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Technological Innovations for Precious Specimen Tracing: the Precious Specimen Delivery Information System (PSDIS)

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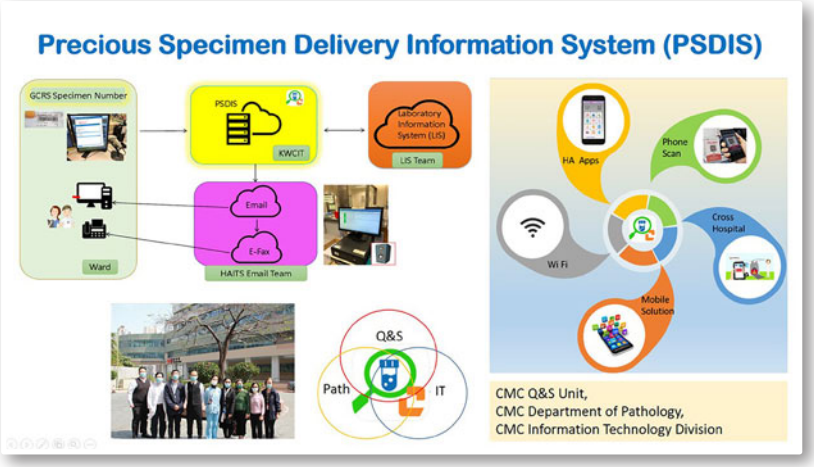
Precious Specimen Delivery Information System (PSDIS) was first implemented in Caritas Medical Centre (CMC) since September 2021. Specimens and staff card were first scanned with barcode scanner in wards. Information regarding staff number, specimen number, time of delivery, and ward location would be automatically stored in a local PSDIS server. Upon specimen arrival and registration via Laboratory Information System (LIS), information could be fetched by the PSDIS server, indicating successful specimen arrival.



Cerebrospinal fluid (CSF), tissues and fluid for urgent Gram stain test, corneal scraping, and bone marrow aspirate are designated to arrive within one hour. The time target is adjustable. Beyond the targeted time, automated alarm and email would alert ward and laboratory staff.

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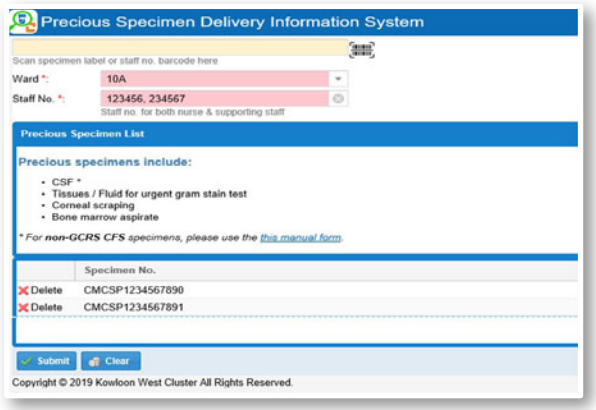
Specimen Collection & Tracing



2,488 specimens were delivered via PSDIS in the first year. Zero specimens were missing, and more than 98.5% specimens fulfilled the target time.

PSDIS is a simple and effective inventive IT system, allowing data matching at backend between Generic Clinical Request System (GCRS) and LIS, and unifying workflow across departments. Installation is easy at low cost. It is easy to learn, allows automatic storage of transaction records, carries no sensitive personal data, and can highly adapt to different clinical settings.

PSDIS is anticipated to rollout in regional cluster, permitting more variety of specimens, allowing cross-hospital transfer, and incorporating into mobile solution, HA Apps, interchange solution, and self-checking or stocktaking system.

Editorial Comments

Specimen delay and/or loss, especially for those precious ones, have significant implications for patient management and may result in irreversible impact on patient outcomes. While majority of the pathology laboratories are adopting manual documentation for specimen tracking, PSDIS is a much better solution.

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

Mitigate the Risk of Loss of Clinical Specimen

*By **Mr WS Wong[1] and Mr Albert LI[2]**, Allied Health Committee of Pathology Quality & Safety Workgroup*
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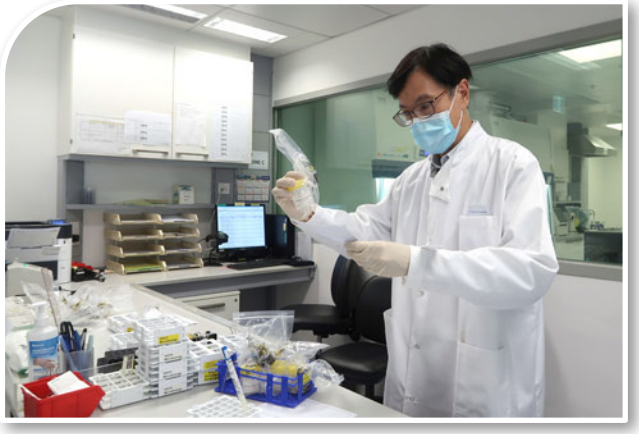
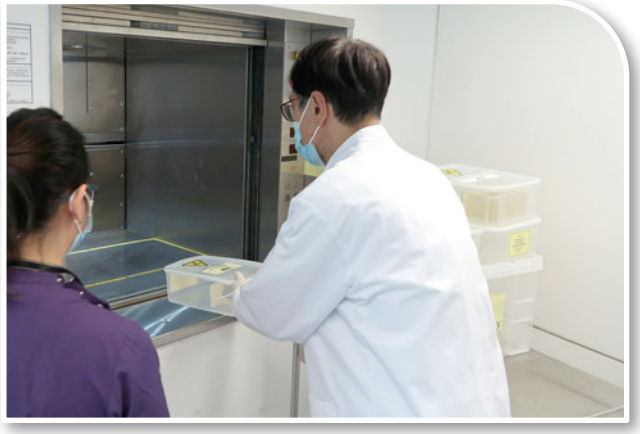
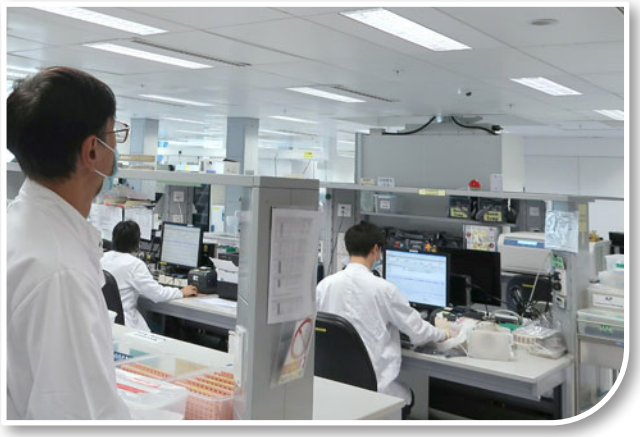
Loss of specimen leads to catastrophic consequences since it affects the management of the patients, however it is one of the most common clinical risks identified in Clinical Pathology Departments.

To mitigate the risk and adopt preventive measures, a study was carried out in which the overall observation of various scenarios, clinical experience sharing and incident review were gathered and analysed.

The contributing factors of the specimen loss could be categorised by personnel, technology, method as well as environment, in which low staff alertness, inadequate traceability of the specimen flow, communication gap, limitation of pneumatic tube system and mishandling of specimen after receipt at laboratory. Preventive measures including education and sharing session, document traceability improvement, enhanced communication with hospital users, workflow reengineering and monitoring of pneumatic tube system, good housekeeping practices and implementation of CCTV at reception are recommended.







By leveraging innovative and smart technologies into clinical settings, it ensures an end-to-end specimen tracing from clinical units to laboratories, in terms of effectiveness and efficiency, which allows adaptation along the current delivery workflow and data flow along Generic Clinical Request System (GCRS) and Laboratory Information System (LIS) to enable close monitoring of precious specimen and avoid loss by timely acknowledgement and feedback with unification across hospitals.

Editorial Comments

Pre-analytic error is the most common laboratory error type that imposes potential significant harm on patients. Specimen processing involves complex handoffs. Thoughtful root cause analyses as well as process monitoring can detect and address systems vulnerabilities. Optimal system solutions reconciliation can improve reliability and safety cost-effectively.

Dr Ian Chan, Deputising Service Director (Quality & Safety), KEC

Closing the Loop in Specimen Collection by Generic Clinical Request System - Paperless Label Printing with UPI and Scheduling (GCRS-PLUS)

*By **Dr Jeffrey Ng[1], Ms Helena Chan[2] and Ms Daisy Au[3]***

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The Generic Clinical Request System (GCRS) in Clinical Management System (CMS) has been adopted in the Hospital Authority for more than a decade. Since 2008, the Unique Patient Identification (UPI) workflow in specimen collection has been enhanced by the vendor solution initiated from Quality and Safety Team. However, the specimen collection time would not be captured before arrival and registration of specimen at the laboratory. The collector of a specimen also cannot be identified. Moreover, the manual handling of job sheets has been another area of environmental and privacy concern. In collaboration with HOIT & HI Team, Haven of Hope Hospital (HHH) has piloted a new project named "GCRS-Paperless Label Printing with UPI and Scheduling" (GCRS-PLUS) to enhance specimen collection process since May 2021.

Features of GCRS PLUS

Unique Patient Identification

Patient identity checking is always the top priority in healthcare procedures. As the list of laboratory request is now made available in the mobile App, the patient's identity can be verified on tablet with its camera.

Traceable & Closed-Loop Specimen Collection

Different timestamp, from order to collection, can be recorded in the system. Besides, the collector's information is now traceable within the CMS.

Environmental Friendly

After the project has piloted and later fully implemented in HHH wards, we have saved approximately 13,000 pieces of job sheets in the first six months.

Timely Communication among Team

Real time display of information of laboratory requests and their schedules on both Clinical Dashboard (CDB) and in the App has helped to minimise the chance of missing order or repeated specimen handling.

The positive experience and the comments from frontline colleagues have been put forward for future enhancement. We are happy to have witnessed the improvement in clinical efficiency and enhancement in patient care process with the use of IT.

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Editorial Comments

Laboratory tests contribute vital information for correct diagnostic and therapeutic decisions. The whole specimen handling processes, starting from test ordering and correct specimen labelling to timely specimen transportation and collection, are essential prerequisites for the timely and accurate test results. The enhancement in GCRS-PLUS has facilitated the closed-loop management and real-time monitoring of specimen collection process and has allowed us to manage the process in a synchronised way to achieve clinical efficiency and optimal cost.

Dr Lai Ping Cheung, Deputy Service Director (Quality & Safety), NTEC

CLUSTER SHARING

A Simple Drop Box Design to Achieve Security in Specimen Collection

New Territories East Cluster

By ***Ms Pui Ying Mak[1], Ms Mei Ling Lai[1], Ms Fei Ling Kwok[1], Ms Pui Ha Lam[1], Ms Caroline WH Chiu[1], Dr Wing Kit Leung[1], Dr Eric MT Hui[1], Dr Maria KW Leung[1] and Dr Elsie Hui[2]***

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Specimen collection is a routine and heavy workload in General Outpatient Clinics (GOPC). There are about 100-150 specimens collected in each clinic every day. In the past practice, patients dropped down their specimens in an unlocked collection box which located nearby the treatment room. The collection facility was undesirable and had potential risk of missing patient specimens though clinic staff were nearby.

Moreover, the specimen bottles in the boxes are prone to expose patients' personal particulars from the labels on the specimen bottles. To ensure the security of collected specimens and to protect patient data privacy, a specimen drop box in a single direction pathway was created to prevent incidents of missing specimen.

The specimen drop box was designed to fix on the floor with lockable door, only designated staff could take out the specimen. The highlights of the design were to ensure that all collected specimens were kept in a locked place before sending out to laboratory. A notice board was erected on the top of the collection box for placing simple and clear instruction on specimen collection. To enhance the security and stability of specimens, a "Z-like" swirling tunnel was designed such that specimens slide down to the bottom via the swirling tunnel. The "Z-like" design could avoid specimens being taken out from the opening and also prevent exposing patient personal particulars.

The specimen drop boxes were used in 9 GOPC clinics located in New Territories East Cluster since 1st December 2018. After using this eye-catching and self-assisted drop box for collecting specimen, it is more flexible and easier for patients to return their specimens to clinic. The merits of this drop box are "Secure" and "Effective" specimen collection.

Editorial Comments

As there were reported incidents of loss of specimen from an unattended collection box, this simple "Drop Box" provided a safe and efficient way for specimen collection. With the clear instruction on the notice board, patients can recheck whether the specimen is well labelled or packed. The "Z-like" swirling tunnel design is smart to avoid breakage of specimen bottle from high impact fall. Other clusters may consider installing similar Drop Boxes which may save the manpower to watch over the collection box in GOPC.

Ms Bonnie Wong, Cluster Manager (Quality & Safety), NTWC