Investigating the transfer safety checklist process when transferring patients to and from diagnostic imaging

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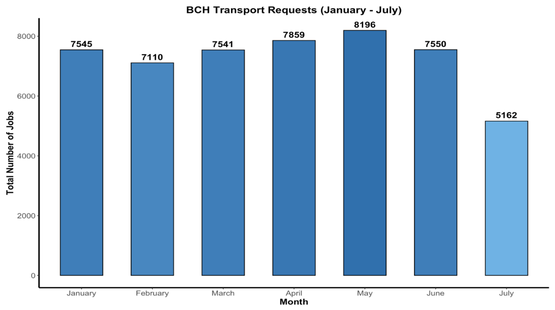
INTRODUCTION

Adverse events during intra-hospital transfers (IHTs) to and from diagnostic imaging (DI) are among the most common patient safety incidents (PSIs) related to care transitions in hospitals [1], [2]. Effective transitions and handovers are critical to reducing PSIs, improving efficiency, enhancing communication, and shortening patient's length of stay. Checklists have been developed to support safety in IHTs, including transfers to DI. However, low compliance with these checklists remains a challenge in supporting safety during transport [3].



Note: BCH = ***Brampton Civic Hospital, one of the location of*** William Osler Health System

OBJECTIVE

The project aims to improve the safety of the IHT to and from diagnostic imaging by investigating existing challenges associated with the transfer process and factors impacting checklist compliance.

METHODS

The study was conducted at William Osler Health System (Osler). The team employed contextual inquiry, involving observations and interviews, to gather data on the ED to DI transfer process between June and August 2024. Existing data from Osler was also analyzed, such as checklist audit data and incident report data, to establish the baseline.

Participants: 15 Registered Nurse; Porters; DI Clerks; ED Clerks
Data collection Literature review; contextual inquiry; existing process and outcome data
Data analysis: descriptive statistics; Process map; PETT Scan[4]

Process maps were created to provide a clear understanding of the transfer process, illustrating where and how the checklist is utilized. A PETT (*people, environment, tasks, tools*) scan was developed to summarize barriers to safety, highlight compliance issues, transfer-related PSIs, and workflow inefficiencies.

RESULTS

System Factor	Barriers	Facilitators
People • Nurse • Porters • DI clerk • ED clerk • Patients	• The responsibility of completing the checklist prior to patient transport to DI can be overlooked, leading to incomplete documentation.(Nurse) • The process of obtaining a copy, faxing it to DI, and placing it in the nurse's orders can be time-consuming and prone to errors, potentially delaying patient care. (Nurse) • Perception that the transport checklist is not useful, double documentation, not necessary. (Nurse) • Experience and knowledge of the ED results in some porters asking for the checklist and others bypassing it. (Porter) • Lack of information about patient and inability to locate nurse. (Porter) • Transport checklist not completed. (DI clerk) • Orders must be manually entered into MedTech, which can be time-consuming and prone to data entry errors. (ED clerk) • Coordinating transport for patients with multiple orders, such as for DI and bloodwork. (Patients)	• DI clerk provides support when feasible • Porter reminds nurse to complete checklist • Dedicated porters for ED to DI transfers. • Several porters will have long tenure (5+ years) • Nurses will communicate isolation status to porters
Environments • Physical • Socio-organizational • External	• No training and no standard for the whole transfer process, everyone has their own workflow and fills out papers differently/not consistently. • Lack of porter that responsible for only ED to and from DI [2 porters for day shift; 1 porter for evening shift; one porter for overnight shift] • It is not easy for both patients and newly trained porters to walk by themselves, they may get lost. • Checklists are stored in different areas depending on the zone of the ED	• Proximity of DI to ED • Isolation precautions placed on patient room • Wayfinding to support transport from ED to DI.
Tools	• Manual completion of documents for the transfer process leading to inefficiencies, including the repeated entry of the same information on multiple sheets, which increases the risk of errors and delays. • The use of multiple documents, including the patient transfer checklist, EDDI porter workflow log sheet, and transport notice, can create confusion and inconsistencies in the transfer process, leading to potential delays and communication breakdowns. • The use of multiple systems, such as Meditech for ED, Syngo for DI, and Sectra for imaging results, can lead to repeated work, as staff must navigate and input information across different platforms, increasing the likelihood of errors and inefficiencies in the patient transfer process. • The DI appointment system, which requires scheduling the patient's DI testing time, can cause delays or miscommunication if not properly managed	• ED-DI porter workflow log sheet can help porter to know which porter picks up which patient. • Transport Notice can help porter to pick up or deliver the patient. • DI Order Requisition form provides Isolation status and oxygen field. • Checklist is designed to be straightforward and easy to use
Tasks	• Lack of specific instructions for the patient to follow, so they may become unsure of what to do next, resulting in the porter and ED nurse often having difficulty finding the patient. • After receiving the fax from the ED, the DI clerk must manually enter the patient's information into the Syngo system, print the document, and prepare the sheet for the porter, which can lead to delays or errors. • Checklist only completed in specific circumstances - isolation and oxygen. • Checklist outside of standard workflow, checklist stored at one location on nursing station. • Patients who can walk sometimes get the DI sheet by themselves. • Non-ambulatory patients should have the sheet faxed to DI, and then DI arranges a porter to pick it up.	

Table 1. PETT scan summarizing barriers and facilitators

Key findings

- We identified 22 barriers, and 12 facilitators based on our observations, interviews, and review of protocols, SOPs from four dimensions, and were categorized into the PETT scan components (Table 1).
- X-ray and CT scan had a much higher rate of incidents compared to others in comparison to other DI procedures.
- Lack of the checklist contributes to both transport delays and cancellations, impacting the overall process efficiency.

RECOMMENDATIONS & CONCLUSION

Recommendations:

1. Retiring the checklist - Add information on oxygen and isolation status on DI requisition form
2. Maintaining the checklist – make electronic and shift completion from ED nurse to other HCW
3. Other suggestions:
   - Increase porter staffing during peak periods
   - Redesign workflow to facilitate communication between ED and DI
   - Develop patient tracking process to support coordination among services

Barriers related to various system issues, such as the lack of electronic systems, were found to be contributing to the checklist underutilization and workflow inefficiencies. Our analysis identified improvement opportunities in all four areas of the PETT scan. Several recommendations have been proposed to improve safety and efficiency during IHT.

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References

[1] H. K. Choi, S. D. Shin, Y. S. Ro, D. K. Kim, S. H. Shin, and Y. H. Kwak, "A before- and after-intervention trial for reducing unexpected events during the intrahospital transport of emergency patients," *Am. J. Emerg. Med.*, vol. 30, no. 8, pp. 1433–1440, Oct. 2012, doi: 10.1016/j.ajem.2011.10.027.
[2] Farnoosh, L., Hossein-Nejad, H., Beigmohammadi, M.-T., & Seyed-Hosseini-Davarani, S.- H. (2018). Preparation and Implementation of Intrahospital Transfer Protocol for Emergency Department Patients to Decrease Unexpected Events. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6549197/
[3] P. Williams, S. Karuppiah, K. Greentree, and J. Darvall, "A checklist for intrahospital transport of critically ill patients improves compliance with transportation safety guidelines," *Aust. Crit. Care*, vol. 33, no. 1, pp. 20–24, Jan. 2020, doi: 10.1016/j.aucc.2019.02.004.
[4] Holden, R. J., & Carayon, P. (n.d.). SEIPS 101 and seven simple SEIPS tools. Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC8543199/