



Technology innovation in
medication: what works and
what doesn't

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Who am I/why am I here

- Quality Use of Medicines for 11 years
- project based – error review/quality improvement
- not rocket science
- project implementation the focus
- best idea may not be sustainable once project officer finished
- sustainability is the goal

Sustainable change/improvement

- building relationships
- finding clinical champions
- change leaders/early adopters
- many wins/ some failures
- learnt most from my mistakes
- “ stumbled upon” human factors
- JP Kotter : 8 easy steps to change

How to make change sustainable

Forcing functions & constraints
“making it easy to do the right thing”



Automation & computerisation



Standardisation & protocols



Checklists & double check systems



Rules & policies



Education & Information

Ref: To Err is Human

Acknowledgement: NSWTAG



Hierarchy of Effectiveness

Remove the risk



Install safety device



Prompts & Checklists



Administrative controls, eg policies



Education



Accept the risk

- Remove KCl amps
- Oral dispensers not compatible w. IV line
- Warfarin prescribing box on med chart
- Policy or guideline
- Education session

Ref: Hierarchy of Effectiveness

Relation to Human Factors

If the risk can not be removed/ no forcing function

- automation/computerisation
- safety device/ alerts / checklists

Then

- education
- audit and feedback
- culture change
- longer time to sustainability/may never reach there

Human factors

- does it really close the loop?
- are there no workarounds?
- technology often feels like it takes longer – much quicker to scribble a prescription by hand rather than via a computer
- staff may not understand the rationale for the forcing function
- staff will “think of a way” if they can

Human factors

Cannot over emphasize

- engage all stakeholders in the principles
- include all stakeholders in development of process and details
- education always required
- audit and feedback – congratulate successes, listen to issues
- personal communication vital

Technology and sustainability with medication

- mandatory field to be completed before process can be finalised
 - ADR/allergy entry mandatory before prescribing
 - decision support to check patient has no ADR to drug prescribed
 - mandatory scanning a to check correct drug when pharmacists dispense
 - barcoding of drug/ patient/ medication chart to prevent administration errors

Technology innovation in Medication

Major benefits for medication safety/ error prevention

Not as easy to design and implement as some think

- electronic prescribing - HealthSMART
- barcoding/scanning- closing the loop
- electronic decision support- Guidance MS
- 'Smart Pumps' – medication safety software

Electronic prescribing

- Victoria - 4 organisations have 'Release 1B/2A' of HealthSMART – discharge prescribing
- working towards release 2C - inpatient prescribing and E- MAR (medication administration record)
- complex meds, infusions?
- implementation requires use of human factors principles as any other change
- other systems at other hospitals/ other states

Electronic Prescribing (contd)

- Basic safety principle is standardisation
 - benefit of different systems at different organisations/ different states ?
 - paper NIMC – Australia wide, why not e- prescribing
- Is it a forcing function?
 - ADR status release 1 – not mandatory
 - default is “ allergies not recorded”
 - if ADR entered as free text/not drop down box decision support not activated
 - initial audit at Eastern post HS – NO IMPROVEMENT

E- prescribing – HealthSMART

- many improvements
 - 50% reduction in clinical interventions by pharmacists (check discharge script against med chart) 18% to 9%
 - NO legibility issues
 - Dr cannot forget dose/ frequency, cannot scribble drug name
- BUT if name scribbled this prompts staff to check
 - study that if name and dose via computer, staff dont check (I Coombes)

E- prescribing (contd)

- extra safety features – duplication checking – to prevent same drug ordered twice
- necessary for analgesia
- do we “turn it on” and risk – “alert fatigue” or turn it off. At present its off.
- drug- drug interaction checking – set at high

E- prescribing – HealthSMART

Other issues

- printer problems
- frustration if system down
- staff using another log-in, then complaining as they cant complete script
- wrong drug form, wrong strength , directions in system, - hydromorphone

E- prescribing - issues

- downtime : paper scripts required
- how will it work with complete system?
- still need checks in place – hospital pharmacist to review, not sent to community pharmacy
- unsuccessful implementation at well known hospital - didnt engage staff, prescribing process too slow - had to withdraw re- start
- another US paed hospital – admission before meds prescribed

Bar coding /scanning

- pharmacist scanning to check dispensing
- close the loop for safe prescribing, administration to the bedside
 - scan drug, order, the patient
 - only foolproof if drug barcode is on each individual tablet/ ampoule/ dose
- workarounds- US experience
 - several patient ID labels by computer – NOT on patient...
 - wrong ID band applied at admission
- no perfect solution yet

Electronic decision support – Guidance MS

- electronic aid to ensure appropriate antimicrobial prescribing
- implementation in Vic in progress
- major safety benefit for all - prevent antimicrobial resistance
- not a forcing function at present- would need to be linked with HealthSMART
- as per hierarchy of effectiveness - require ongoing education, audit and feedback

Smart pumps

- infusion pumps with medication safety software
- “drug library” min and max settings for drug concentrations
- prevents some infusion errors – wrong rate
- issues
 - “opt in” or “opt out”
 - all drugs or some – searchable list, number of characters
 - “soft” or “hard” limits

Smart pumps (contd)

- wireless – reprogramming/ upgrading
- downloadable reports – feedback
- major practice changes required
- several hospitals have implemented, still issues
- not fool proof



Thanks

appreciate the opportunity to promote
understanding of hierarchy, human factors
their relationship to sustainable change

Questions ?