ismp CANADA | SHOPPERS DRUG MART | UNIVERSITY OF TORONTO LESLIE DAN FACULTY OF PHARMACY | UNIVERSITY OF WATERLOO FACULTY OF SCIENCE School of Pharmacy

Incidents Associated with Centralized Automated Processing of Multi-Medication Compliance Packs

Adrian Boucher[1,4], Larry Sheng[2], Certina Ho[1,2,4], Peter Tolios[3], Karan Almaula[3], Jason Wong[3]

[1]Leslie Dan Faculty of Pharmacy, University of Toronto; [2]School of Pharmacy, University of Waterloo; [3]CPAK Shared Services, Shoppers Drug Mart; [4]Institute for Safe Medication Practices Canada

Introduction

- Multi-medication compliance aids (MCAs) organize medications based on date and time of administration. Benefits of MCAs include improved medication adherence, reduced caregiver stress, and fewer medications stored at home.
- Studies have found that manual preparation of MCAs is associated with an increased risk of medication incidents compared to traditional dispensing.
- Centralized MCA pharmacies utilize automation and standardized workflows to improve efficiency, but few studies have examined the quality and safety of these facilities.
- The objective of this study was to quantify and characterize incidents associated with the preparation of MCAs at the largest centralized prescription filling facility in Canada.

Methodology

- MCAs prepared by nine automated compliance pack preparation machines (i.e. robots) (SynMed® XF or SynMed® Ultra) were checked against the pack labels by pharmacy professionals over an eight-week period from December 2017 to January 2018 (Figure 1).
- Incidents were documented on a reporting form with the following information: the associated robot, the type of pharmacy professional who discovered the incident, the type of incident, and a description of the incident.
- Descriptive statistics and qualitative thematic analysis were performed to determine the incident rate and identify key safety risks that may be associated with each type of incident.

Results

- A total of 121,250 MCAs containing 838,358 prescriptions were prepared during the study period.
- Pharmacy professionals discovered 5,733 incidents affecting 4.73% of MCAs. This corresponds to a prescription incident rate of 0.68%.
- The most common types of incidents were dose transition (19.3%), additional dose (18.6%), and omission of medication (16.0%) (Figure 2).
- Themes and key safety risks identified from qualitative analysis were manual processes, robot calibration, and sanitary practices (Table 1).

Conclusion

- Centralized processing of MCAs achieved a prescription incident rate of 0.68%, which is substantially lower than rates associated with manual preparation.
- Opportunities to improve safety and efficiency were identified and focus on reducing human-involved processes, fine-tuning of robot performance, and reviewing current policies and procedures.
- Centralized automated filling of MCAs represents a safe and efficient alternative to manual preparation of MCAs in community pharmacies.

(References: Available upon request)

FIGURE 1.
Preparation of Multi-Medication Compliance Aids (MCAs) at a Centralized Filling Pharmacy

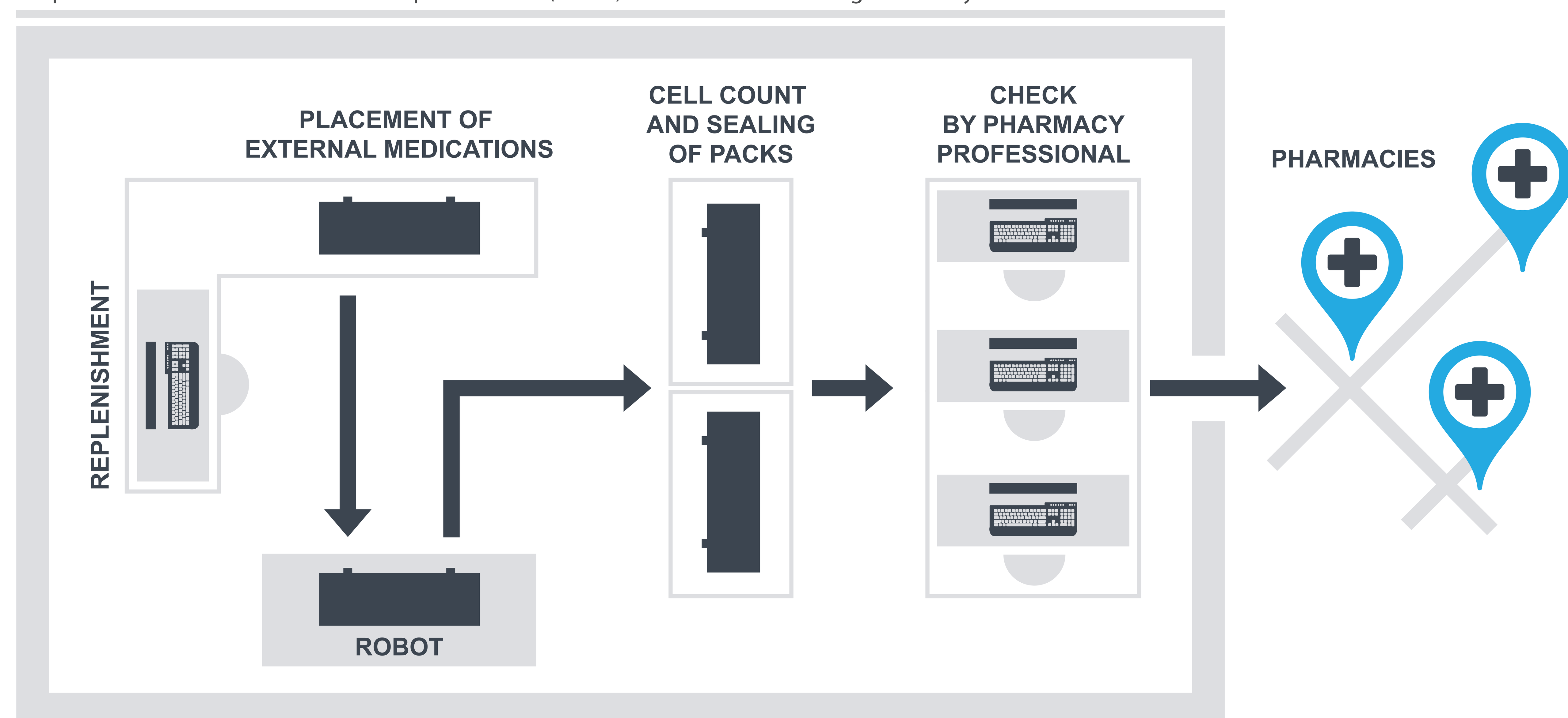
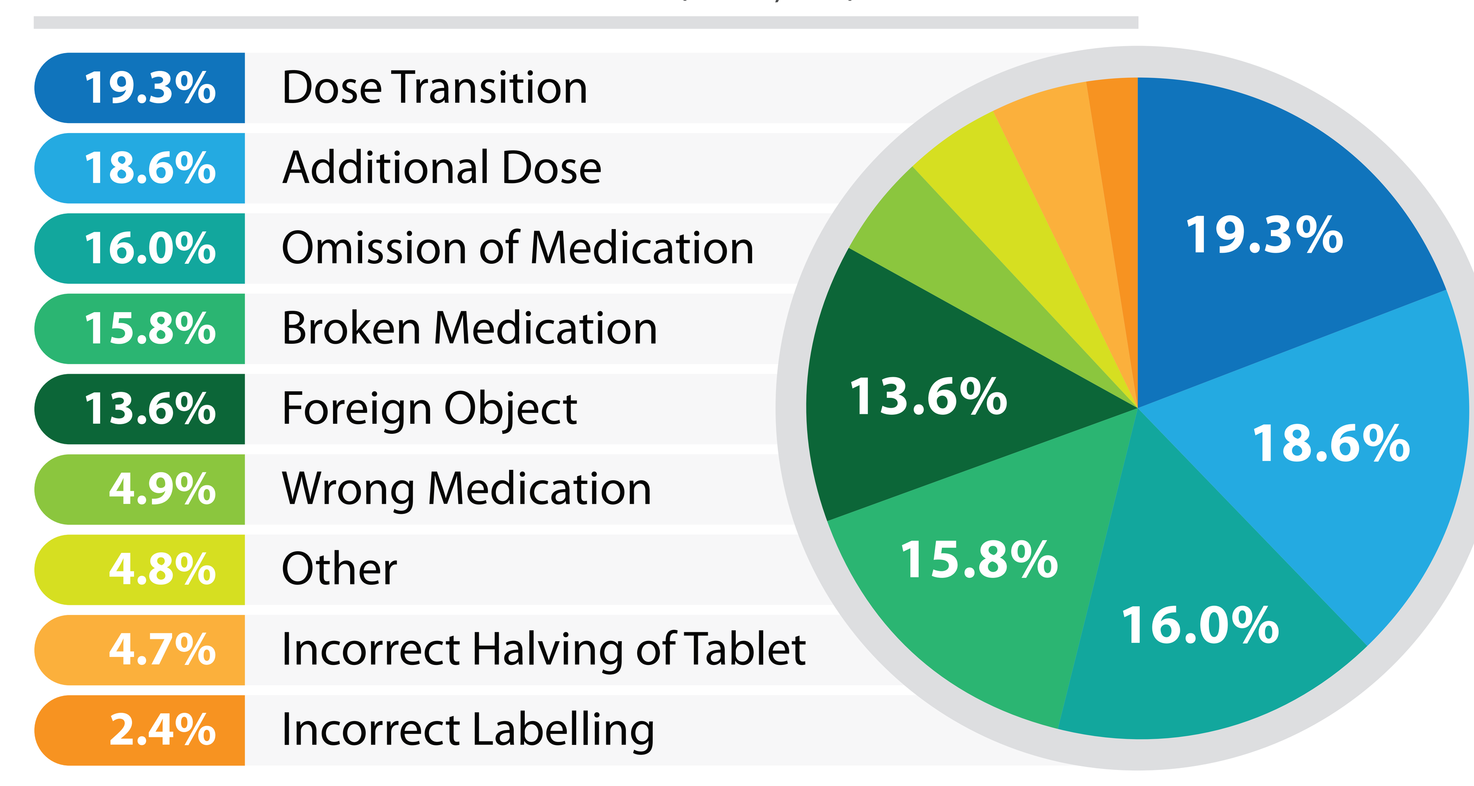


FIGURE 2.
PROPORTION OF INCIDENTS BY TYPE (n = 5,733)



The authors would like to acknowledge the support from CPAK Shared Services, Shoppers Drug Mart, Toronto, Canada, in conducting this study; the Institute for Safe Medication Practices Canada for the analysis of study results and the design of this poster.

Corresponding Author: Adrian Boucher (adrian.boucher@mail.utoronto.ca)

Disclosures: Authors of this poster have the following to disclose concerning possible personal or financial relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
Adrian Boucher – Nothing to disclose; Larry Sheng – Nothing to disclose; Certina Ho – Nothing to disclose; Peter Tolios – Nothing to disclose; Karan Almaula – Nothing to disclose; Jason Wong – Nothing to disclose

TABLE 1.
Key Safety Risks Associated with Centralized Processing of MCAs

Themes	Incident Examples
MANUAL PROCESSES *Key Safety Risks:* • Cutting of tablets • Filling of external medication • Movement of trays • Cell count • Overfilling of cells • Sealing of compliance packs	• *Mirtazapine 30 mg ¼ tablet instead of ½ tablet in Wednesday bedtime slot.* • *Extra Metolazone (manual addition) tablet in Friday AM slot.* • *Furosemide 40 mg ½ tablet was cut too large.* • *Calcium carbonate was loaded into the robot instead of Janumet® XR.* • *Vitamin D 1000 units tablets were mixed with ASA 81 mg tablets in the robot.* • *Rivaroxaban 20 mg jumped from Wednesday at dinner to Thursday at dinner.* • *Card not sealed correctly.* • *One patient's card needed to be transferred to a larger card.*
ROBOT CALIBRATION *Key Safety Risks:* • Unique medication qualities • Cassette opening • Nozzle suction strength	• *Vitamin D3 gel capsules stuck together in Friday lunch slot.* • *Broken Perindopril 8 mg in Tuesday and Wednesday bedtime cells.* • *Missing Quetiapine 25 mg from Sunday morning slot.*
SANITARY PRACTICES *Key Safety Risks:* • Person protective equipment • Replenishment of cassettes	• *Hair in Wednesday morning slot.* • *All bedtime slots contained dust.* • *Lint ball found in Friday lunch slot.*

February 2019 – Copyright © 2019 ISMP Canada. Poster designed by Kris Duwyn.