醫院管理局
HOSPITAL AUTHORITY

ANNUAL REPORT
ON SENTINEL AND SERIOUS UNTOWARD EVENTS
October 2023 - September 2024

Acknowledgments

This is the 17th Annual Report on Sentinel and Serious Untoward Events. On 1 October 2007, the Hospital Authority (HA) introduced a Sentinel Event Policy (the Policy) to further strengthen the reporting, management and monitoring of serious medical incidents. It was followed by the first Annual Report in January 2009, which covers all the Sentinel Events (SE) that occurred from October 2007 to September 2008. Since then, this Report has been published every year, and the Policy updated to incorporate Serious Untoward Events (SUE) in 2010 and include a supplementary note on definitions and qualification criteria of SE in 2015. The spirit of the Policy, however, has remained steadfast.

Seventeen years is not a short time. We have witnessed HA's continuous efforts in improving quality and safety of healthcare provided, by gathering incident reports through the Advance Incident Reporting System (AIRS), analysing the root cause(s) of incidents, formulating patient safety recommendations and effecting educational, system and cultural changes to minimise the recurrence of similar events.

We are pleased to extend our sincere gratitude to all colleagues who have participated in incident reporting and investigation; to colleagues who have taken extra steps to avert or avoid patient safety incidents; and most importantly, to all who have remained vigilant and prioritised patient safety despite formidable stress and workload. You have enabled us to stay true to our Mission of "Helping People Stay Healthy"! Thank you.

Patient Safety and Risk Management Department
Quality and Safety Division

Table of Content

1. Executive Summary

This Annual Report provides a summary of all Sentinel Events (SE) and Serious Untoward Events (SUE), comprising 29 SE and 80 SUE, reported between October 2023 and September 2024.

Sentinel Events

The 29 reported SE represented an incident rate of 1.3 per 1,000,000 episodes of patient attendances/ discharges and deaths. Of these SE, 26 cases (90%) occurred in acute general hospitals with 24-hour Accident and Emergency (A&E) services. Two cases (7%) occurred in hospitals with a mix of acute and non-acute services and one (3%) case happened in acute hospital of special nature.

The top three categories of SE were "Retained instruments or other material after surgery/ interventional procedure" (13 cases); "Surgery/interventional procedure involving the wrong patient or body part" (nine cases) and "Other adverse events resulting in permanent loss of function or death (excluding complications)" (four cases).

Of the 13 retained instruments or other material after surgery/interventional procedure incidents, eight cases were related to broken instruments/materials. Other three cases were due to incorrect counting and the reminding two cases were due to ineffective handover.

Among the nine incidents of surgery/interventional procedure involving the wrong patient or body part, six cases were occurred at operating theatre or interventional suite. The other three cases involved bedsides procedure.

Four cases of diverse nature were reported as "Other adverse events resulting in permanent loss of function or death (excluding complications)", with two cases leading to major consequence.

The two cases of inpatient deaths from suicide (including home leave) were inpatient. The overall assessment and management of the cases was determined to be appropriate by the investigation panel.

The two cases of inpatient suicide represented a suicide rate of 0.1 per 100,000 inpatient admissions, the lowest rate observed in the last three years.
Other reported SE was "Maternal death or serious morbidity associated with labour or delivery" (one case).

Among the 29 SE, three cases (two inpatient suicide and one maternal death/morbidity) resulted in mortality. Of the remaining SE, four cases resulted in major/moderate consequence and 22 cases resulted in minor/insignificant consequence.

The common contributing factors of SE are as follows:
1. Communication, knowledge/skills/competence
2. Work environment/scheduling
3. Patient factors
4. Equipment
5. Policies/procedures/guidelines
6. Safety mechanisms

Recommendations were made to address these factors.

Serious Untoward Events

Of the 80 SUE which could have led to death or permanent harm, 74 were medication error and six were patient misidentification.

The three most common drugs involved in medication error were anticoagulant (15 cases), inotrope (10 cases) and known drug allergy (nine cases)/insulin (nine cases). Of the nine known drug allergy cases, three cases involved eye drops and two cases involved Penicillins.

Of the 80 SUE cases, 60 cases resulted in minor/insignificant consequence and 20 cases resulted in moderate consequence.

2. Introduction

The Sentinel Event Policy was implemented in 2007, while Serious Untoward Event was incorporated later in 2010. After implementation of the Sentinel and Serious Untoward Event Policy (The Policy) in 2010, the Policy was updated in July 2015 (Annex I) with inclusion of supplementary notes on definitions and qualification criteria of SE as well as new Chinese translations of SE and SUE.

The Policy dictates how hospitals are to manage SE and SUE. This includes the reporting of these incidents, and how they are investigated, which is to utilise root cause analysis (RCA) methodology. The RCA panels are tasked to review and identify the root cause(s) and to make recommendations for the hospital and Hospital Authority Head Office (HAHO) management to improve patient safety.

This 17th Annual Report provides a summary and analysis of the SE and SUE reported via the Advance Incident Reporting System (AIRS) between 2023-24. The aim of publishing this Annual Report is to share the lessons learnt from SE and SUE, with a view of improving quality patient-centred case through system improvement and teamwork.

To facilitate understanding of the scope and definition of SE and SUE, the following abbreviated captions for SE and SUE categories will be used in this report:

Sentinel Events (Nine Categories)

Category 1	Surgery/interventional procedure involving the wrong patient or body part [Wrong patient/part]
Category 2	Retained instruments or other material after surgery/interventional procedure [Retained instruments/material]
Category 3	ABO incompatibility blood transfusion [Blood incompatibility]
Category 4	Medication error resulting in major permanent loss of function or death [Medication error]
Category 5	Intravascular gas embolism resulting in death or neurological damage [Gas embolism]

Category 6 Death of an inpatient from suicide (including home leave)
[Inpatient suicide]

Category 7 Maternal death or serious morbidity associated with labour or delivery
[Maternal death/morbidity]

Category 8 Infant discharged to wrong family or infant abduction
[Wrong infant/abduction]

Category 9 Other adverse events resulting in permanent loss of function or death (excluding complications)
[Others]

Serious Untoward Events (Two Categories)

Category 1 Medication error which could have led to death or permanent harm
[Medication error]

Category 2 Patient misidentification which could have led to death or permanent harm
[Patient misidentification]

3. Sentinel Events Statistics

3.1 SE Trend (4Q 2014 – 3Q 2024)

3.1.1 Overview

The annual number of episodes of patient attendances/discharge and death, and the SE incident rate per 1,000,000 episodes of patient attendances/discharges and death in past 10 years were depicted in Figure 1. Total number of SE in the past 10 years was also appended in Figure 2 for reference.

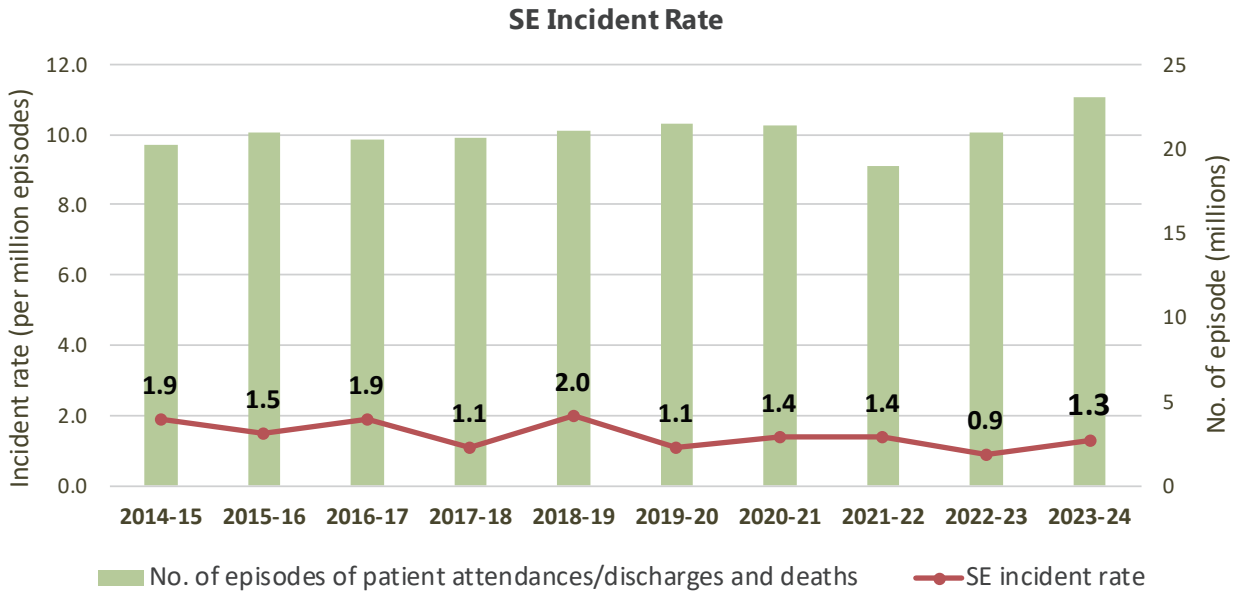
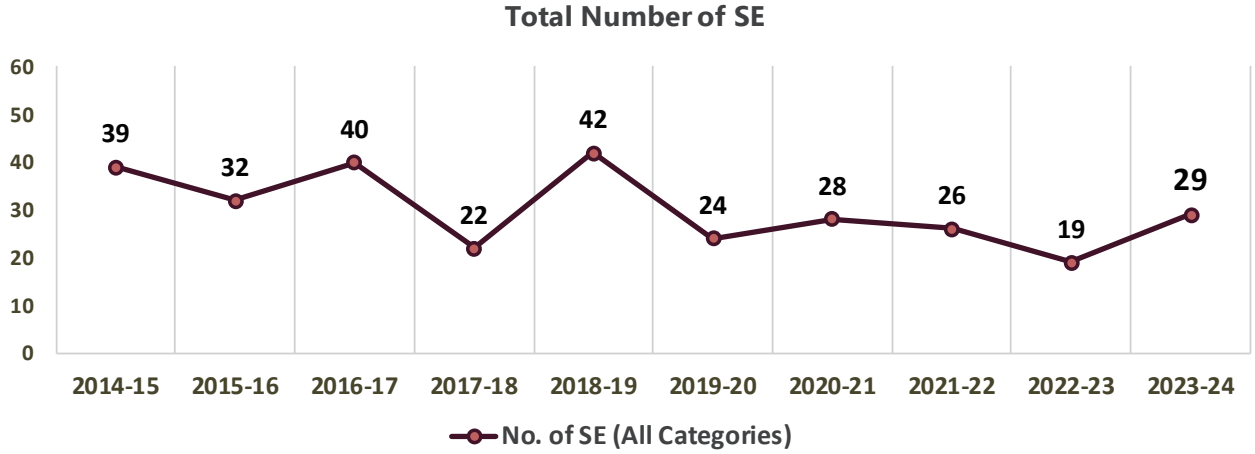


Figure 1



*Statistics from October to September of respective year

Figure 2

3.1.2 SE Category

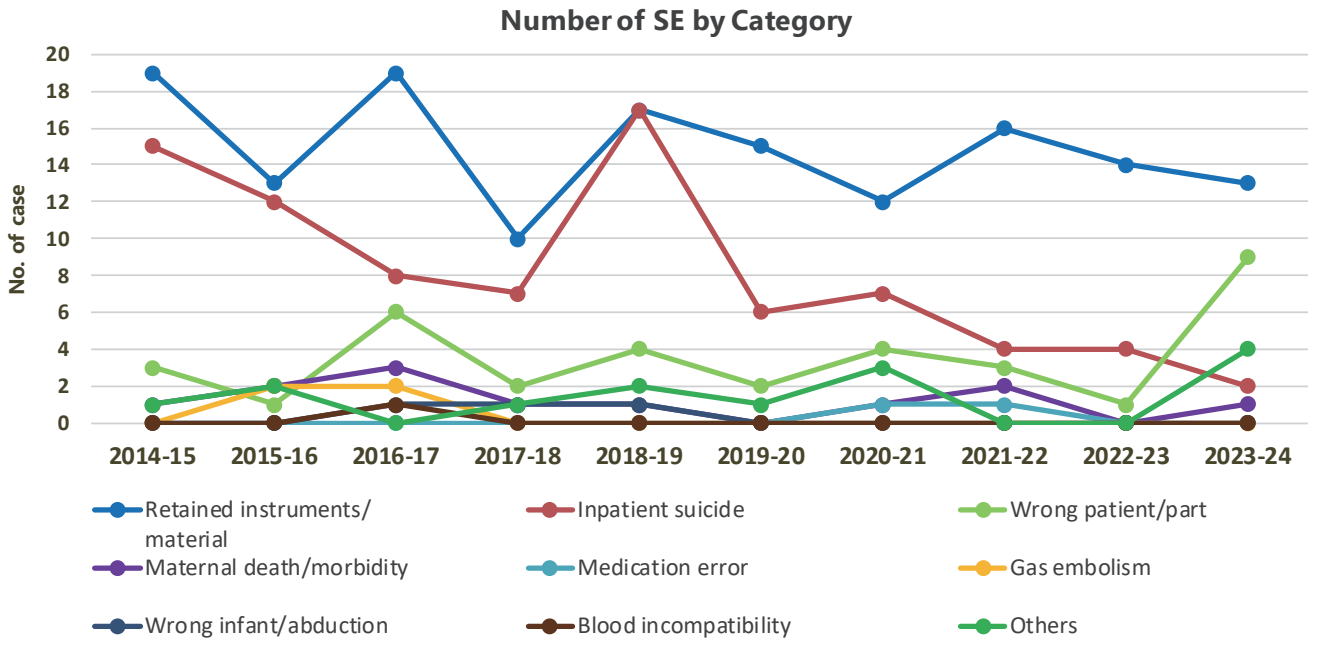


Figure 3

Number of SE by Category

	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024
Retained instruments/ material	19	13	19	10	17	15	12	16	14	13
Wrong patient/part	3	1	6	2	4	2	4	3	1	9
Inpatient suicide	15	12	8	7	17	6	7	4	4	2
Maternal death/ morbidity	1	2	3	1	1	0	1	2	0	1
Gas embolism	0	2	2	0	0	0	0	0	0	0
Medication error	0	0	0	0	0	0	1	1	0	0
Wrong infant/ abduction	0	0	1	1	1	0	0	0	0	0
Blood incompatibility	0	0	1	0	0	0	0	0	0	0
Others	1	2	0	1	2	1	3	0	0	4
Total	**39**	**32**	**40**	**22**	**42**	**24**	**28**	**26**	**19**	**29**

*Statistics from October to September of respective year

Table 1

Retained instruments/material remained the most frequently reported SE. The number of Category 1: wrong patient/part and Category 9: Others SE reached their highest levels in recent years (Figure 3 and Table 1).

3.1.3 SE Outcome

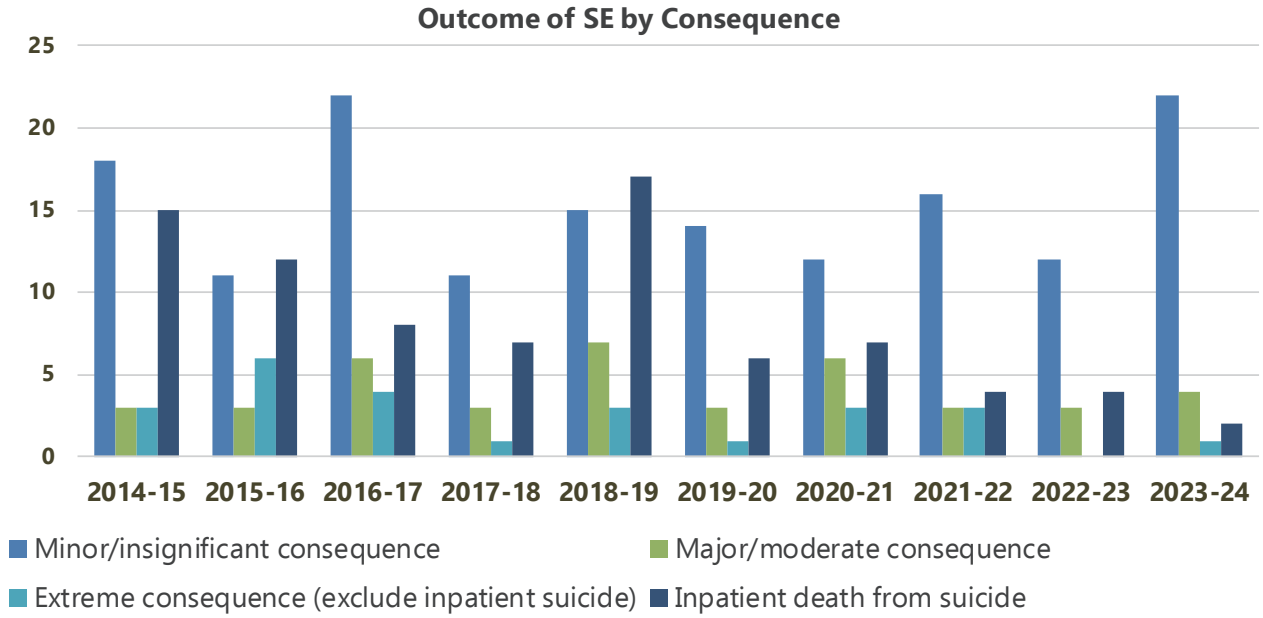


Figure 4

Number of SE by Consequence

	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024
Minor/insignificant consequence	18	11	22	11	15	14	12	16	12	22
Major/moderate consequence	3	3	6	3	7	3	6	3	3	4
Extreme consequence (exclude inpatient suicide)	3	6	4	1	3	1	3	3	0	1
Inpatient death from suicide	15	12	8	7	17	6	7	4	4	2
Total	**39**	**32**	**40**	**22**	**42**	**24**	**28**	**26**	**19**	**29**

*Statistics from October to September of respective year

Table 2

3.2 SE Report (4Q 2023 – 3Q 2024)

3.2.1 Overview

Below charts illustrated the quarterly distribution of SE (Figure 5), distribution by category (Figure 6) and by hospital setting (Figure 7). Excluded two inpatient suicide cases, the remaining 27 SE with 81% (n=22) resulted in minor/insignificant consequence; 15% (n=4) resulted in moderate/major consequence and 4% (n=1) resulted in extreme consequence (Figure 8).

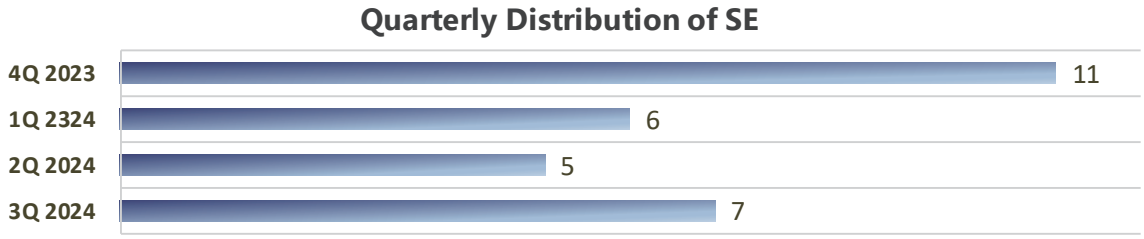


Figure 5

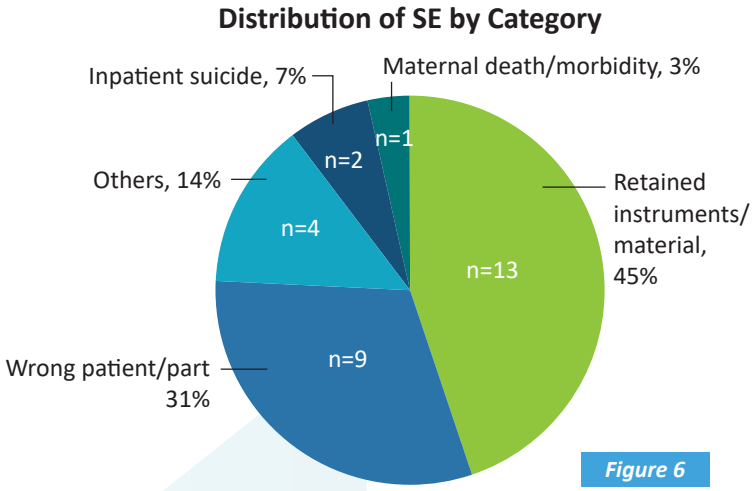


Figure 6

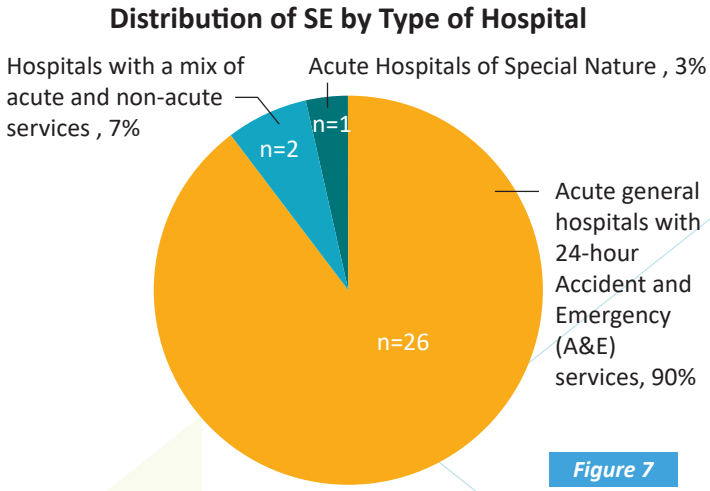


Figure 7

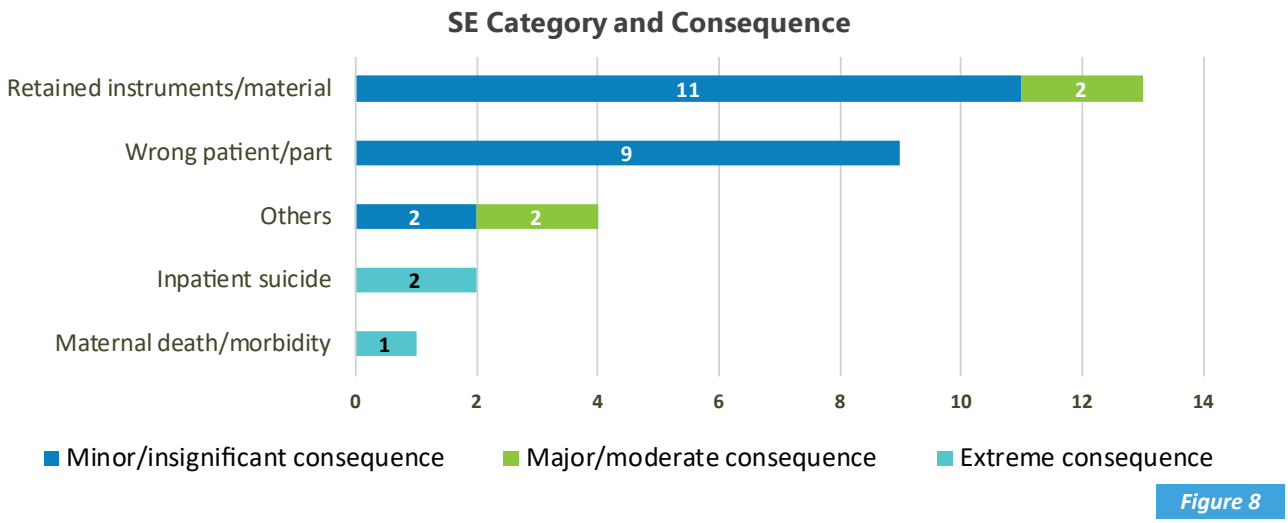


Figure 8

3.2.2 Category: Retained Instruments/Material

Of the 13 retained material cases, eight cases occurred in operating theatre/interventional suite and the other five cases happened during bedside procedure. A greater proportion of the cases were related to broken instrument/material, while incorrect counting and ineffective handover also contributed to two and three cases respectively (Figure 10). Broken instrument was the most common contributing factors of retained material (Table 3).

Though retained material cases remained at the top of reported SE incidents, the number of such cases has been observed to gradually decrease over the past two years, with 16 cases in 2021-22 and 14 cases in 2022-23, compared to the current 13 cases.

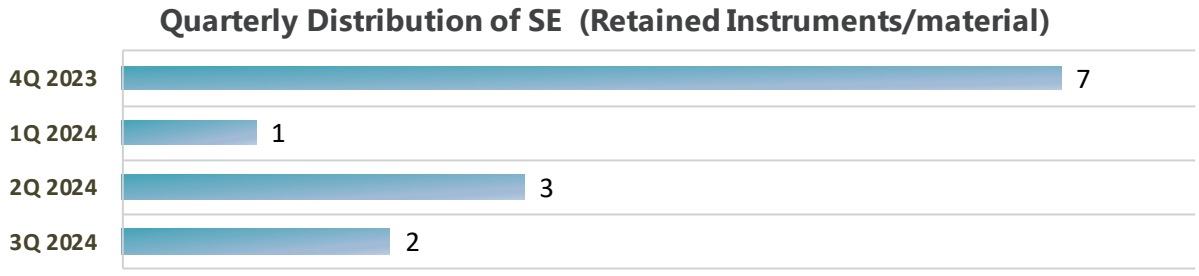


Figure 9

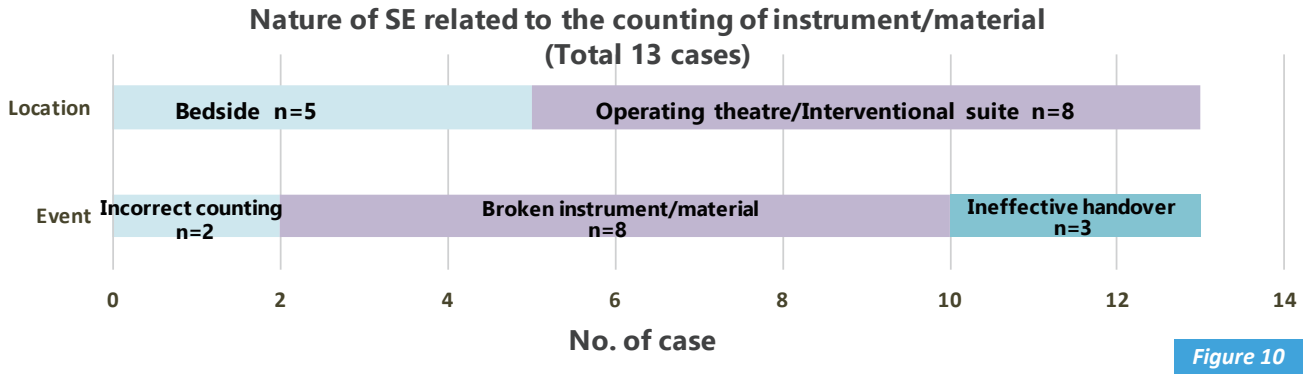


Figure 10

Type of Instrument/Material	No. of case
Broken instrument	5
Drain/Catheter	4
Gauze/Dressing material	3
Nasogastric tube	1
Total	**13**

Table 3

3.2.3 Category: Wrong Patient/Part

All nine cases involved wrong body parts, with no case involving wrong patients. Of these cases, six cases were occurred in the operating theatre or interventional suite. The other three cases involved bedside procedure. Both nerve block and bedside procedure contributed to a greater proportion of the incidents. (Figure 12).

In these wrong body part incidents, which involved endovenous ablation for varicose veins, laser iridotomy or pleurodesis procedure, the error was identified at a very early phase. Corrective actions or rectifications such as withdrawal of needle insertion and cancellation of the procedure were implemented at early phases to prevent harm to the patient.

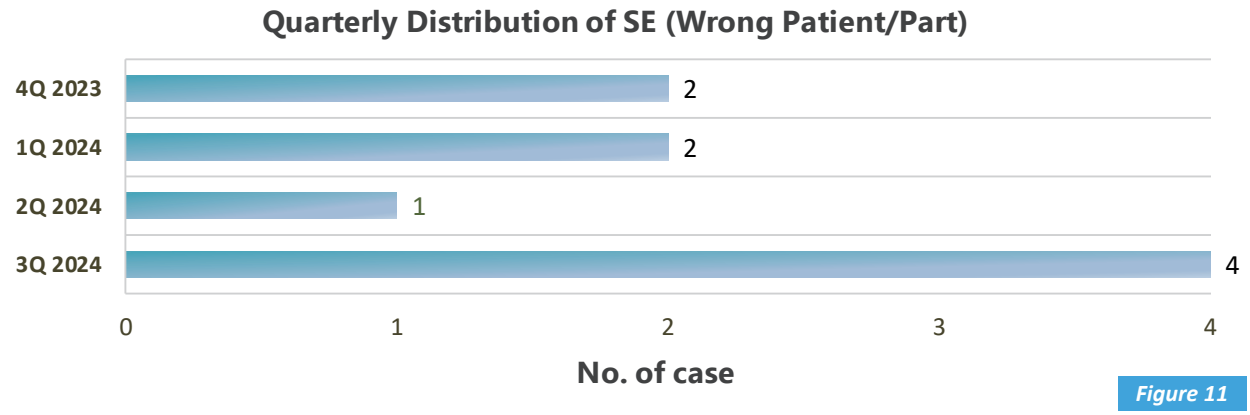


Figure 11

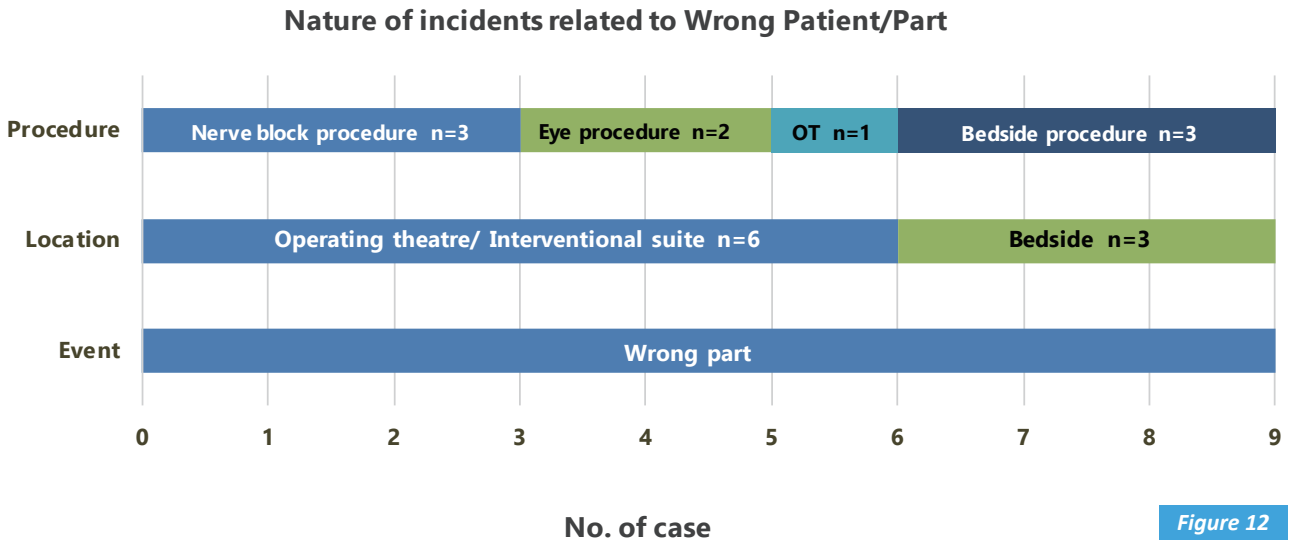


Figure 12

3.2.4 Category: Others

Four cases were classified as Category 9 between 2023-24. Each differs in nature, and a brief description is as follows:

Case 1: The valve of oxygen cylinder was found not opened during patient transfer. Inexperience in transferring critically ill patient and inadequate clinical handover among teams led to the incident. Misinterpretation of valve open due to the presence of residual gas also contributed to the incident.

Case 2: The tubing of the ventilator for a patient in an isolation room was found disconnected at the ventilator side. This disconnection could be attributed to the patient's movements, and the central monitoring system was not activated correctly. Consequently, the alarm in the isolation room was not promptly noticed by the clinical team.

Case 3: An unnecessary total abdominal hysterectomy and bilateral salpingo-oophorectomy were performed due to specimen contamination. The incident was contributed by the unfavourable design of the mould thermal chamber, unsafe work habits, and a low awareness of contamination risks.

Case 4: A nasogastric tube was discovered in the patient's bronchus, possibly due to incorrect insertion into the left bronchus, with the tip entering the left pleural cavity. Given the presence of potentially infected pleural effusion, a false-positive result could occur.

The increase in the SE cases in Others category can be attributed to a rise in staff awareness regarding incident management and the adoption of a structured approach to case investigation. This heightened awareness has led to a greater recognition and reporting of SE case in Others category.

Root cause analyses were carried out for each incident, and the resulting recommendations were shared with all HA hospitals through various communication platforms.

3.3 International Sentinel Events Reporting

In the United States (US), sentinel event voluntarily reported to the Joint Commission on Accreditation of Healthcare Organisations were 1,441 in 2022 and 1,411 in 2023 respectively.[1] These events were reported across a broad patient population and encompassed a range of incidents, including self-harm, treatment delays, falls, pressure injuries, fires, assaults, and clinical alarm responses. Of the reported SE, 18% were linked to patient deaths and 8% to permanent harm or loss of function.

In Victoria, Australia, 245 SE were reported between July 2022 and June 2023, with the most frequently reported event during this period being the recognition and response to clinical deterioration (71). [2]

In Western Australia (WA), there were 23 SE reported in 2022–23 with serious harm or death to patients.[3] The most commonly reported event during this period in WA was medication errors resulting in serious harm or death (12), all with associated serious harm to patients.

In Hong Kong, the rate of SE per 1,000,000 patient attendances/discharges and deaths in the HA was 0.9[4] in 2022–23 and 1.3 in 2023–24. Including two cases of inpatient suicide, 27% of these events led to significant consequence or death.

The rate of inpatient suicide incident in 2023–24 was 0.10 per 100,000 inpatient admissions, which included the incidents from all inpatient clinical settings (both general and psychiatric).

Table 4 summarises the top three commonly reported SE in the HA, WA, and the US Joint Commission for reference, with sentinel event categories unique to the US underlined.

Hospital Authority	Western Australia	US Joint Commission
1. Retained instruments/ material (13)	Medication error resulting in serious harm or death (12)	Fall (672)
2. Wrong patient/ part (9)	Surgery or other invasive procedure performed on the wrong site resulting in serious harm or death (6)	Wrong site (112) (Includes wrong site surgery, wrong procedure, wrong patient and wrong implant.)
3. Others (4)	Unintended retention of a foreign object in a patient after surgery or other invasive procedure resulting in serious harm or death (5)	Unintended retention of a foreign object (110)

Table 4

1. The US Joint Commission, Sentinel Event Data 2023 Annual Review.
2. Safer Care Victoria, Sentinel Events Annual Report 2022 – 2023.
3. Department of Health, Government of Western Australia. Your Safety in our Hands in Hospital- An integrated approach to Patient Safety Surveillance by WA Health Service Providers, hospitals and the community: 2023.
4. Remark: The SE rate in 2023-24 per 100,000 population per year was 0.38.

4. Serious Untoward Events Statistics

4.1 SUE Trend (4Q 2014 – 3Q 2024)

4.1.1 SUE Category

A total of 80 SUE were reported in 2023-24. The yearly distribution of SUE by category since 2014 was depicted in Figure 13, with total number of cases each year shown at the top of each bar. The yearly outcomes of SUE were depicted in Figure 14.

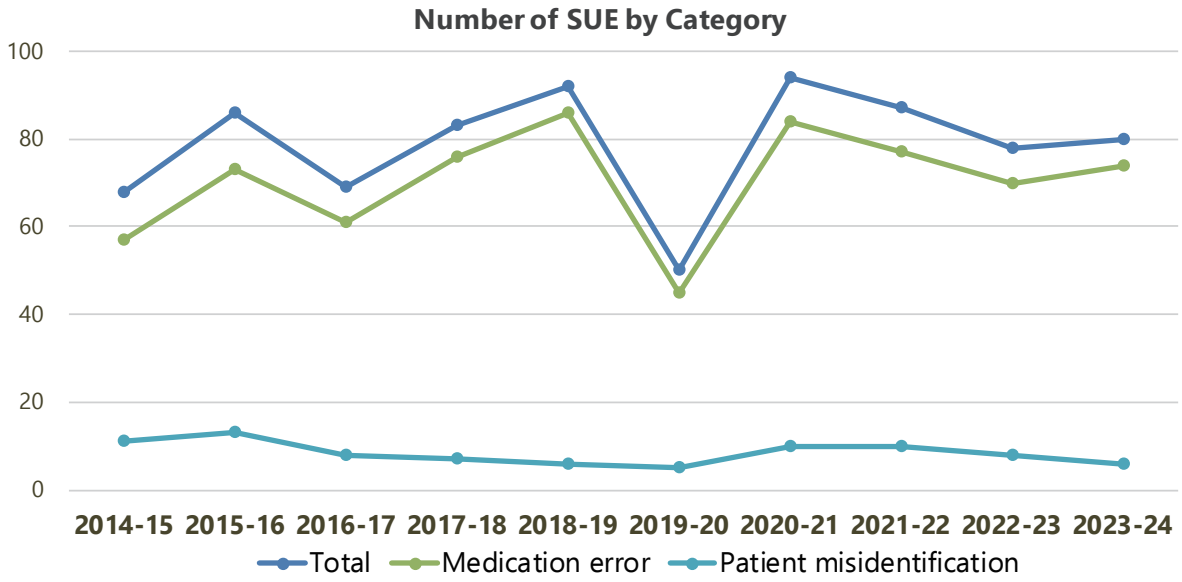


Figure 13

Number of SUE by Category

	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024
Medication error	57	73	61	76	86	45	84	77	70	74
Patient misidentification	11	13	8	7	6	5	10	10	8	6
Total	68	86	69	83	92	50	94	87	78	80

*Statistics from October to September of respective year

Table 5

4.1.2 SUE Outcome

The outcomes were grouped into minor/insignificant consequence, moderate consequence and temporary consequence in Figure 14. The description of the consequences was illustrated in Annex II.

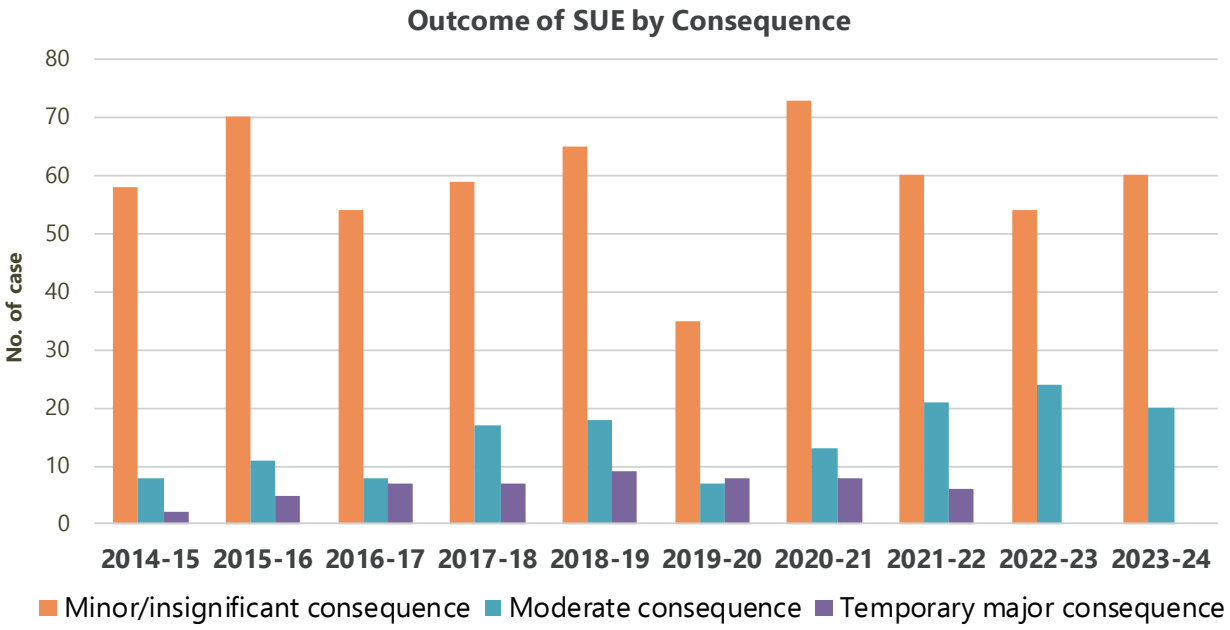


Figure 14

4.1.3 SUE - Medication Error

The yearly trend of three highlighted drugs involved in medication incidents was depicted in Figure 15. Other common drugs involved were inotrope, insulin and dual antiplatelet therapy (DAPT) etc. A list of high alert medication was listed in Annex III.

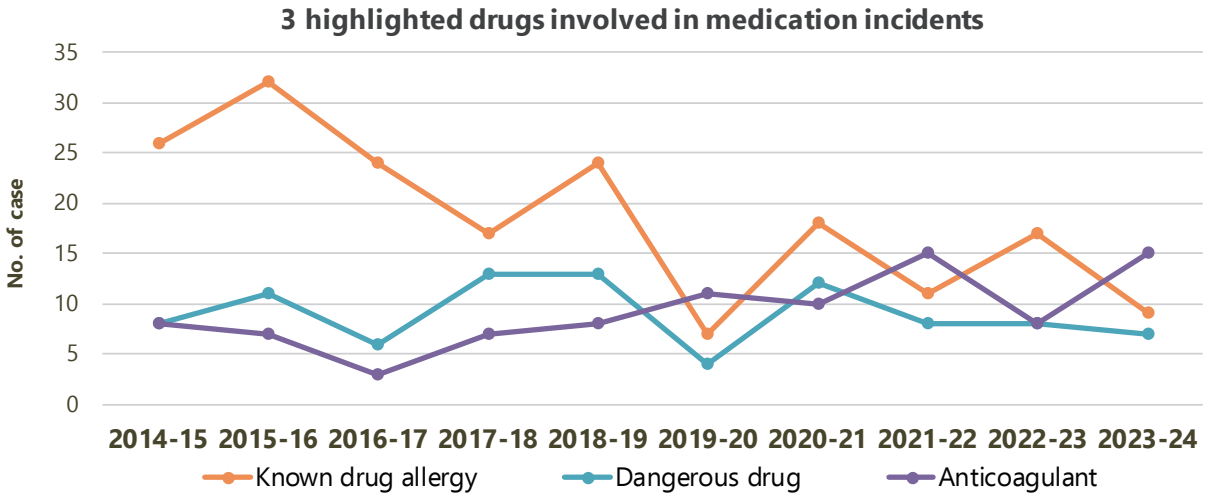


Figure 15

4.2 SUE Report (4Q 2023 – 3Q 2024)

4.2.1 Overview

The quarterly distribution of SUE reported was illustrated in Figure 16. Of the 80 SUE cases, 60 resulted in minor/insignificant consequence, while 20 resulted in moderate consequence. There were no cases reported with temporary major consequence (Figure 17).

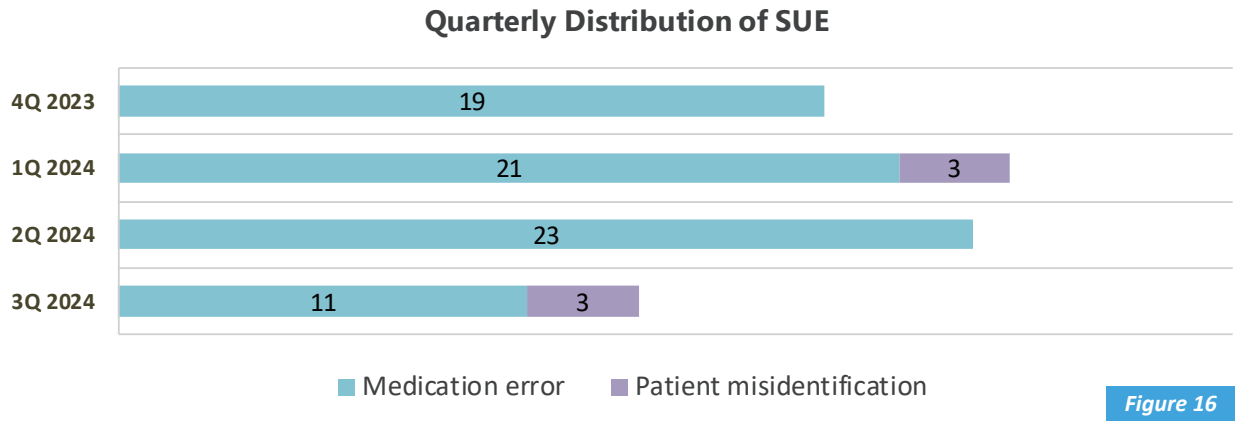


Figure 16

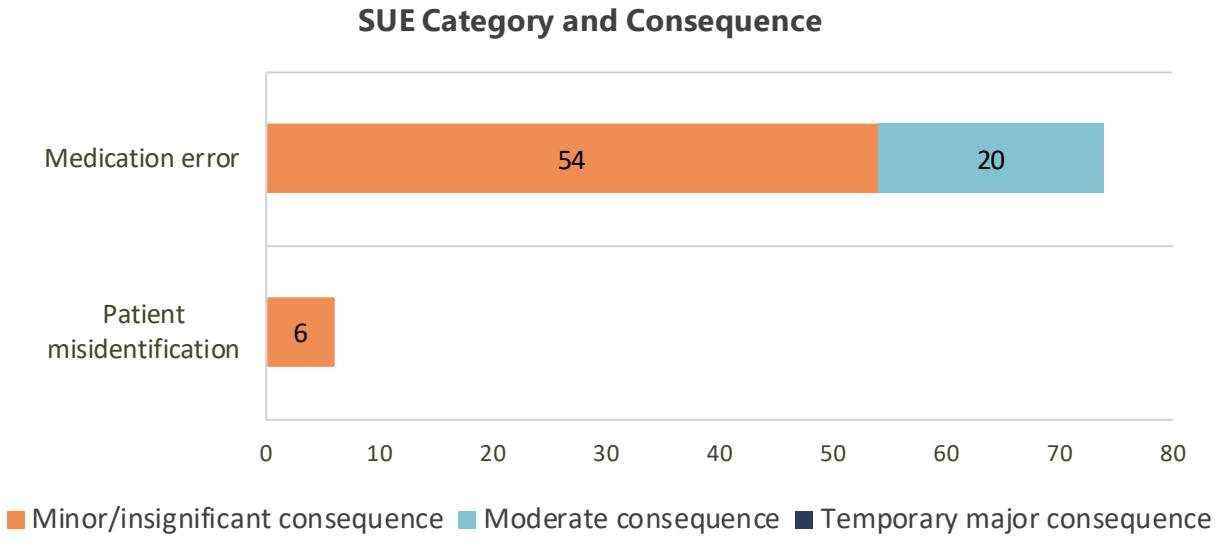


Figure 17

4.2.2 Category: Medication Error

Compared to previous years, the number of incidents involving known drug allergy and dangerous drug has decreased, while cases involving anticoagulant, inotrope, and insulin have become more significant relatively. The top three common drugs involved in medication errors between 2023-24 were anticoagulant (15 cases), inotrope (10 cases), and known drug allergy (nine cases)/insulin (nine cases). Medications such as anti-thyroid drug and Factor VIII were grouped under Others category (Figure 18).

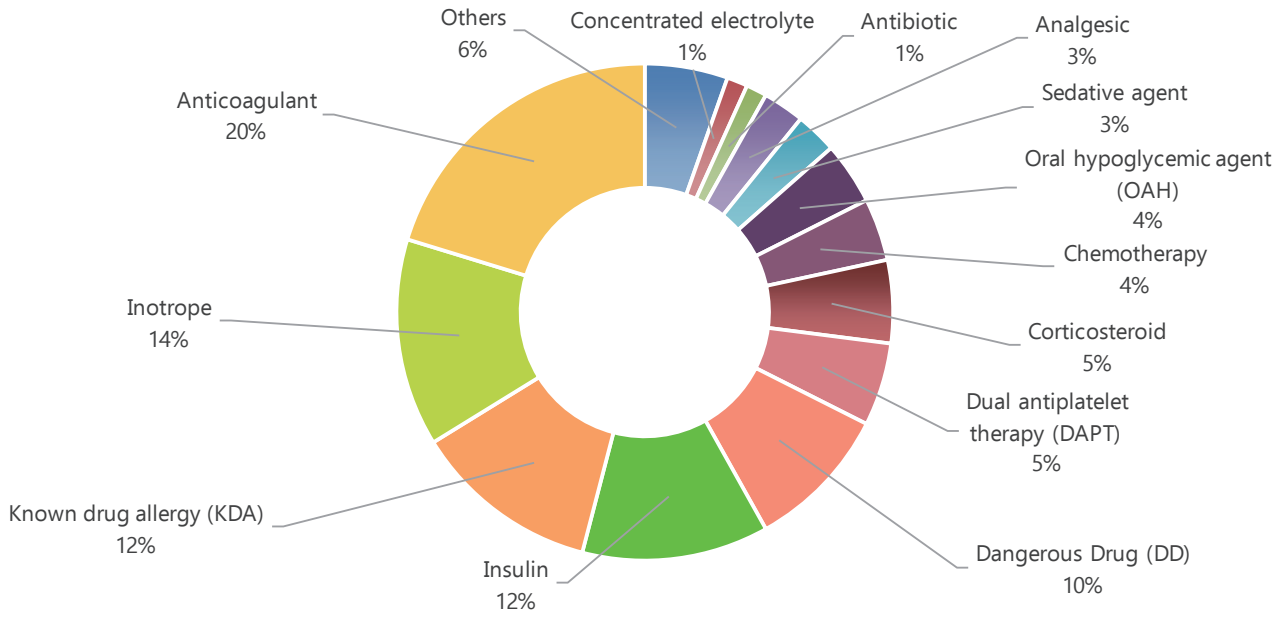


Figure 18

Distribution of drugs related to known drug allergy and location of occurrence

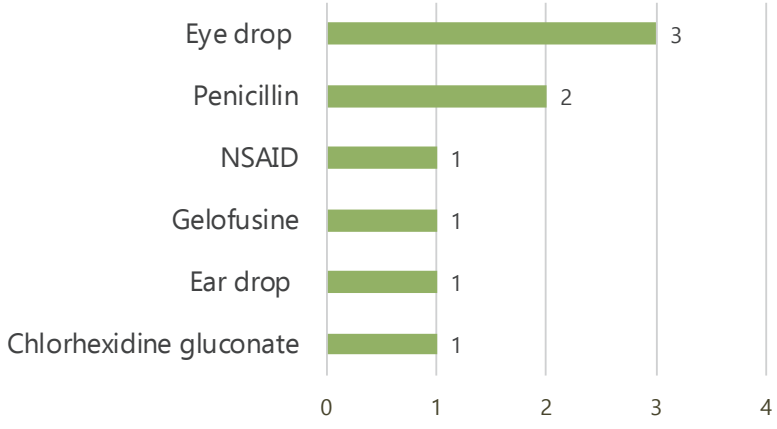


Figure 19

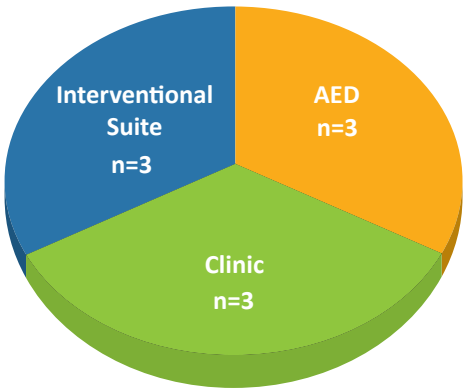


Figure 20

Of the nine medication errors related to known drug allergy, the most commonly involved drugs were eye drop (Mydrin-P, Fluorescin eye drop and Maxitrol eye drop) and Penicillin (Figure 19). The incidents occurred in interventional suite, Accident & Emergency Department (AED) and outpatient clinic with an equal distribution (Figure 20). All the nine cases resulted in minor/insignificant consequence.

4.2.3 Category: Patient Misidentification

A total of six SUE due to patient misidentification were reported. The top two scenarios included patient misidentification during drug prescription (three cases) and during drug administration (two cases) (Table 6).

Patient Misidentification Scenario	4Q 2023	1Q 2024	2Q 2024	3Q 2024
During drug administration	0	2	0	0
During drug prescription	0	1	1	1
During procedure preparation	0	0	1	0
Total	0	3	2	1

Table 6

All the patient misidentification cases had minor/insignificant consequence (Table 7).

Patient Misidentification Scenario	Minor/Insignificant
during drug administration	2
during drug prescription	3
during procedure preparation	1
Total	**6**

Table 7

5. Analysis of Sentinel Events

In this chapter, the common contributing factors and recommendations revealed by the RCA panels (including recommendations which had been implemented or being followed by clusters/hospitals to prevent recurrence) for each category of SE reported in 2023-24 were analysed. HAHO would collaborate with clusters and hospitals to improve system, redesign and optimise work processes to enhance patient safety. A brief description of individual SE could be found in Annex IV.

Category 2 – Retained Instruments/Material (13 cases)

Apart from commonly implicated items such as drain/catheter (four cases), gauze/dressing material (three cases) and nasogastric tube (one case), for which risk mitigation measures have been on-going, two types of retained materials have been particularly highlighted this year.

The first type pertains to special instrument and instrument fragment in orthopaedic and heart surgery (five cases). Increased vigilance in reviewing intraoperative X-ray and heightened awareness when checking the integrity of instrument may reduce the recurrence of similar incident involving retained material. It is also recognised that some of these incidents may be practically unavoidable due to the inherent risk of wear and tear on instrument during high-friction contact in surgery, along with the challenge of identifying minute fragment.

The second type of retained material highlighted in this report is ureteral stenting (JJ Stent), inadvertently left in the patients' body for extended periods. This type of retention appears to be less common. To ensure the timely removal of the stent, a clinical data framework for ureteric stent operation was developed and implemented in HA hospitals. This framework was integrated into the Operating Theatre Records System (OTRS), allowing surgeon to input the type and insertion date of the ureteric stent into a mandatory field. Subsequently, an automated reminder would be sent to designated hospital coordinator for follow-up on outstanding case.

Category 1 – Wrong Patient/Part (Nine cases)

In the six cases involving wrong body parts, contributing factors were related to surgical site marking. The absence of site marking and non-visualisable marking resulted in procedure being performed on the wrong body part. Surgical site marking should be completed before commencing the procedure, and the marking's position must remain clearly visible to the surgeon throughout the procedure.

In the three nerve block cases, a common contributing factor was the omission of the 'Stop before you block' procedure. It is essential to reinforce the practice of 'Stop before you block' and ensure that it is carried out right before proceeding with needle insertion for the regional block procedure.

Having analysed the SE reported in 2023-24, we have observed that new and emerging risks continue to arise in our clinical environment. It is crucial that we not only bolster our existing risk mitigation measures to prevent incidents, but also remain vigilant in recognising and addressing the new challenges. Through this proactive approach, combining our established safety practices with innovative solutions, we strive to minimise risks and ensure the safest possible environment for our patients.

6. Analysis of Serious Untoward Events

Of the total 80 SUE cases reported in 2023-24, Category 1 – Medication error related to anticoagulant (20%), inotrope (14%) and known drug allergy (12%)/insulin (12%) contributed most significantly to the number of SUE in this period. On the other hand, there were six cases of Category 2 – Patient misidentification, accounting for 8% of all reported SUE. These types of SUE were discussed in the subsequent sections, with essential recommendations and safety messages provided.

Category 1 – Medication Error (74 out of 80 SUE cases)

The number of medication items dispensed in HA per year was 58.7 million in the first nine months of 2024 compared to 74.7 million for the entire of 2023. The rate of number of medication incidents reported (including medication incidents classified as SUE) per one million medication items dispensed was 10.7 for the first nine months of 2024, compared to 12.1 for 2023. Notably, between 2011 and 2018, this rate consistently exceeded 17. The decline in the rate of medication incidents coincided with the gradual introduction of In-patient Medication Order Entry (IPMOE) system in HA since 2013.

Medication Error: Anticoagulant (15 cases)

Anticoagulant is classified as high alert medications according to the HA Medication Safety Committee. Overdose of anticoagulant could lead to uncontrolled bleeding, which can be life-threatening. Of the SUE medication error related to anticoagulant, warfarin (6 cases) was the most commonly involved oral anticoagulant. Prescribing error and unnecessary administration were commonly implicated in warfarin related cases.

Recommendations summarised from the cases' investigations:

1. To reinforce the practice of reviewing the patient's drug profile before drug prescription
2. To promote the importance of inputting the use of anti-platelets/anticoagulation in the alert box by Cardiologists with exact intended duration/dates
3. To explore the feasibility of system enhancement on Medication Order Entry (MOE) to generate a system alert or prompt to prescriber when the prescriber is repeating an outdated drug regimen into a prescription
4. To explore the feasibility of system enhancement on MOE to allow prescribers to repeat drug from the tab page of Medication Journey
5. To explore the feasibility of utilising the "Clinical Intent" function in MOE as a system safety net for the patients who have undergone mechanical mitral valve replacement and require life-long warfarin
6. To enhance staff training on proper practice of medication prescription and administration of medication (AOM), especially the high alert medications
7. To reinforce the nurse compliance to the Nursing Standard and Guidelines on AOM
8. To reinforced stringent independent double checking of high alert medication

Medication Error: Inotrope (10 cases)

Of the SUE medication errors, 10 cases involved inotrope which representing 14% of the SUE cases. The majority of the cases occurred during emergency situation, such as, when patient's condition suddenly deteriorated or during resuscitation. To ensure staff readiness in managing emergencies, adequate training should be provided, particularly for the junior staff.

Recommendations summarised from the cases' investigations:

1. To add a departmental drug prescription template for intramuscular Adrenaline for anaphylactic shock in the IPMOE system
2. To ensure staff are familiar with commonly used emergency medications
3. To encourage staff participation in courses that include elements of Crew Resource Management (CRM) to enhance teamwork and communication
4. To enhance communication between staff- speak up and clarify for any queries
5. To reinforce nurses to comply with the 5-right principle for drug administration
6. To enhance education and training for nurses, focusing on clinical emergency situations and the correct administration of high-risk medication
7. To reinforce staffs' independent double check with a systematic trace back sequence through "visual & tactile" inspection

Medication Error: Insulin (Nine cases)

Insulin contributed to nine cases of all SUE medication incidents. Among these incidents, two cases involved the administration of insulin during fasting. With the rollout of Medication Genie, the capillary blood glucose result can be displayed during the drug administration process in IPMOE, which can aid decision-making. Additionally, the order to withhold insulin during fasting should be clearly stated. By utilising the 'Withhold' function in IPMOE effectively, insulin can be withheld properly to prevent unintended administration.

Of these incidents, two cases involved wrong infusion rate of Dextrose-Insulin (DI) drip for hyperkalaemia management. Setting up drug library with rate limit in infusion pump could prevent the infusion rate from exceeding the therapeutic range.

Recommendations summarised from the cases' investigations:

1. To reinforce staff compliance on AOM procedure especially for antidiabetic medication administration
2. To comply with the stringent independent double checking process during AOM especially when rate adjustment is involved
3. To enhance nurse training on managing diabetic patients during fasting, focusing on the correct procedures for medication orders, including withholding insulin
4. To strengthen staff compliance on reviewing dietary status and intake before insulin administration
5. To enhance the communication between clinical teams

Category 2 – Patient Misidentification (Six cases)

In 2023-24, six cases of patient misidentification were reported, representing 8% of all SUE cases. Patient identification verification is mandatory prior to all procedures, but not limited to medication administration. It was also crucial before drug prescription and preparation for procedure. Misidentification of patient in such scenario could potentially cause significant harm or lead to undesirable outcome for patient. Strict compliance with proper patient identification procedure and restarting the patient identification process when interrupted should help avoid these incidents.

Among the patient misidentification cases, one involved relying on bed number as a patient identifier. It led to a wrong patient being transferred to the procedure room and resulted in unnecessary administration of sedative agents to the patient. Even in a busy clinical environment with significant stress to complete multiple concurrent tasks, the step of confirming the correct patient's identity before the procedure must not be skipped.

Recommendations summarised from the cases' investigations:

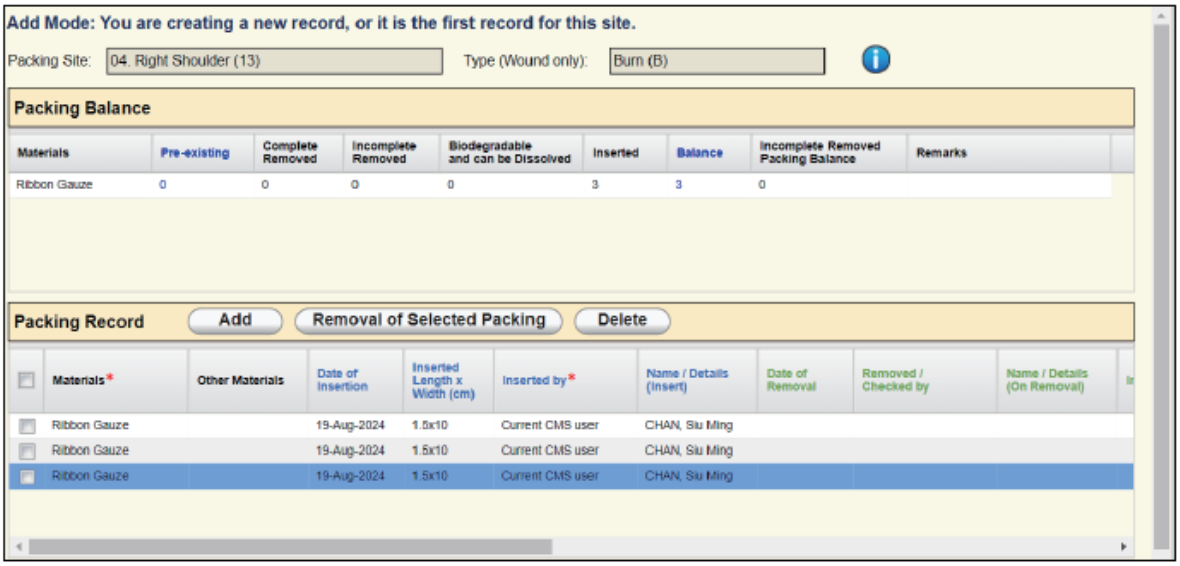
1. Reinforce staff compliance with the patient identification checking procedure
2. Reinforce compliance with the bedside procedure safety checks for bedside interventions
3. Reinforce compliance with the medication checking procedures before administering procedural sedation
4. Reinforce the practice of using patient identifiers, other than bed numbers only, for clinical handovers

7. Ongoing Risk Reduction Measures

Various risk reduction measures have been implemented or are being adopted to enhance patient safety. The highlights of these measures are outlined below:

7.1 Wound and Packing Module in Smart Nursing

To focus on preventing incidents involving retained dressing materials, the "Wound and Packing Module" in Smart Nursing 2.0 has been introduced to provide a common platform for wound packing documentation with facilitation from Nursing Services Department (NSD). This module will serve as a corporate solution for wound and packing documentation. Staff feedback has been collected, and the system has been modified. The rollout plan has been ready initiated in clusters.

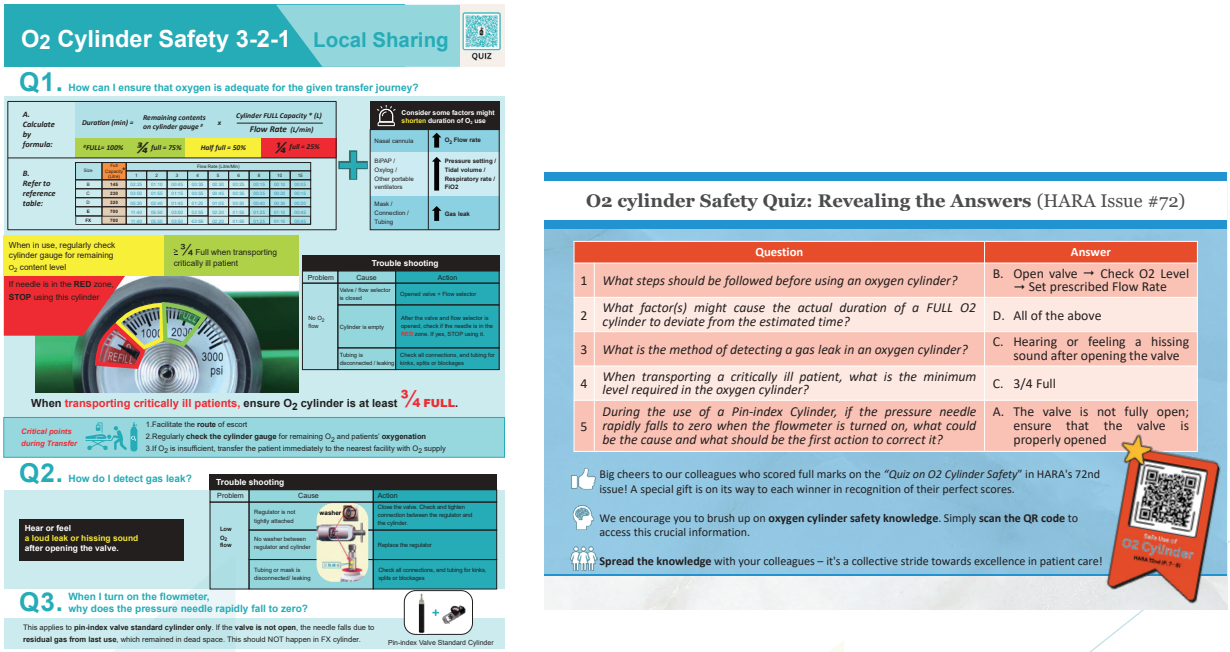


Screenshot of Wound and Packing Module

7.2 Safe Use of Oxygen Cylinder

To promote the safe use of oxygen cylinder and raise staff awareness, incidents were shared along with a prize quiz. Important points on handling the oxygen cylinder were highlighted. In addition to refreshing staff's knowledge, case analyses were conducted to identify common causes of oxygen-related incidents and high-risk areas that require attention.

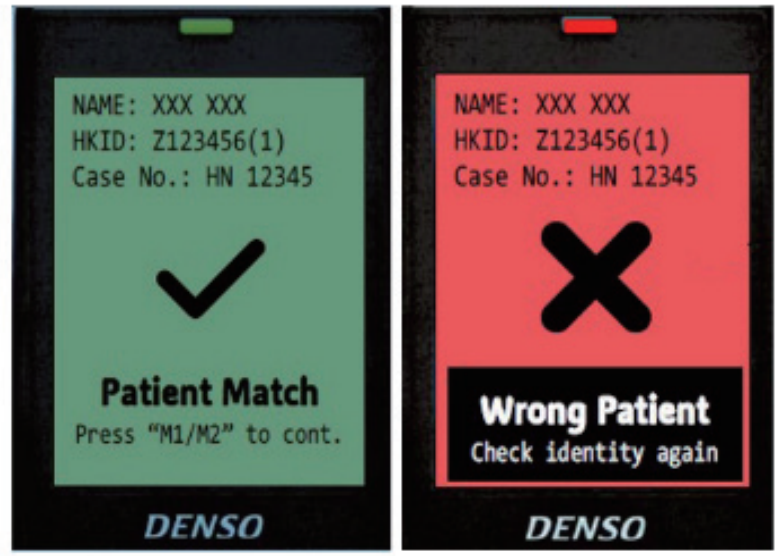
Based on risk prioritisation, a pilot program for digital oxygen cylinder will be introduced to HA hospitals, starting with the Non-Emergency Ambulance Transfer Service (NEATS) receiving bays. With the new features of the cylinder, the operational status can be displayed on the digital screen, and audible alerts will be generated for specific conditions, such as low gas content.



HA Risk Alert issue 72: Sharing on safe use of oxygen cylinder

7.3 Enhancement on IPMOE Handheld Scanner

To prevent patient misidentification incidents during drug administration, enhancement on display and alarm of the IPMOE handheld scanner was proposed by clusters. The proposal was supported and proposed enhancement would be included in the coming contract for the IPMOE devices.



Proposed enhancement on IPMOE handheld scanner

7.4 Infusion Pump Risk Reduction

Based on a comprehensive analysis of infusion-related incidents, innovative solutions, including the built-in features to ensure infusion safety, were explored to prevent the errors associated with infusions.

During the course of this analysis, four high-risk drug groups were pinpointed as particularly critical. These groups include Vasopressor, Opioid, Insulin, and Anticoagulant. Understanding the potential consequence to patient by these medications, proactive measures were initiated to bolster medication safety within our healthcare system.

To fortify safety protocols, a review of drug orders across clusters was conducted, leading to the alignment of best practices in medication ordering. This effort was pivotal in standardising the drug prescription process and ensuring consistency in medication management practices.

In a significant stride towards enhancing safety and efficiency, a Corporate Standard Dilution Table (SDT) was developed for the identified high-risk drug groups. This resource serves as a quick-reference guide for frontline staff when handling cases involving high-risk drug infusions. By providing readily accessible information, it is able to ensure the drug prescription within the acceptable range to prevent medication incident.

These strategies aim at optimising patient care standards and fostering a culture of safety and excellence across our healthcare system. Through continuous innovation and strategic interventions, the higher standards of patient safety strategies can be achieved.

Standard Dilution Table for General Adult Ward

Syringe Pump

This table is applicable to all general adult settings. If clinical team deems a strength outside this table necessary for patient, it should be prescribed with appropriate justification and documentation.

		Strength	Dose added	Diluent	Total volume	Concentration
Vasopressors	Adrenaline	1:10000 (1mg/10ml)	3mg	NS/D5	50ml	60 microgram/ml
	Dobutamine	250mg/20ml	125mg	NS/D5	50ml	2.5 mg/ml
	Dopamine	200mg/5ml	100mg	NS/D5	50ml	2 mg/ml
	Isoprenaline	0.2mg/ml	1mg	NS/D5	50ml	20 microgram/ml
	Noradrenaline	4mg/4ml	2mg	D5	50ml	40 microgram/ml
Opioids	Morphine	15mg/ml	45mg	NS/D5	45ml	1 mg/ml
Insulin	Actrapid	1000 unit/10ml	50 units	NS	50ml	1 unit/ ml
Anticoagulants	Heparin	5000 units/5ml	5000 units	NS/D5	50ml	100 units/ml

Standard Dilution Table for General Adult Ward

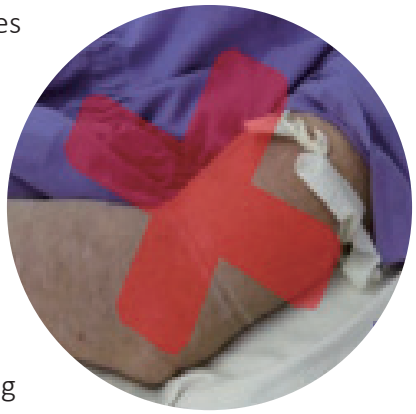
Infusion Pump

This table is applicable to all general adult settings. If clinical team deems a strength outside this table necessary for patient, it should be prescribed with appropriate justification and documentation.

		Strength	Dose added	Diluent	Total volume	Concentration
Vasopressors	Adrenaline	1:10000 (1mg/10ml)	6mg	NS/D5	100ml	60 microgram/ml
	Dobutamine	250mg/20ml	250mg	NS/D5	100ml	2.5 mg/ml
	Dopamine	200mg/5ml	200mg	NS/D5	100ml	2 mg/ml
	Isoprenaline	0.2mg/ml	2mg	NS/D5	100ml	20 microgram/ml
	Noradrenaline	4mg/4ml	4mg	D5	100ml	40 microgram/ml
Anticoagulants	Heparin	5000 units/ 5ml	10000 units	NS/D5	100ml	100 units/ml

Corporate SDT for high-risk drugs

7.5 Tourniquet Risk Reduction



To mitigate the risk of tourniquet retention, two administrative measures have been implemented in all HA hospitals. These include "one patient, one tourniquet with regular counting" and "record of counting (pre & post procedure)". These measures have proven to be effective in preventing incidents of tourniquet retention.

To eliminate the practice of using disposable gloves as tourniquets, the "Policy on Prohibition of Disposable Gloves Use as Tourniquets" was established. The use of disposable gloves as tourniquets during venepuncture is strictly prohibited, as they were not designed for vascular occlusion and presents significant patient safety risks. All staff should use approved tourniquet devices for blood collection procedures.

In pursuit of further innovation, the Working Group of Safe Use of Tourniquet explored and piloted smart devices such as auto-release tourniquet and tourniquets with timers within the HA. The auto-release tourniquets are designed to release automatically after a designated period if left on patients and feature visual and audible alarms to alert healthcare workers to potential retention. Tourniquets with timers similarly help to increase staff alertness and awareness of retention incidents.

To further promote the tourniquet safety, effective preventive measures were shared in the HA Risk Alert (HARA) and on the Instagram of the Patient Safety and Risk Management Department.

7.6 Enhance Staff Competency on Nasogastric Tube Verification

In response to incidents of intern misinterpreting the position of a nasogastric tube on chest X-ray, a mandatory online refresher training course with competency assessment was implemented. All the interns were required to complete the course and achieve full marks on assessment before being authorised to independently interpret nasogastric tube position on chest X-ray.

The training initiative was supplemented by the dissemination of six key criteria for nasogastric tube interpretation to all HA staff through Patient Safety Express to strengthen existing knowledge and enhance staff competency.

Online course and Patient Safety Express on confirmation of nasogastric tube position

Apart from reinforcing training, enhancement to the Generic Clinical Request System (GCRS) for chest X-ray booking was completed. A new option for "For Nasogastric Tube Position" was added to the predefined view list of Chest X-rays in the master list in the GCRS across all HA hospitals.

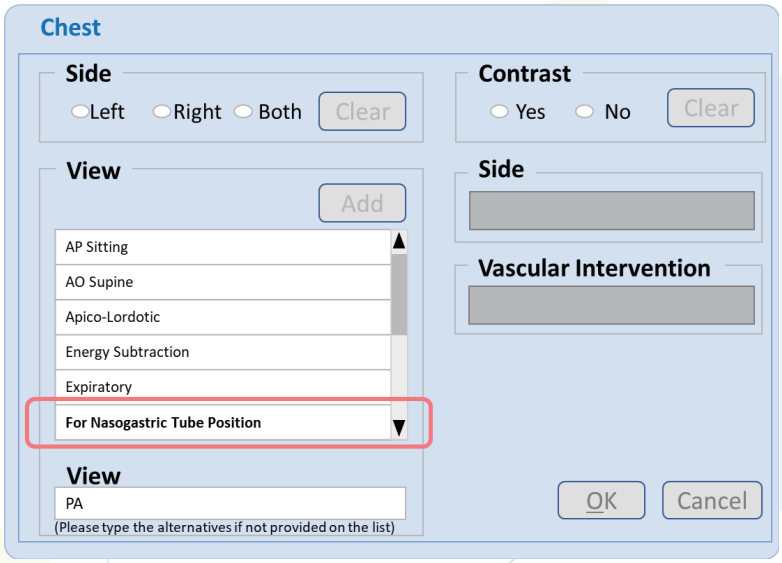


Illustration of New Option in GCRS Platform

8. Learning and Sharing

Forum and Publication

The Patient Safety and Risk Management (PS&RM) Department has continued to promote continuous learning by initiating educational programmes in 2023-24. The HARA publications continued to play a vital role in disseminating learning points and information on SE and SUE to both staff and the public. The department facilitated two biannual staff forums, which were attended by over 4,300 healthcare professionals at various levels, from executives to frontline staff.

HA Risk Alert

Staff Sharing Forum on Sentinel & Serious Untoward Event 2024

Furthering the PS&RM's commitment to improving patient safety, the department participated in the International Forum on Quality and Safety in Healthcare 2024 and delivered a keynote presentation entitled *"Sentinel Event Policy of Hospital Authority, Hong Kong - 17 years on, what have we learnt?"*. The presentation provided a platform for sharing insights and experiences with global healthcare systems, with a particular focus on the incident management strategies and the reporting system in HA - Advance Incident Reporting System (AIRS).

The International Forum on Quality and Safety in Healthcare 2024

9. The Way Forward

In moving forward, implementing technological solutions can enhance patient safety and facilitate the risk mitigation. By working together with Information Technology and Health Informatics Division (IT&HI), we can develop comprehensive strategies that not only address current challenges but also pre-emptively identify and mitigate potential risks, ultimately enhancing patient safety across all facets of our healthcare system.

Parts of the initiatives which planned in 2025 are highlighted as follow:

Medication Journey and Clinical Intention

To provide a clear overview of medications prescribed by various specialties, the concept of a patient-based medication journey, which offers a consolidated view of medications prescribed by different specialties, is introduced. The primary goal is to streamline the tracking of drug changes during transitions between care settings. By expanding the utilisation of clinical intent, which captures the prescription indication and duration, this approach can provide decision support for healthcare professionals during drug prescription.

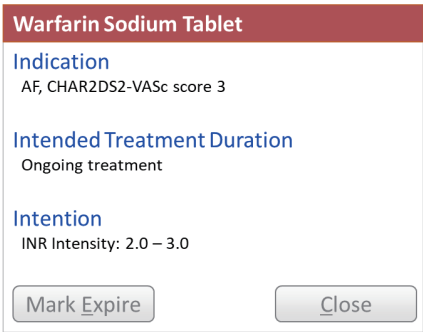


Illustration of Clinical Intention

Result Screening

To ensure a close loop communication and streamline the process for clinical staff to screen laboratory and radiology results, the Result Screening App has been developed. This application can capture the reading date and time, along with follow-up instructions. Consequently, a closed-loop communication system, where all investigation results are acknowledged and acted upon as necessary, can be established to prevent the omission of crucial results.

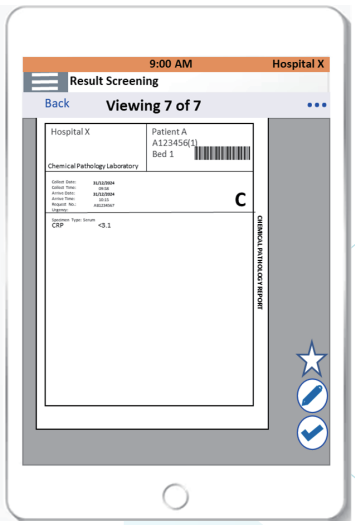


Illustration of Result Screening App

Corporate Root Cause Analysis (RCA) Training

In the coming year, the PS&RM will organise a corporate RCA training workshop. The training will be facilitated by an experienced international trainer, who will adeptly tailor external expertise to meet our local requirements. A significant aspect of the training will incorporate the component of human factor engineering in RCA, aiming at system improvement.

The training program consists of two parts. The first part includes four 2-day RCA training workshops designed for Quality and Safety (Q&S) personnel and RCA investigators. These workshops will cover methodologies for conducting individual and aggregate RCAs effectively. The second part is a half-day interactive workshop tailored for senior management, emphasising the final RCA report and recommendations.

Our principal objective is to enhance the quality and consistency of our incident investigation processes. By achieving this, we anticipate stronger, more effective recommendations that will significantly improve the overall quality and safety of our systems and procedures.

ANNEX I –
HA Sentinel and Serious Untoward Event Policy

HA SENTINEL AND SERIOUS UNTOWARD EVENT POLICY (July 2015)

1. Purpose

The Sentinel and Serious Untoward Event Policy defines the process for identification, reporting, investigation and management of Sentinel Events (SE) 「醫療風險警示事件」and Serious Untoward Events (SUE)「重要風險事件」in the Hospital Authority.

2. Scope

This Policy applies to sentinel and serious untoward events related to care procedures.

3. Objectives

- To increase staff's awareness to SE and SUE.
- To learn from SE and SUE through Root Cause Analysis (RCA), with a view to understand the underlying causes and make changes to the organisation's systems and processes to reduce the probability of such an event in the future.
- To have positive impact on patient care and services.
- To maintain the confidence of the public and regulatory/accreditation bodies.

4. Definition of Mandatory Reporting Events

4.1 Sentinel Events

1. Surgery/interventional procedure involving the wrong patient or body part.
2. Retained instruments or other material after surgery/interventional procedure.
3. ABO incompatibility blood transfusion.
4. Medication error resulting in major permanent loss of function or death.
5. Intravascular gas embolism resulting in death or neurological damage.
6. Death of an inpatient from suicide (including home leave).
7. Maternal death or serious morbidity associated with labour or delivery.
8. Infant discharged to wrong family or infant abduction.
9. Other adverse events resulting in permanent loss of function or death (excluding complications).

4.2 Serious Untoward Events

1. Medication error which could have led to death or permanent harm.
2. Patient misidentification which could have led to death or permanent harm.

5. Management of SE and SUE

5.1 *Immediate response* upon identification of a SE or SUE

5.1.1 Clinical Management Team shall assess patient condition and provide care to minimise harm to patient.

5.1.2 Attending staff shall notify senior staff of Department without delay (even outside office hours). Hospitals should establish and promulgate a clear line of communication for SE and SUE to all staff.

5.1.3 Department and hospital management shall work out an immediate response plan, including

- Disclosure to patient/relatives;
- When to notify HAHO;
- Public relation issues and media, (making reference to HAHO Corporate Communication Section's protocol/advice); and
- Appropriate support/counselling of staff.

5.2 Reporting (within 24 hours)

5.2.1 Hospitals must report SE and SUE through the Advance Incident Report System (AIRS) within 24 hours of their identification to

- Provide an initial factual account; and
- Mark the case as "SE" or "SUE" in AIRS accordingly.

5.2.2 Hospitals shall consider additional reporting requirements as indicated, for example, to Coroner in accordance to statutory requirement.

5.3 Investigations

5.3.1 Within 48 hours

5.3.1.1 For SE, HAHO shall appoint an RCA Panel, composing of members from hospital RCA team, respective COCs, external senior clinicians, HAHO coordinator and/or lay persons from Hospital Governing Committee, to evaluate the event reported.

5.3.1.2 For SUE, the RCA Panel shall be formed by respective hospital.

5.3.2 Hospital shall submit a detailed factual account to HAHO in 2 weeks.

5.3.3 The RCA Panel shall submit an investigation report to the Hospital Chief Executive in 6 weeks.

5.3.4 Hospital shall submit the final investigation report to HAHO in 8 weeks.

5.4 Follow-up (post 8 weeks)

5.4.1 Implicated departments shall implement the action plan as agreed in the RCA report, and risk management team/personnel shall monitor compliance and effectiveness of the measures in due course.

5.4.2 The panel at HAHO shall review RCA reports to identify needs for HA-wide changes, and to share the lessons learned through Safety Alert, HA Risk Alert (HARA), Patient Safety Forum, SE and SUE Report (to public) and follow-up visits.

5.4.3 The HAHO would visit respective hospitals for the implementation of improvement measures.

Supplementary Notes to Sentinel Event

If an incident involves a criminal act, a deliberately unsafe act, substance abuse, or deliberate patient harm or abuse, the incident should not be scrutinised by the Sentinel Event Policy.

Definition of common terms of Sentinel Event

1. Surgery/interventional procedure

Any procedures, regardless of setting in which it is performed, that involves any of the following:

- Creation of surgical wound on skin or mucous membranes.
- Making a cut or a hole to gain access to the inside of a patient's body.
- Inserting an instrument or object into a body orifice.
- Use electromagnetic radiation for treatment.

It includes fine needle aspiration, biopsy, excision and cryotherapy for lesions, radiology interventional procedures, anaesthetic block and vaginal birth or Caesarean delivery.

2. Permanent loss of function

It means sensory, motor, physiologic, or intellectual impairment not present on admission requiring continued treatment or lifestyle change. When "permanent loss of function" cannot be immediately determined, applicability of the policy is not established until either the patient is discharged with continued major loss of function, or two weeks have elapsed with persistent major loss of function, whichever occurs first.

Reportable Sentinel Event

1. Surgery/interventional procedure involving the wrong patient or body part

Any surgery/interventional procedure performed on an unintended patient or unintended body part.

The event can be detected at any time after the surgery/interventional procedure begins which is the point of surgical incision, tissue puncture or the insertion of instrument into tissue, cavities or organs.

Not to be included

- Unsuccessful procedure as a result of unknown/unexpected anatomy of the patient.
- Changes in plan during surgery with discovery of pathology in close proximity to the intended place where risk of a second surgery or procedure outweighs benefit of patient consultation or unusual physical configuration (e.g. adhesion, spine level/extra vertebrae).
- Blood taking, parenteral administration of drug, and use of otoscope without any intervention.

2. Retained instruments or other material after surgery/interventional procedure

Unintended retention of a foreign object in a patient after a surgical/invasive procedure ends. It also includes items were inserted into patient's body during a surgery/interventional procedure and not removed as planned. The size of the retained foreign object and the potential for harm from the retained foreign object, or whether the object is removed after discovery is irrelevant to its designation as a Sentinel Event.

'Instrument or other material' includes any items (such as swabs, needles, wound packing material, sponges, catheters, instruments and guide wires) left unintended.

'Surgery/interventional procedure' ends after all incisions have been closed in their entirety, and/or all devices, such as probes or instruments, that are not intended to be left in the body have been removed, even if the patient is still in the operation theatre or interventional suite under anaesthesia.

Not to be included

- Objects that are intentionally (i.e. by conscious decision) left in place during the surgery/interventional procedure.
- Objects are known to be missing prior to the completion of the surgery or interventional procedure and may be within the patient (e.g. screw fragments, drill bits) but where further action to locate and/or retrieve would be impossible or carry greater risk than retention.

3. ABO incompatibility blood transfusion

Administration of blood or blood product(s) having ABO incompatibilities, regardless of whether it results in transfusion reaction or other complications.

Not to be included

- Clinically indicated transfusion of ABO incompatible blood or blood product.

4. Medication error resulting in major permanent loss of function or death

Medication error includes error in the prescribing, dispensing, or administration of a medicine resulting in permanent loss of function or death. It includes, but not limited to, an error involving the wrong drug, the wrong dose, the wrong patient, the wrong time, the wrong rate, the wrong preparation, or the wrong route of administration.

Not to be included

- Death or permanent loss of function associated with allergies that could not be reasonably known or discerned in advance of the event.
- Variance in clinical practice on drug selection, dose and route of administration agreed by professional.

5. Intravascular gas embolism resulting in death or neurological damage

Death or neurological damage as a result of intravascular air embolism introduced during intravascular infusion/bolus administration or through a haemodialysis circuit.

Not to be included

- The introduction of air emboli: via surgical site (particularly Ear, Nose and Throat surgery and neurosurgery), during foam sclerotherapy and during the insertion of a central venous catheter.
- Where the introduction of the air embolism is deliberately by the patient.

6. Death of an in-patient from suicide (including home leave)

Death from suicide of in-patient committed any time after in-patient admission and before discharge, including home leave.

Not to be included

- Deaths resulting from self-inflicted injuries that committed before admission.
- Deaths from suicide committed while waiting for admission to the hospital.
- Suicidal death of a patient attending an out-patient service (such as Out-patient Department, Accident and Emergency Department).
- Unsuccessful suicide attempts.

7. Maternal death or serious morbidity associated with labour or delivery

It includes death or serious morbidity of a woman during or following childbirth from any cause related to or aggravated by labour, delivery or its management. It also includes obstetric complications resulting in death or serious morbidity. Serious morbidity means permanent loss of function.

"Associated with" means that it is reasonable to initially consider that the incident was related to the course of care. Further investigation and/or root cause analysis of the event may be needed to confirm or refute the presumed relationship but this should not delay reporting of event.

8. Infant discharged to wrong family or infant abduction

An in-patient aged 12 months or below is discharged to a wrong family or taken away from the hospital ward without prior notice to the hospital.

9. Other adverse events resulting in permanent loss of function or death

An injury related to medical management, in contrast to the natural course of patient's illness or underlying condition or known complications of treatment, resulting to permanent loss of function and death.

Medical management includes all aspects of care including diagnosis and treatment, and the systems and equipment used to deliver care.

Not to be included

- Event relating to the natural course of the individual's illness or underlying condition or to known complications of treatment.
- A death or loss of function following a discharge against medical advice (DAMA).
- Hospital-acquired infection(s).

Final decision-making around individual events is for HAHO consultation with cluster SDs.

ANNEX II – Description of Consequences

Sentinel Events

Category of Consequence	Severity Index of Incident	Description
Minor/ Insignificant	1	Incident occurred (reached patient) but no injury sustained Monitoring may be required No investigation or treatment required
	2	Minor injury Monitoring, investigation or minor treatment required No change in vital signs
Major/ Moderate	3	Temporary morbidity Monitoring, investigation or simple treatment required Some changes in vital signs
	4	Significant morbidity Transfer to a higher care level, emergency treatment, surgical intervention or antidote required Significant changes in vital signs
Extreme	5	Major permanent loss of function or disability
	6	Death

Serious Untoward Events

Category of Consequence	Severity Index of Incident	Description
Minor/ Insignificant	1	Incident occurred (reached patient) but no injury sustained Monitoring may be required No investigation or treatment required
	2	Minor injury Monitoring, investigation or minor treatment required No change in vital signs
Moderate	3	Temporary morbidity Monitoring, investigation or simple treatment required Some changes in vital signs
Temporary Major	4	Significant morbidity Transfer to a higher care level, emergency treatment, surgical intervention or antidote required Significant changes in vital signs

ANNEX III – High Alert Medications List

The table below contains a list of high alert medications extracted from the "HAHO Safety Solutions on High Alert Medications" paper published by the Medication Safety Committee in November 2017.

Categories of Medications
1. Concentrated electrolytes
2. Chemotherapeutic agents (parenteral and oral)
3. Drugs commonly associated with drug allergies (e.g. penicillin, aspirin, NSAIDs)
4. Vasopressors and inotropes
5. Anticoagulants (parenteral and oral)
6. Neuromuscular blocking agents (e.g. atracurium, rocuronium)
7. Oral hypoglycaemics
8. Insulins
9. Narcotics (e.g. fentanyl) and opioids

ANNEX IV – Individual Sentinel Events

Category 1: Surgery/interventional procedure involving the wrong patient or body part

Case 1

A patient was scheduled for right eye prophylactic laser iridotomy (LI) followed by left eye cataract extraction. On the day of the right eye LI procedure:

✓ Pre-intervention checks and site marking (right forehead)
✓ TIME OUT safety checks to confirm correct patient, procedure and laterality

Due to dim lighting and a blurred protective plastic shield used for infection control, the LI laser was mistakenly applied to the left eye after completing right eye, as the site marking was not clearly visible.

The error was immediately recognised. The patient experienced no adverse effects and later underwent left eye cataract surgery without complications.

Areas for Improvement Identified:

1. Remove or replace the plastic shield to ensure clear visibility
2. Introduce micropore strips for marking to facilitate laterality verification

Case 2

A patient with bilateral varicose veins was scheduled for Bilateral Great Saphenous Vein (GSV) + Left Small Saphenous Vein (SSV) Endovenous Obliteration of Varicose Vein with Radiofrequency Ablation (RFA) + Ligation and Avulsion of Bilateral Perforators.

- E-consent: Did not specify RFA was intended for bilateral GSV and left SSV only
- Surgical site marking: Not performed during pre-operative assessment in ward
- SIGN IN (the patient was in prone position): Marking of the puncture point was incorrectly performed on the right calf for SSV puncture, instead of the intended left SSV
- TIME OUT: Incorrect side for RFA and the discrepancies between the intended operation stated in the safety checklist and e-consent were not detected

The right SSV was punctured (2-3mm); this was immediately noted, with the procedure then correctly proceeding on the left SSV uneventfully.

Areas for Improvement Identified:

1. Ensure surgical site marking was performed before arrival to the theatre room.
2. When performing surgical procedures on patients in a prone position, use explicit markings of "R" and "L" to indicate laterality
3. Conduct vigilant safety check at each phase of surgical checking to confirm the correct patient, procedure, and body parts involved

Case 3

A patient with metastatic prostate cancer was admitted for dyspnoea. Bilateral chest drains were inserted.

LEFT side Pleurodesis was planned for the patient to be carried out at bedside. 1% Lignocaine (10mg/ml) 10ml intrapleural and Talc 2 grams intrapleural cavity over the LEFT side was prescribed on IPMOE. A consent form indicating the LEFT side was signed, and subsequently, the medications were injected into the patient's RIGHT chest drain at the patient's bedside. The patient remained stable.

Area for Improvement Identified:

Reinforce the practice of using Bedside Procedure Safety Checklist for pleurodesis procedure

Case 4

A patient with LEFT clavicle fracture underwent open reduction and internal fixation under general anaesthesia (GA). In the operation theatre, the "SIGN IN" and "TIME OUT" checking procedure were performed with the confirmation of patient identity, consent form and surgical site marking.

The anaesthetist draped at RIGHT side of patient's neck while an injection trolley and an ultrasound machine were also placed near the RIGHT side of the patient. After completion of the injection, the surgeon discovered that the regional block was performed to the RIGHT instead of LEFT side of patient's neck. LEFT cervical plexus block was immediately performed. The patient underwent the operation uneventfully.

Areas for Improvement Identified:

1. Reinforce the practice "Stop before you Block": Anaesthetist initiates checking process with another assistant
2. Include "TIME OUT" of regional block in Surgical Safety Checklist

Case 5

A patient with metastatic lung cancer presented with left pleural effusion. Doctor A ordered pleural tapping for left side and signed the consent form prepared by a Physician Assistant, who mistakenly indicated "right-sided" pleural tapping. No site marking was performed.

Doctor B performed bedside handheld ultrasound from the patient's right side for site confirmation. The ultrasound showed solid features and minimal fluid. Nurse C noted that the consent form indicated the procedure should be on the right side. Doctor B proceeded with a testing needle for pleural tapping on the right side and aspirated only 2ml of blood and air. The procedure was stopped immediately.

Eventually the correct left-sided pleural tapping was performed uneventfully.

Areas for Improvement Identified:

1. Reinforce training in interpreting ultrasound to identify correct side for pleural tapping
2. Ensure site marking for pleural tapping procedure according to Bedside Procedure Safety Policy

Case 6

A patient presented to the Accident & Emergency Department (A&E) with a splinter embedded in the left RING finger, specifically on the palmar aspect of the distal phalanx tip. The doctor ordered a "Foreign body exploration and removal" procedure, and a consent form was signed. During the procedure, the patient was positioned with the palm facing upward. After confirming the site of the foreign body with the patient, the doctor placed a surgical drape with an opening exposing the left RING finger. After preparing Lignocaine, the doctor decided to inject it over the dorsal side of the fingers. The doctor removed the sterile drape and asked the patient to turn her palm downward. Following the change in position, Lignocaine was inadvertently injected into the left MIDDLE finger instead of the intended RING finger.

Areas for Improvement Identified:

1. Confirm the procedure site with other parties e.g. patient/ nurse before the procedure
2. Mark the procedure site with appropriate markings when needed
3. Check patient's clinical notes, consent and clinical condition before procedure/when distractions occur

Case 7

A patient was admitted for an operation to repair LEFT inguinal hernia under spinal anaesthesia. The Anaesthetist recommended placing an ilioinguinal nerve block for post-operative pain management. Before the operation, SIGN IN was conducted to confirm the surgical procedure, laterality of the operation site and its marking. Spinal anaesthesia was then performed. During the nerve block procedure, a trolley with materials was placed on the patient's RIGHT side, while an ultrasound machine was placed on the LEFT. The Anaesthetist unintentionally stood on the patient's RIGHT side and performed the ilioinguinal nerve block. After the injection, a circulating nurse discovered that the ilioinguinal nerve block was performed at the RIGHT side instead of the intended LEFT side. After assessing patient's condition and confirming the dosage of medication, another nerve block was placed at the LEFT side of patient's lower.

Areas for Improvement Identified:

1. Reinforce the practice **"Stop before you block"**
2. Use "Pointing and Calling" technique to point to the site for regional anaesthesia and verbally confirm the procedure during "Stop before you block"

Case 8

A patient was admitted for a LEFT proximal femur valgus osteotomy with a planned LEFT regional block for postoperative pain relief. During SIGN IN, the surgical site marking was verified. During TIME OUT after anaesthesia induction, Doctor A and Nurse B confirmed the surgical site marking at the LEFT ankle, with Doctor C not involved in this step. Subsequently, Doctor A and Doctor C inserted an arterial line on the patient's RIGHT side. Doctor A secured the arterial line and Doctor C began preparing the patient's RIGHT groin for the regional block. Despite noticing the discrepancy, Nurse B did not promptly address the incorrect side preparation. Doctor A, under Doctor C's supervision, then performed a regional block on the RIGHT groin. After the completion of the RIGHT regional block, Nurse B questioned the absence of a LEFT regional block, leading to the discovery of the incident. The patient's right lower limb sensation and power remained unaffected.

Areas for Improvement Identified:

1. Reinforce the practice **"Stop before you block"**
2. Use "Pointing and Calling" technique to point to the site for regional anaesthesia and verbally confirm the procedure during "Stop before you block"

Case 9

A patient with diabetic retinopathy underwent panretinal photocoagulation on the RIGHT eye. Eye drops were applied to the patient's RIGHT eye. TIME OUT was conducted before the procedure. However, the doctor performed laser therapy on the LEFT eye. The error was noticed shortly after the procedure began. Laser therapy was then correctly administered to the RIGHT eye. Following an examination, it was confirmed that neither eye had sustained damage.

Area for Improvement Identified:

1. Enhance vigilance in TIME OUT on the correct side by:
   - Strengthen the process of verifying the operation site marking

Category 2:
Retained instruments or other material after surgery/interventional procedure

Broken Instrument

Case 1

A patient had cardiac allograft vasculopathy with permanent pacemaker (PPM) underwent a redo heart transplantation, including removal of PPM. The operation was uneventful, and the patient was transferred to the Cardiothoracic Surgical Intensive Care Unit for post-operative care. Serial CXRs were arranged for monitoring.

On post-operative day 16, noted a linear line over right lower zone on a CXR, suspected to be a remnant of the previous implant, but considered clinically insignificant. A CT thorax confirmed the presence of a 3.4cm linear hyperdensity in the right lower lobe segmental pulmonary artery. The patient opted for conservative treatment after discussion.

Areas for Improvement Identified:

1. Include the risks and complications of retained foreign body in the informed consent form for heart transplant with pacemaker removal
2. Ensure thorough checking of integrity and completeness of removed implant, especially for those long-term implants where fracture/metal fatigue/adhesion is expected

Case 2

A patient had emergency nailing due to left trochanteric femur fracture. The operation was uneventful, no instrument parts appeared to be detached during the surgery or instrument checks. Later, while disinfecting and packing equipment in the Theatre Sterile Supply Unit, a metal ring from the targeting device was found missing. An X-ray revealed that the metal ring had been retained inside the body, which was successfully surgically removed.

Areas for Improvement Identified:

Perform an immediate on-table integrity check upon removal of the targeting device, and review the checking methods

Case 3

A patient underwent open reduction and internal fixation for right coronoid process fracture with subluxation.

An on-loan instrument set containing drill bits was used. A 1.6mm drill bit was installed without inspecting the tip. Intraoperative X-rays initially did not reveal any foreign bodies.

An instrument count was performed without cross-checking, verifying the quantity without assessing integrity.

Upon review, a metallic spiral strip was found retained in the medullary cavity of the coronoid process. The patient opted for conservative treatment.

Areas for Improvement Identified:

1. Explore feasibility of using single-use drill bits, particularly those with small diameters (≤2.5mm) to prevent risk of breakage
2. Enforce strict compliance with instrument integrity checks during operations, followed by clinical supervision and audit
3. Enhance alertness on reviewing intraoperative X-ray images in identification of possible foreign bodies

Case 4

A patient was admitted for a right total hip replacement (THR) due to osteoarthritis. During the operation, the flex shaft (Figure 1) broke into pieces. The pieces were retrieved by the scrub nurse and checked for integrity by surgeon. The wound was closed without complications. An X-ray on post-operative day 3, revealed no foreign body. The patient recovered uneventfully.

At a follow-up appointment, a 6mm curve radio-opacity over lesser trochanter was identified. A subsequent CT confirmed the 6mm metallic density close to the right hip joint (Figure 2). The patient opted for conservative treatment.

Areas for Improvement Identified:

When a retained foreign body is suspected, early investigation, follow up of abnormal result and open disclosure should be considered with reference to the clinical condition.

Drain/Catheter

Case 5

A patient with increased hydrocephalus underwent bilateral cranioplasty with the insertion of an external ventricular drain (EVD). Two JP drains, cut to appropriate length, were placed during the operation. Two days later, the JP drains and the EVD were removed at bedside.

Upon readmission for hydrocephalus two months later, a CT scan revealed a retained segment of the JP drain on the right side of the scalp, which was successfully surgically removed.

Areas for Improvement Identified:

1. Explore surgical wound drains of different lengths to reduce the need for cutting drains during operations
2. Enhance the accuracy of integrity checks for surgical wound drains that have been cut during insertion:
   - ✓ Explore ways to facilitate identification of the cut point on the drain;
   - ✓ Documenting the drain details in the operation record and crosschecking against it upon drain removal

Case 6

A patient with a history of renal stones, had been receiving follow-up care at a urology clinic. A referral letter was issued to reschedule an appointment. Six months later, an urgent JJ stent insertion was performed during an admission for urosepsis. Upon discharge, a new referral letter stating the urgent stent insertion was issued.

At the urology follow-up, the referral letter concerning the urgent stent insertion could not be found in the patient's record; only the initial referral letter was present. The doctor, after reviewing a magnetic resonance cholangiopancreatography (MRCP) results that showed no stones with no hydronephrosis, then closed the case. Later, the patient was admitted for dysuria, X-ray and CT scan indicated a 3.3 cm encrustation on the stent's distal coil, which was then removed.

Areas for Improvement Identified:

1. Ureteric stent operation CDF was newly developed to safeguard ureteric stent could be removed within specific timeframe
2. Strengthen the comprehensive review of patient's clinical history during follow up, emphasising same specialty entries

Case 7

A patient with suspected ovarian cancer underwent abdominal tapping for ascites drainage, using a 16-gauge angiocatheter. The procedure was uneventful, and the angiocatheter remained in place for continuous drainage for 9 days.

Upon removal, the doctor noticed that the retrieved catheter appeared shorter than expected. The doctor sought clarification of its length from a nurse and documented "tip intact" in the records while awaiting confirmation. The following day, during another diagnostic operation, a 6.5cm fragment of the angiocatheter shaft was found in the abdominal cavity and successfully retrieved.

Areas for Improvement Identified:

1. Angiocatheter may be prone to breaking if left inside body for a prolonged period – Use appropriate instrument set for abdominal tapping/paracentesis
2. Enhance documentation and communication, including specifying the type of instrument used
3. Conduct integrity checks on instruments upon removal; and document the condition of removed catheter in patient's record

Case 8

A patient underwent lumbar 4-5 (L4-L5) Transforaminal Lumbar Interbody Fusion (TLIF) surgery. A Redivac drain was inserted and anchored in position.

On post-operative day 4, a nurse removed the drain and encountered mild resistance. The nurse noticed that the tip of the drain was missing with irregular cut end. The operating surgeon was called to enquire about the shortened end, and the surgeon explained that the tip had been cut between the side holes during the operation. No further clarification was requested regarding the irregularity of the cut end.

X-ray revealed a segment of linear opacity. A computer tomography (CT) scan confirmed a 5.5 cm radiopaque foreign body at the posterior column of L4. A surgery was performed to remove the retained drain.

Areas for Improvement Identified:

1. Establish a handover system to measure and document length of the drain inserted in operating theatre, verify length of drain segment removed in ward against the operation record
2. Implement a structured communication process between interdisciplinary teams using Situation, Background, Assessment and Recommendation (SBAR)
3. Procure drains with different lengths to avoid drain cutting

Case 9

A patient was admitted for a fracture of the right distal radius and ulna and underwent open reduction and fixation. The operation was uneventful. The integrity of all instruments was checked both preoperatively and postoperatively and confirmed to be intact. An intraoperative X-ray did not reveal any foreign bodies. However, a postoperative X-ray showed a tiny radiopaque focus in the metaphyseal region, which was suspected to be a retained fragment from K-wire (Figure 2). The patient opted for conservative treatment after discussion

Areas for Improvement Identified:

1. Reinforce staff alertness of the possibility of fragment detachment from K-wires during operation

Gauze/Dressing Materials

Case 10

A patient admitted for right upper quadrant pain, underwent urgent laparoscopic appendectomy. Following the surgery, a wound nurse observed a gapped surgical wound and performed wound irrigation and packing. The wound was primarily under the care of wound team, with ward nurses support. One month later, during a routine wound assessment, a wound nurse discovered a cotton-like material after irrigation.

Areas for Improvement Identified:

1. Wound care advices, including risk precautions and methods of wound packing, should be clearly documented to facilitate communication between wound team and ward nurses
2. Check integrity of any instrument/material placed inside a wound or body cavity

Case 11

A patient with a stage IV cervical cancer was hospitalised for abdominal and back pain. Due to significant per vaginal bleeding (PVB), the patient underwent several per vaginal (PV) examinations with gauze packing for haemostasis. "One-gauze-in, one-gauze-out" method had been adopted and the used gauzes were discarded in the designated container. A long gauze was packed with a visible tail as documented. After finished the examination, a Patient Care Assistant counted the number of used plain gauzes and asked involved doctor/case nurse to counter-check. However, the counter-check step was not completed.

Two weeks later, a plain gauze was found at the vaginal opening and removed.

Areas for Improvement Identified:

1. Revise the guideline on the gauze counting procedure during PV examination, including:
   - ✓ Clarify the role delineation of doctors, nurses, and supporting staff on the counting process
   - ✓ Ensure that the performing doctor is engaged in the counting process and is responsible for confirming the number of accountable items placed inside patient's body

Case 12

A patient was admitted to Hospital X for right testicular pain, and underwent exploration of the scrotum and bilateral orchidopexy. He later developed a scrotal wound infection and underwent orchidectomy with incision and drainage. One ribbon gauze was packed into each scrotal wound, and the left testis was covered with paraffin gauze.

Post-surgery, the patient complained of groin pain. The surgeon replaced the two ribbon gauzes but left the original paraffin gauze in the left scrotum, documenting that "all dressings were removed and two ribbon gauzes were replaced". The recovery room nurse verified with the surgeon and documented in the perioperative nursing record that "one paraffin gauze still remained in the wound". Despite this, ward nurses replaced only the ribbon gauzes during daily dressing without noting the paraffin gauze. The patient was discharged for daily dressing at General Out-patient Clinic.

An ultrasound report from Hospital X and a subsequent ultrasound during the patient's later admission to Hospital Z both suggested suspected surgical material in left scrotum. After review, the urology teams at both hospitals opted not to proceed with further wound exploration and recommended follow-up as planned.

Two months after the operation, the patient noticed discharge from the scrotum and self-punctured it, observing whitish material from the wound. Bedside exploration retrieved two pieces of fragmented paraffin gauze (Figure 1) from the scrotal wound.

Areas for Improvement Identified:

1. Avoid using paraffin gauze packing in deep cavities
2. Keep all packing materials with 3cm tails leaving at skin level
3. Reinforce accurate packing information on operation record by surgeon
4. Reinforce ward nurses to review perioperative nursing record
5. Reinforce alertness of suspected surgical material retention on ultrasound report

Nasogastric Tube

Case 13

An old age home (OAH) resident on long-term NG tube feeding had a history of repeated pulling out the NG tube. Reinsertion of NG tubes were performed by Community Geriatric Assessment Service (CGAS) nurses and an OAH nurse. After each removal, CGAS nurses documented the tube integrity as "without defects", whereas there were no records of NG tube insertions by the OAH nurse.

The patient was later admitted for fever. An abdominal X-ray revealed two NG tube tips below the diaphragm, which were then successfully removed.

Areas for Improvement Identified:

1. CGAS nurse should verify and counter-check NG tube integrity with OAH staff for traceability
2. Conduct X-ray if a retained NG tube is suspected
3. Consider the option of PEG feeding in cases of uncooperative patients

Category 6:
Death of an inpatient from suicide (including home leave)

Case 1

An elderly patient with end-stage renal failure was admitted for fluid overload and chest infection. Throughout the stay, the patient remained emotionally stable, and a suicide risk assessment indicated no risk. Similarly, no signs of significant depression or anxiety were noted during the palliative team's assessment.

During a late night routine ward round, the patient was asleep without any apparent abnormalities. However, 15 minutes later, the patient was found unconscious with neck entangled by the connection tube of a blood pressure (BP) machine. Resuscitation attempt was unsuccessful.

Areas for Improvement Identified:

1. Secure high-risk equipment out of patient reach whenever possible
2. Minimise use of long connection tubes for BP machines
3. Enhance psychosocial support for patients with terminal illness

Case 2

A patient with newly diagnosed stage 3 myeloma was admitted for chemotherapy. The patient had no previous history of psychiatric illness, and his emotional state was assessed as stable upon admission. Suicidal assessment indicated no risk. No signs of depression were observed and psychological support was provided by the cancer case nurse.

During the stay, the patient experienced moderate pain from myeloma. A multidisciplinary team was involved in the patient's care and pain management.

A week after admission, the patient requested clothes and privacy for a bed bath. The curtains were closed for privacy. Shortly afterwards, the patient was found hanging using a strap of his own handbag from the lifting pole on his bed. Resuscitation attempt was unsuccessful.

Areas for Improvement Identified:

1. Raise awareness and sensitivity regarding changes in patient mood and the potential need for reassessment of suicidal risks
2. Review the necessity and potential risks associated with lifting poles, considering individual patient needs

Maternal Death with Massive Pulmonary Embolism and Delivery of a Complete Hydatidiform Mole and Male Stillbirth

Category 7: maternal death or serious morbidity associated with labour or delivery

Case 1

A woman at approximately 24 weeks of gestation, without prior antenatal checkups, arrived in critical condition at the A&E. She presented with tachycardia and hypertension and was classified as a Category 1 case. Emergency management was initiated, and she was diagnosed with suspected preeclampsia and per vaginal bleeding, along with uncertain fetal viability.

Intrauterine death (IUD) was confirmed at the delivery suite. A normal vaginal delivery was performed and a fresh fetus with no signs of life at birth was delivered. However, placental separation was noted, and emergency manual removal of the placenta was performed in the operating theatre.

During the procedure, the woman experienced cardiac arrest and active resuscitation efforts were undertaken. An echocardiogram revealed a large mass in the right ventricle, and thrombolysis was administered. Despite intensive resuscitation efforts, the woman succumbed.

The final diagnosis was massive pulmonary embolism, twin pregnancy with a complete hydatidiform mole, and a male stillbirth.

Area for Improvement Identified:

1. After reviewing the case, the review panel concluded that the patient received timely management and appropriate treatment

Category 8:
Other adverse events resulting in permanent loss of function or death

Case 1

A patient was admitted for blood pressure control ahead of a scheduled elective cataract surgery two days later. With a medical history of inguinal hernioplasty, intestinal obstructions, and peptic ulcer with surgery performed, he reported abdominal pain during admission, which worsened into desaturation with shortness of breath, requiring oxygen therapy at 5L/min. His blood pressure subsequently dropped. Suspecting acute abdomen or bowel obstruction, clinical teams suggested admission to the intensive care unit (ICU).

In preparation for the transfer, the oxygen tubing was detached from the wall oxygen flowmeter and connected to the oxygen cylinder. The oxygen flow rate was adjusted to 5L/min. The sound of gas flow was heard before the oxygen tubing was connected to the cylinder. The patient was then escorted by the transport team to the ICU.

During transportation, the patient experienced desaturation and the oxygen flow rate was increased to 9L/min. Upon ICU arrival, it was discovered that the oxygen cylinder valve had not been turned on.

Areas for Improvement Identified:

1. Refresher Training for Oxygen Cylinder Use: Staff handling oxygen cylinders and transporting critically ill patients should receive refresher training
2. Clear roles: The transport team must have clearly defined roles during the entire transport process (i.e. both preparation for and actual transportation)
3. Clinical handover and documentation during entire transport process: Utilise transportation form/ checklist and crew resource management training to enhance communication
4. Understand FX oxygen cylinder: Be aware that residual oxygen could be trapped in the space between oxygen valve and flow selector. Turning on the flow selector could release this oxygen, creating a sound of gas flow even when the valve is closed.
5. Visual Aids for On-the-Spot Learning: Put up education poster at cylinder storage locations and attach cue card to each cylinder

Case 2

A patient with history of pulmonary tuberculosis was admitted for shortness of breath. He was later transferred to Intensive Care Unit (ICU) due to septic shock and required mechanical ventilation. After treatment, the patient was transferred to an isolation ward due to the infectious risk. The patient was conscious and upper limbs were restrained to prevent body movement from causing disconnection with the ventilator tubing and intravenous lines. Staff left the room after checking vital signs and ventilator functions.

Around 40 minutes later, the patient was found unconscious with ventilator tubing detached. The tubing was immediately reconnected. The patient subsequently returned to spontaneous circulation after resuscitated.

How did it happen:

1. Alarm detection: Visual and audible alarms from ventilator and bedside monitor could not be detected by staff outside the isolation room due to closed double doors
2. Cross-checking: Lack of clear cross-checking mechanism to ensure normal functioning of monitoring equipment
3. Monitoring Challenges: The distance between the central monitoring system and the nurse station, along with the system displaying multiple data sets from life-supporting equipment, made it difficult for staff to notice real-time changes and disconnections

Areas for Improvement Identified:

1. Improve alarm systems for ventilators and monitors
2. Develop a cross-checking mechanism for life-supporting equipment and monitoring systems to ensure effective continuous patient monitoring
3. Improve design of user interface and location of the central monitoring system
4. Consider capnography monitoring for ventilated patients both at the bedside and in the central monitoring system

Case 3

Patient A had endometrial sampling for post-menopausal bleeding, while Patient B, diagnosed with endometrial cancer, had a vaginal biopsy on the same day. Both specimens were sent to the same laboratory.

During the processing of Patient B's biopsies, a piece of tissue was unintentionally thrown off and landed on an unused mould. This mould was subsequently used to hold Patient A's biopsy, leading to contamination.

Laboratory staff suspected there might have been a discrepancy between the biopsy fragments and the recorded gross description, the apparent discrepancy was considered within an acceptable range and the procedure was continued with further follow-up.

Patient A's biopsy report indicated carcinoma leading to a total hysterectomy with bilateral salpingo-oophorectomy and pelvic lymph node sampling. Following surgery, no carcinoma was found in the pathological examination. Genetic testing further confirmed the specimen contamination.

Areas for Improvement Identified:

1. Minimise Contamination: Cover the chamber housing unused moulds and place unused moulds bottom-up to minimise contamination
2. "One Case, One Mould" Practice: Ensure only one new mould is on the platform at a time during embedding procedure
3. Training and supervision: Conduct audits on embedding Standard Operating Procedures, emphasising on checking specimen descriptions against actual specimens before embedding
4. Risk Mitigation Guidelines: Establish specific guidelines on risk mitigation in managing laboratory events, including handling suspected contamination; and managing discrepancies in tissue samples
5. Macroscopic Description System: Improve the current system for macroscopic description of sampling with well-defined parameter to enhance traceability of specimen size
6. Effective Communication: Ensure explicit descriptions of possible abnormal situations in the laboratory to facilitate effective communication between staff and escalation of follow-up actions when necessary

Case 4

A patient was admitted for cervical cord injury with tetraplegia. The patient was tracheostomised with long-term ventilator care and on nasogastric (NG) tube feeding.

A scheduled change for NG tube was performed and Chest x-ray (CXR) was order. Later, the NG tube's position was confirmed by pH test with result below 5.5 and auscultation. Feeding was resumed. The CXR was done afterwards and reviewed by an intern who did not recognise the malposition of the NG tube.

The patient's condition suddenly deteriorated. He was immediately resuscitated and a bronchoscopy was performed. The NG tube was found to be misplaced in the left-sided bronchus and it was immediately removed. The patient's condition deteriorated and was transferred to Intensive Care Unit (ICU) for further care.

Areas for Improvement Identified:

1. The incident occurred despite the nurses had confirmed the NG tube position by the pH test before feeding. In retrospect, the NG tube was mistakenly inserted into the left bronchi and the tip of the NG tube might have entered the left pleural cavity. With the existence of possibly infected pleural effusion, false-positive result to the pH test might have occurred
2. To widen the use of CXR to confirm the position of NG tubes, in view of the possibility of false-positive results of pH test
3. To enhance training and education for doctors on radiological confirmation of NG tube position and recognition of abnormality related to NG tube position
4. To introduce a new and specific X-ray examination request in the clinical management system to ensure radiological image quality for NG tube confirmation

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