

# Implementation of Automatic Medication Unit Dose Dispensing System (AMUDDS): YCH Experience

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With the commitment to reduce human errors during medication dispensing and administration processes, Yan Chai Hospital (YCH) has implemented the Automatic Medication Unit Dose Dispensing System (AMUDDS) since Mar 2018.

The AMUDDS consists of (1) a medication dispensing unit, where medications are packed into individual medication pouches; and (2) a medication checking unit, where the medication pouches will be checked against the database for correctness. The medication pouches are automatically packed on a unit dose basis – Each medication pouch contains the required amount of tablets / capsules of one kind of medication for a single dose.

At wards, the AMUDDS facilitates accurate and timely sorting of pouches into patients' drawers in the medication trolley as the pouches are sorted according to bed number. The AMUDDS also improves the efficiency during drug administration rounds as the unit doses are sorted according to drug administration time. Furthermore, due to the unit dose feature of the AMUDDS, the need for calculation of number of tablets / capsules for each dose is reduced, thereby reducing potential human errors during drug administration.

The AMUDDS is now serving the Coronary Care Unit and 19 acute, rehabilitation and infirmary wards from medical, orthopaedics, and surgical specialties in YCH.

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Fig. 1 AMUDDS performing automated drug picking



Fig. 3 Medication pouches produced by AMUDDS

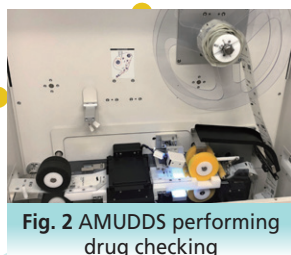


Fig. 2 AMUDDS performing drug checking



Fig. 5 Medication refill supplied to wards

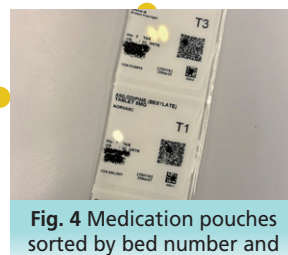


Fig. 4 Medication pouches sorted by bed number and time of administration

## Editorial Comments

Medication error is considered to be one of the top risks in the Hospital Authority. Different health care professionals are involved in the processes of the medication system. Automatic Medication Unit Dose Dispensing System in which medications are dispensed in a ready-to-administer form has helped to streamline the workflow and mitigate the medication risk.

Ms Karen MAK, Senior Manager (Allied Health), HAHO

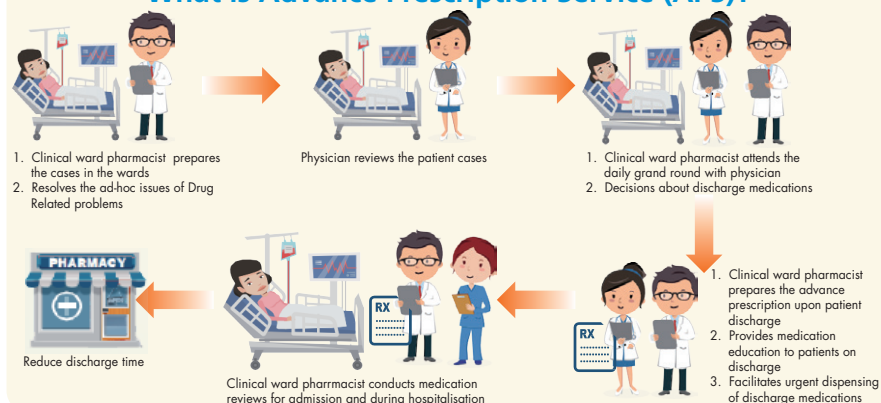
# Advance Prescription Service (APS) Provided by Clinical Ward Pharmacist: Prospective Study Demonstrating Reduction in Discharge Time of the General Medical Wards with Complex Medication Regimens

By Mr Vincent K C Wong<sup>1</sup>, Mr Thomas Y H Cheung<sup>1</sup>, Ms Angie H Y Wong<sup>1</sup>, Ms Clara C H Ng<sup>1</sup>, Mr Raymond W M MAK<sup>1</sup>, Ms Frances H Chiu<sup>2</sup>, Mr William C M Chui<sup>1</sup>, Dr Carmen W S Chan<sup>3</sup>, Prof C S Lau<sup>3</sup>

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Hospital services are under increased pressure for the availability of hospital beds, timely discharge and quality inpatient care. This may lead to prescribing errors and medication discrepancies on discharge. Queen Mary Hospital (QMH) is the pioneer in Hong Kong implementing the Advance Prescription Service (APS). This clinical pharmacy service was introduced in Dec 2017 with active participation of clinical ward pharmacists and now has been running in three general medical wards in QMH. The aims are to: (1) improve the quality of inpatient care & enhance medication safety; (2) expedite the discharge process of inpatients; and (3) relieve the workloads of clinical staff. A multi-disciplinary team approach has been adopted with the collaboration of medical doctors, nurses and clinical ward pharmacists.

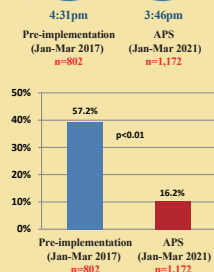
## What is Advance Prescription Service (APS)?



The high turnover rate of hospital beds in general medical wards could relieve the great demand of hospital beds. With the implementation of APS, we identified that patients were discharged 45 minutes earlier in the post-implementation period (Jan to Mar 2021) compared with the pre-implementation period (Jan to Mar 2017). During the post-implementation period, clinical ward pharmacists prepared 84.6% of prescriptions and reduced the percentage of items requiring an amendment from 65% to 17% ( $p < 0.01$ ). Medical staff ( $n=82$ ) and nursing staff ( $n=274$ ) surveyed felt that the integrated APS improved the patient flow and should be incorporated into the standard practice.

The APS improved patient discharge process by decreasing the number of prescriptions requiring amendments and reducing the time taken to discharge patients. Additionally, this service received healthcare professionals' satisfaction and demonstrated that a multi-disciplinary collaboration in ward can provide a unique platform for enhancing quality care and maximising the utilisation of hospital beds.

↓ 45 mins



## Feedbacks of Stakeholders



"Extremely helpful! Opportunity to learn more from clinical pharmacist."  
"Valuable aid to clinical decision making."

"Workload is far more manageable."  
"Reduced intern overtime significantly."

"Incredibly helpful! Patient discharge process has been greatly streamlined."

"Medication charts and discharge medications are more accurate which is safer for the patient."



"Thank you very much to the pharmacist in the ward tending very efficient & special care to my father especially in the very tight schedule. I received calls from pharmacist, reminding very clearly on the medicine changes. (My father has a long list of medicine of over 19)"



The case discussion between clinical ward pharmacists and house officers when formulating a discharge prescription.

## Editorial Comments

*The Advance Prescription Service provided by clinical ward pharmacists demonstrates a good example of successful multidisciplinary collaboration. In addition to improving the efficiency of patient discharge process, it has enhanced medication safety and relieved staff workloads.*

*Dr K H LAU, Chief Manager (Quality & Standards), HAHO*



# Technological Enhancement in Clinical Out-patient Pharmacy Service: Drug Refill Service in New Territories West Cluster

By **Mr Jeff Lee<sup>1</sup>**, Pharmacist; **Ms Grace Young<sup>1</sup>**, Senior Pharmacist; **Ms Pauline Chu<sup>1</sup>**, Department Manager and Clinical Stream Coordinator; **Dr C K Mok<sup>2</sup>**, Consultant

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Since Dec 2017, Drug Refill Service (DRS) has been implemented in Tuen Mun Hospital (TMH) targeting Medicine & Geriatrics Specialist Out-patient Clinic (SOPC) patients with prolonged follow-up periods. This service aims to break the prescriptions of long duration into shorter refills. Medication reconciliation will be done by pharmacists for each case and phone contact patients with medication changes to ensure patient compliance and knowledge of their treatment regimens so as to prevent drug-related problems (DRPs). Face-to-face counselling would be arranged for cases with potential DRPs. For cases requiring immediate attention by physicians, they would be referred to SOPC for the DRPs. By using tele-pharmacy service and medication counseling in SOPC, holistic pharmaceutical care could be provided to patients in ambulatory care.



Besides enhancing the clinical care of SOPC patients, the implementation of DRS in TMH also induced technological enhancements of patient safety in the pharmacy workflow. A tagging system was introduced to NTWC. Refill medications prepared in Tin Shui Wai Hospital, a centralised dispensing site in NTWC, were packed, sealed and transported to drug collection site - Tuen Mun Hospital. A unique tag was assigned to each drug pack for systematic track-and-trace operation. Once the drug pack arrived the drug collection site, SMS notification would be sent to the patient automatically as a reminder for his/her drug collection. This would minimise the risk of missing drug dosages due to running out of supply. The tagging system could also alert pharmacy staff to pick up the correct drug pack according to guiding light signal at the storage area. This could significantly reduce the human error of wrong drug pack retrieval from storage and issuing to patient.



Refill medication was dispensed to patient at drug collection site

## Editorial Comments

*The medication reconciliation by pharmacists together with the technological advancement in the drug refill process in TMH, including the centralised dispensing service, drug packs with unique tags and medication refill reminders, has demonstrated an excellent example of how the hospital striving for quality improvement and patient-centered care.*

**Dr L P CHEUNG**, Deputy Service Director (Quality & Safety), NTEC

# Patient Safety Culture in KCC Pharmacy Service - The First Survey

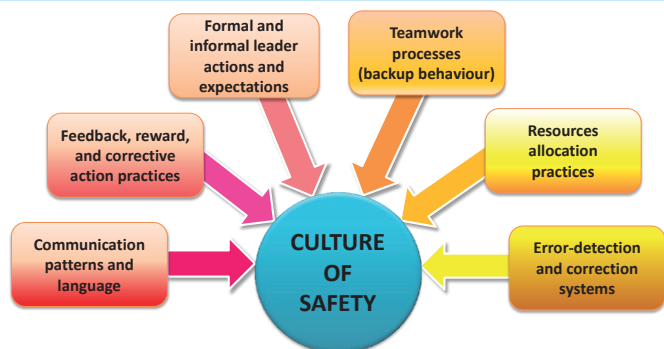


## Kowloon Central Cluster

By **Ms Miranda CHUI<sup>1</sup>** on behalf of the **KCC Pharmacy Patient Safety Culture Working Group** (Mr Michael LING<sup>2</sup>, Dr Wilson LEUNG<sup>3</sup>, Ms Salina LAM<sup>3</sup>, Ms Miranda CHUI<sup>1</sup>, Ms Kitty CHU<sup>3</sup>, Ms Belinda Wong<sup>2</sup>, Mr Eric CHAN<sup>4</sup>, Ms Elisa CHUNG<sup>5</sup>, Ms Mary LAU<sup>6</sup>, Ms Hayley MAK<sup>6</sup>, Ms Vincy CHAN<sup>2</sup> and Mr Gordon MIU<sup>5</sup>)

Pharmacy Department, <sup>1</sup>Kowloon Hospital, <sup>2</sup>Kwong Wah Hospital, <sup>3</sup>Queen Elizabeth Hospital, <sup>4</sup>Hong Kong Eye Hospital, <sup>5</sup>Buddhist Hospital, <sup>6</sup>Our Lady of Maryknoll Hospital

### Core Aspects of Safety Culture<sup>^</sup>

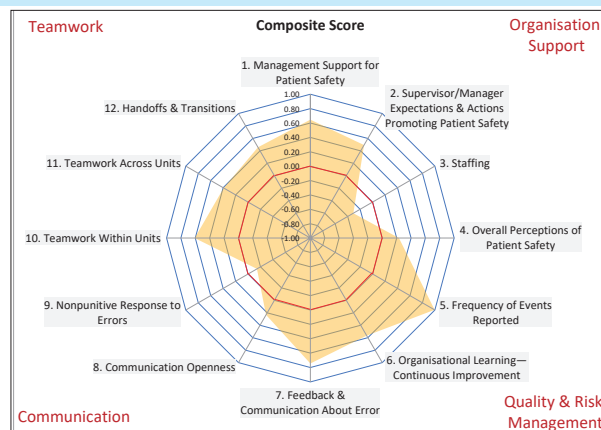


A total of 317 dispensers and pharmacists from 11 KCC hospital/ clinic pharmacies took part in the survey. The survey results demonstrate that KCC pharmacy departments have a good culture in Frequency of Events Reported, Feedback & Communication about Error, Management Support for Patient Safety and Teamwork within Units. On the other hand, the areas on Staffing, Non-punitive Response to Error, and Communication Openness are needed to be addressed.

### Way Forward

The survey has generated a useful database to perform stratified analyses, such as by years of experience. Improvement measures can also be made against areas with relatively low scores. Focus groups can be formed in individual work units to collect feedbacks and formulate improvement strategies. Conducting subsequent surveys can help us track trends in safety culture after improvement measures have been implemented.

### Radar chart summarising the overall scorings of the 12 composites in KCC



In future, we hope that the survey would also be taken up by other clusters or institutions, so that we can learn from each other via benchmarking. We believe that a positive safety culture in an institution will make medication safety projects more meaningful and sustainable.

### Further Reading

- <sup>1</sup> Schein E : Organisational Culture and Leadership. 4th Edition. San Francisco, Ca. Jossey-Bass 2010
- Assess Patient Safety Culture Using the Hospital Survey on Patient Safety: Facilitator Guide (access via <https://www.ahrq.gov/hai/tools/mvp/modules/cusp/assess-psc-hsop-fac-guide.html>)
- Patient Safety Culture in the Kowloon Central Cluster Pharmacy Services ~The First Survey~ (access via [http://www.ha.org.hk/visitor/ha\\_view\\_content.asp?Content\\_ID=258918&Lang=ENG](http://www.ha.org.hk/visitor/ha_view_content.asp?Content_ID=258918&Lang=ENG))



## Editorial Comments

AHRQ's Surveys on Patient Safety Culture began in 2001. The Survey has been conducted in many countries and applied in different healthcare settings. It is good to see the Pharmacy Team in KCC has conducted the Survey with sound analysis and followed up by a Focus Group.

**Ms Bonnie WONG**, Cluster Manager (Quality & Safety), NTWC

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