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

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

Pharmacists receive the order, verify and dispense drugs to ward

Administration record can be seen in pharmacy to facilitate drug refill
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**

1. Handwritten MAR
2. Fax to Pharmacy
3. Data input
4. Clinical verification
5. Pick, check and send to ward

**IPMOC**

1. Instant electronic transmission of prescription
2. Orders prioritized by ADT (Admin Due Time)
3. Clinical verification
4. Pick, “check” and send to ward

- + Check Rx active status
- Pledge: 1hr before ADT
- IPD vs Wardstock
- Faxed items only
- FIFO
• Benefits of IPMOE:
  – NO transcription error
  – Instant transmission & real-time update of medication profile
  – Automatic prioritization for dispensing
  – Track and trace of dispensed medications
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 IPM O E Implementation

• Study period:
  – Pre-IPM O E: 1 Nov – 30 Nov 2013
  – Post-IPM O E: 1 Nov – 30 Nov 2014

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

Total 22 wards / 690 beds for same specialties & wards
• Objectives:

① Evaluate pattern of clinical verification of IPMÖE 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
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**
71% are verified within 30 mins & 86% are completed within 1 hour

Timely confirmation of high priority orders

Facilitate urgent drug administration & strengthen medication safety
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 ≥ 1 hour in advance

Achieving administration of RIGHT medication at RIGHT time
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
Medication replenishment is a corporate feature in IPMOE to let nursing staff raise request to Pharmacy if stock is found inadequate via routine supply.

"Out of stock" is the default reason in system.
• 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

<table>
<thead>
<tr>
<th>Reasons</th>
<th>No. of Items</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken / Contaminated</td>
<td>29</td>
<td>2.27%</td>
</tr>
<tr>
<td>Drug not received</td>
<td>31</td>
<td>2.43%</td>
</tr>
<tr>
<td>Out of stock</td>
<td>1,215</td>
<td>95.29%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>1,275</strong></td>
<td></td>
</tr>
</tbody>
</table>
• 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
• 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