Little things matter: a time and motion study of pharmacists' activities in a paediatric hospital

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CHSSR Research Areas

- Pathology and imaging informatics
- Human factors evaluation and design
- Medication safety and eHealth
- Work innovation and communication
- Safety and integration of aged and community care
- Primary care safety

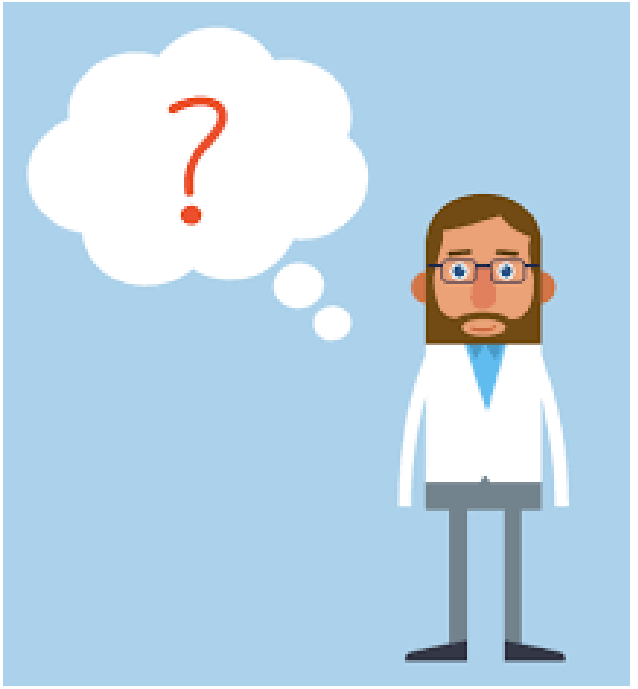
Understanding Work

How do healthcare providers distribute their time?

What work tasks do they conduct?

Who do they interact with?

How often are they interrupted?



Existing Literature

DOCTORS' AND NURSES' WORK

Several time and motion studies of doctors' and nurses' work.

Westbrook et al.[1] found no significant change in proportion of time doctors and nurses spent on direct patient care or medication-related tasks before and after implementation of eMMS. Finding helped alleviate clinicians' concerns about system detracting from time with patients.

[1]*Westbrook et al. (2013) Impact of an electronic medication management system on hospital doctors' and nurses' work: a controlled pre-post, time and motion study. J Am Med Inform Assoc.*

Existing Literature

PHARMACISTS' WORK

Limited evidence of pharmacists' work practices. None in paediatrics.

Lo and colleagues[2] found differences in pharmacists' work in paper-based wards compared to eMMS wards. The authors suggested that differences were attributable to eMMS allowing pharmacists easy access to information for conducting medication reviews and improved clarity of orders reducing queries.

[2]*Lo et al. (2010) Comparison of pharmacists' work patterns on hospital wards with and without an electronic medication management system (eMMS). J Pharm Pract Res.*

Paediatric Complexities

Additional medication complexities:

Child’s age

Size (height, weight, body surface area)

Conditions

Route of administration

Study Aim

To quantify how clinical pharmacists in a paediatric hospital spend their time.

Method

STUDY SETTING

Large paediatric hospital in Sydney, NSW.

Provides services to 80,000 children annually.

Hospital uses paper charts to document clinical notes, medication orders and administrations, while pathology orders and results are electronic.

Method

STUDY DESIGN AND DATA COLLECTION TOOL

Direct observational time and motion using the Work Observation Method By Activity Timing (WOMBAT) technique.

WOMBAT

WHAT IS WOMBAT?

Rigorous and reliable method for investigating healthcare providers work.

Used by several international research teams.

Enables collection of multi-dimensional work, as well as interruptions, and multi-tasking.

Automatically time-stamped data.

Data reflects the complexity of clinical work.

WOMBAT

MULTI-DIMENSIONAL

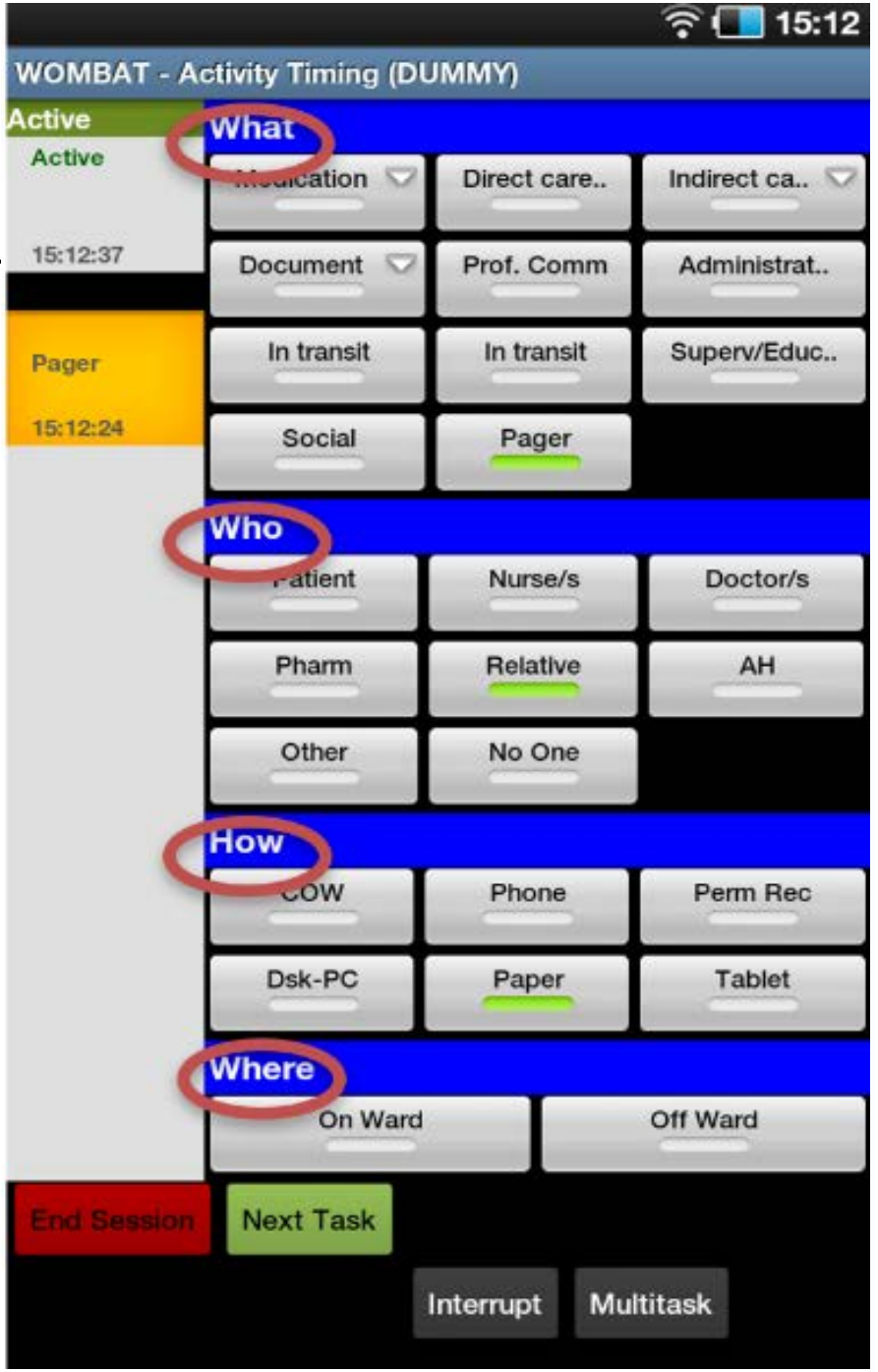
Can include, but not limited to:

WHAT (the task that is being conducted)

WHO (the person or people with whom the task is being conducted)

HOW (the means by which the task is being completed)

WHERE (the location where the task is being conducted)

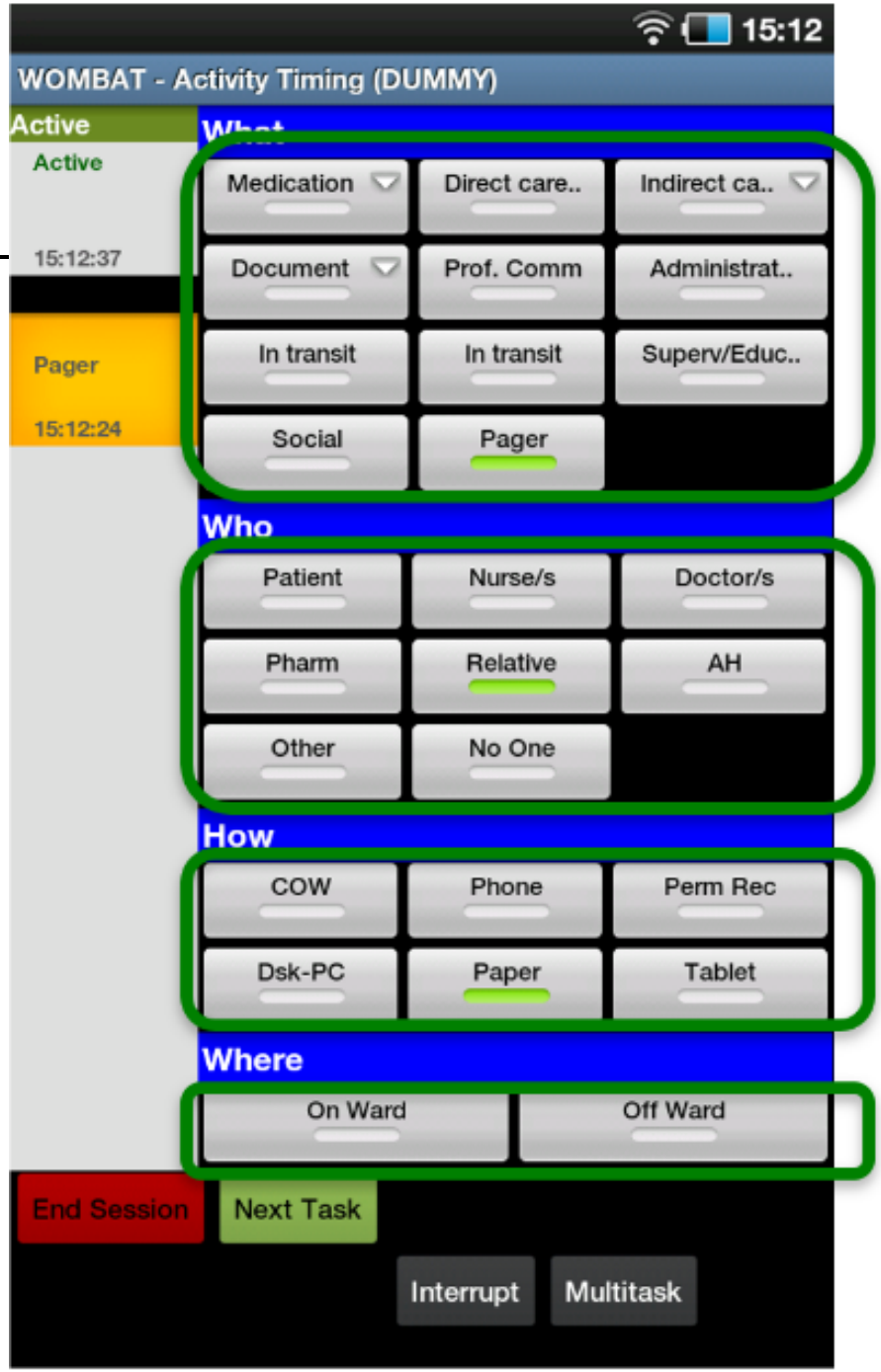


WOMBAT

CATEGORIES

Within each dimension, are a list of customisable categories.

Can also include subcategories.



WOMBAT

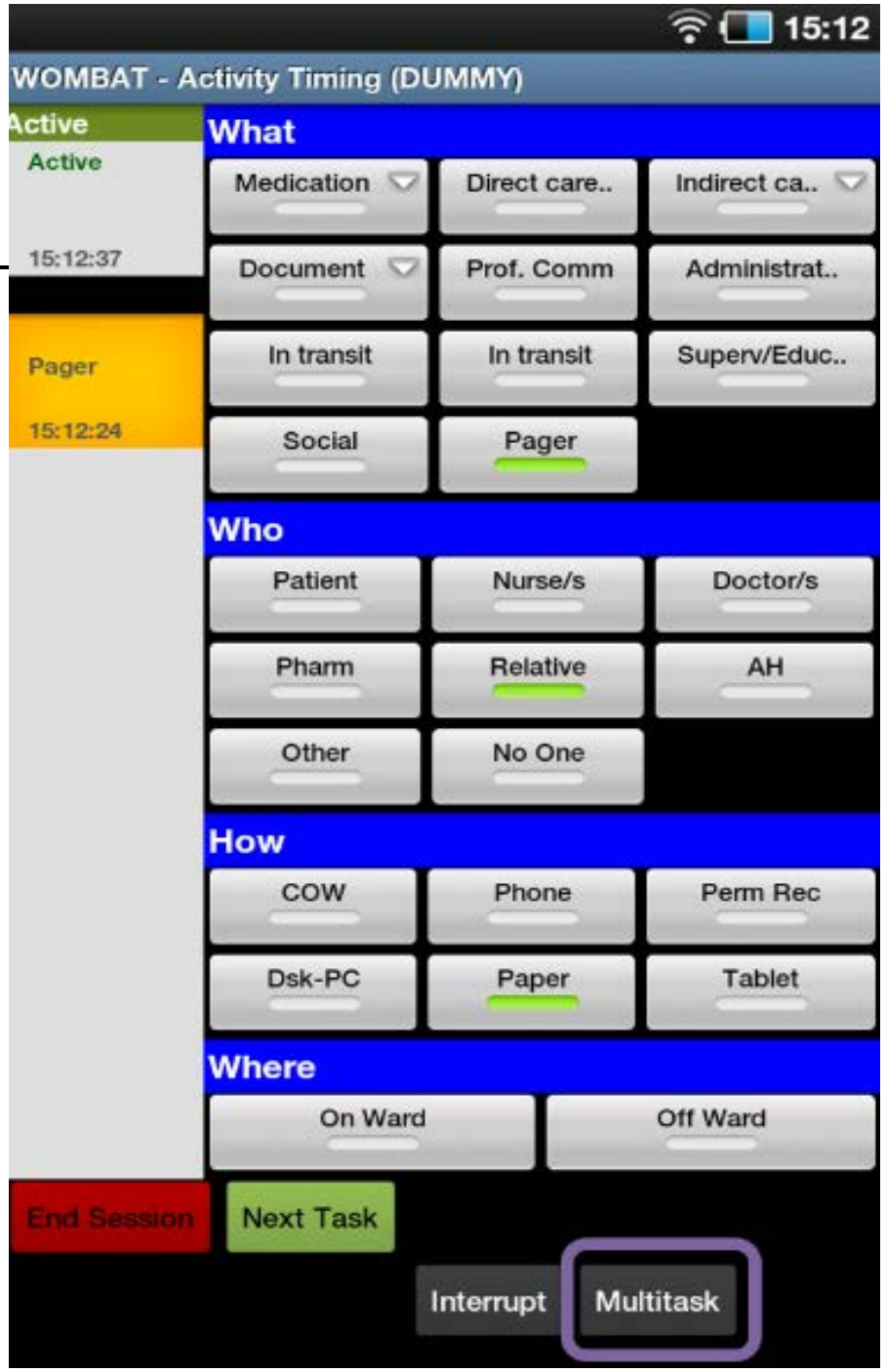
INTERRUPTIONS

Interruption – an external stimulus resulting in the clinician stopping the current task to respond to the stimulus.

WOMBAT

MULTI-TASKING

Multi-tasking – conduct of two or more tasks simultaneously.



Categories for Pharmacists' Study

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BASED ON SCHOFIELD ET AL.

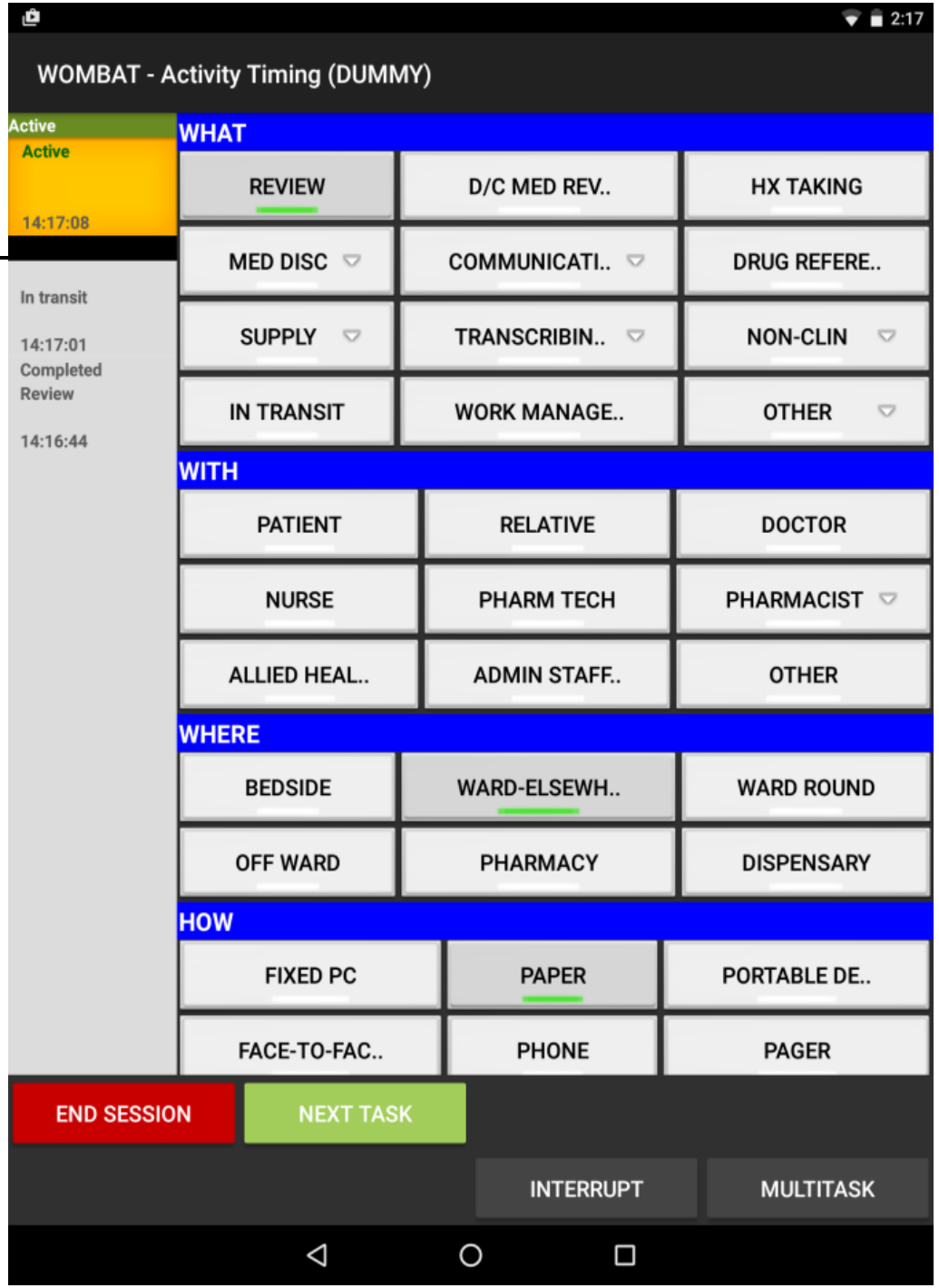
Task type	Definitions
Review	Review of medication charts and/or medical notes
Communication	Communicating about anything excluding medications.
Non-clinical tasks	Includes: looking for something, social activities/private, meetings.
Supply	Dispensing medications for patients or maintaining ward stock.
Medication discussion	Taking about anything related to medications.
In transit	Physically moving to change location.
Drug reference	Seeking drug information from references.
Work management	Gathering things, getting ready, organising work tasks.
Other	Includes: training of prescribers to use eMMS, lunch break, anything else.
History taking	Taking a medication history or reconciling medications.
Discharge medication review	Preparing medications on discharge or writing a discharge summary.

Schofield et al. (2015) The impact of electronic prescribing systems on pharmacists' time and workflow: protocol for a time-and-motion study in English NHS hospitals. BMJ Open.

WOMBAT Template for Pharmacists' Study

Two observers familiarised themselves with the data collection tool and definitions.

Used Android tablets running WOMBAT software to collect data.



Data Collection

Training to achieve close agreement between the two observers – kappa score of 0.87.

Pharmacists observed between October 2015 to February 2016.

Maximum of 2 hours per session.

7 pharmacists covering eight wards were observed for 62.1 hours.

Data Analysis

Pharmacists performed 4,578 individual tasks.

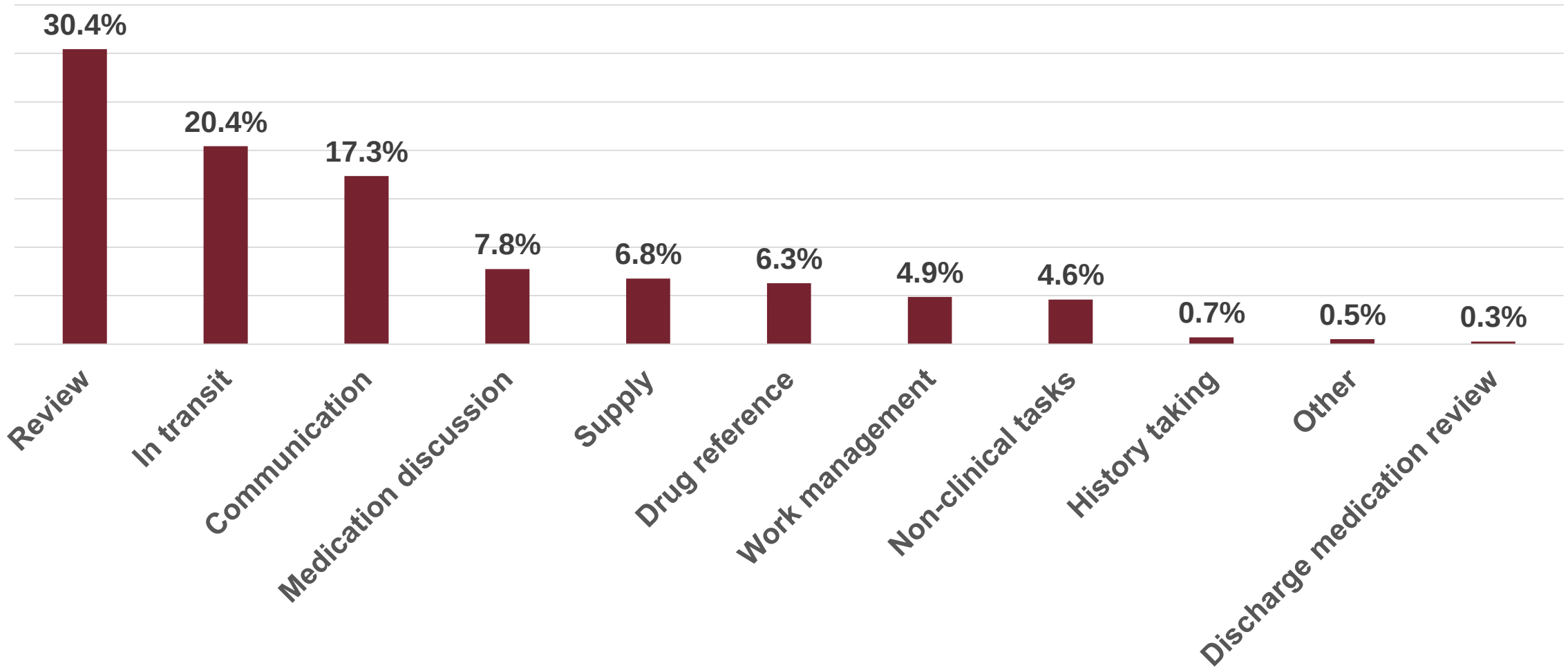
We calculated:

- frequency for each task;
- proportion of time on different tasks;
- time spent multi-tasking;
- and rate of interruptions.

Data were analysed using SAS.

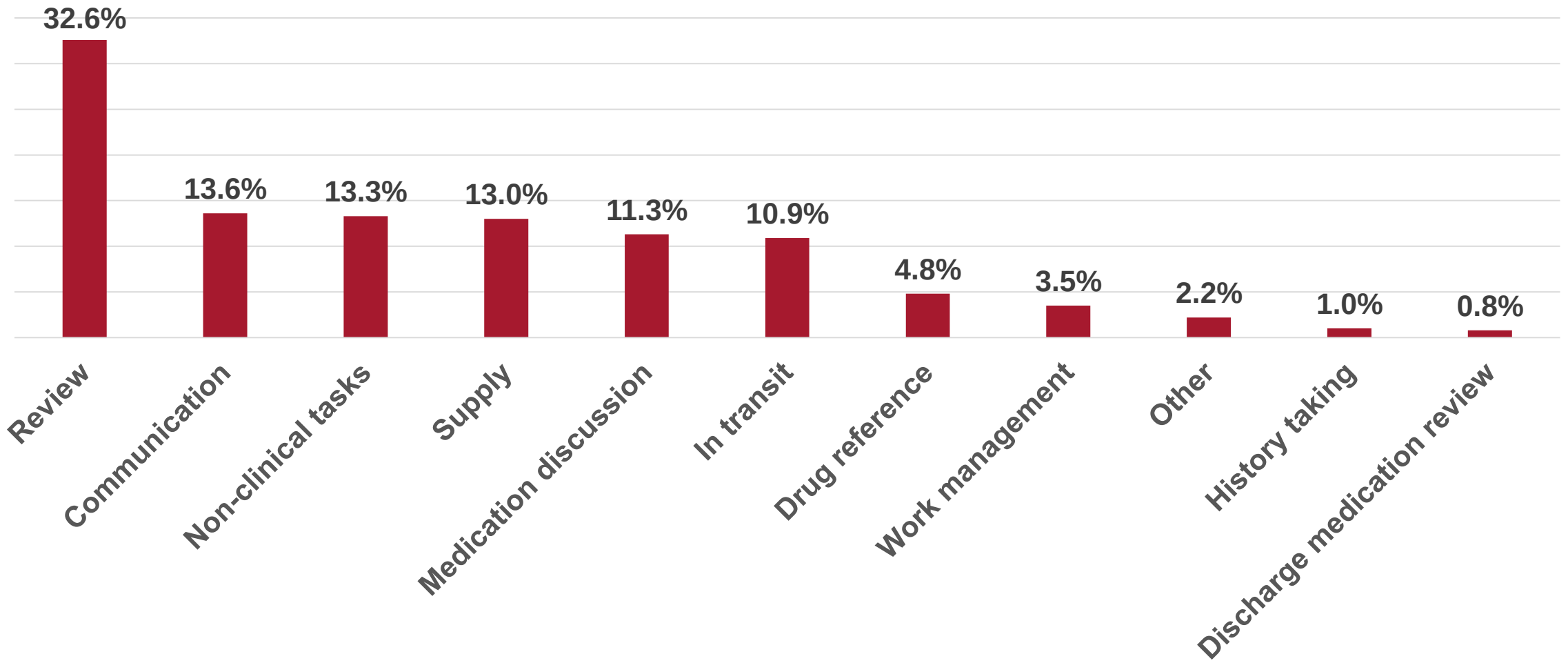
Results

FREQUENCY OF TASKS



Results

DISTRIBUTION OF TIME SPENT ON TASKS



Results

WHERE AND WITH WHO

Almost all medication review tasks were performed on the ward (91.7%).

Only 5.9% of medication reviews were conducted by the patient bedside.

Pharmacists performed most tasks alone (73.6%).

Only 0.3% and 1.4% of tasks involved input from patients or relatives, respectively.

Results

INTERRUPTIONS

Interruption rate of 3.5 per hour.

Interruptions occurred most frequently during:

- work management tasks (6.9 per hour),
- discharge medication review (6.4 per hour) and
- medication review (5.6 per hour).

Results

MULTI-TASKING

Pharmacists spent 2.8 hours (4.4%) of time multi-tasking.

Pharmacists were more likely to multitask during medication discussion, followed by communication, using a drug reference and history taking.

Discussion

Paediatric pharmacists spend a third of their time reviewing charts and another third divided between communicating with others, performing non-clinical tasks and managing ward-stock.

1% of time was spent taking medication histories. Previous findings from deClifford and colleagues, in an adult hospital, reported 9.5% of time taking medication histories.

Number of interruptions to pharmacists' in our study was similar to that reported by Lo and colleagues in an adult hospital (3.5 and 3.8 interruptions per hour, respectively).

Conclusion and Next Steps

First study to quantify how pharmacists in a paediatric hospital spend their time.

Results provide useful baseline data against which to measure the impact of eMMS on pharmacists' work and WOMBAT provides a robust means to collect data to make such comparisons.

Study definitions are also being used to collect pharmacists' work data in other Australian and UK hospitals. This will allow for comparison of pharmacists' work practices in different hospitals and countries.

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