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Supporting Information

Supplementary methods and results

Appendix to: Walker K, Harding AM, Tran J, et al. Medication not accounted for in hospital electronic medication administration records: a retrospective observational study. *Med J Aust* 2022; doi: 10.5694/mja2.51370.

Table 1. Data clean-up rules: master list

Phenoxymethylpenicillin 250mg capsules

- This medication was not routinely stocked on imprest
- The few wards (typically only ED) that stocked this medication only stocked the 250mg preparation; therefore, assumed 2 x 250mg doses were administered for 500mg doses
- Low moving item as not commonly prescribed or used

Benzylpenicillin 1.2g vials

- For wards that did NOT stock 600mg vials on imprest, assumed 600mg doses and <600mg doses were administered via 1 x 1.2g vials and the remaining vial was discarded
- For wards WITH 600mg vials, assumed all 600mg and <600mg were administered via 600mg vials (0 x 1.2g vials)
- For wards the did NOT stock 600mg vials, assumed 1.8g doses were administered via 2 x 1.2g vials and the remaining vial was discarded
- For wards WITH 600mg vials, assumed 1.8g doses were administered via 1 x 1.2g vial + 1 x 600mg vial to minimise wastage. Some of these administrations would have been administered by 3 x 600mg vials.
- One hospital assumed 1.8g doses were administered via 3 x 600mg vials rather than 1.2g vials

Cefalexin 500mg capsules

- Removed all 250mg doses as unable to halve a 500mg capsule
- Removed all liquid preparations and intravenous (IV) administrations
- Wards did not stock 1g capsules; therefore, assumed all 1g doses were administered by 2 x 500mg capsules

Ceftriaxone 1g vials

- Not all hospital wards routinely stock this medication on imprest; therefore, the medication would have been dispensed directly from pharmacy or borrowed from another ward prior to administration
- For doses <1g, assumed 1 x 1g vial was administered and the remaining vial was discarded
- For 2g doses, assumed 2 x 1g vails were administered as ward do not routinely stock 2g vials on imprest

Amoxicillin 500mg capsules

- Removed all 250mg doses as unable to halve a 500mg capsule
- Removed all liquid preparations and IV administrations
- None of the wards routinely stock 1g amoxicillin tablets/capsules; therefore, assumed all 1g doses were administered via 2 x 500mg capsules

Ampicillin 1g vials

- Two hospitals did not stock this medication on imprest; amoxicillin 1g vials are used preferentially. Thus, unable to compare results of these hospitals
- For 2g doses, assumed 2 x 1g vials were administered
- For doses <1g, assumed 1 x 1g vials was administered and the remaining was discarded

Ondansetron 4mg orally disintegrating tables (ODTs)/wafer/non-soluble tablets

- Assumed that orally disintegrating tablets (ODTs), non-soluble tablets and wafers are used interchangeably on the wards
- Removed all doses that could not have been administered via halving/quartering a 4mg tablet
- For all wards that did NOT stock 8mg preparations on imprest, assumed 8mg doses were administered via 2 x 4mg ODTs/wafers/non-soluble tablets
- For wards that DID stock 8mg preparations on imprest, assumed 8mg doses were administered via 1 x 8mg ODT/wafer/non-soluble tablet (0 x 4mg preparation)
- 1mg, 2mg, 3mg and 5mg doses, assumed that a 4mg ODT/non-soluble tablet was halved/quartered and the remaining tablet was discarded

Ondansetron 4mg/2ml vials

- For all wards that did NOT stock 8mg vials on imprest, assumed 8mg doses were administered via 2 x 4mg vials
- For wards that DID stock 8mg vials on imprest, assumed 8mg doses were administered via 1 x 8mg vial (0 x 4mg vial)
- For doses <4mg, assumed 1 x 4mg vial was administered and the remaining vial was discarded

Metoclopramide 10mg tablets

- For doses <10mg, assumed a 10mg tablet was halved/quartered and the remaining tablet was discarded
- For 20mg doses, assumed 2 x 10mg tablets were administered

Metoclopramide 10mg/2ml vials

- For doses <10mg, assumed 1 x 10mg vial was administered and the remaining vial was discarded
- For 20mg doses, assumed 2 x 10mg ampoules were administered

Pantoprazole 40mg tablets

- Removed all sachets
- For wards that did NOT stock 40mg tablets, assumed 40mg doses were administered via 2 x 20mg tablets (0 x 40mg tablets). For 80mg doses on these wards, assumed 4 x 20mg tablets were administered
- Unable to halve a 40mg tablet as they are enteric coated. Thus, assumed all 20mg doses were administered via 0 x 40mg tablets
- For wards WITH 40mg tablets, assumed 80mg doses were administered via 2 x 40mg tablets

Pantoprazole 40mg vials

- Not all hospital wards stock this medication; therefore, this medication for those wards was either borrowed from other wards of dispensed directly from pharmacy
- For 20mg doses, assumed 1 x 40mg vial was administered and the remaining was discarded
- For 80mg doses, assumed 2 x 40mg vials were administered

Temazepam 10mg

- For 5mg doses, assumed 1 x 10mg tablet was halved and the remaining tablet was discarded
- For 20mg doses, assumed 2 x 10mg tablets were administered

Diazepam 5mg tablets

- Removed all rectal administrations (not many)
- For 2mg and 4mg doses at one hospital, assumed 2mg tablets were administered as it would be too difficult to break a 5mg tablet
- For all 2.5mg doses, assumed 1 x 5mg tablet was administered and the remaining half was discarded
- For 10mg, 15mg and 20mg doses (not many), assumed multiple 5mg tablets were administered given that all of the wards only have 5mg tablets available on imprest (including ED)

Diazepam 10mg/2ml vial

- Low moving item; therefore, results are less reflective of the 'true' discrepancy rate
- Not commonly stocked on hospital wards (mostly in ED); therefore, was either borrowed or dispensed directly from pharmacy prior to administration
- For doses <10mg, assumed that 1 x vial was administered and the remaining vial was discarded

Paracetamol 500mg tablets (non-soluble and effervescent)

- Combined that data for effervescent and non-soluble tablets as these are likely used interchangeably
- Removed all suppositories, oral solutions, and IV injections
- For 125mg, 250mg, 375mg, 500mg, 750mg and 1000mg doses assumed 1-2 x 500mg tablets were administered and remaining tablet (if any) was discarded
- Doses that could not be administered via quartering/halving a 500mg tablet were assumed to be given via a liquid solution

Paracetamol 665mg tablets

- One hospital did not stock this medication
- Unable to halve this medication as it is modified release
- For 1330mg doses, assumed 2 x 665mg tablets were administered

Paracetamol-codeine 500mg-30mg tablets

- For 0.5 tablet doses, assumed 1 x tablet was administered and the remaining tablet was discarded
- 1 tab = 1 tablet administered; 2 tabs = 2 tablets administered
- Some patients in ED were prescribed a 'box' of paracetamol-codeine 500mg-30mg (not common). If a 'box' was ordered, then assumed 10 x tablets were supplied to the patient, likely on discharged. It's uncertain whether this medication would have come from the main ED imprest, the after-hours units or discharge prescription cupboard

Oxycodone immediate release (IR) 5mg

- Removed all liquid oxycodone administrations
- Some hospital wards have 10mg IR capsules on imprest. Therefore, for doses on these wards that were multiples of 10mg (e.g. 10, 20, etc), assumed they were administered using 10mg capsules. For all doses ending in a 5 (e.g. 5, 15, 25, etc), assumed 1 x 5mg IR tablet was administered as unable to halve a capsule.
- It is possible that some 10mg doses would have been administered via 2 x 5mg tablets and some 15mg doses via 3 x 5mg tablets, however, it's impossible to differentiate these scenarios retrospectively
- For hospital wards that did NOT have 10mg capsules, assumed that all doses were administered via 5mg tablets e.g. 10mg via 2 x 5mg tablets, 15mg via 3 x 5mg tablets, etc
- For 2.5mg doses, assumed 1 x 5mg tablet was halved and the remaining medication was discarded
- Historically, at one hospital, the half tablet was retained due to legal requirements until the legislation changed (2017) allowing nurses to 'destroy' part oral doses. The negative discrepancy rate is likely explained by the previous practice of keeping all half tablets. It will be difficult to retrospectively know how many half tablets were kept and how many were destroyed during the study period. Thus, our figures for this medication are likely to be inaccurate.

Table 2. Overall discrepancies of the medication examined – all sites combined.

Medication, medication unit	Units supplied	Units administered	Discrepancy	Discrepancy (95% CI)
Antibiotics				
Phenoxymethylpenicillin, 250 mg capsule	410	54	356	**86.8% (83.1, 89.9%)**
Benzylpenicillin,1.2 g injection	18,577	17,934	643	**3.5% (3.2, 3.7%)**
Cefalexin, 500 mg capsule	21,508	14,711	6,797	**31.6% (31.0, 32.2%)**
Ceftriaxone, 1 g vial	29,802	26,696	3,106	**10.4% (10.1, 10.8%)**
Amoxicillin, 500 mg capsule	29,404	21,282	8,122	**27.6% (27.1, 28.1%)**
Ampicillin, 1 g vial	9,627	9,131	496	**5.2% (4.7, 5.6%)**
Amoxicillin/clavulanate, 500 mg/125 mg tablet	2,579	1,967	612	**23.7% (22.1, 25.4%)**
Gastrointestinal medications				
Ondansetron, 4 mg tablet	63,164	29,520	33,644	**53.3% (52.9, 53.7%)**
Ondansetron, 4 mg ampoule	25,956	21,362	4,594	**17.7% (17.2, 18.2%)**
Metoclopramide, 10 mg tablet	20,000	14,366	5,634	**28.2% (27.6, 28.8%)**
Metoclopramide, 10 mg ampoule	11,981	10,801	1,180	**9.9% (9.3, 10.4%)**
Pantoprazole, 40 mg tablet	48,150	37,893	10,257	**21.3% (20.9, 21.7%)**
Pantoprazole, 40 mg vial	16,019	14,358	1,661	**10.4% (9.9, 10.9%)**
Benzodiazepines				
Temazepam, 10 mg tablet	12,453	7,564	4,889	**39.3% (38.4, 40.1%)**
Diazepam, 5 mg tablet	34,002	30,596	3,406	**10.0% (9.7, 10.3%)**
Diazepam, 10 mg ampoule	216	263	-47	**-21.8% (-16.6, -28.0%)**
Analgesics				
Paracetamol, 500 mg tablet	758,834	603,682	155,152	**20.5% (20.4, 20.5%)**
Paracetamol, 665 mg tablet	63,840	56,782	7,058	**11.1% (10.8, 11.3%)**
Paracetamol/codeine, 500 mg/30 mg tablet	13,967	12,782	1,185	**8.5% (8.0, 9.0%)**
Oxycodone, 5 mg tablet	172,487	161,841	10,646	**6.2% (6.1, 6.3%)**
All medications	1,352,976	1,093,585	259,391	**19.2% (19.0, 19.4%)**

CI = confidence interval.