

# **Interruptions during Medication Administration: Assessing the Impact of a Set of Interventions**

**Deteriorating Patient Programme  
4<sup>th</sup> November, 2010**



**Eileen Relihan**  
**Contact: [erelihan@stjames.ie](mailto:erelihan@stjames.ie)**

# Background

---

- Interruptions have been identified as a contributory factor to medication errors.
- Evidence that interruptions during medication administration ↑ errors
- Much research quantifying the volume & type of interruptions on medication rounds
- Safety agencies have advocated the use of visual symbols during the medication round
- Limited evaluation of the strategies to address these interruptions.

# **Objective**

---

To assess the value of a set of interventions in reducing the interruption/distracton rate during medication rounds

# Methodology

---

## Study Design

Pre and post-intervention observational study of nurses undertaking medication rounds.

## Pre and Post-Intervention Assessments

- Observation of 32 medication rounds; 16 pre- and 16 post-intervention
- No. & source of interruptions pre- and post-intervention recorded & compared.

# Interventions

---

1. Education
2. Red Aprons
3. Checklist
4. Signage on ward
5. Patient information leaflets



## Before you Begin

1. Advise colleagues that you are beginning the round and to intercept any queries arising.
2. Organise management of the medication keys.
3. Collect all equipment required for medication round - sharps bin, medication cups etc.
4. Advise students accompanying you to reserve questions until the round is fully complete.
5. When ready to begin, put on **Red Apron**.

## During the Round

6. Hang the 'Do not Interrupt' sign on the door of each bay and close the door.
  7. Do not engage in **CONVERSATION** unrelated to medication delivery.
  8. Do not allow **INTERRUPTIONS** during medication round, unless emergency:
    - if interrupted, state: "on medication round at present. Please speak to a colleague."
    - other staff members field phone calls & interruptions for nurses on medication round.
  9. **Focus on ONE patient** at a time:
    - only one kardex at a time, on the drug trolley
    - deliver one patient's medication at a time.
  10. Do not administer medications if:
    - the **ALLERGY** box on the kardex has not been completed.
    - the prescription is **ILLEGIBLE** and /or unclear.
- } Contact the prescriber to amend prescription. If required, escalate the issue to more senior members of the team to ensure doses are not missed.
11. Apply **5 RIGHTS**: right medication, right patient, right dose, right time, right route.
  12. For all medications, verify the **patient ID** by checking the MRN on the kardex against the MRN on the ID band and asking patient to state name and date of birth.
  13. Involve a **2<sup>nd</sup> PERSON** in checking process, for higher risk medications (see table below).
  14. **WITNESS** consumption of medications by patient before signing kardex.

CHECKS REQUIRED*	MEDICATIONS APPLICABLE *
<b>Single Person Administration</b>	<ul style="list-style-type: none"> <li>• Most <b>oral</b> medications (exceptions listed below)</li> <li>• <b>Enoxaparin</b> (Clexane<sup>®</sup>) doses less than or equal to 40mg</li> <li>• <b>Tinzaparin</b> (Innohep<sup>®</sup>) 3,500 or 4,500 units pre-filled syringes</li> </ul>
<b>Double Check Administration</b> <ul style="list-style-type: none"> <li>• Double checking of <b>medication</b> by a 2<sup>nd</sup> person</li> <li>• Both practitioners must sign the kardex</li> </ul>	<ul style="list-style-type: none"> <li>• <b>IM injections</b></li> <li>• <b>IV &amp; SC</b> medication <u>not</u> requiring pump administration</li> <li>• <b>Warfarin</b></li> <li>• Medications involving <b>calculations</b></li> <li>• <b>Weight-related</b> drug doses</li> </ul>
<b>Two-Person Administration</b> <ul style="list-style-type: none"> <li>• Double checking of both <b>medication &amp; patient ID</b> by a 2<sup>nd</sup> person.</li> <li>• <b>Administration witnessed</b> by 2<sup>nd</sup> person</li> <li>• Both practitioners must sign the kardex</li> </ul>	<ul style="list-style-type: none"> <li>• Medications <b>requiring pump</b> administration</li> <li>• <b>Controlled</b> drugs (MDAs)</li> <li>• <b>Chemotherapy</b></li> <li>• <b>Insulin</b></li> <li>• <b>Tinzaparin</b> (Innohep<sup>®</sup>) doses greater than 4,500 units</li> <li>• <b>Enoxaparin</b> (Clexane<sup>®</sup>) doses greater than 40mg</li> <li>• <b>Clinical trial</b> medications</li> </ul>

Lower Risk Meds

**C  
H  
E  
C  
K  
I  
N  
G  
  
I  
N  
T  
E  
N  
S  
I  
T  
Y**

Higher Risk Meds

# Alert!



The  
**RED APRON**  
means:

Do NOT Disturb  
Nurses  
Administering  
Medications

Focused on Patient Safety... for YOU!

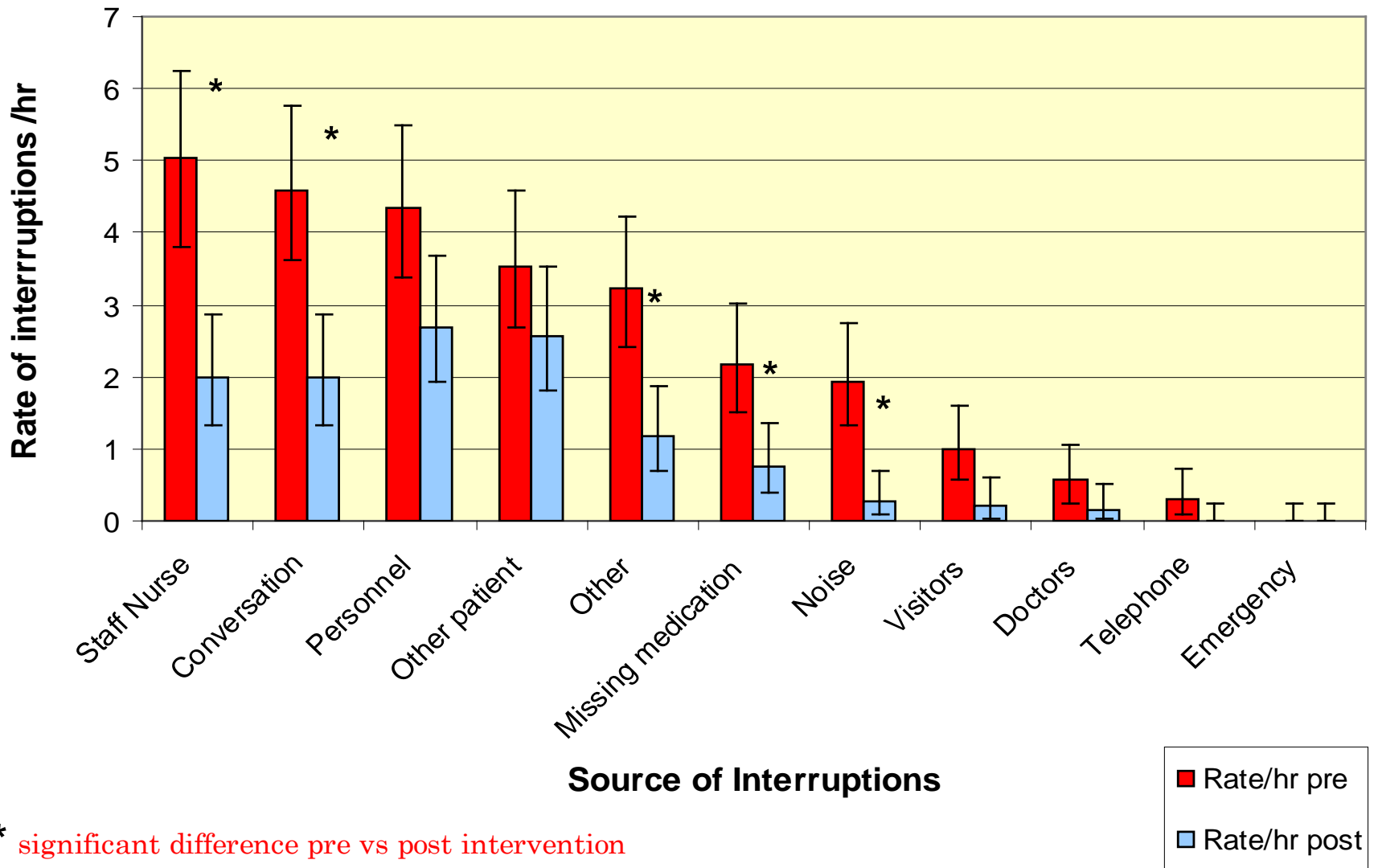
# Results: Interruption Rate

---

Highly significant ( $p < 0.001$ ) decrease in the interruption rate post-intervention relative to pre-intervention

Rate of interruptions post-intervention 0.43 times that of the pre-intervention level

**Fig. 3** Interruption rate per hour for each source of interruptions pre and post intervention



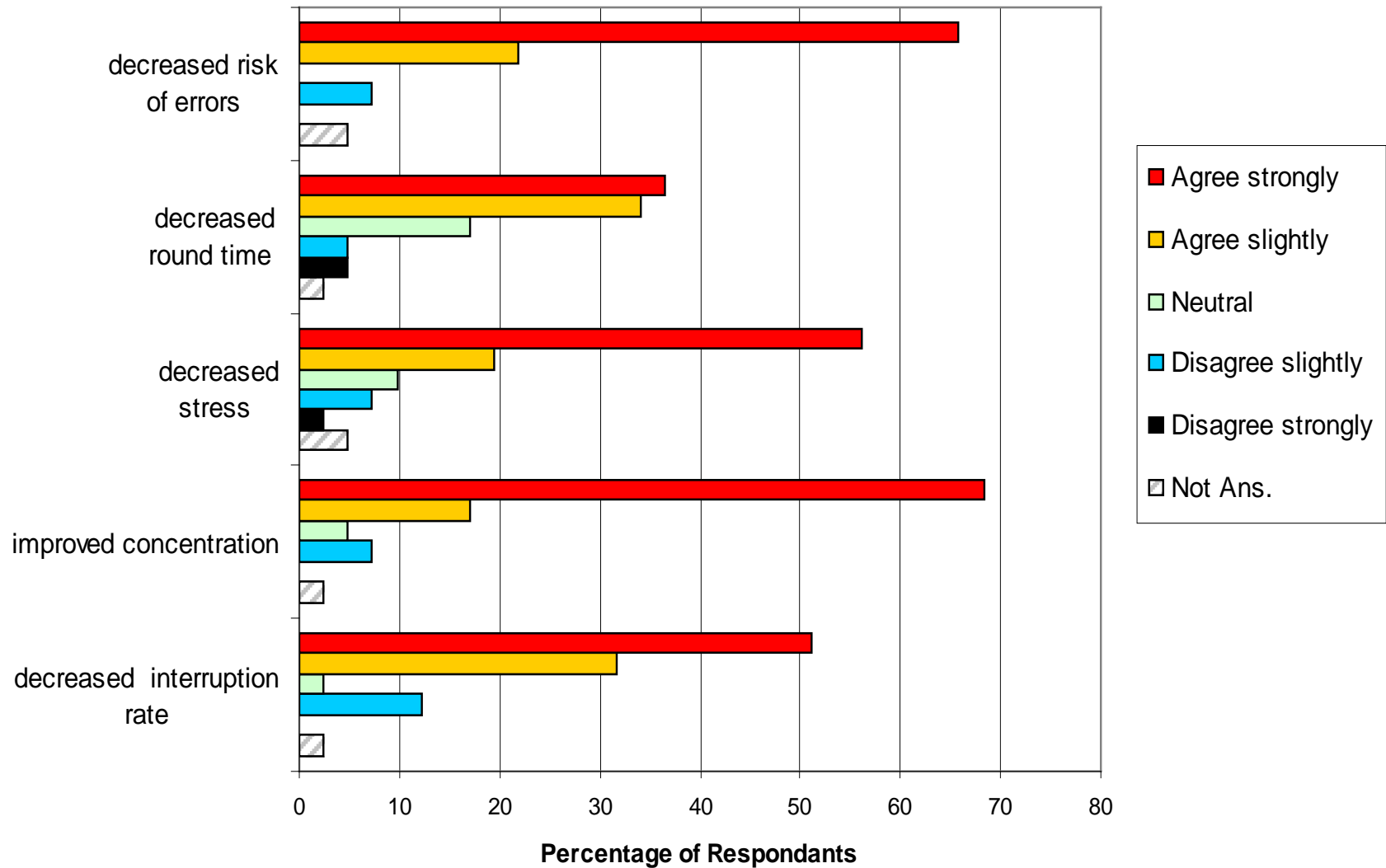
# Results: Behaviour Modification

Interruption Source	Pre-Intervention Observations	Post-Intervention Observations
Staff nurses & Conversation	Staff nurses were the greatest source of interruption	Awareness of the impact of case-irrelevant conversation 'Key holder' system effective
Personnel	Third largest source of interruptions	Behaviour changes were noticeable
Other patient	Category least amenable to control	Behaviour change challenged by rapid patient turnover.
Other	Related to nurse seeking missing prescription sheets /equipment.	Interruptions reduced by improved workflow organisation, planning & teamwork.
Missing medication	Disjointed work pattern	Streamlined work practices /teamwork apparent: <ul style="list-style-type: none"><li>- second nurse acting as a 'runner'</li><li>- single trip to collect missing meds</li></ul>

<b>Noise</b>	Bay door left open. High levels of staff traffic and ambient noise within bay.	Closing the bay door reduced the ambient noise to much lower levels. Traffic was minimised as staff assessed the need to enter the bay.
<b>Visitors</b>	Nurses were frequently interrupted at the trolley and in the corridor.	Visitors were alerted by posters and aprons. Less noise and fewer staff interruptions created a calmer environment on the round.
<b>Doctors</b>	Doctors interrupted with non-essential queries.	Doctors limited interruptions to times when critical information had to be communicated.
<b>Telephone</b>	Phone calls were one of the most disruptive types of interruptions.	Easiest source of interruptions for staff to divert from the nurse undertaking the medication round.
<b>Emergencies</b>	None: pre- or post-intervention	

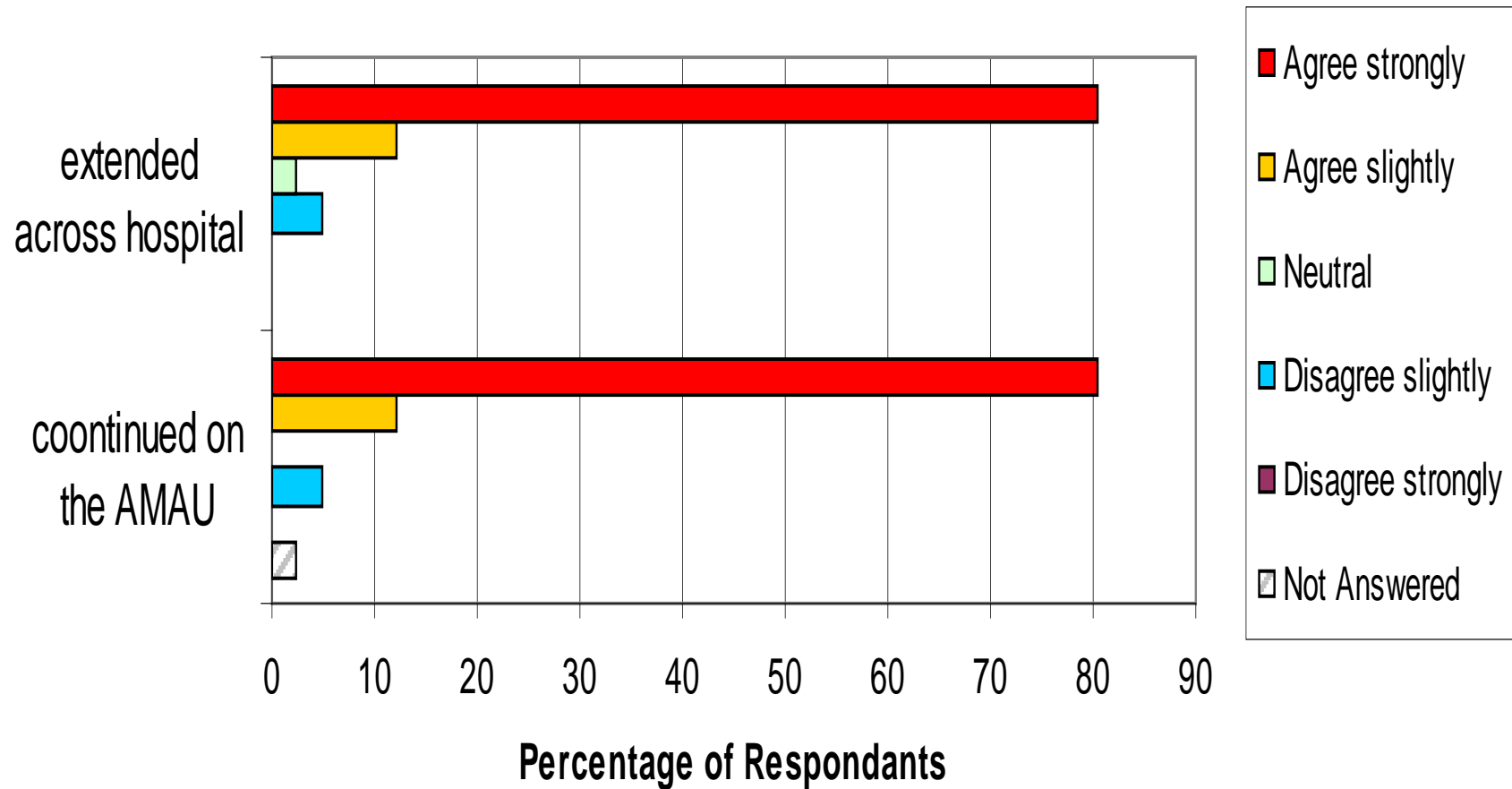
# Results: Questionnaire

Respondent Opinion Regarding the Beneficial Effects of 'Do Not Disturb' System (n=41)



# Results: Questionnaire

Respondent Opinion Regarding Future  
of 'Do Not Disturb' System (n=41)



# Requirements

## Equipment

- ✓ Red aprons (€ 137/year)
- ✓ 2 x apron holders in clinic room
- ✓ Hooks for bay/side room doors

## Documentation

- ✓ Laminated colour signs
- ✓ Checklists for trolleys
- ✓ PILs

## Staff

- ✓ Energy & Motivation of All the Workforce!

# Conclusions

---

- High levels of interruptions from multiple sources during medication rounds on the AMAU
- A multi-factorial approach was successful in reducing the interruption/distraction rate
- Measures interacted and reinforced each other, making it difficult to assess the impact of any single intervention in isolation.
- System is being expanded hospital-wide on a phased basis.

# References

---

1. Westbrook J, Woods A, Rob M, Dunsmuir W, Day R. Association of interruptions with an increased risk and severity of medication administration errors. *Arch Intern Med* 2010; 170(8): 683-690.
2. Biron A, Loiselle C, Lavoie-Tremblay M. Work interruptions and their contribution to medication administration errors: an evidence review. *Worldviews on Evidence-Based Nursing* 2009; 6(2): 70-86.
3. Armitage G, Knapman H. Adverse events in drug administration: a literature review. *J Nurs Manag* 2003; 11(2):130-140.
4. Fry M, Dacey C. Factors contributing to incidents in medicine administration. Part 2. *Br J Nurs* 2007;16(11):678-681.
5. Healey A, Sevdalis N, Vincent C. Measuring intra - operative interference from distraction and interruption observed in the operating theatre. *Ergonomics* 2006;49(5-6):589-604.
6. Pape T. Applying airline safety practices to medication administration. *Medsurg Nurs* 2003;12(2):77-93.
7. Pape T, Guerra D, Muzquiz M, Bryant J, Ingram M, Schraner B, et al. Innovative approaches to reducing nurses' distractions during medication administration. *J Contin Educ Nurs* 2005;36(3):108-116.