Enhancement of Pharmacy Services following Implementation of In-patient Medication Order Entry (IPMOE) System at Prince of Wales Hospital (PWH)

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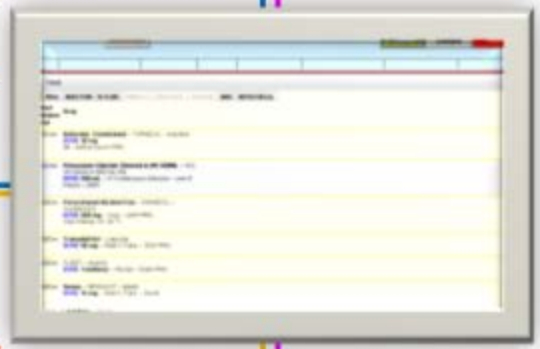
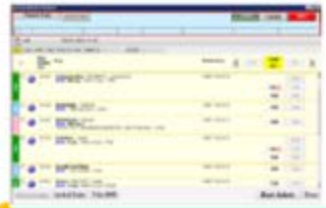
IPMOE – Close Loop System

Doctors prescribe via IPMOE

Drug order details are sent to Pharmacy System electronically



Nurses login and view MAR via IPMOE



System auto-assign schedule & sort out drugs due for administration

✓ Nurses scan barcode on drug bag to verify Right drug & Right time

Patient Identity & Drug data are transmitted to scanner via Bluetooth

✓ Nurses scan barcode on patient wristband to verify Right patient

Drug administration details are clearly documented in the system

Administration record can be seen in pharmacy to facilitate drug refill

Pharmacists receive the order, verify and dispense drugs to ward

Background

- PWH: the 3rd hospital in HA to implement IPMOE
- First live- run: 9 July 2014 in a medical ward
- Rollout plan: by specialty and by ward
- As of 30 April 2015, IPMOE is fully implemented in:
  - Medical
  - Surgery
  - Orthopedics
  - ICU / OT
  - Obstetrics & Gynaecology
  - Paediatrics
  - Private and integrated wards

Pharmacy Dispensing Workflow

Conventional

Handwritten MAR

Fax to Pharmacy

Data input

IPD vs Wardstock

Clinical verification

Faxed items only

Pick, check and send to ward

FIFO

IPMOE

Instant electronic transmission of prescription

Orders prioritized by ADT

(Admin Due Time)

Clinical verification

Pick, "check" and send to ward

+ Check Rx active status

Pledge: 1hr before ADT

Pharmacy Dispensing Workflow

- Benefits of IPMOE:
  - NO transcription error
  - Instant transmission & real-time update of medication profile
  - Automatic prioritization for dispensing
  - Track and trace of dispensed medications

Change of Pharmacy Practice

To maximize benefits of IPMOE design, Pharmacy has revised:

- **Ward stocks**

- **Job duties**
- **Pharmacists to verify all IPMOE orders**
- **Drug picking workflow**
- Generate "to be due" items Q30mins
- **Drug delivery**

Retrospective Study of Pharmacy Service following IPMOE Implementation

- Study period:
  - Pre-IPMOE: 1 Nov – 30 Nov 2013
  - Post-IPMOE: 1 Nov – 30 Nov 2014

  for same specialties & wards

- Specialty included:
  - Medicine
  - Surgery
  - Integrated wards
  - Private

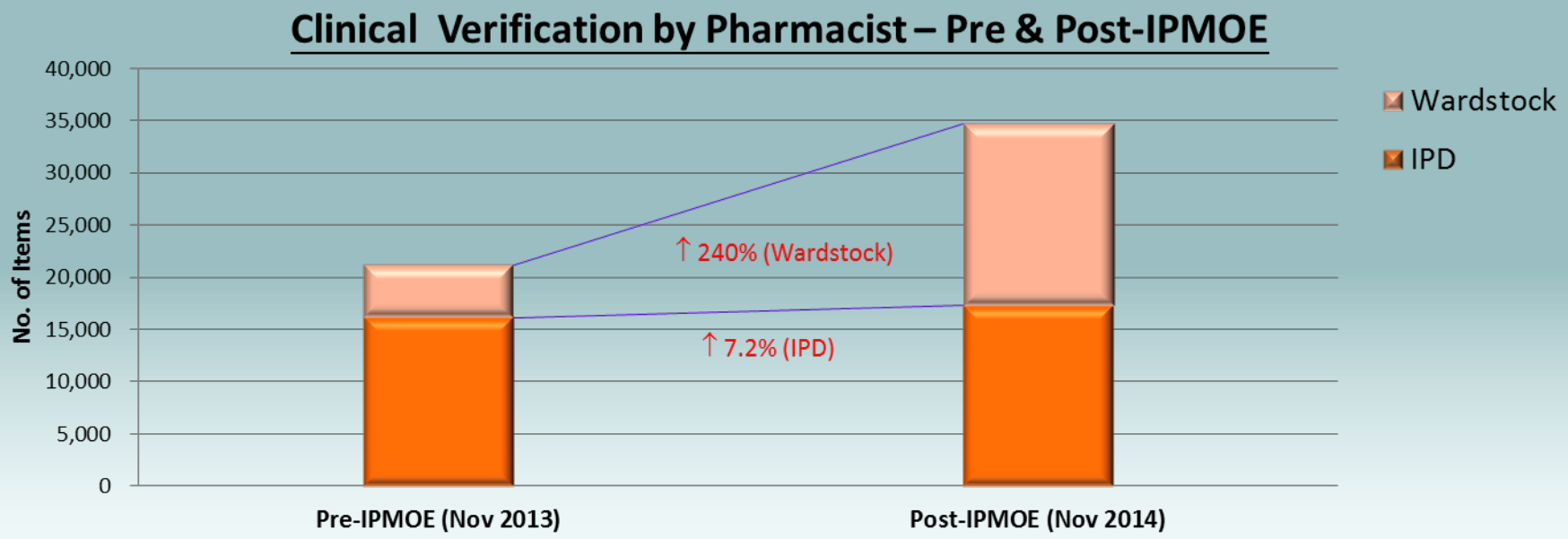
  Total 22 wards / 690 beds

Retrospective Study of Pharmacy Service following IPMOE Implementation

- Objectives:
  - ① Evaluate pattern of clinical verification of IPMOE orders by Pharmacists
  - ② Review the drug distribution performance in relation to administration due time (ADT)
  - ③ Assess prevalence of medication replenishment requests (RR) outside routine supply

Result – Volume of Clinical Verification

- Prescriptions sent to Pharmacy for verification:
  - Pre- vs Post- IPMOE : 21,282 vs 34,716 items



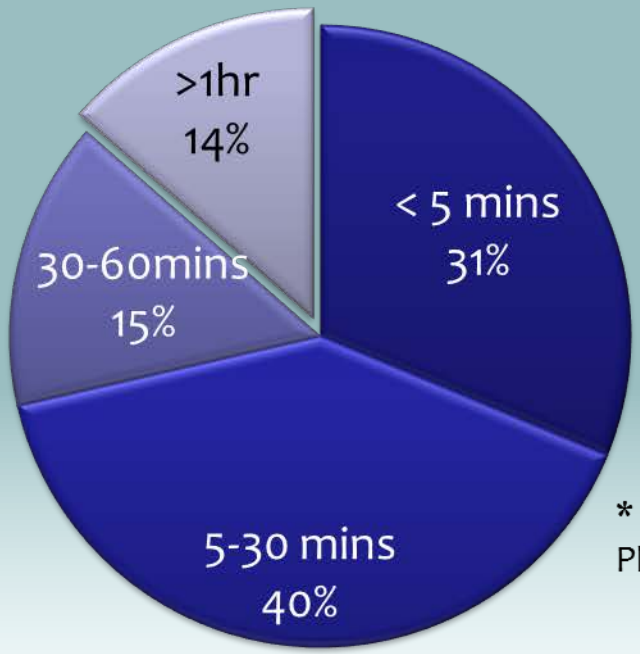
**Total volume processed by Pharmacy including refills are 49,493 & 80,595 items in pre- and post-periods respectively*

- ⇧63% order for verification
- Electronic data transmission enables 100% clinical verification of complete drug profile by pharmacists

Result – Timeliness of Rx Verification

Verification of Newly Prescribed Orders by Pharmacist

[IPD & wardstock , n=34,716]



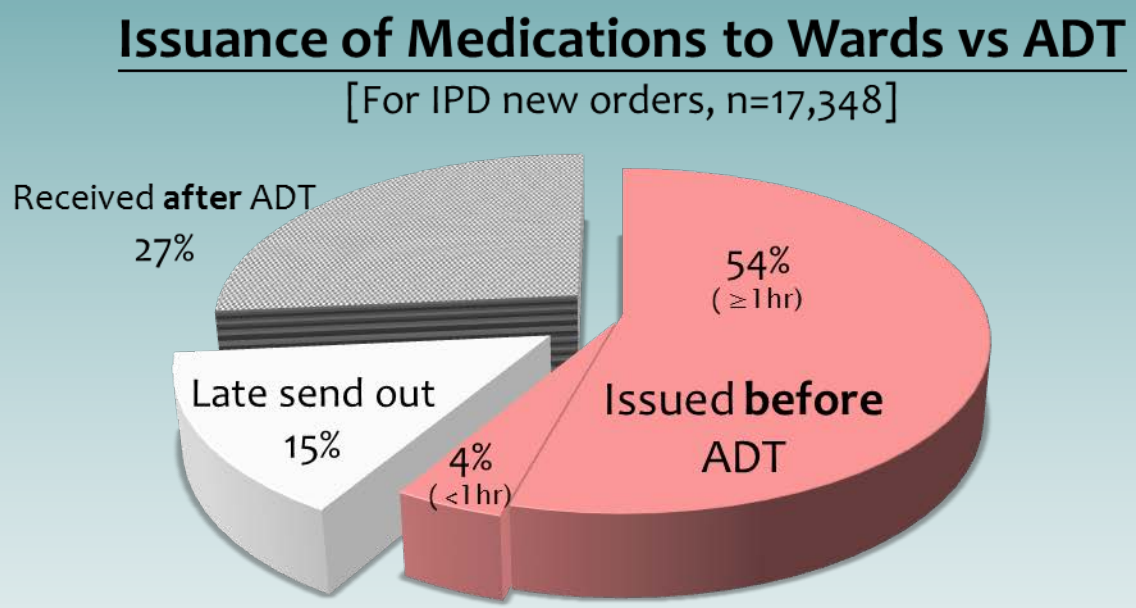
* Time range = Time to verification by Pharmacist after order is prescribed

- 71% are verified within 30 mins & 86% are completed within 1 hours

➢ Timely confirmation of high priority orders

➢ Facilitate urgent drug administration & strengthen medication safety

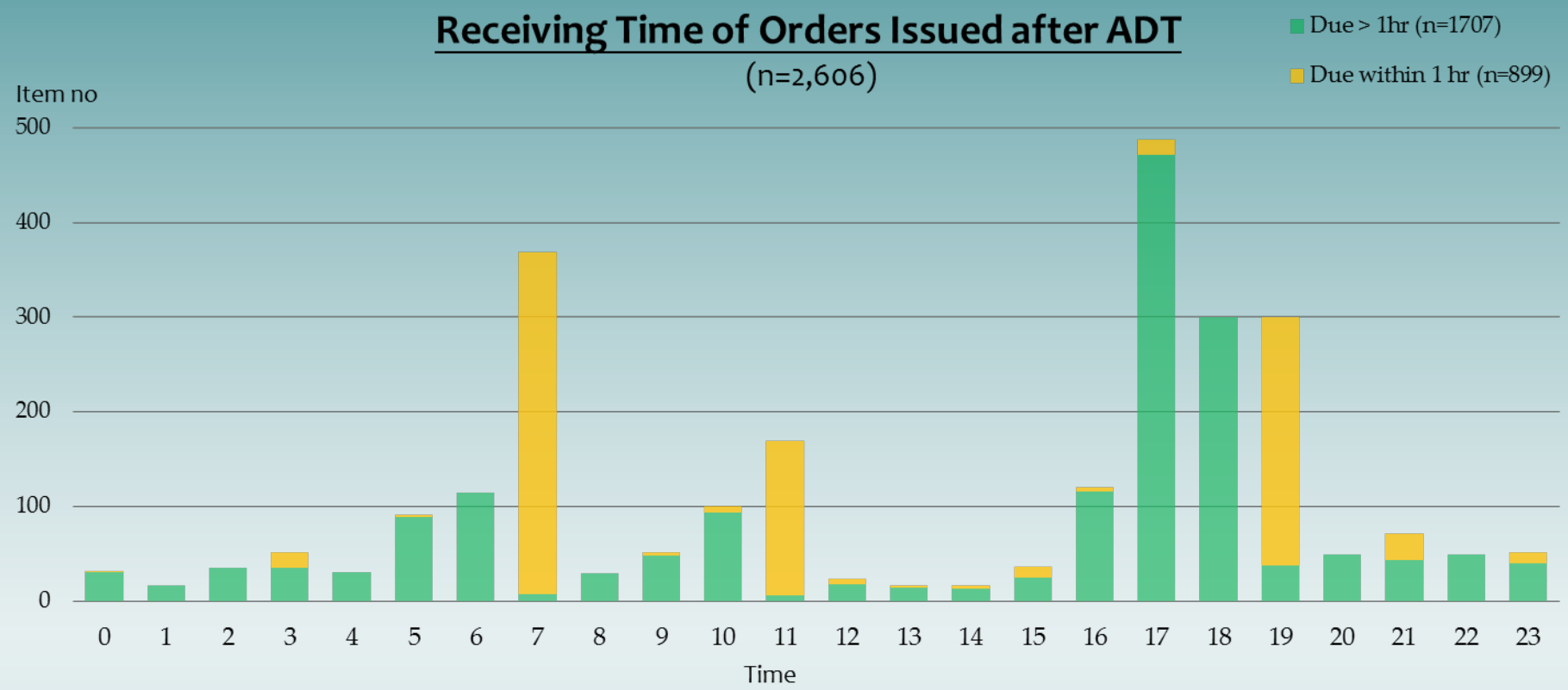
Result - Effectiveness of Medication Issuance against Administration Due Time (ADT)



- 27% transmitted to Pharmacy after ADT, mainly PRN & STAT orders, could not be evaluated
  - *PRN and STAT orders are on top priority for verification and dispensing in system*
- 58% was issued to wards before ADT with majority ≥ 1hour in advance

➢ **Achieving administration of RIGHT medication at RIGHT time**

Result – Analysis of Suboptimal Performance



- Orders that could not be issued before ADT were
  1. Mainly received at 7-8am and 5-8pm which are clinical ward rounds
  2. Prescribed within 1 hour to standard administration schedule i.e. 8A, 12N and 8P

➢ To review pharmacist support and drug delivery schedule outside normal service hours

Monitoring of Medication Replenishment

- Medication replenishment is a corporate feature in IPMOE to let nursing staff raise request to Pharmacy if stock is found inadequate via routine supply

Clinical Management System [CMS]

Drug Admin by Patient

Pharmacy Management System - Windows Internet Explorer

PMS [Vetting] (UAT) Hospital: TMH(WKS) User: bonnie_admin(gcppms-ipmoe05)

PMS OP | PMS IP | Enquiry | Report | File Maintenance | System Configuration | CDDH | Support | Window | Help | Close | Logoff

Reset | Show All Request

F/18y 夏明春 IPMOE PATIENT, 63 Alert

DOB : 20-Sep-1994 HKID # : M100063(8) MED IP07-04 Adm : 11-Sep-2012 HN12000355X (VH)

PHS Spec. DMSC PHS Ward IP07 Patient Cat. Other Doc. Patient Status Active Edit Private Pregnancy Contraindication Checking

Label Language English Weight: kg Height: cm BSA: m² View eMAR

To Do List (2) | Replenishment Request (1) | Current Medication

Disp.	Drug	Issue Qty	Reason	Direct Label Print	Request Date / Time	Status
☐	Cefuroxime Sodium – ZINACEF – injection DOSE 750 mg – IV bolus – Q8H		Out of stock		05-Mar-2013 21:18	Outstanding

Active | Inactive

Cefuroxime Sodium – ZINACEF – injection DOSE 750 mg – IV bolus – Q8H

Amoxycillin (Trihydrate) + Clavulanic Acid – AUGMENTIN – tablet – 375mg DOSE 375 mg – oral – Q8H

Insulin Human Isophane + Neutral 70%/30% – HUMULIN 70/30 – penfill – 100u/ml – 3 mL DOSE 15 unit(s) – SC Bolus – before breakfast – AND Insulin Human Isophane + Neutral 70%/30% – HUMULIN 70/30 – penfill – 100u/ml – 3 mL DOSE 5 unit(s) – SC Bolus – before lunch

Insulin Human Isophane + Neutral 70%/30% – injection – 100u/ml – 10 mL – mixtard 30hm DOSE 3 unit(s) – SC Bolus – OM for 3 DOSE

Metoprolol Tartrate – tablet DOSE 50 mg – oral – STAT for 1 DOSE

Captopril – tablet DOSE 50 mg – oral – BD

Fentanyl Citrate – injection DOSE 25 microgram(s) – IV bolus – Daily DD-redispense

Zidovudine – capsule

Save Profile | Cancel

"Out of stock" is the default reason in system

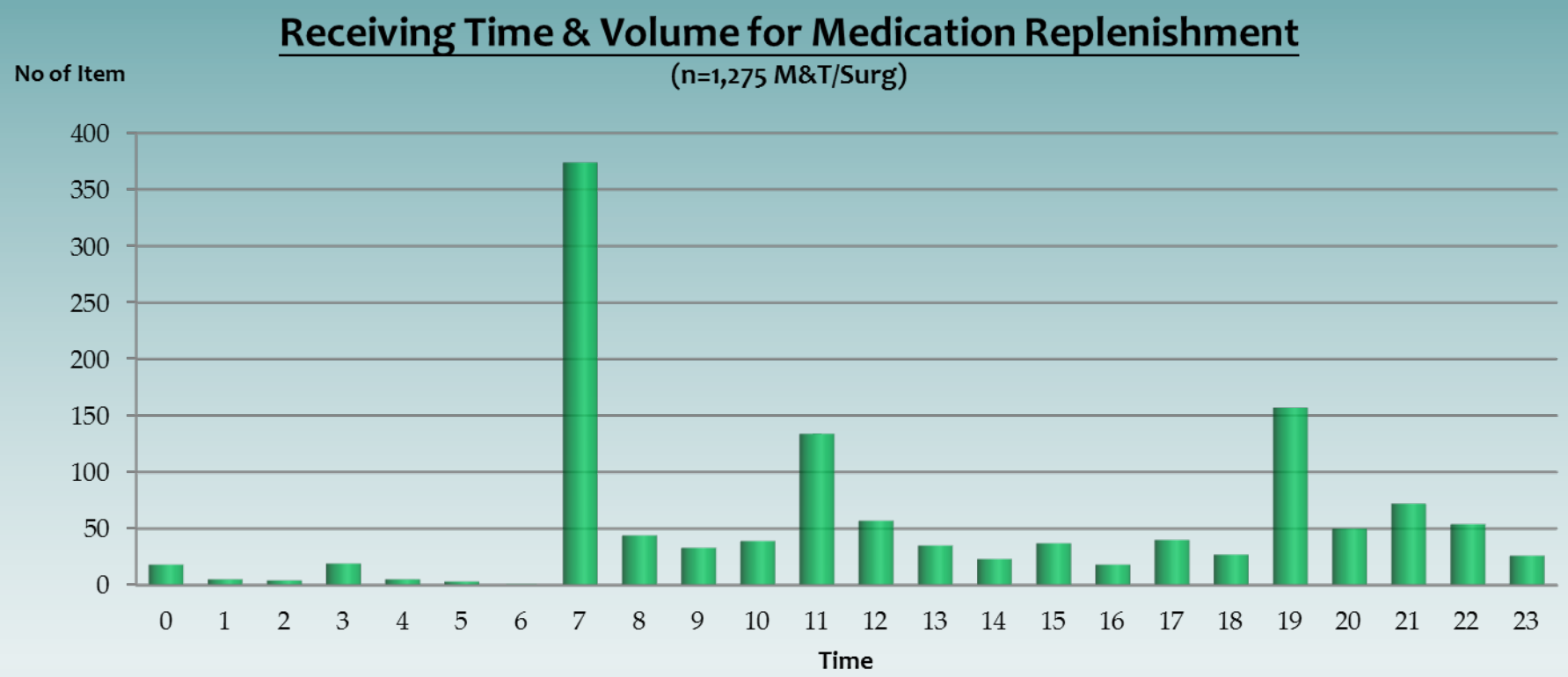
Done | Local intranet | Protected Mode: Off | 100%

Monitoring of Replenishment Requests

- Review period : 1 – 30 Nov 2014
- Specialty included: Medical and Surgical wards
- Exclusion: RR due to "Single" supply nature
- Results:
  - Total no of RR : 1,275
  - Reasons for replenishment

Reasons	No. of Items	%
Broken / Contaminated	29	2.27%
Drug not received	31	2.43%
Out of stock	1,215	95.29%
Total:	1,275	

Result – Medication Replenishment Requests



- Medication replenishment requests were
  - Commonly made at 7A, 11A and 7P (within 1 hr to standard AOM i.e. 8A, 12N & 8P)
  - Similar pattern to orders with suboptimal performance

➢ To further review the causes and explore improvement measures

Conclusion

- Implementation of IPMOE has
  - Enhanced medication safety with 100% clinical verification of complete medication profile by pharmacists
  - Improved efficiency of prescribing -dispensing - drug administration cycle

Way Forward

- Further improvement of Pharmacy service via :
  - Reviewing manpower arrangement and drug delivery schedule to meet clinical practice
  - Streamlining operations and making use of available system features to maximize benefits of IPMOE and uphold safety and efficiency

Thank You