritise critical medication supply and administration
**What are critical medications?**

<table>
<thead>
<tr>
<th>Medication type</th>
<th>Specific examples</th>
<th>Possible Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulants</td>
<td>heparin, warfarin, enoxaparin</td>
<td>Deep vein thrombosis, pulmonary embolism</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>diazepam, phenytoin</td>
<td>Seizure activity, especially if omitted peri-operatively</td>
</tr>
<tr>
<td>Antidotes</td>
<td>naloxone, digoxin-specific antibody, <em>Resonium</em>, protamine, folinic acid</td>
<td>Toxicity, overdose related events</td>
</tr>
<tr>
<td>Usually STAT order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimicrobials</td>
<td>intravenous antibiotics, antivirals, antifungals</td>
<td>Sepsis, prolonged infection</td>
</tr>
<tr>
<td>Intravenous and oral Corticosteroids</td>
<td>prednisolone, cortisone</td>
<td>Acute asthma attack, delayed symptom control</td>
</tr>
<tr>
<td>Clozapine</td>
<td>clozapine</td>
<td>Re-titration, recurrence of symptoms</td>
</tr>
<tr>
<td>Cytotoxics</td>
<td>methotrexate weekly, cyclophosphamide, etoposide, thalidomide</td>
<td>Incomplete remission, prolong hospital stay to finish course. Symptom exacerbation</td>
</tr>
<tr>
<td>Hypoglycaemic agents</td>
<td>insulin, immediate release sulfonylurea, e.g. glibenclamide</td>
<td>Ketoacidosis, hyperglycaemia</td>
</tr>
<tr>
<td>Immunosuppressant</td>
<td>cyclosporine, tacrolimus</td>
<td>Transplant rejection, exacerbation symptoms</td>
</tr>
<tr>
<td>Anti-parkinsons medications</td>
<td>levodopa combinations, bromocriptine, cabergoline</td>
<td>Exacerbation of symptoms, rigidity, falls</td>
</tr>
</tbody>
</table>

*Adapted from National Patient Safety Agency (NPSA) 2010: “Safety in doses: improving the use of medicines in the NHS”*
Audit tool

<table>
<thead>
<tr>
<th>Patients admitted &gt; 24 hours (EXCLUDE first 24 hrs of admission)</th>
<th>Medines prescribed on regular, variable (including warfarin), once only &amp; telephone sections of drug chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient identifier</td>
<td>Medicine prescribed as</td>
</tr>
<tr>
<td></td>
<td>Missed doses of Critical Medicines</td>
</tr>
<tr>
<td></td>
<td>Medicine listed on Critical list Y/N</td>
</tr>
<tr>
<td></td>
<td>Amounts off critical for this patient Y/N</td>
</tr>
<tr>
<td></td>
<td>Medicine name</td>
</tr>
<tr>
<td></td>
<td>Dose missed</td>
</tr>
<tr>
<td></td>
<td>Prescribed mode</td>
</tr>
<tr>
<td></td>
<td>Time (D) Day (E) Night (N)</td>
</tr>
<tr>
<td></td>
<td>Type of order</td>
</tr>
<tr>
<td></td>
<td>Regular</td>
</tr>
<tr>
<td></td>
<td>Variaes</td>
</tr>
<tr>
<td></td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td>Warfarin</td>
</tr>
</tbody>
</table>

Comments / Patient outcome as a result of missed critical medicine.

VictorianTAG Quality Use of Medicines
Hospital Audit

Aim: To test the audit tool

- 11 hospitals
- 17,361 doses audited
- 321 patients
  - 55% medical,
  - 36% surgical,
  - 9% paediatric
- 749 preventable missed doses
  - 4.3% (1.2 - 13.6%)
Preventable missed doses

- 17,361 doses
- 749 missed in error
  - Not available: 0.9% (0.3 to 4.3%)
  - Unclear documentation: 3.8% (0.5 to 9.2%)

- 749 missed in error
  - ‘Critical’ doses: 22.4% (1 to 60%)
Critical case 2:

Missed IV antibiotic

30 year old patient admitted with extensive burns.
- Ordered stat dose of IV vancomycin, ....not administered
- METcall was made as he became hypotensive, febrile

Factors
- Order not communicated to nursing
- Stat order not seen
Critical case 4: Missed steroid doses

A 65 year old female was admitted for surgery after a fall, with steroid-dependent adrenal disease

- *nil by mouth* pre-operation
- two cortisone doses were omitted.
- cortisol level 51 (100-540 nmol/L)

Factors

- NBM- medication plan should be clearly stated
- Medication “not available”
Consider interventions

1. System to check medications are given during nursing shift
   - Check stat orders - were they given?
2. Guideline for peri-op fasting
3. Systems
   - prioritise critical meds ordering, dispensing
   - medications availability after hours
   - store & transfer of patient own medications
e.g. red/green bag system
<table>
<thead>
<tr>
<th>Hospital</th>
<th>Audit</th>
<th>Comments re educational package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern</td>
<td>Intend to re-audit</td>
<td>Educational package suggest short DVD that managers can watch in their own time via Learning Management System.</td>
</tr>
<tr>
<td>Cabrini</td>
<td>Re-audited in 2013</td>
<td>Will use the educational package when finalised.</td>
</tr>
<tr>
<td>Caulfield</td>
<td>Will audit regularly</td>
<td>Educational package a great resource – will use when available.</td>
</tr>
<tr>
<td>Melbourne</td>
<td>Annual audit*</td>
<td>Educational power point would be great for inclusion as part of our Medication Error prevention Program.</td>
</tr>
<tr>
<td>Peninsula</td>
<td>*Only if electronic as we use an electronic prescribing system</td>
<td>Very interested in the education package as omitted doses are a frequently reported medication incident at our organisation. Educational materials will be great to raise awareness.</td>
</tr>
<tr>
<td>Wimmera</td>
<td>*We believe it is a valuable resource and will use the audit again. eg. monthly conducted by nursing staff.</td>
<td>Educational package a great resource – will use when available.</td>
</tr>
<tr>
<td>Austin</td>
<td>*Need to re-consider tools in light of electronic meds management system but the principles remain valid</td>
<td>Educational package needs to include examples from electronic meds management systems.</td>
</tr>
</tbody>
</table>
Prescribing Matters
This newsletter provides feedback and sends reminders to prescribers about issues raised in incidents, film rounds and audits.
It supplements Medication Matters with a focus on safe prescribing.

Ensure CRITICAL DOSES are not missed

Missing a dose of a critical medication may lead to patient harm and can be avoided

Safe prescribing
Prescribers can help decrease the risk of missing critical medications:
1. After prescribing the medication frequency, write medication administration times
2. Communicate stat orders to nursing staff
3. For peri-operative patients clarify when medications should be administered
   - If the oral route cannot be used, indicate the route of administration

What are critical medications?

<table>
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<tr>
<th>Missing doses of</th>
<th>Possible outcome</th>
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<th>Possible outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticonvulsants</td>
<td>Seizure</td>
<td>Corticosteroids</td>
<td>adrenal insufficiency</td>
</tr>
<tr>
<td>Antiplatelets</td>
<td>Thrombosis</td>
<td>Cytotoxics</td>
<td>delayed response</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Increased overdose toxicity</td>
<td>Hypoglycaemias</td>
<td>high blood sugar levels</td>
</tr>
<tr>
<td>IV antibiotics</td>
<td>Increased duration of symptoms</td>
<td>Immunosuppressants</td>
<td>delayed engraftment</td>
</tr>
<tr>
<td>Clozapine</td>
<td>Re-iteration of dose</td>
<td>Antiparkinson agents</td>
<td>difficulty in breathing</td>
</tr>
</tbody>
</table>

Incidents that could have been avoided

| Stat dose Vitmain K missed...patient with high INR. Ensure the patient’s nurse is aware of stat doses, to prioritise administration and ensure availability. |

http://www.npsa.nhs.uk/practice/securehtml/46720
How useful is this newsletter? Your feedback is appreciated.
Medication Safety Committee, Alfred Health Phone: (03) 9076 3305
New NIMC code?

✓ = dose administration unclear

- A "Tick" is a non-approved code, however can it be classified as a missed dose? It had definitely been given on confirmation with the nurse who had done it. For this audit, I considered a "tick" to be a non-approved code and therefore an "unintentional missed dose."

- New medication chart written for patient but old chart not ceased. Both charts were active. Mane meds on new chart signed as given, mane meds on old chart ticked. Patient reports being given lithium dose twice. (2x500mg)…. no noted symptoms of lithium toxicity (Riskman)

- ACQHC considering new NIMC code [G] for Given for 2014 NIMC update
Using the Education and Audit Package

1. Decrease patient harm
   - missed critical doses may result in patient harm and should be identified and minimised.

2. Audit and feedback of data helps target interventions
   - decrease the rate of incidents related to missed doses
   - audit meets criteria for the National Accreditation Standard 4; Medication Safety

3. Facilitates feedback, education to staff about critical medications
Wish list

1. Availability state-wide, nationally
2. Electronic Audit tool + spreadsheet to enable trending of data
3. Staff education package e.g. *Moodle* or similar
   - Use pre/post audit
   - Use after critical missed med incidents

*Thank you!*