Reduction in Non-Evidence-Based Proton-Pump Inhibitors Prescription on Discharge (Sustainability Phase)

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Mission Statement

To reduce non-evidence-based proton-pump inhibitors (PPI) prescription in both inpatient and outpatient settings over a sustained period.

Team Members

	Name	Designation	Department / Division
Team Leaders	Christina Tan Jiun Yu	Senior Pharmacist	Pharmacy
	Dr Tan Yan Ru	Associate Consultant	General Medicine
Team Members	Dr Lam Ming Ai	Consultant	Geriatric Medicine
	Dr Christine Lorraine Balibadlan	Resident Physician	General Medicine
	Dr Tan Shu Wei	Medical Officer	General Medicine
	Geraldine Ng Li Yuen	Advanced Practice Nurse	General Medicine
	Selina Cheong	Senior Pharmacist	Pharmacy
	Shanice Goh	Pharmacist	Pharmacy

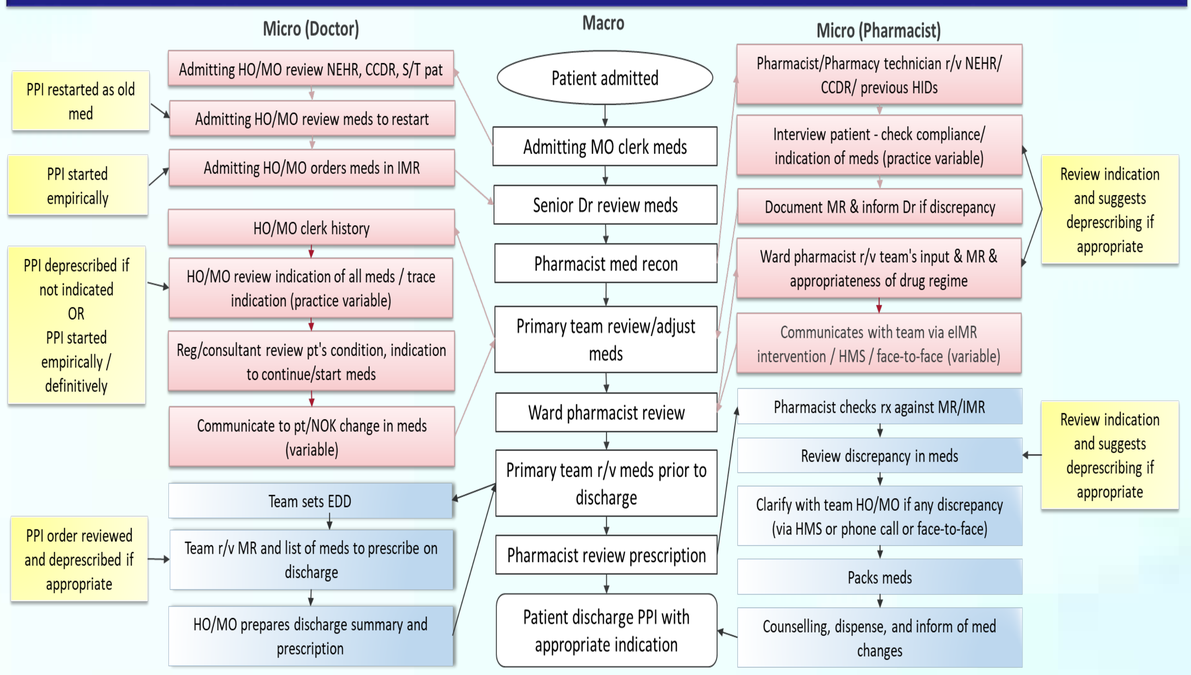
Advisors: A/Prof Thomas Lew, Dr Ng Wee Khoon & Lim Wan Peng

Sponsor: Lim Hong Yee

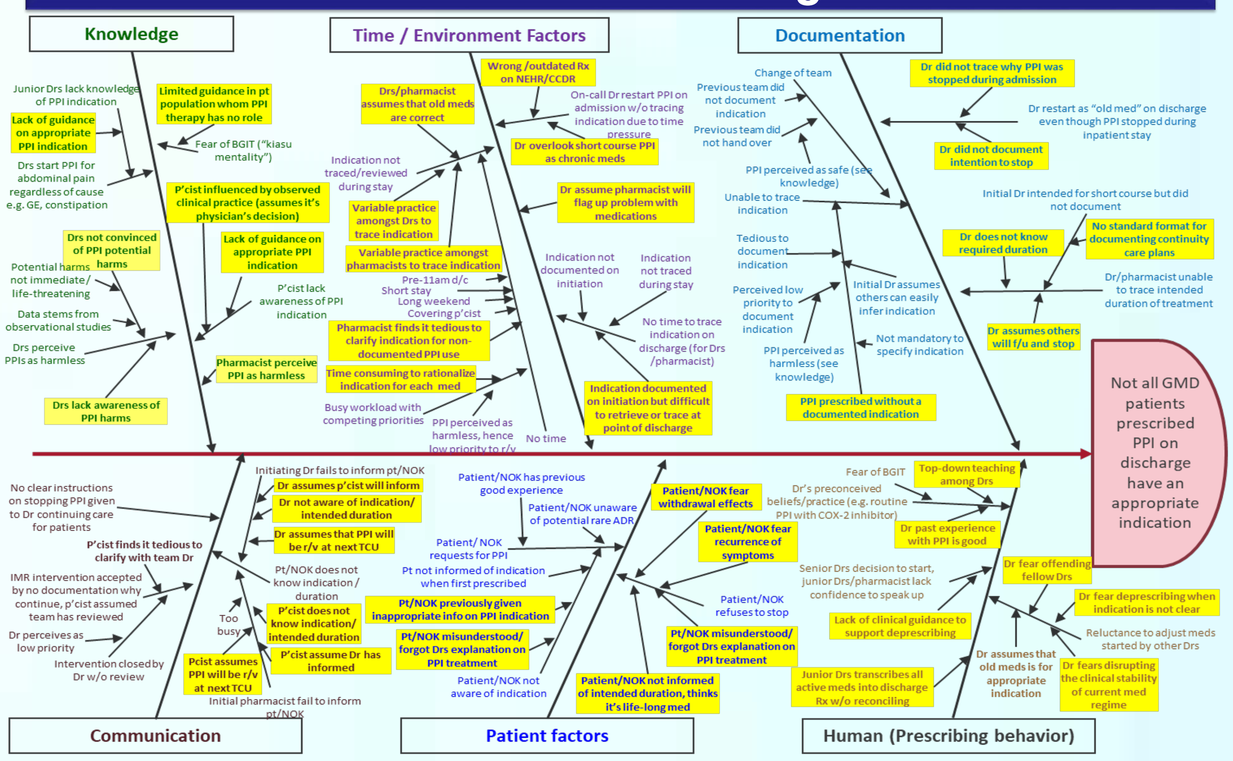
Evidence for a Problem Worth Solving

1. PPI utilization in Tan Tock Seng Hospital (TTSH) increased at an alarming rate from 6.63 million units of oral PPI dispensed in Year 2010 to 7.78 million units in Year 2015.
2. A point-prevalence survey conducted among TTSH inpatients in Year 2011 found that only 46% of patients on PPI fulfilled FDA-approved indications, 11% had borderline indications based on expert consensus or guideline-recommended indications, and the remaining 43% of patients had no clear indication.
3. Overutilization of PPI is concerning given its association with adverse effects such as pneumonia, hypomagnesemia, fractures, Clostridium difficile infection and kidney disease. Unnecessary prescription of medications is also associated with increased pill burden, reduced medication compliance and increased healthcare expenditure.
4. A PPI deprescribing guide was developed and disseminated hospital-wide in October 2016, followed by roadshows to selected prescribing departments.
5. We embarked on a multidisciplinary Clinical Practice Improvement Program (CPIP) in collaboration with Department of General Medicine to identify targeted strategies to sustain the initial uptake of the deprescribing guide (as previous published studies suggest that possible rebound may occur after the initial 6 months).

Flow Chart of Process

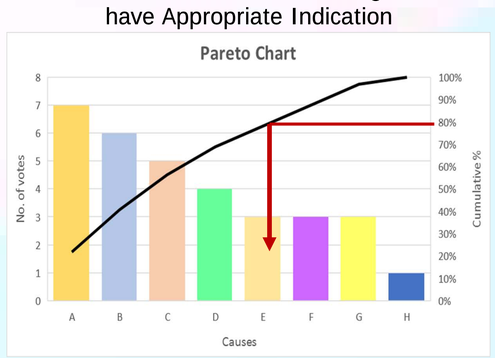


Cause and Effect Diagram



Pareto Chart

Causes that lead to Not All GMD Patients Prescribed PPI on Discharge have Appropriate Indication

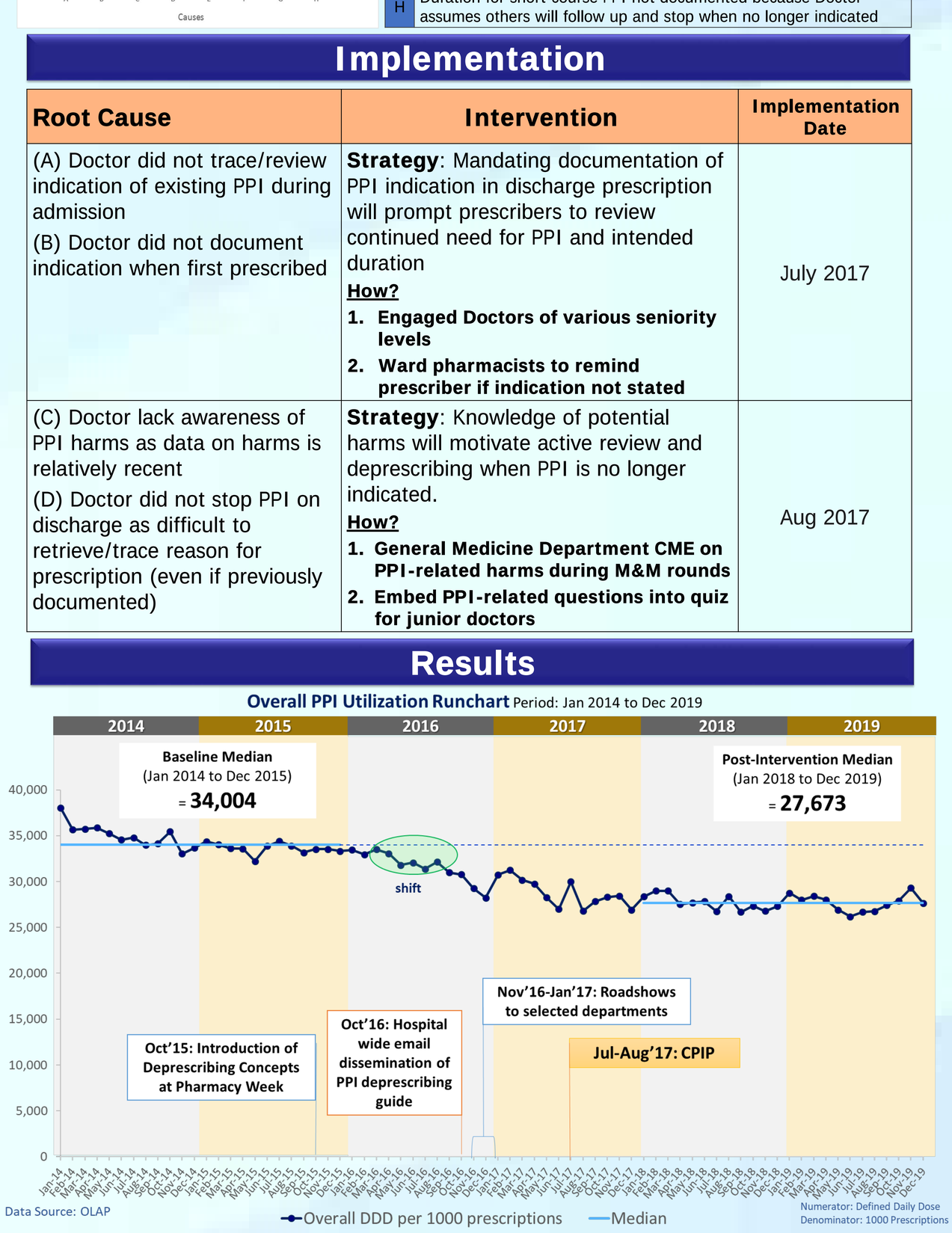


A	Doctor did not trace/review indication of existing PPI during admission
B	Doctor did not document indication when first prescribed
C	Doctor lack awareness of PPI harms as data on harms is relatively recent
D	Doctor did not stop PPI on discharge as difficult to retrieve/trace reason for prescription (even if previously documented)
E	Doctor too busy to rationalize indication for each medication in a multimorbid patient
F	No standard format for documenting continuity care plans leads to short-course PPI continuation beyond required
G	Doctor fear deprescribing existing PPI when indication is not clear
H	Duration for short-course PPI not documented because Doctor assumes others will follow up and stop when no longer indicated

Implementation

Root Cause	Intervention	Implementation Date
(A) Doctor did not trace/review indication of existing PPI during admission (B) Doctor did not document indication when first prescribed	**Strategy**: Mandating documentation of PPI indication in discharge prescription will prompt prescribers to review continued need for PPI and intended duration **How?** **1. Engaged Doctors of various seniority levels** **2. Ward pharmacists to remind prescriber if indication not stated**	July 2017
(C) Doctor lack awareness of PPI harms as data on harms is relatively recent (D) Doctor did not stop PPI on discharge as difficult to retrieve/trace reason for prescription (even if previously documented)	**Strategy**: Knowledge of potential harms will motivate active review and deprescribing when PPI is no longer indicated. **How?** **1. General Medicine Department CME on PPI-related harms during M&M rounds** **2. Embed PPI-related questions into quiz for junior doctors**	Aug 2017

Results



Overall PPI utilization refers to the total quantity of oral PPI dispensed in outpatient and inpatient prescriptions. This was used as a surrogate measure of non-evidence-based PPI prescription to monitor the sustainability of the quality improvement initiatives implemented.

1. PPI utilization in TTSH decreased following the dissemination of PPI deprescribing guide and roadshows in Oct'16-Jan'17 and the decline was sustained following the CPIP initiatives.
2. This decline in PPI utilization effected a cost reduction of $84,147 per annum (based on a year-to-year comparison of Year 2014 versus Year 2019)

Lessons Learnt

1. Managing an interdisciplinary team and engaging commitment of team members
2. Multidisciplinary team with involvement of staff at various levels provides a more comprehensive view of barriers and enablers
3. Important to identify and engage stakeholders commitment
4. Story-telling is a useful tool to influence change

Strategies to Sustain

1. Regular reminders and engagement of stakeholders and clinical staff on the ground
2. Continued audit on rates of PPI utilization and provide regular feedback to the stakeholders
3. Identify platforms for continual education to educate new staff
4. Empower patients to be active partners in their health - encourage and promote communication between clinicians and patient during routine clinical encounters
5. Explore electronic prescribing systems capability to prompt prescribers to document indication clearly