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Critical analysis of current Medication Reconciliation Practices performed at various transition points in a patient's care, such as admission, transfer and discharge of medical wards in National Hospital-Sri Lanka

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I. Abstract

Medication reconciliation is a formal process for creating the most complete and accurate list possible of a patient's current medications and comparing the list to those in the patient record or medication orders. The National Hospital of Sri Lanka [NHSL] headed by a Deputy Director General [DDG] of Health Services has three medical units. They are 2nd,3rd and professorial units. The objective of the case study was to analyse current medication reconciliation practices performed at medical wards in National Hospital Sri Lanka. The methods used for analysis were a self-administered structured questionnaire [SAQ] for doctors and nurses who work at medical wards, key informant interviews [KIIs] with consultants who work at medical wards, document reviews and direct observation. The prioritized problem was the lack of a medication reconciliation standardized process. The prioritized root causes to be addressed are the lack of a standardized medication reconciliation protocol, inadequate training on medication reconciliation for healthcare staff and fragmented communication among different healthcare providers involved in the process. The recommendation is to develop and implement a standardized medication reconciliation protocol.

Keywords: Medication reconciliation, patient's care, transition points, medical wards

II.Introduction

The National Hospital of Sri Lanka [NHSL] established in 1864, situated in Colombo on a 32-acre block of land is the largest Teaching Hospital in Sri Lanka and the final referral center in the country consisting of 3324 beds and headed by a Deputy Director General of Health Services with three Deputy Directors. it is the training center for undergraduates and postgraduate trainees of the Faculty of Medicine and Postgraduate Institute of Medicine, Colombo. The Nursing Training School and Post Basic School, Colombo, and schools of radiography, pharmacy, cardiography, physiotherapy and occupational therapy are also affiliated with the NHSL (Official website & Progress Review Report,2022).

Medication reconciliation is the systematic process of identifying and resolving discrepancies in a patient's medication list during transitions of care. Medical wards, being one of the busiest areas in a hospital, often experience challenges in performing medication reconciliation effectively. Medication reconciliation is carried out to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be done at every transition of care in which new medications are ordered or existing orders are rewritten. Transitions in care include changes in setting, service, practitioner, or level of care. This process comprises five steps:

1. Develop a list of current medications
2. Develop a list of medications to be prescribed
3. Compare the medications on the two lists
4. Make clinical decisions based on the comparison
5. Communicate the new list to appropriate caregivers and the patient.

The NHSL has three medical units namely 2nd,3rd and professorial units. Moreover, the units comprised of 16 wards. This case study was carried out to analyse the medication reconciliation practices at medical wards in NHSL, identifying key issues which affect patient safety. Information regarding medical wards is shown in Table 1.

Medical Unit	No. of Wards	No. of Beds	No. of Consultants	No. of Medical Officers	No. of Nursing Officers	No.of Admissions	The average length of stay [ALOS]	Bed occupancy rare [BOR]
2nd, 3rd & Prof. Unit [08 Units]	16	860	08	34	254	198146	2.7	63%

(Data source: Medical Record Department, NHSL,2022

Table 1:Information about medical wards at NHSL in 2022

Objectives of the case study

1) To analyze current medication reconciliation practices at NHSL
2) To determine priority areas in medication reconciliation to be improved at NHSL.
3) To develop strategies to improve medication reconciliation practices at NHSL.

Methodology

- Key informant interviews (KIIs) were carried out with medical consultants at medical wards in NHSL.
- A self-administered structured questionnaire [SAQ] in Google form was shared with doctors and nurses to obtain their perceptions, practices, experience and suggestions.
- Direct observation by the Principal Investigator [PI] on how the practices are carried out at medical wards in NHSL.
- Document reviews were carried out by the PI.
- Analyzed the collected data and arranged brainstorming sessions.
- Based on the findings from the analysis, practicability and feasibility made the recommendations to improve medication reconciliation practices at medical wards in NHSL through a literature review as well as brainstorming with senior registrars and registrars in medical administration.

Problem prioritation

Problem prioritisation was conducted using the nominal group technique with 3 senior registrars and 2 registrars in medical administration, MO/Planning, 1 MO and 1 NO at medical wards in NHSL.

Table 2: Priority Matrix for Prioritization Medication Reconciliation Issues at NHSL

Priority Matrix for Training Needs Prioritization	Problems	Number of votes received		Total Votes	Final Priority
	Medication Reconciliation Issues at Medical Wards in NHSL	1st Round Six votes for each of eight members [48votes]	2nd Round Five votes for each of eight members [40 votes]		
	1. Documentation Errors	3	1	4	-
	2. Limited Access to Medication History	3	2	5	-
	3. Communication Gaps	7	6	13	2
	4. Lack of Health Information Technology [EHR]	3	2	5	-
	5. Lack of Medication Reconciliation Training	4	2	6	-
	6. Time Constraints	6	5	11	3
	7. Unavailability of an Auditing and Feedback system	2	1	3	-
	8. Lack of Medication Reconciliation Standardized Process	9	11	20	1
	9. Unavailability of a Medication Reconciliation Team	2	1	3	-
	10. Lack of Multidisciplinary Collaboration	1	1	2	-
	11. Not conducting daily medication reviews	1	2	3	-
	12. Poor Post-Discharge Follow-up	3	2	5	-
	13. Lack of monitoring system	2	2	4	-
	14. Lack of patient and family engagement	2	2	4	-

III. Problem Analysis

The prioritized medication reconciliation issue was the Lack of Medication Reconciliation Standardized Process at NHSL. The root cause analysis was conducted by literature exploration, KII with relevant stakeholders and brainstorming sessions with 3 senior registrars and 2 registrars in medical administration. It is illustrated below.

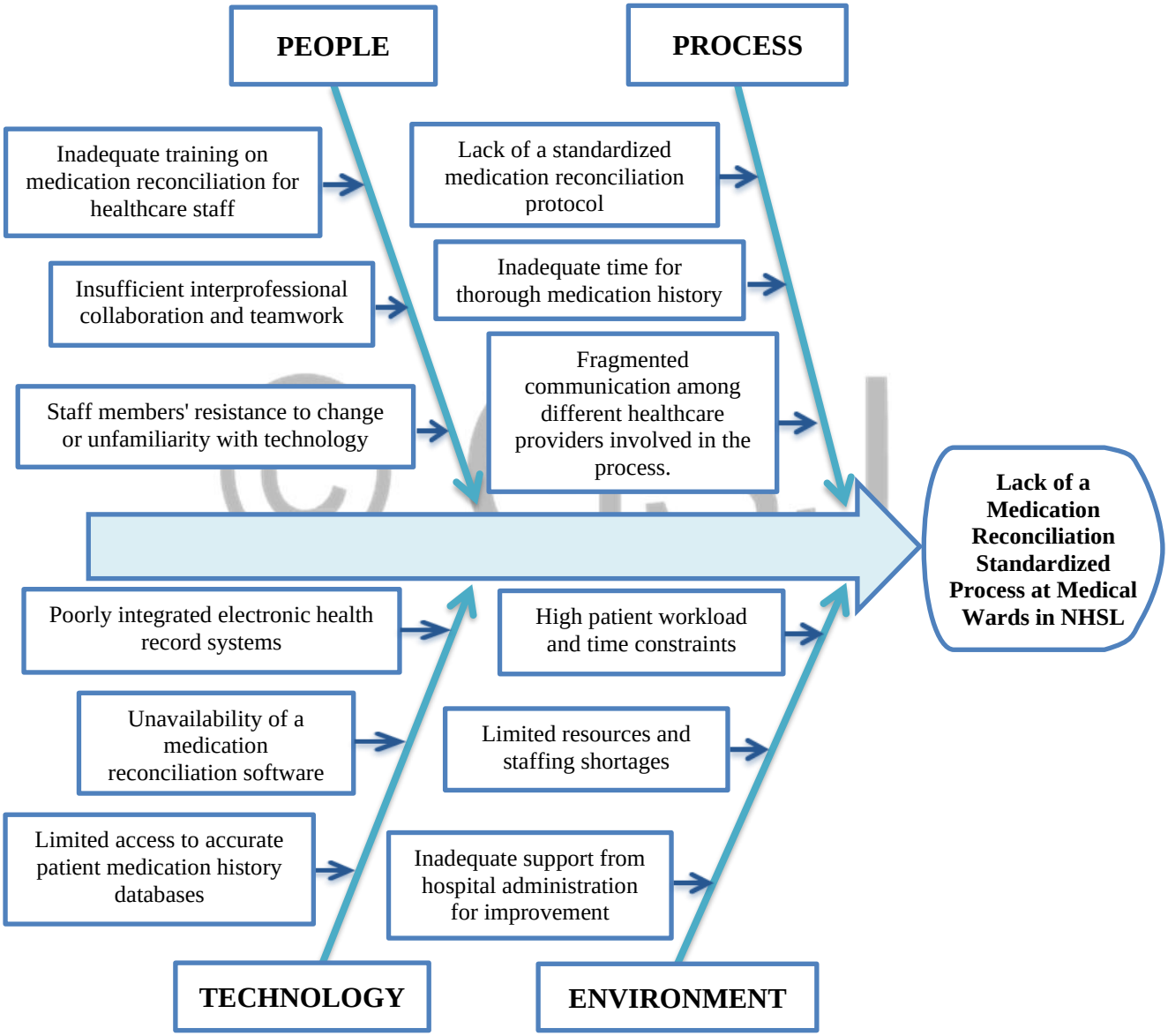

Figure 1: Ishikawa chart - Root cause analysis

These root causes were prioritized considering;

- The feasibility to address - technical, administrative, financial, and practicability.
- The impact of the root cause.
- The time factor to introduce interventions.

Table 3: Priority Matrix for Root Cause Prioritization for Lack of Medication Reconciliation Standardized Process at Medical Wards in NHSL

Priority Matrix for Root Cause Prioritization	Root Causes	Number of votes received		Total Votes	Final Priority
	Lack of Medication Reconciliation Standardized Process at Medical Wards in NHSL	1st Round [Six votes for each of eight members] [48 votes]	2nd Round [Five votes for each of eight members] [40votes]		
	1. Lack of a standardized medication reconciliation protocol	14	13	27	1
	2. Insufficient interprofessional collaboration and teamwork	4	1	5	-
	3. Staff members' resistance to change or unfamiliarity with technology	3	2	5	-
	4. Inadequate time for thorough medication history collection	2	1	3	-
	5. Inadequate training on medication reconciliation for healthcare staff	10	7	17	2
	5. Poorly integrated electronic health record systems	1	1	2	-
	6. Limited access to accurate patient medication history databases	1	2	3	-
	8. Fragmented communication among different healthcare providers involved in the process.	5	4	9	3
	9. Unavailability of a medication reconciliation software	2	1	3	-
	10. High patient workload and time constraints	4	3	7	-
	11. Limited resources and staffing shortages	1	3	4	-
	12. Inadequate support from hospital administration for improvement initiatives	1	2	3	-

The root cause prioritisation was carried out using the nominal group technique with 3 senior registrars and 2 registrars in medical administration, MO/Planning, 1 MO and 1 NO at medical wards in NHSLAccording to the number of votes received by each root cause, they are arranged in descending order. Afterwards, using Microsoft Office 365 Excel, a Pareto chart was created.

Table 4: Root Causes Arranged in Descending Order

Root Cause Prioritization for Lack of Medication Reconciliation Standardized Process at Medical Wards in NHSL	Votes
1. Lack of a standardized medication reconciliation protocol	27
5. Inadequate training on medication reconciliation for healthcare staff	17
8. Fragmented communication among different healthcare providers involved in the process	9
10. High patient workload and time constraints	7
2. Insufficient interprofessional collaboration and teamwork	5
3. Staff members' resistance to change or unfamiliarity with technology	5
11. Limited resources and staffing shortages	4
4. Inadequate time for thorough medication history collection	3
7. Limited access to accurate patient medication history databases	3
9. Unavailability of a medication reconciliation software	3
12. Inadequate support from hospital administration for improvement initiatives	3
6. Poorly integrated electronic health record systems	2

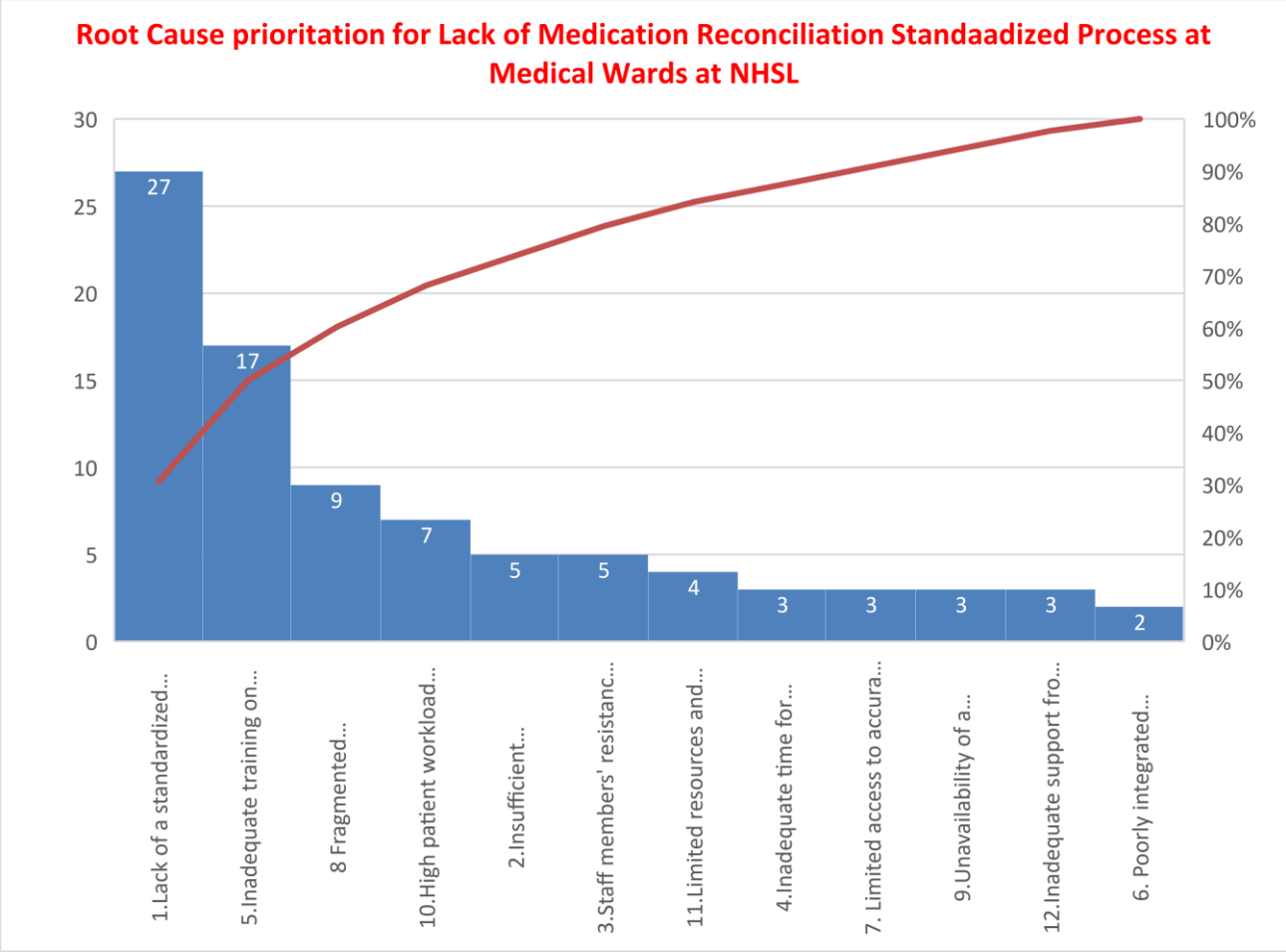

Figure2:Pareto Chart for Root Cause Analysis

IV.Proposals

Solutions for the vital root causes were identified through SAQ, literature search and brainstorming sessions. According to the Pareto analysis following are the vital few root causes.

1. Lack of a standardized medication reconciliation protocol
2. Inadequate training on medication reconciliation for healthcare staff
3. Fragmented communication among different healthcare providers involved in the process

The aforementioned root causes can be addressed by implementing the following solutions and suggestions. Here are some proposals for effective medication reconciliation practices at medical wards:

I. Standardized Medication Reconciliation Protocol

Develop a standardized and comprehensive medication reconciliation protocol that can be followed for every patient during transitions of care. This protocol should include clear guidelines on data collection, verification, and documentation.

II. Designated Medication Reconciliation Team

Establish a dedicated team responsible for medication reconciliation. This team should consist of pharmacists, nurses, and physicians with expertise in medication management.

III. Medication History Collection

Gather a complete and accurate medication history for each patient upon admission. Utilize electronic health records (EHRs) and consider involving patients and their families in providing medication information.

IV. Technology Integration

Leverage technology to enhance medication reconciliation accuracy and efficiency. Implement electronic prescribing systems, barcode scanning, and EHRs to reduce the risk of errors and improve information sharing.

V. Multidisciplinary Collaboration

Encourage open communication and collaboration between healthcare professionals involved in the patient's care. Clearly define roles and responsibilities for medication reconciliation.

VI. Patient Education

Educate patients and their families about their medications, including the purpose, proper administration, and potential side effects. Provide written materials or educational resources to reinforce the information.

VII. Daily Medication Reviews

Conduct daily medication reviews to ensure that any changes in the patient's medication regimen are promptly recorded and communicated to all team members.

VIII. Medication Discrepancy Resolution

Investigate and resolve any discrepancies found during the reconciliation process. Promptly communicate with the patient's primary care provider or pharmacy to verify medication information.

IX. Post-Discharge Follow-up

Continue medication reconciliation during the transition of care from the hospital to other healthcare settings. Provide clear discharge instructions and a medication list for the patient to share with their primary care provider.

X. Training and Education

Conduct regular training sessions for staff members involved in medication reconciliation to keep them updated on best practices and changes in medications or protocols.

XI. Performance Monitoring and Quality Improvement

Implement a system to monitor the effectiveness of the medication reconciliation process and identify areas for improvement regularly.

XII. Learn from Near Misses and Errors

Establish a culture of learning from near misses and medication errors related to reconciliation. Conduct root cause analysis to understand the underlying causes and implement preventive measures.

XIII. Patient Engagement

Involve patients in the medication reconciliation process by encouraging them to be active participants in their care. Encourage them to ask questions about their medications and share any concerns they may have.

XIV. Leadership Support

Obtain support from hospital leadership to prioritize and invest in medication reconciliation initiatives. Engage hospital administrators to allocate resources and create a culture that values patient safety and medication management.

By implementing these solutions, NHSL could improve medication reconciliation practices, minimize medication-related errors, and enhance patient safety during transitions of care. It's crucial to continuously review and improve these practices to adapt to the evolving needs of patients and the healthcare system

The overview of the medication reconciliation process is illustrated in Figure 3.

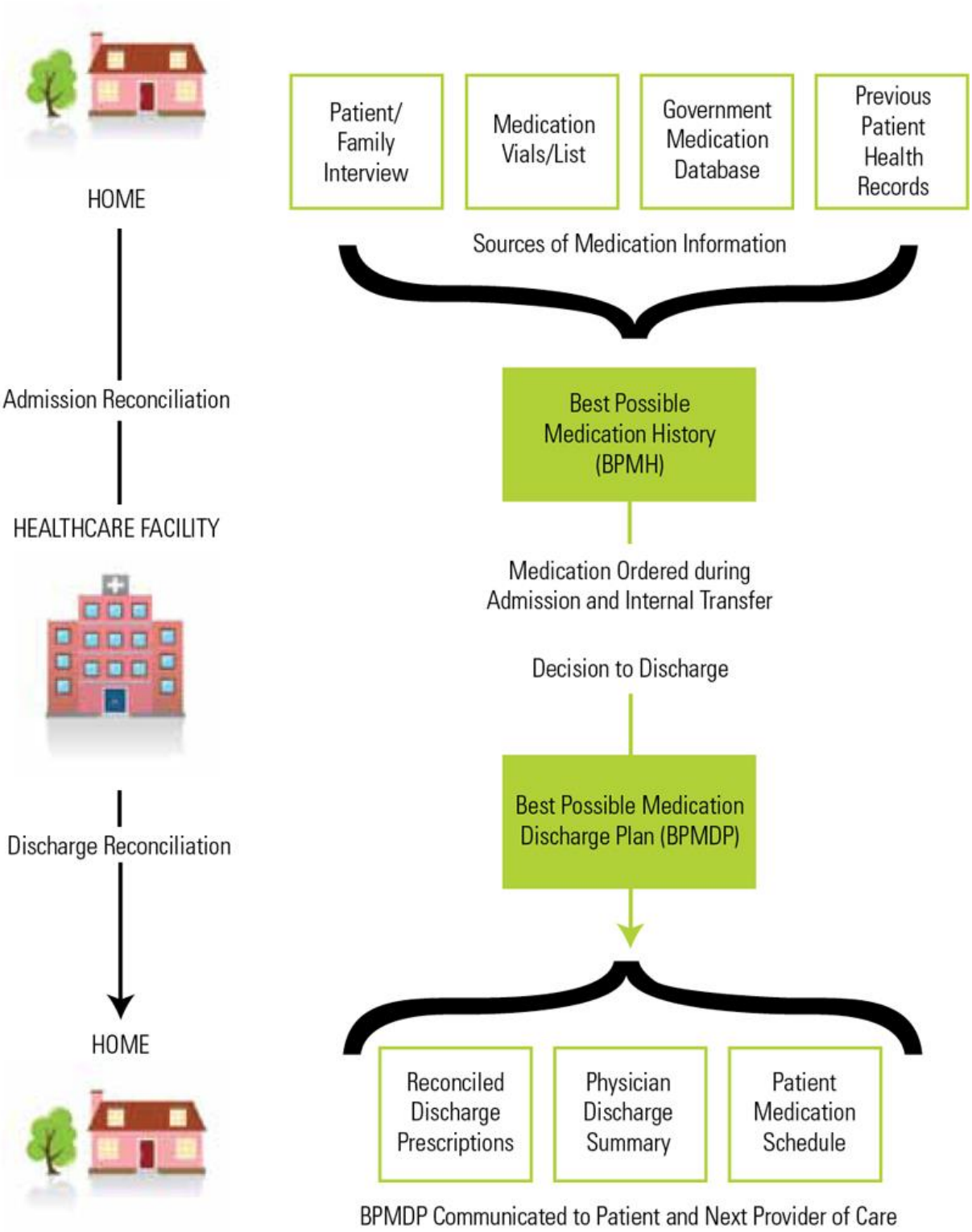

Figure 3:Overview of medication reconciliation - Where,What.When and How

However, considering the feasibility of addressing technical, administrative, financial and practicability; I will suggest the following recommendation for medical wards of the NHSL.

V.Recommendations

Developing a Standardized Medication Reconciliation Protocol for the medical wards of NHSL is crucial to ensure patient safety and continuity of care. Medication reconciliation is the process of creating and maintaining an accurate list of all medications a patient is taking during transitions of care. Here are the steps to develop the protocol:

1. **Form a Multidisciplinary Team**

Assemble a team of healthcare professionals including doctors, nurses, pharmacists, and IT specialists who will collaborate in the development and implementation of the protocol. Each team member will bring a unique perspective and expertise to the process.

2. **Assessment of Current Practices**

Understand the current medication reconciliation process in your medical wards. Identify existing strengths and weaknesses and assess the barriers that prevent effective medication reconciliation.

3. **Review Guidelines and Best Practices**

Familiarize the team with medication reconciliation guidelines and best practices from reputable sources such as the World Health Organization (WHO), Institute for Healthcare Improvement (IHI), or local regulatory bodies.

4. **Develop the Protocol**

Based on the guidelines and best practices, create a standardized medication reconciliation protocol that outlines the step-by-step process for all involved at medical wards in NHSL. The protocol should address medication history taking, verification, and communication processes during admission, transfer, and discharge of patients at medical wards in NHSL.

VI.Implementation

Implementation of the aforementioned recommendations could be done at NHSL through the following strategies.

Table 4:Implementation-Strategy,Activities and Responsibility

Strategy	Activities	Responsibility
1. Training and Education	I. Provide comprehensive training to all staff involved in medication reconciliation II. Ensure that they understand the protocol [importance and potential effect on patient safety] III. Post-training assessment using "Kirkpatrick" evaluation tool	DDG DDs Medical Consultants ET&RUnit of MoH MO/QMU MO/HE SGNO Ward Masters Ward Sisters
2. Implementation and Rollout of the protocol	I. Implement the protocol in one medical ward II. Identify any issues or challenges before full-scale implementation III. Establish mechanisms to monitor the implementation of the protocol continuously	DDG DDs Medical Consultants ET&RUnit of MoH MO/QMU MO/HE SGNO Ward Masters Ward Sisters

VII.Conclusion

The case study highlighted the importance of addressing medication reconciliation issues at medical wards in NHSL to enhance patient safety and improve medication management. By implementing standardized protocols, promoting better communication, and leveraging health information technology, the NHSL could reduce medication errors, optimize patient care, and ensure smooth care transitions for patients in medical wards.

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