Safety of medication administration in the home: Should we double check?

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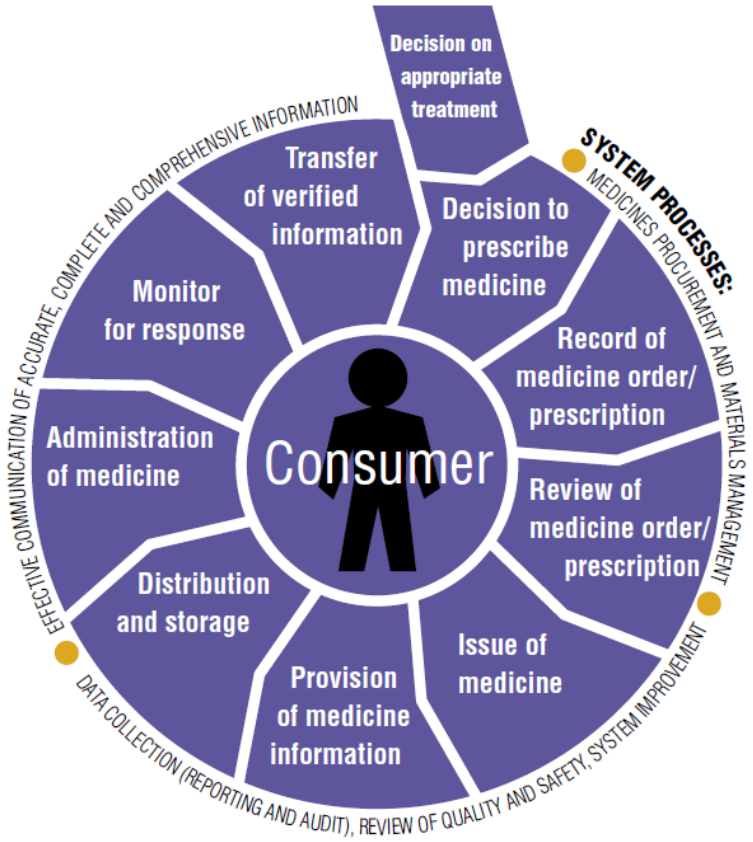
Presentation Overview

- The problem
  - Medication errors
  - Home care
- A solution?
- Accuracy and feasibility study
- Plans for the future

Medication Errors: The facts

- Most common type of error to occur
- Potentially serious and harmful consequences.
- Over 1.5 million Australians experience an adverse effect from medications each year costing ~ $660 million
- 2-3% of all admissions have an adverse medication event
- Paediatrics has a high error rate reported globally
  - 3 x times more likely to result in harm
- International gold standard- Double check

Medication management cycle

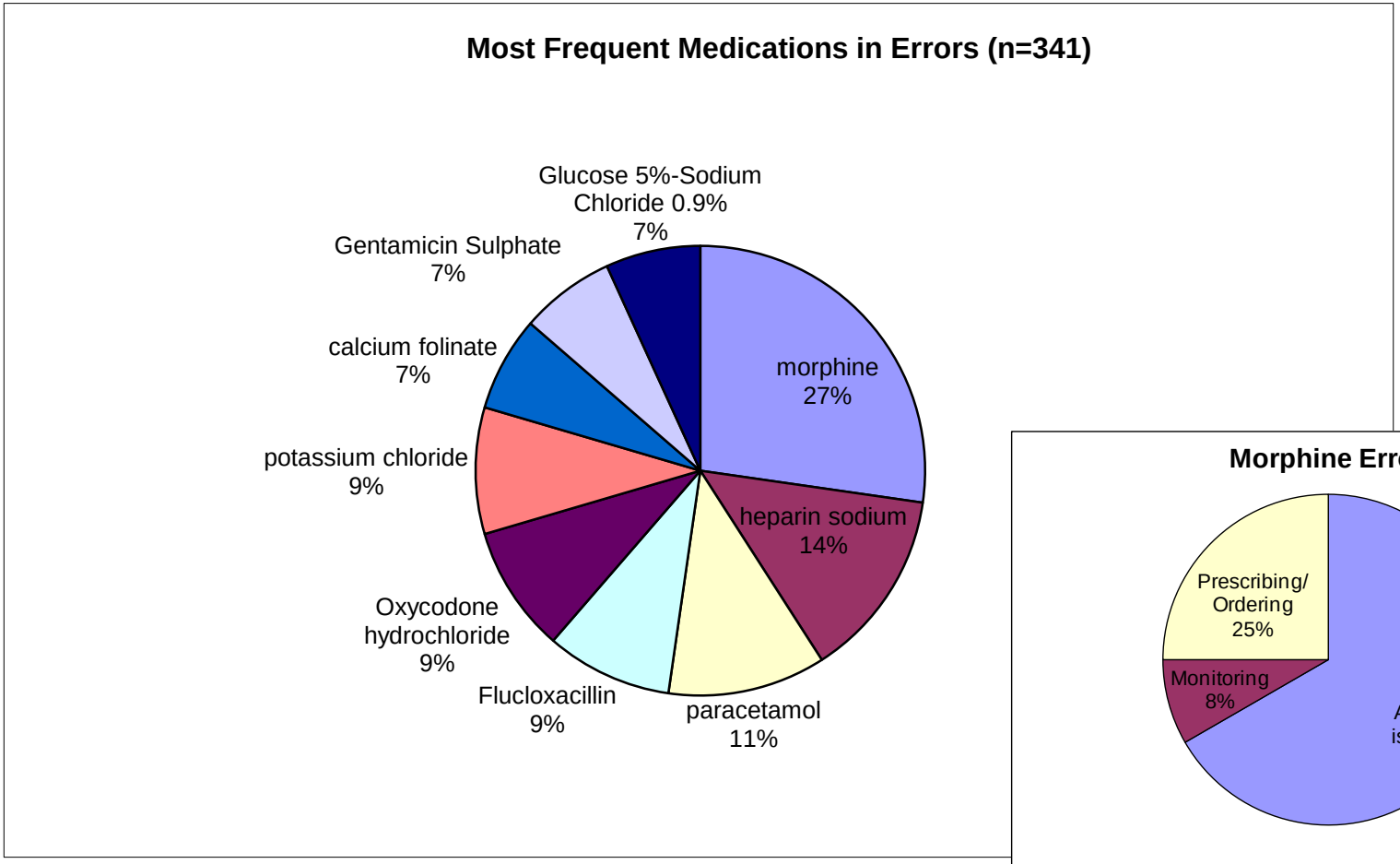


- A medication order requires interpretation by many individuals.
- Each step in the medication management cycle an opportunity for error.
- Different members of the medication management team rely on other team members to detect errors and avert patient harm.

The nurse is the last line of defence before an error reaches a patient- most administration errors are preventable

Source: National Safety and Quality Health Service Standards

Inpatient medication errors



Source: Nursing Education RCH, Medication management committee 2012

Home care

- Care provision by clinicians in a patient's home as an alternative to care in a hospital setting
- Increasing pressure to provide home care
- Little documented evidence of medication errors
- No ability to perform double check
- Potential for even greater error?

RCH experience

- Nursing team contracted to provide home services with RCH
- Medication preparation outsourced to pharmaceutical company
- Experienced nurses caring for complex patient groups
  - Home ventilation
  - Home intravenous therapy
- Medication error - 10 x dose given IV

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- Established program of home telehealth in oncology and palliative care

Study Aim

Home care must provide the same standard of care as hospital- gold standard of double check

- To assess the feasibility and efficacy of using Internet-based video communication for medication double-checks

Research question

- In children who are receiving home based care, can mobile Internet video communication be used to improve the safety of medication administration?

  - Accuracy study- published ✓
  - Feasibility/ Activity- ✓
  - Costs

Bradford N, Armfield NR, Young J, Smith AC. Feasibility and accuracy of medication checks via Internet video. *Journal of telemedicine and telecare. 2012.*

Literature review

- Evidence of technology to assist dispensing/calculation
- Videoconferencing to ensure compliance
- No reports of using video to double check

Methods

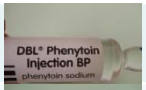
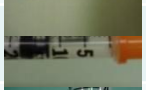
- Stage 1
  - Feasibility/ Accuracy of reading medication item via web camera
  - different web cameras tested
  - Integrated web camera designed to focus within closer range
  - Used for Stage 2

Methods Continued

- Stage 2
  - Volunteers (n=10) recruited
  - 30 different medication items
  - Asked to sequentially record details
  - Repeated “face to vial” on different occasion >7 days

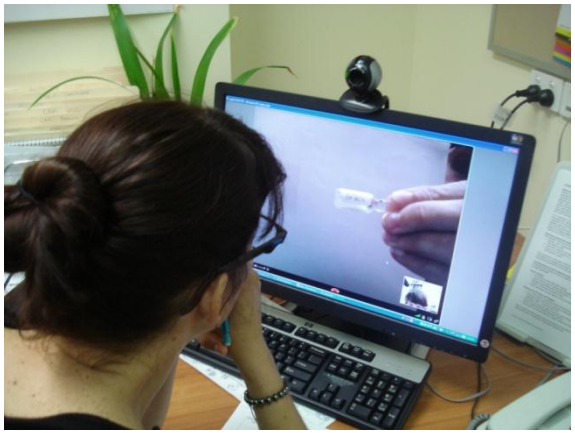
Results- Stage 2

- 300 Items
- 100% accuracy drug name/dose/ amount in syringe >1ml
- Unit Syringe 70% accuracy
- Expiry dates most challenging

Item checked	Example	Number of observations	Video check – n (%) Correct	FTV n (%) Correct
Printed drug dose/name (glass ampoule, bottle)		60	60 (100%)	60 (100%)
Printed expiry date (glass)		40	37(93%)	40 (100%)
Plastic vial name		50	50 (100%)	50 (100%)
Plastic Vial embossed expiry		40	25 (63%)	40 (100%)
Drug name/ dose tablet silver backing		20	17 (85%)	20 (100%)
Embossed expiry tablet		20	17 (85%)	20 (100%)
Syringe contents (unit)		10	7 (70%)	10 (100%)
Syringe contents (> 1ml)		20	20 (100%)	20 (100%)
Intravenous fluid bag		40	40 (100%)	40 (100%)
TOTAL		**300**	**273 (91%)**	**300 (100%)**

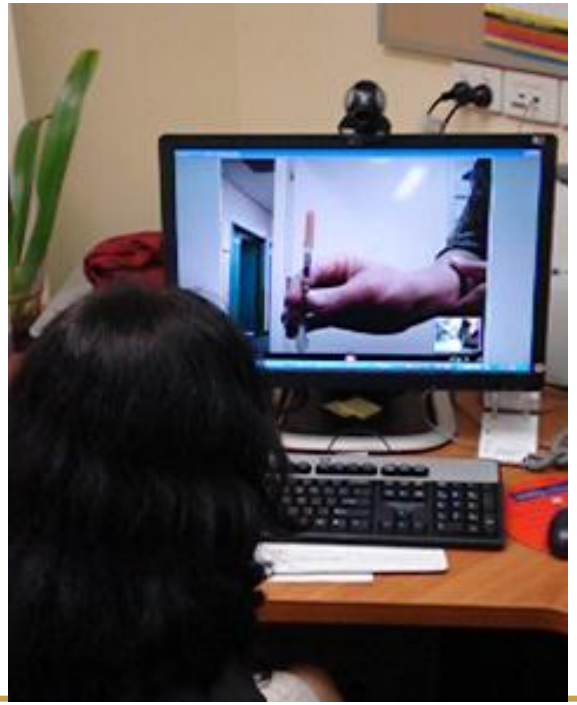
Results- Stage 2 continued

- Mean overall accuracy was 91% for all items,
- Confirming efficacy of webcam and real-time Internet video for checking medication items.
- Comparator group-
  - Face to vial (FTV): 100% accuracy



Stage 3: Feasibility

- Observational study- safety
- Laptop computers and mobile Internet
- Observations of various aspects of clinical care
- Data collected on each video link
  - Items checked, confidence ratings,
  - potential to prevent travel
  - Prevent need for outsourcing medication preparation

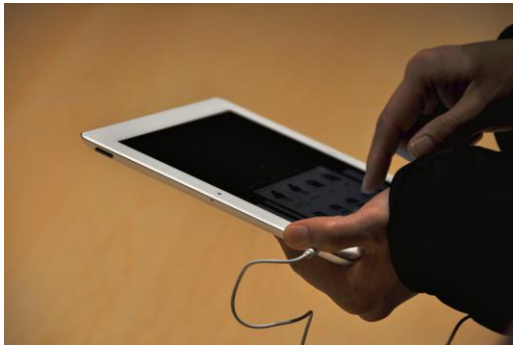


Results- Stage 3

- Laptops not successful
  - Technology, bulky
  - Used on only 6 occasions over 3 months

- Tablets/Ipads
  - Popular with nurses
  - Added convenience of apps for drug calculation, navigation

- Used successfully daily (n=76)
  - Medication checks
  - Wound care
  - Ventilator settings

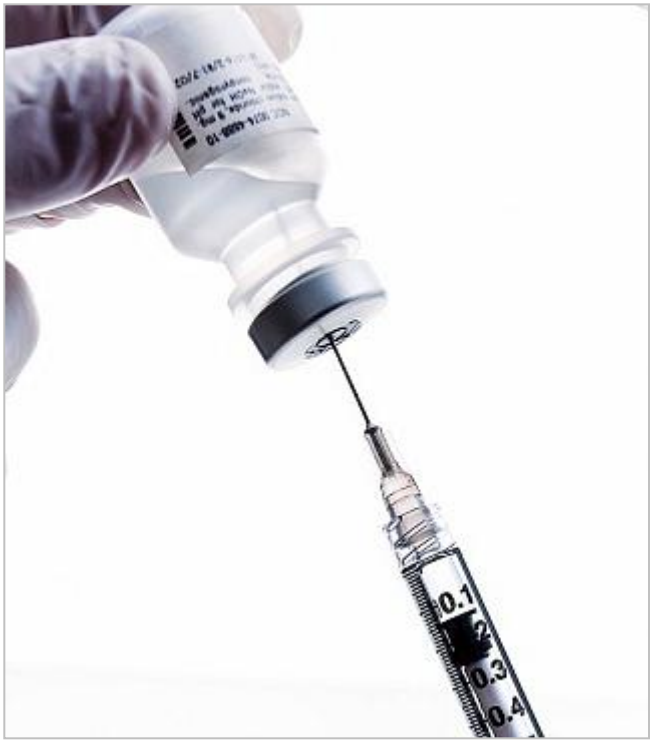


Challenges

- Lighting
- Internet connection
- Expiry dates

Future Potential

- Current practice to outsource medication preparation
- Results in delayed discharge
- Internet video in home check potential to reduce time and costs and improve safety



Conclusion

- Medication errors potentially dangerous or fatal mistakes
- Most common type of error to occur in hospital facilities
- Prudent to assume errors will occur in community based care
- Technology may have a useful role to play in processes to ensure the safe use of medications in home care
- Identified limitations
- Demonstrated feasibility and efficacy

Thank you and acknowledgements

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