Impact of nursing on patient safety
The case of medication errors

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Outline

• The role of nurses in the medication process
• Why do we have so many medication errors? Understanding the issue
• Effectiveness of different interventions & strategies
• How to change when change is hard
The role of nurses in the medication process

• (a) ordering/prescribing,

• (b) transcribing, verifying, dispensing and delivering

• (c) administering, and

• (d) monitoring and reporting.
The role of nurses in the medication process

• (a) ordering/prescribing,
  – Mainly Doctors, but also APN-nurses
  – Errors related to knowledge, workload, attitude
The role of nurses in the medication process

- (a) ordering/prescribing,
- (b) transcribing, verifying, dispensing and delivering
  - Nurses & pharmacists
The role of nurses in the medication process

• (a) ordering/prescribing,
• (b) transcribing, verifying, dispensing and delivering
• (c) administering, and
  – Mainly nurses
  – 20- 27% errors incl. wrong time errors
  – 7-18% errors excl. Wrong time errors
  – MAEs are most likely to be wrong time, omissions, and wrong dose (wrong or extra dose).

Bates et al. 1995; Pepper 1995; Leape et al. 1995
The role of nurses in the medication process

• (a) ordering/prescribing,
• (b) transcribing, verifying, dispensing and delivering
• (c) administering, and
• (d) monitoring and reporting.

– Major underreporting (10-25%)
– Incident reporting is unreliable (1% reporting compared with direct observation, 1/7 compared with chart review)

Pepper, 1995; Flynn et al. 2002
Summary of main evidence of the problem

- Important role of nurses in medication process
- Time consuming, critical (last person in chain), mainly involved in administration
- High number of medication administration errors (MAE) – high variability
- Mainly wrong time, omissions, and wrong dose
- Highly underreported in voluntary reporting systems
WHY DO WE HAVE SO MANY MEDICATION ERRORS?

UNDERSTANDING THE ISSUE
We can’t change the human condition, but we can change the conditions under which humans work.
Different factors

Latent failures

Active failures

<table>
<thead>
<tr>
<th>SYSTEM FACTORS</th>
<th>PROCESS FACTORS</th>
<th>HUMAN FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Low staffing – high Workload</td>
<td>- Distractions</td>
<td>- Knowledge of medication</td>
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<tr>
<td>- Long shifts, rotating Shifts</td>
<td>- Interruptions</td>
<td>- Mathematical skills</td>
</tr>
<tr>
<td>- Agency/ floating/ Temporary staff</td>
<td>- Double check procedures</td>
<td>- Experience</td>
</tr>
<tr>
<td>- Poor lighting</td>
<td>- Technology (e.g. barcode: BCMA)</td>
<td>- Dyslexia problems</td>
</tr>
<tr>
<td>- Emergency situations</td>
<td>- Communication</td>
<td>- Fatigue</td>
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<tr>
<td>- Patient transfers</td>
<td>- Complexity</td>
<td></td>
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<tr>
<td>- Safety Climate</td>
<td>- Monitoring patients’ Responses to medication</td>
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</table>
Theory of human factors

(J. Reason, 1990)
What do we know about effective interventions?

• Evidence is weak and inconsistent
• Effect of system-focused strategies such as:
  – increasing nurse staffing levels, decreasing workloads, improving the safety climate, instituting policy and procedures such as RN independent double-checks
  – No systematic assessment, lack on evaluation studies
Effect of safety climate on medication errors*

- Quasi-experimental design: 4 Belgium hospitals: 4 control wards, 12 intervention wards
- Intervention:
  - Education (knowledge about medication) and improved prescribing
  - Involvement of patient in medication administration (information)
  - Systematic reporting culture on ADE
- Evaluation ADE by IHI-trigger tool (chart review)**

<table>
<thead>
<tr>
<th>Results</th>
<th>Pre-intervention ADE-rate</th>
<th>Post-intervention ADE-rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>9/259 (3,47%)</td>
<td>6/267 (2,25%)</td>
</tr>
<tr>
<td>Intervention group</td>
<td>18/800 (2,25%)</td>
<td>8/870 (0,92%)</td>
</tr>
<tr>
<td>Relative Risko</td>
<td>0,87 [0,65-1,07]</td>
<td>0,74 [0,42-1,02]</td>
</tr>
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</table>

* Hellings, 2009

** Resar et al. 2003
Process focus

• Process-focused factors include minimizing distractions and interruptions during medication administration, using equipment correctly, and assessing and monitoring the patients’ responses to the medications.

• A few small, single-site studies have assessed the effects of implementing protocols addressing these issues;

• but overall, the evidence is weak.
Few studies on assessing the impact on error rates of bar-coded medication administration and other medication safety technologies.

- Franklin et al. reported a decline in MAE rates from 8.6 percent to 4.4 percent in a teaching hospital in England. The system included BCMA, computerized order entry, automated dispensing, and electronic medication administration record.

Franklin et al., 2007
Human factors

• The human factors of knowledge and skills (e.g., mathematical) have been studied for decades, and changes in basic education and continuing education have been made.

• Studies linking these strategies to outcomes such as the rate of medication errors have not been completed.

• The impact of fatigue on MAEs is currently of great interest, but mainly descriptive studies.
HOW TO CHANGE THINGS WHEN CHANGE IS HARD?
## In general: what works?

<table>
<thead>
<tr>
<th>Most of time effective</th>
<th>Sometimes effective</th>
<th>No or little effect</th>
<th>Effect not known - variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach visits</td>
<td>Audit &amp; feedback</td>
<td>Educational materials</td>
<td>Financial stimuli</td>
</tr>
<tr>
<td>Decision support, reminders</td>
<td>Opinion leaders / champions</td>
<td>Courses, conferences</td>
<td>Administrative / organisational interventions</td>
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<td>Interactive education</td>
<td>Local consensus meetings</td>
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<tr>
<td>Multi-faceted interventions</td>
<td>Patient-oriented interventions</td>
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<td>Mass-media interventions</td>
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</table>

(Grol, Wensing & Eccles, 2005 – review of reviews)
Theory of Planned Behaviour

(Ajzen 1991)
You should look how change/intervention has impact on the behaviour of health professional / nurse

• Normalization process model
• Normalization vs adoption / rejection
• 4 dimensions:
  – Interactional workability: effect on interactions between people and practices
  – Relational integration: relation to existing knowledge and relationships
  – Skill-set workability: effect on current division of labour
  – Contextual integration: relation to the organisation
You should focus your interventions on left and right brain activities
Taking Stairs?

Left brain

Right brain

Left brain
Left (Rider) – right (elephant) brain

DIRECT THE RIDER
2. Find the Bright Spots 27
3. Script the Critical Moves 49
4. Point to the Destination 73

MOTIVATE THE ELEPHANT
5. Find the Feeling 101
6. Shrink the Change 124
7. Grow Your People 149

SHAPE THE PATH
8. Tweak the Environment 179
9. Build Habits 203
10. Rally the Herd 225

Path

Rider

Elephant

switch
How to change things when change is hard
Chip & Dan Heath
NEW YORK TIMES NO. 1 BESTSELLER
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• Heath C, Heath D, Switch: how to change things when change is hard, Crown Business, 2010
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THANK YOU FOR YOUR ATTENTION