



Risk Alert



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A Risk Management Newsletter for Hospital Authority Healthcare Professionals

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Opening Message

HARNESSING THE POWER OF AI

The integration of digital technology with medical care has been underway in HA for three decades. This started with CMS and has accelerated with HA Go and the Smart Hospital. The goals of digitisation have always been to raise the quality and safety of care delivered to patients and to streamline the workflow of staff but now the development of artificial intelligence (AI), first with Big Data driven machine learning, and then with Generative AI (such as ChatGPT), promises to be a game changer.

HA is actively exploring this technology. We have deployed AI to review chest X-rays, hip X-rays and brain CTs routinely and more radiological and image based AI is in development. AI is helping predicting patient discharge and we are exploring AI to predict patient deterioration. We have seen the power of this technology to improve quality and safety, but we are also very mindful of the risks.

AI models must be carefully validated against HA data in HA's AI Lab to ensure they perform well locally, and we must deploy them suitably within our clinical workflow. We must understand the impact of deploying each AI, particularly the impact on clinical decision making. AI development must be a collaborative process led by clinicians, to ensure that the AI advice is accepted.

The combination of AI and smart medical care has endless possibilities, but as the saying goes, "with great power comes great responsibility". Moving forward, we must ensure that AI is deployed in HA safely, effectively and responsibly.

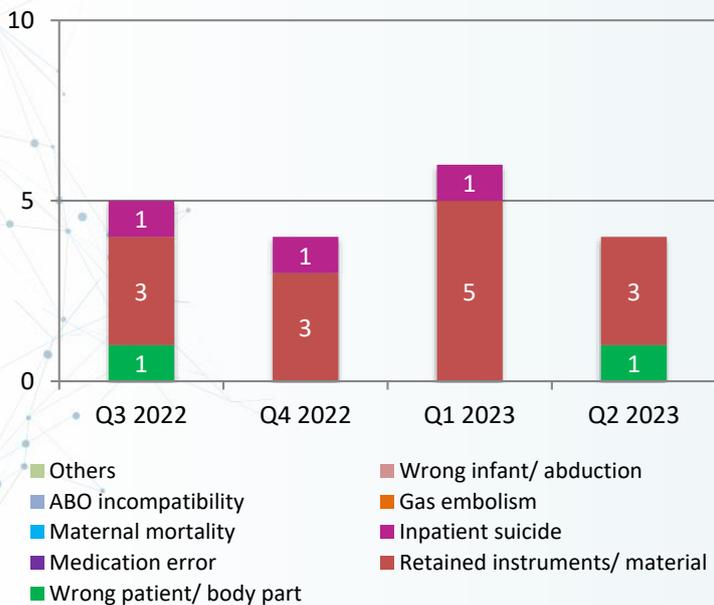


Dr NT CHEUNG

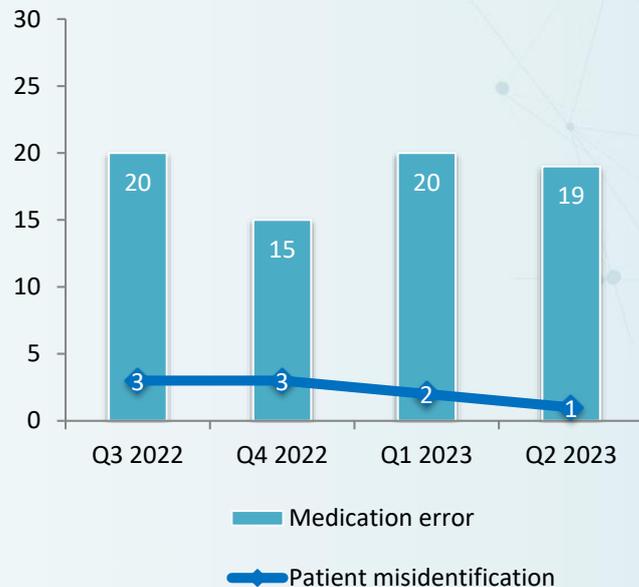
Head of Information Technology and Health Informatics, HAHO

SE & SUE Statistics

Distribution of SE in the last four quarters



Distribution of SUE in the last four quarters



Sentinel Events

Wrong Body Part

Pleural Drain on Incorrect Side

Ultrasound guided **LEFT** pleural drainage was requested for a patient with recurrent **LEFT** pleural effusion via the Generic Clinical Request System (GCRS). The doctor selected "*Percutaneous Drainage of Abscess of Fluid Collections*" under the Department of Radiology (DR) in the e-Consent module. The e-Consent was then signed.

The doctor performed an ultrasound examination on the patient's **RIGHT** chest and noted a significant amount of pleural fluid.

The doctor and nurse then performed the TIME OUT procedure and checked the interventional procedural safety checklist against the eConsent. However, the e-Consent did not specify which side the pleural drainage should be performed on. The laterality on the GCRS request form was not checked.

Ultrasound-guided **RIGHT** pleural drainage was eventually performed instead of **LEFT** pleural drainage. Around 800mL of pleural fluid was drained from the **RIGHT** chest over 2 hours after the procedure. The wrong side drainage was discovered later.

Areas for Improvement Identified:

1. Specify the laterality in the consent
2. Review the interventional procedural safety checklist used in DR, including the addition of laterality to the checklist and the addition of imaging review in the TIME OUT phase
3. Consider a designated location or folder to place the GCRS request form, consent form and interventional procedural safety checklist together to facilitate the checking process

Retained Material

Cement

A patient with fractured left neck of femur underwent a left hip unipolar arthroplasty. During the operation, surgeons provided adequate irrigation and had performed palpation to rule out cement or bone retention in the potential spaces. However, an X-ray taken on post-operative day 2 showed a 5mm radio-opaque lesion located lateral to the left proximal femur (Figure 1). A subsequent computer tomography (CT) confirmed the radio-opaque lesion was located at the muscle layer lateral to the left proximal femur, which is not communicated to the joint.



Figure 1. Cement

Areas for Improvement Identified:

1. Raise staff awareness on the risk of cement retention during operation
2. Consider intra-operative X-ray if there is a clinical suspicion of cement retention

Wound dressing material

A patient had two hospital admissions across two months due to an infected sacral sore with a deep tunnel wound (>10cm). The wound was cared by ward and wound nurses. It was also examined by doctors during ward rounds.

Negative pressure wound therapy (NPWT) was initiated using a tailor-made wound filler (Figure 2). In one episode of wound assessment, all dressings had already been removed upon wound nurse's review. The patient was later discharged to an old age home (OAH) where daily wound care management was continued by community nurses.

Around one month later, an 11.5 x 1.5cm object (Figure 3) was retrieved from the wound tunnel during performing wound dressing by a community nurse. It was confirmed to be the tailor-made wound filler.

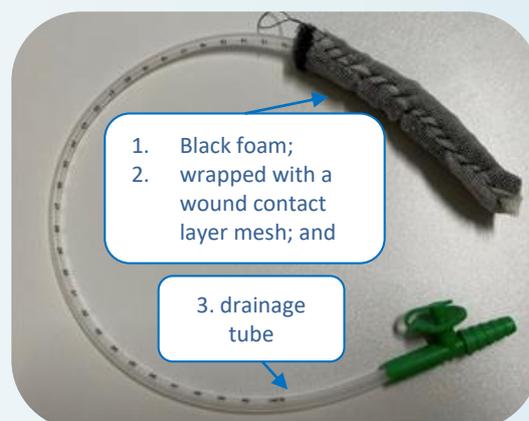


Figure 2. Tailor-made wound filler – 3 components secured with sutures as one unit



Figure 3. The retrieved object

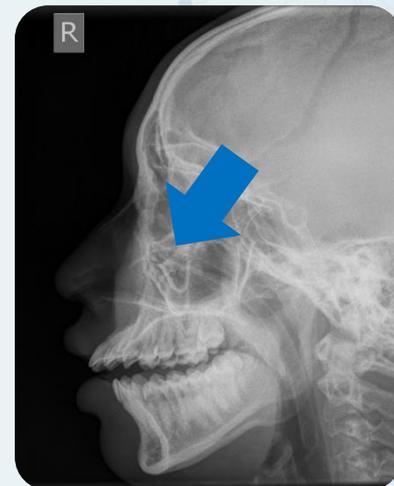
Areas for Improvement Identified:

1. Enhance training and provide information on components of tailor-made wound filler with diagrams/illustrations for reference
2. Ensure tailor-made wound filler is kept for wound nurses' inspection or take clinical photos for documentation
3. Reinforce the documentation of removal of wound filler and dressing materials
4. Ensure all components of a tailor-made wound filler are secured before application

Nasopharyngeal Airway

A 13-year-old patient with a history of global developmental delay, mental retardation and autism was admitted for excision of right accessory auricles. The operation was completed uneventfully under general anaesthesia (GA). Towards the end of the reversal of anaesthesia, the patient developed airway obstruction and required the insertion of a nasopharyngeal airway (NPA) into the left nostril. However, there was no documentation of the NPA insertion in the anaesthetic record or in the Post Anaesthesia Care Unit (PACU) arrival note, the clinical handover regarding the NPA insertion was also ineffective.

The patient later developed nasal regurgitation. An X-ray showed that the NPA was retained in the post-nasal space. It was subsequently removed without causing any structural damage.



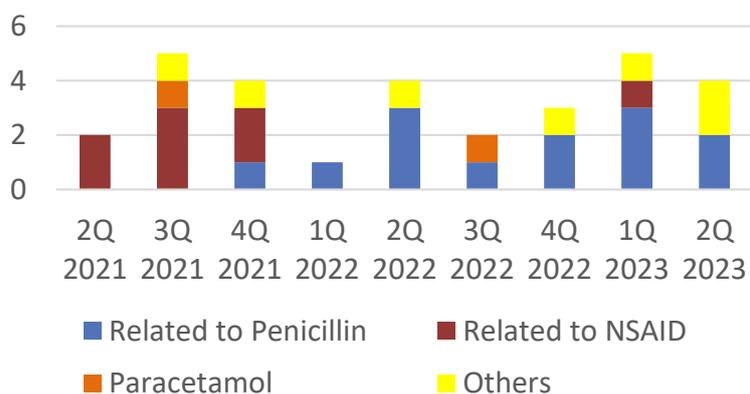
Areas for Improvement Identified:

1. Review and standardise the documentation practices in the anaesthetic record regarding the patient's clinical condition and the use of airway support
2. Reinforce the clinical handover process between Anaesthetist and PACU nurse for accurate communication of critical patient information
3. Explore alternative NPA designs to prevent the risk of dislodgement (e.g. a larger diameter flanges or more rigid materials)
4. Standardise and incorporate practices for counter-checking the removal and integrity of the NPA into the clinical handover processes between Anaesthetists and PACU nurses

Serious Untoward Events

Of the 20 SUE cases reported in 2Q 2023, 19 cases were related to medication errors, including known drug allergy (KDA) (4), anticoagulants (1), dangerous drugs (3), vasopressors and inotropes (1), insulin (2) and others (8).

Number of KDA cases (2Q 2021 – 2Q 2023)



Known Allergy	Allergen Prescribed
Amoxil	Augmentin
Amoxicillin	Augmentin
Mydrin-P eye drop	Mydrin-P eye drop
Instillagel	Lignocaine

Serious Untoward Events

To enhance staff awareness, this issue shall highlight some incidents related to infusions and known drug allergy.

Case 1

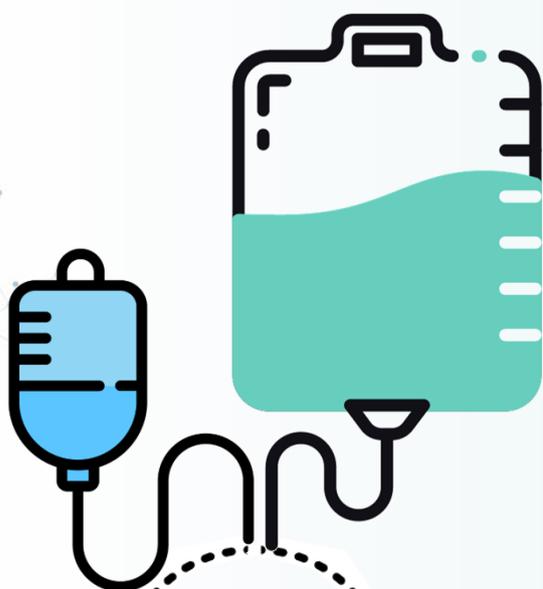
Actrapid 50 units in 50ml normal saline to be given at 1 unit/hour (1ml/hour) was prescribed for a patient with a blood glucose level of 33.1mmol/L. However, the infusion rate was mistakenly set to 50ml/hour using a syringe pump.

Case 2

A baby requires simultaneous medications infusions to support cardiac output. However, the 3-way stopcock for Adrenaline infusion was not open.

Case 3

A patient was prescribed total parenteral nutrition (TPN) Formula at 45ml/hour over 12 hours and intravenous fluids at 500ml/hour. However, the connections was mistakenly reversed when connecting the infusion tubes to the pumps, resulting in the TPN solution infused at 500 ml/hour and the IV fluids at 45 ml/hour.



TRACE BACK INFUSION LINES THROUGH TACTILE AND VISUAL CHECKS



INDEPENDENT DOUBLE CHECKING



EXPLORE USE OF DRUG LIBRARY AND SMART PUMPS



Serious Untoward Events

Case 4

As patient complained of severe scrotal pain, doctor prescribed **Fentanyl subcutaneous (SC)** infusion in IPMOE.

The route of administration was not checked by two nurses when commencing and changing drug bottles. The nurses involved were also unaware of the prescribed route during shift handover and bedside checking.

The Fentanyl infusion was later discovered to be administered via **intravenous (IV) route** instead of the intended SC. The patient's condition was stable.

Case 5

A patient with a history of allergy to **Instillagel** and sulphur was admitted for right leg cellulitis. Intravenous antibiotics were given.

The doctor performed an incision and drainage procedure under **local anesthesia** (5ml 2% plain **Lignocaine**) with informed consent from the patient.

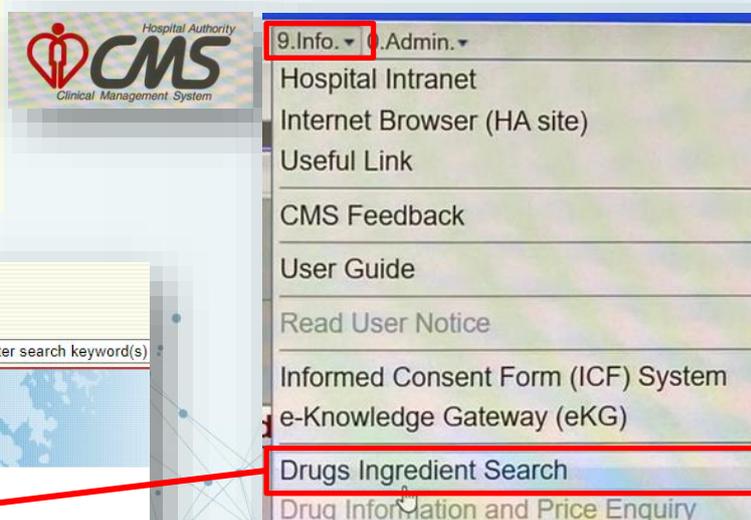
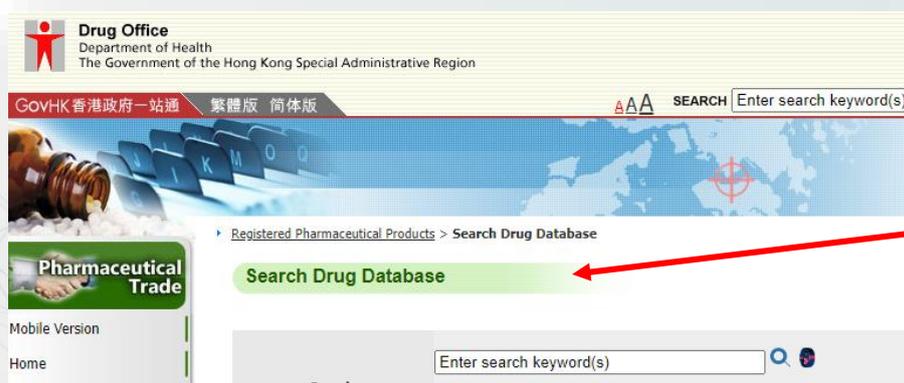
Upon reviewing the patient's allergy history, the doctor was unaware that the **Instillagel contains lignocaine hydrochloride**. The assisting nurse did not further verify the allergy history. After administering the Lignocaine, which contains the same active ingredient as Instillagel, the patient's condition remained stable.

Learning Points

- Administer high alert medication infusion/ Dangerous Drugs (DD) by two nurses throughout the checking of five rights
- Check the full prescription order and tracing infusion line during initial patient assessment
- Document the route of administration in progress notes, particularly for the subcutaneous infusion as the route

Learning Points

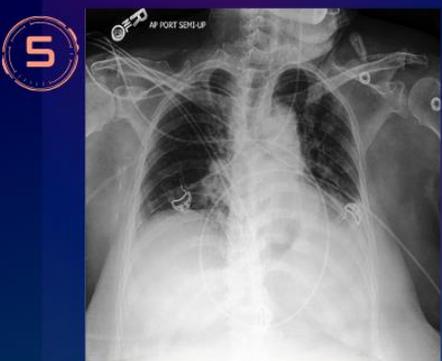
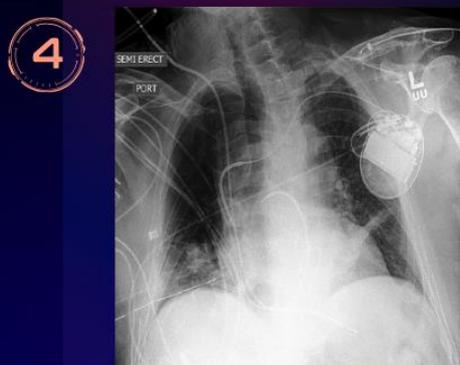
- Check the ingredients of unfamiliar drug from the Drug Office of the Department of Health via:
- CMS --> 9. Info --> Drug Ingredient Search



TEST YOUR SKILLS! CAN YOU SPOT WHAT AI SEES?

Examine the following chest X-rays and see if you can identify any unusual findings:

- a. Cardiomegaly
- b. Consolidation
- c. Mass/ Nodule
- d. Pneumothorax
- e. Pleural Effusion



Read on to find out how AI could help improve patient care.



CHEST X-RAY AI

The Hospital Authority has developed and rolled out a chest X-ray AI (CXR AI) tool to various selected clinical settings for prioritising CXR cases, providing real-time decision support to clinicians, and detecting/localising abnormalities on CXR images.

In this issue, we will walk you through the CXR AI model which could aid clinicians in interpretation of X-ray images.

Current Scope of AI CXR

Pathologies/ Abnormalities	Rollout Sites	Inclusion
Suspicious Mass/ Nodule with Localisation	All HA Hospitals & Clinics	<ul style="list-style-type: none"> Frontal CXR Age 16 or above
Suspicious Pleural Effusion	PMH	
NG tube recognised to be above diaphragm	TMH, POH, TSH, PWH	

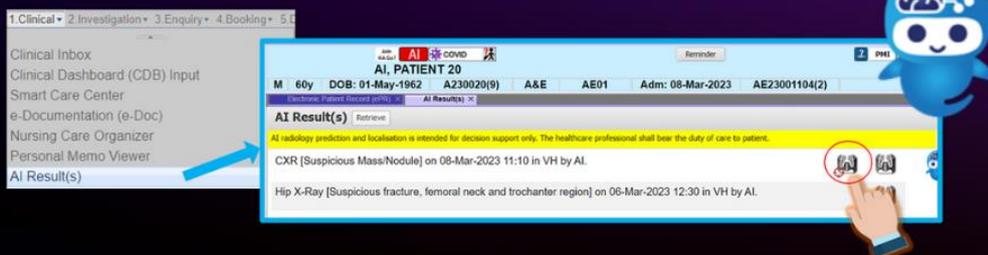
The AI models will continue to be refined, with new features rolled out over time across more settings.

SELF-SERVICE TOOL

Users who would like to use AI model could click and access the result on CMS by:

1. AI RESULT(S) PAGE

With AI Genie to collect users' feedback for refine the AI models



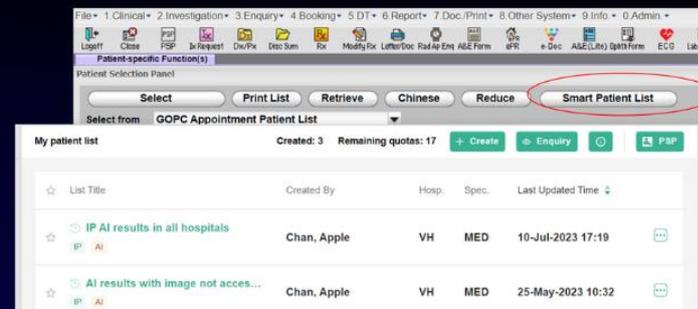
2. AI RESULTS PATIENT LIST

AI result will be displayed when mouse over tooltips



3. SMART PATIENT LIST (SPL)

AI results with unattended images can be retrieved by SPL

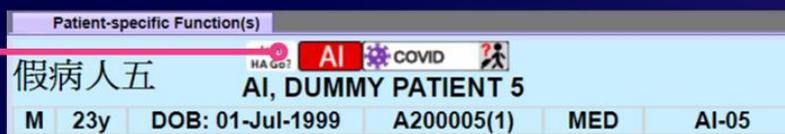


NOTIFICATION TOOL

AI INDICATOR

AI

Suspicious abnormality is detected



ANSWERS TO P.7

- CXR ① a. Cardiomegaly
- CXR ② d. Pneumothorax
- CXR ③ b. Consolidation
- CXR ④ c. Mass/ Nodule
- CXR ⑤ a. Cardiomegaly; e. Pleural Effusion
- CXR ⑥ a. Cardiomegaly; b. Consolidation; e. Pleural Effusion

AI provides valuable insights, flags potential abnormalities and helps streamline the diagnostic process. However it cannot replace the clinical judgement of clinicians. The balance of technological innovation and human expertise is the key to maximising the benefits of AI in healthcare.

THE FINAL DIAGNOSIS IS YOURS: AI'S ROLE AS A INSIGHTFUL ASSIST, NOT STANDALONE SOLUTION

[Credit to HO Q&S & IT&HI Division]

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