ANNUAL REPORT ON
SENTINEL AND SERIOUS UNTOWARD EVENTS

October 2021 – September 2022

HOSPITAL AUTHORITY
HONG KONG

January 2023

醫院管理局
HOSPITAL AUTHORITY

Acknowledgments

This is the 15th 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.

Fifteen years is not a short time. We 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 minimize the recurrence of similar events.

We would like to express our heartfelt gratitude to 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

Contents

1. Executive Summary

This annual report provides a summary of all Sentinel Events (SE) and Serious Untoward Events (SUE), comprising 26 SE and 87 SUE, reported between October 2021 and September 2022.

Sentinel Events

The 26 reported SE represented an incident rate of 1.4 per 1 000 000 episodes of patient attendances / discharges and deaths. All 26 (100%) SE occurred in acute general hospitals with 24-hour Accident and Emergency (A&E) services.

The top three categories of SE were *retained instruments or other material after surgery / interventional procedure* (16 cases); *death of an inpatient from suicide (including home leave)* (four cases, not counting one suspected case that is still under police investigation) and *surgery / interventional procedure involving the wrong patient or body part* (three cases).

Of the 16 *retained instruments or other material after surgery / interventional procedure* cases, seven were related to the counting of instruments / material and the other nine involved broken instruments / material.

The four reported cases of *inpatient suicide* represented a suicide rate of 0.24 per 100,000 inpatient admissions. The overall assessment and management as noted by the investigation panel were considered appropriate.

Of the three cases of *surgery / interventional procedure involving the wrong body part*, two cases occurred in Operating Theatre while one case occurred in a Specialist Outpatient Clinic.

The remaining three reported SE were *Medication error resulting in major permanent loss of function or death* (one case), *and Maternal death or serious morbidity associated with labour or delivery* (two cases).

Among the 26 SE, seven cases (four *inpatient suicide*, one *medication incident*, and two *maternal event*) resulted in mortality.

Of the remaining SE, 16 had minor / insignificant consequence and three had major / moderate 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 87 SUE which could have led to death or permanent harm, 77 were medication error and 10 were *patient misidentification*.

The four most common types of *medication error cases* were those involving *anticoagulant* (15 cases), *known drug allergy* (11 cases), *dangerous drug(s)* (eight cases), and *insulin* (six cases). Of all the *known drug allergy* cases, six were related to penicillin, two were related to non-steroidal anti-inflammatory drugs (NSAID), the remaining were related to fluorescein (one case), lisinopril (one case), and Coltalin (one case).

Of the 87 SUE, six had temporary major consequence, 21 had moderate consequence and 60 had minor / insignificant consequence.

2. Introduction

The Sentinel Event (SE) Policy was implemented in 2007, while Serious Untoward Event (SUE) was incorporated 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 to be investigated using the 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 management and Hospital Authority Head Office (HAHO) to improve patient safety.

This 15th annual report provides a summary and analysis of the SE and SUE reported via the Advance Incident Reporting System (AIRS) between October 2021 and September 2022 (4Q21 - 3Q22). 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 care through system improvement and teamwork.

To facilitate understanding on the scope and definition of SE and SUE, the following abbreviated captions for SE and SUE categories, in square brackets, 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 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 (SE) Statistics

3.1 SE Trend (2012-22)

3.1.1 Overview

The annual number of episodes of patient attendances / discharges and deaths, and the SE incident rate per 1 000 000 episodes of patient attendances / discharges in 2020-21 and 2021-22 were comparable (Figure 1). Total number of SE in the past 10 years is also appended in Figure 2 for reference.

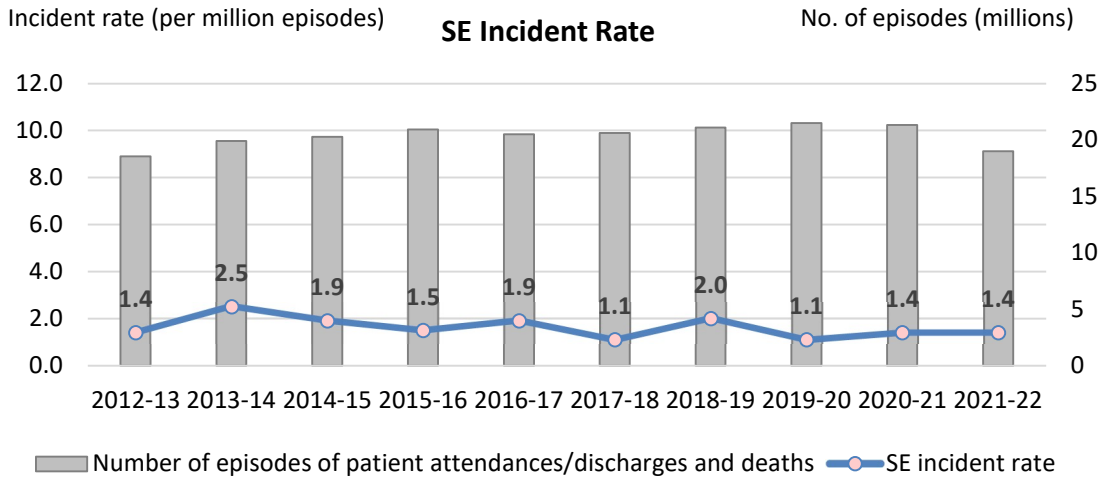

Figure 1

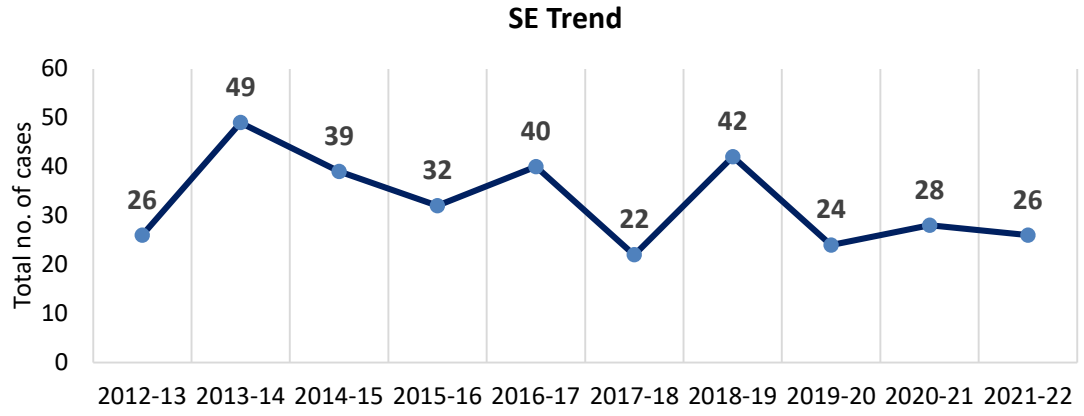

Figure 2

* Statistics from October to September of respective year

3.1.2 SE Category

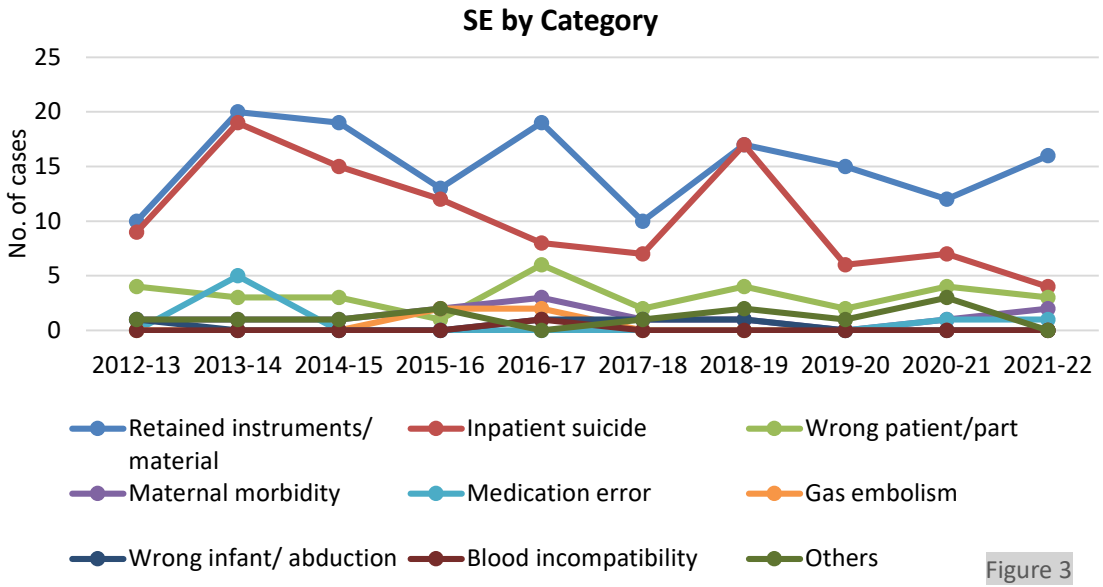

Figure 3

Number of SE by Category

Period / SE Category	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022
Retained instruments / material	10	20	19	13	19	10	17	15	12	16
Inpatient suicide	9	19	15	12	8	7	17	6	7	4
Wrong patient / part	4	3	3	1	6	2	4	2	4	3
Maternal morbidity	1	1	1	2	3	1	1	0	1	2
Medication error	0	5	0	0	0	0	0	0	1	1
Gas embolism	0	0	0	2	2	0	0	0	0	0
Wrong infant/abduction	1	0	0	0	1	1	1	0	0	0
Blood incompatibility	0	0	0	0	1	0	0	0	0	0
Others	1	1	1	2	0	1	2	1	3	0
Total	**26**	**49**	**39**	**32**	**40**	**22**	**42**	**24**	**28**	**26**

* Statistics from October to September of respective year

Table 1

Since 2016-17, *retained instruments / material*, *inpatient suicide (including home leave)* and *wrong patient / part* have remained the top three most frequently reported SE (Figure 3 and Table 1).

3.1.3 SE Outcome

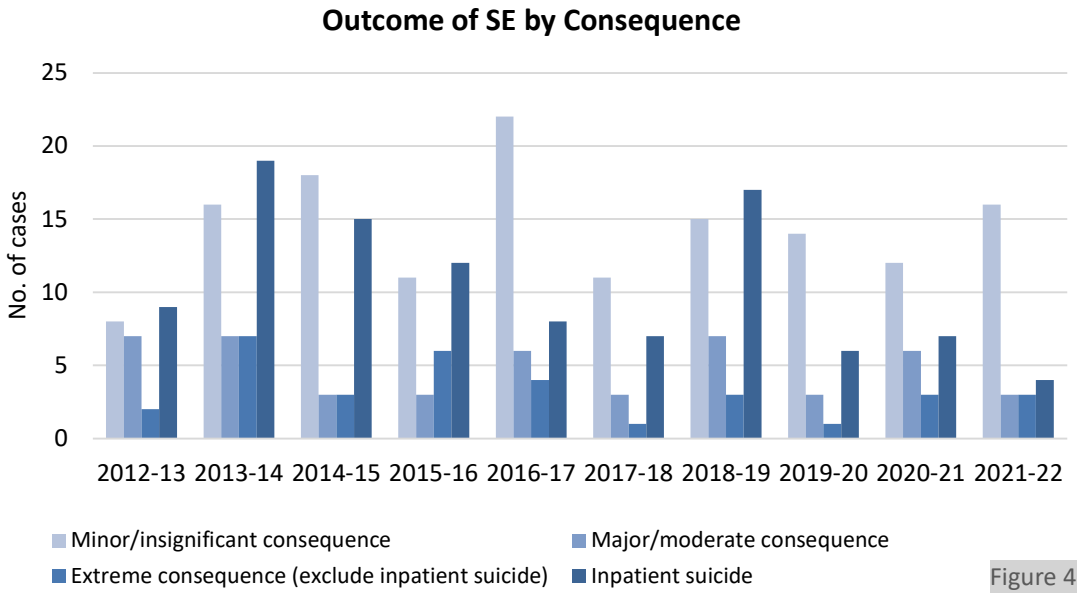

Figure 4

Number of SE by Consequence Category

SE Category \ Period	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022
Minor / insignificant consequence	8	16	18	11	22	11	15	14	12	16
Major / moderate consequence	7	7	3	3	6	3	7	3	6	3
Extreme consequence (exclude inpatient suicide)	2	7	3	6	4	1	3	1	3	3
Inpatient suicide	9	19	15	12	8	7	17	6	7	4
Total	**26**	**49**	**39**	**32**	**40**	**22**	**42**	**24**	**28**	**26**

* Statistics from October to September of respective year

Table 2

The outcomes of SE are grouped into minor or insignificant consequences (i.e. no / minor injury sustained), major / moderate consequences (i.e. temporary / significant morbidity) and extreme consequences (i.e. major permanent loss of function / disability or death) (Figure 4 and Table 2). A description of the consequences is illustrated in Annex II.

3.2 SE Report (4Q 2021 to 3Q 2022)

3.2.1 Overview

Below charts illustrate the quarterly distribution of SE (Figure 5), distribution by category (Figure 6) and by hospital setting (Figure 7). Among the 22 SE unrelated to inpatient suicide, 19 cases (86%) had insignificant consequences, or major / moderate consequences (Figure 8).

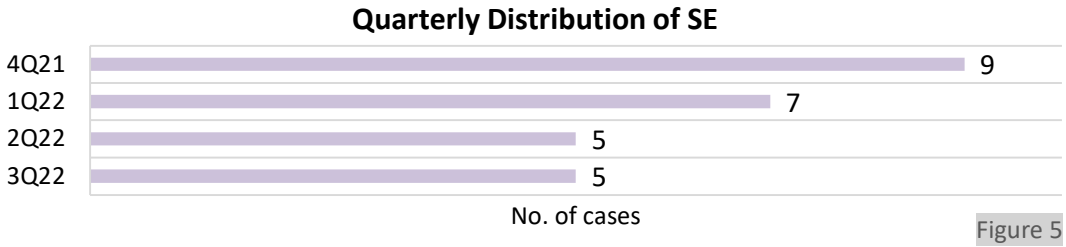

Figure 5

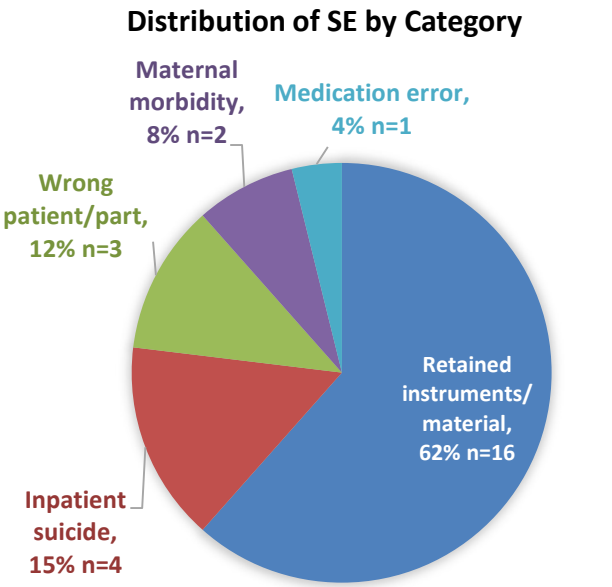

Figure 6

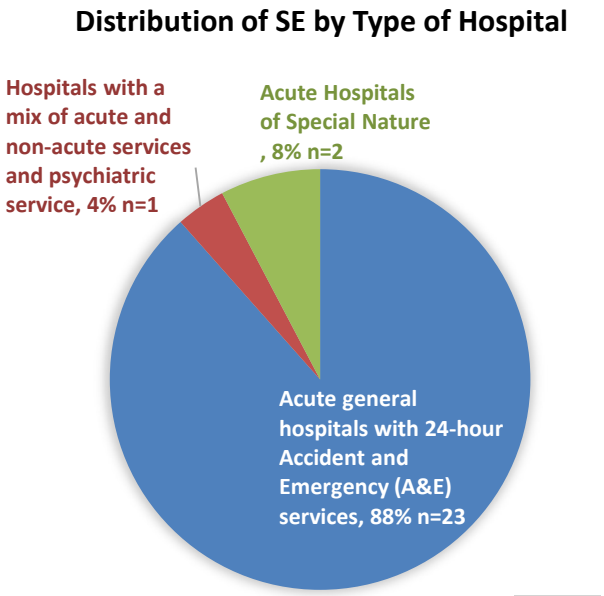

Figure 7

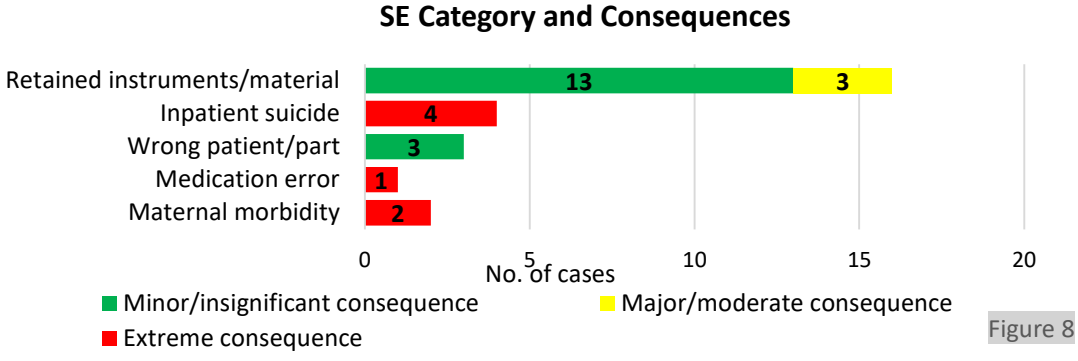

Figure 8

3.2.2 Category: Retained Instruments / Material

Among 16 SE cases of *retained instruments / material*, greater proportion occurred in operating theatre / interventional suite, or involved broken instruments / material (Figure 10). The type of instrument / material involved is summarized in Table 3.

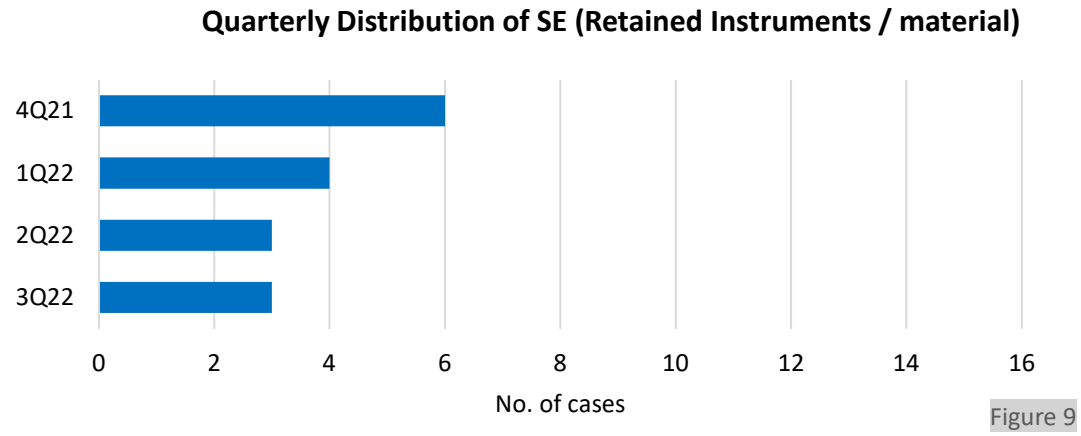

Figure 9

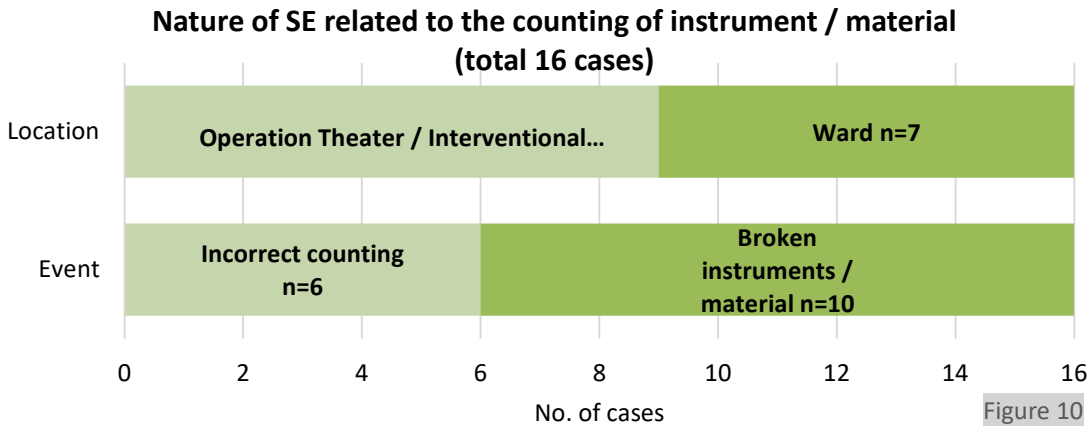

Figure 10

Type of Instrument / Material	Number
Drain / Catheter / Catheter Segment	5
Operating Instrument / Material Fragment	4
Guide wire / Cannula	4
Gauze Material	3
Total	16

Table 3

3.2.3 Category: Inpatient Suicide

Of the four cases of inpatient suicide (Figure 11 and 12), one case occurred in an oncology ward, two cases in medical wards and one case in a psychiatric ward. The inpatient suicide incident rate for the reporting period was 0.24 per 100 000 inpatient admissions.

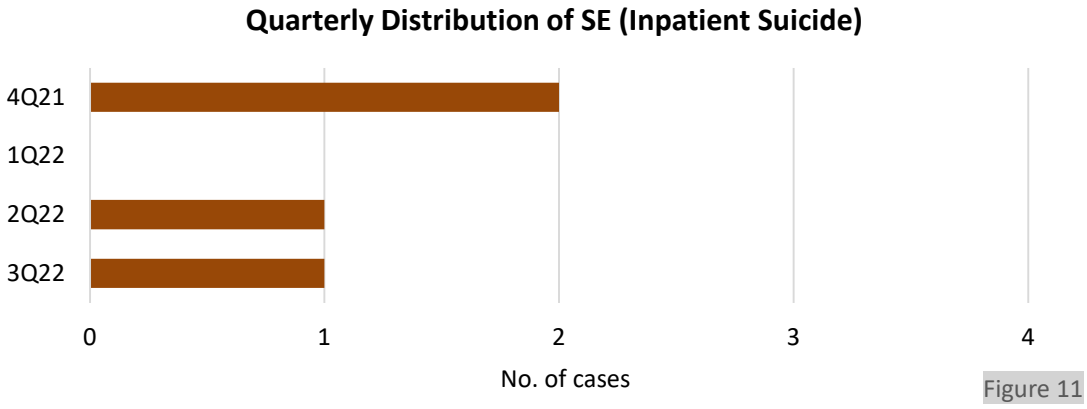

Figure 11

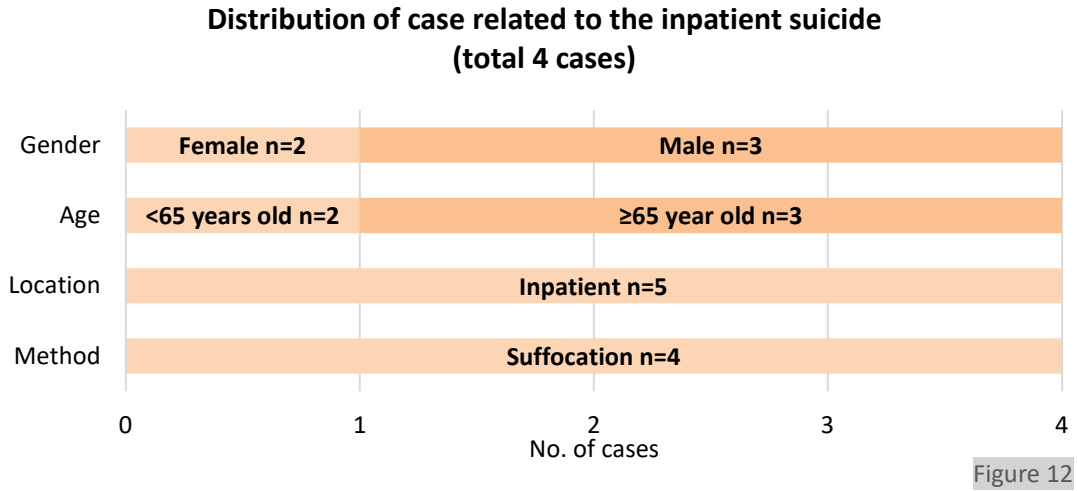

Figure 12

3.2.4 Category: Wrong Patient / Body Part

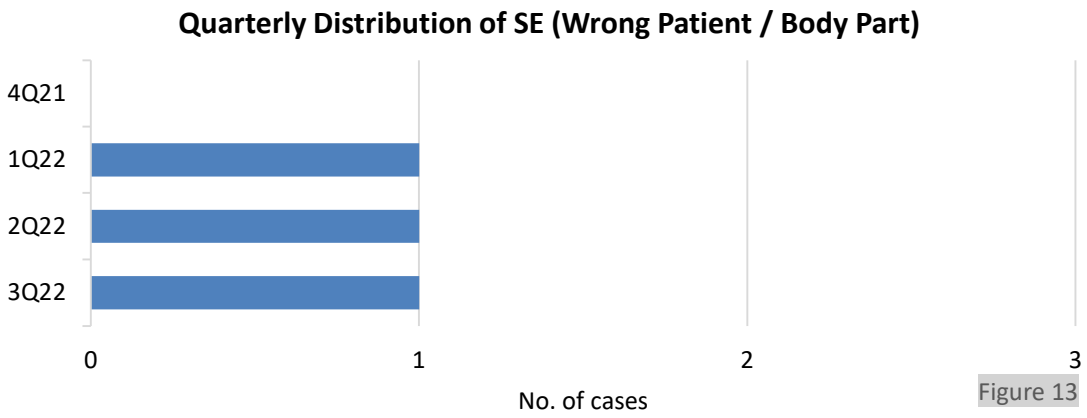

Figure 13

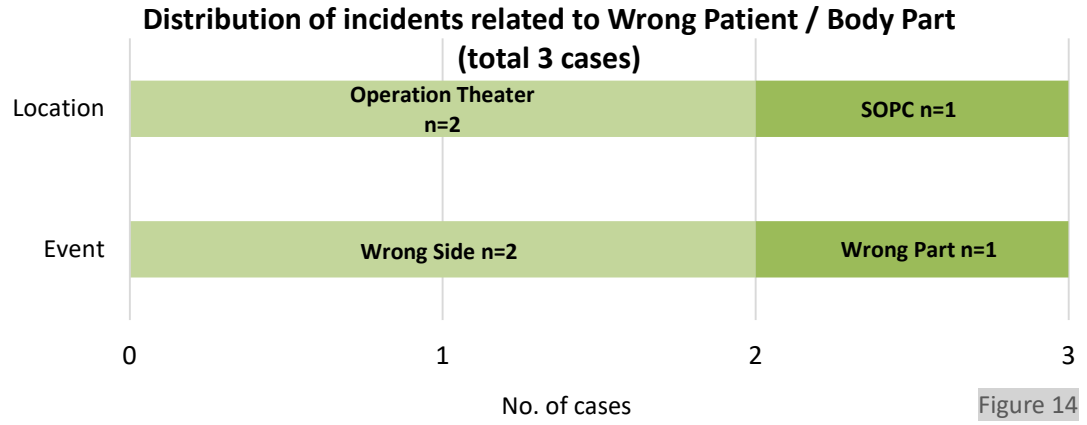

Figure 14

3.3 International Sentinel Event Reporting

In the United States (US), SE voluntarily reported to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) were 809 in 2020 and 1 197 in 2021 respectively.[1] The SE were reported from a larger patient population, and also encompassed a broader definition including self-harm, delay in treatment, fall, pressure injuries, fire, assault, and clinical alarm response, etc. Of these SE, 54% resulted in death / permanent loss of function / permanent harm of the patients.

In Victoria (VIC), Australia (population 6.6 M), there were 168 SE notifications from July 2020 to June 2021. Among these, 15 events of medication error resulted in serious harm or death. In Western Australia (WA), Australia (population 2.7 M), SE are defined as adverse patient safety events that are wholly preventable and result in serious harm or death. The number of SE reported by the Department of Health of WA was 14 in 2019-20 and 19 in 2020-21.[2,3] WA has adopted harm-based definitions, and its suicide SE only included psychiatric units. The SE incident rates in VIC and WA were four per 100 000 patients in 2016-17 and 19.7 per 1 000 000 inpatient episodes of care respectively.[4,5]

In HK, the SE incident rate per 1 000 000 episodes of patient attendances / discharges in HA was 1.1 in 2019-20, 1.4 in 2020-21 and 1.4 in 2021-22 respectively. Of these SE, 27% resulted in significant consequence / death (four suicides and three incidents with significant consequence). The HA inpatient suicide incident rate in 2021-22 was 0.24 per 100 000 inpatient admissions; it included incidents from all inpatient (general and psychiatric) clinical settings.

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[1] The US Joint Commission, Summary Data of Sentinel Events Reviewed by The Joint Commission: as of March 9, 2022.

[2] Sentinel events annual report 2020-2021 (March 2022). Safer Care Victoria, State Government of Victoria, Australia.

[3] Your Safety in our Hands in Hospital - An Integrated Approach to Patient Safety Surveillance in WA Hospitals, Health Services and the Community: 2021. Department of Health, State Government of Western Australia, Australia.

[4] In Victoria in 2016-2017, four patients in every 100 000 were impacted by a sentinel event. *(The latest figure in Sentinel events annual report 2016-2017. Safer Care Victoria, State Government of Victoria, Australia.)*

[5] Department of Health, State Government of Western Australia, Australia recorded 645 001 episodes of care in 2020-21 (Your Safety in our Hands in Hospital - An Integrated Approach to Patient Safety Surveillance in WA Hospitals, Health Services and the Community: 2020).

The top five commonly reported SE in HA, WA Department of Health and the US Joint Commission are summarized in Table 4 for reference. SE categories unique to the US are underlined.

Commonly Reported SE in 2021-22

	HKSAR, China (HA)	WA, Australia (Department of Health)	USA (Joint Commission)
1.	Retained instrument / material (16)	Medication error resulting in serious harm or death (10)	Fall (485)
2.	Inpatient Suicide (including home leave) (4)	Unintended retention of a foreign object in a patient after surgery or other invasive procedure resulting in serious harm or death (3)	Unintended retention of a foreign object (97)
3.	Wrong patient / body part (3)	Suspected suicide in psychiatric unit (3)	Delay in treatment (97)
4.	Maternal Death (2)	Use of incorrectly positioned oro- or naso-gastric tube resulting in serious harm or death (2)	Wrong-site surgery (85)
5.	Medication (1)	Wrong patient / site (1)	Suicide (79)

Table 4

4. Serious Untoward Events (SUE) Statistics

4.1 SUE Trend (2012-22)

4.1.1 SUE Category

A total of 87 SUE were reported in 4Q21 – 3Q22. The yearly distribution of SUE by category since 2012 is depicted in Figure 15, with the total number of cases each year shown at the top of each bar. The yearly outcomes of SUE are depicted in Figure 16.

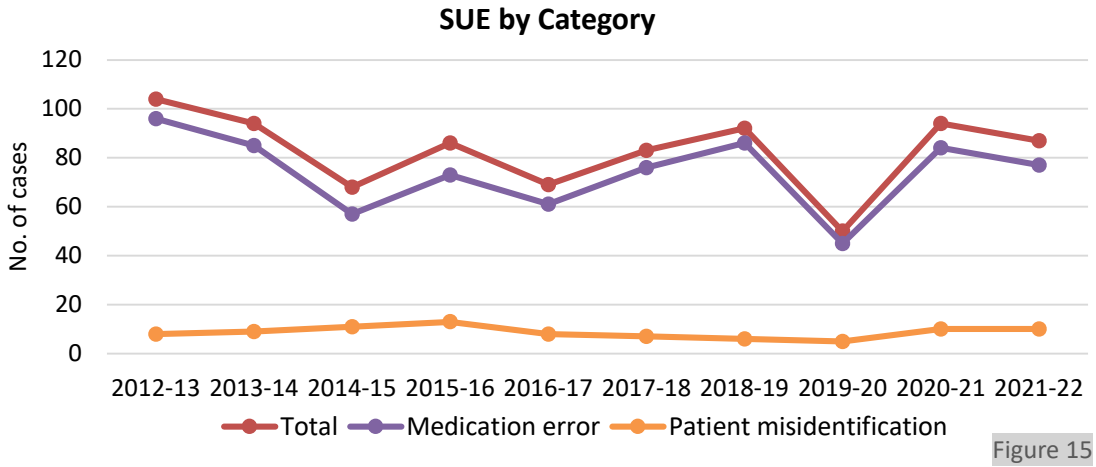


Figure 15

Number of SUE by Category										
Period / SUE Category	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022
Medication error	96	85	57	73	61	76	86	45	84	77
Patient misidentification	8	9	11	13	8	7	6	5	10	10
Total	**104**	**94**	**68**	**86**	**69**	**83**	**92**	**50**	**94**	**87**

* Statistics from October to September of respective year

Table 5

4.1.2 SUE Outcome

The outcomes are grouped into minor or insignificant consequences, moderate consequences and temporary major consequences (Figure 16). The description of consequences is illustrated in Annex II.

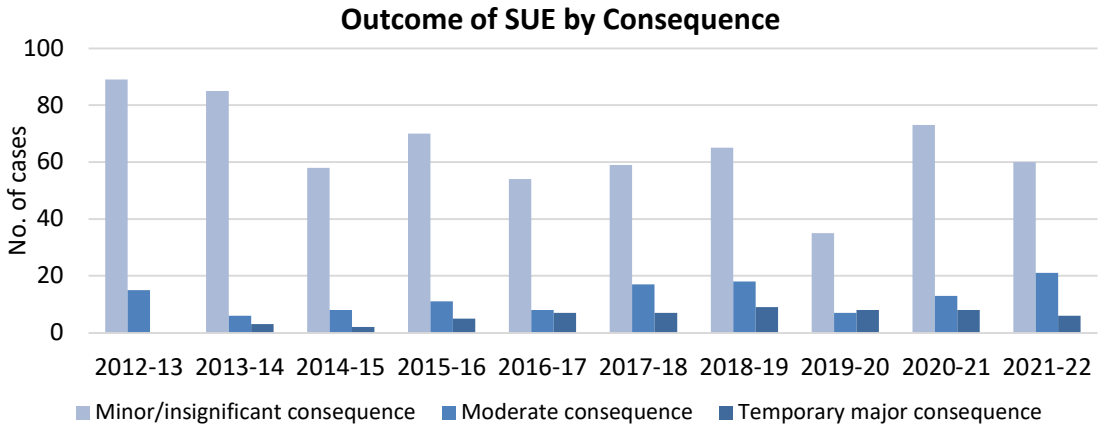


Figure 16

4.1.3 SUE Medication Incidents

The yearly trend of the top three common nature of medication error is depicted in Figure 17. Other common drugs involved are insulin, oral hypoglycemic agents (OHAs), chemotherapy, and antiplatelet etc. A list of high alert medications is listed in Annex III.

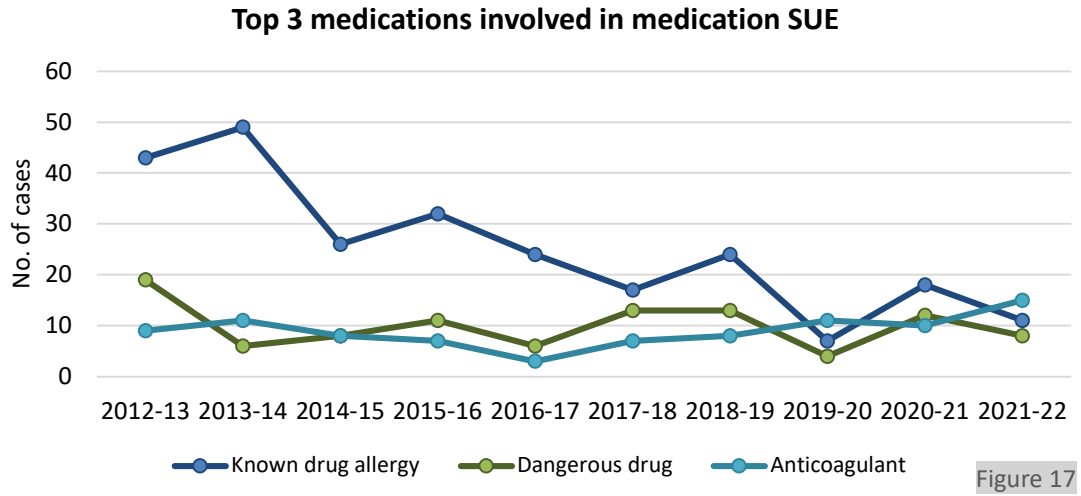


Figure 17

* Statistics from October to September of respective year

4.2 SUE Report (4Q 2021 to 3Q 2022)

4.2.1 Overview

The quarterly distribution of SUE reported is illustrated in Figure 18. Of the 87 SUE cases, 60 had minor / insignificant consequences, 21 had moderate consequences and six had temporary major consequences (Figure 19).

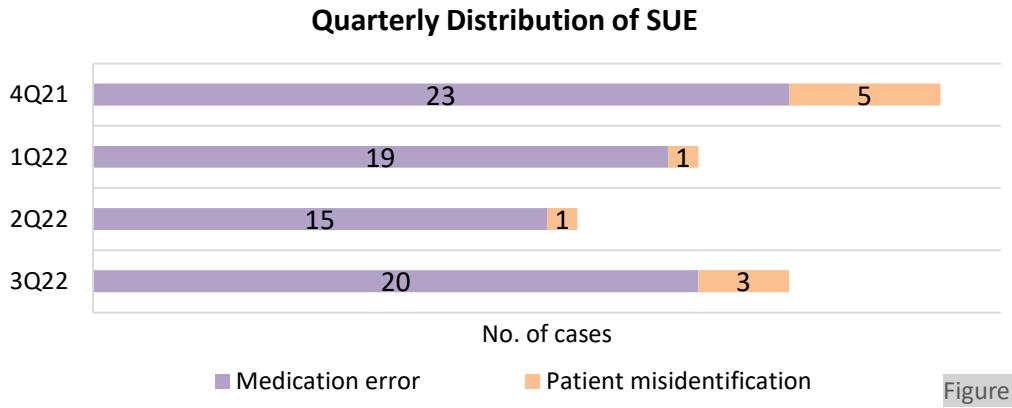
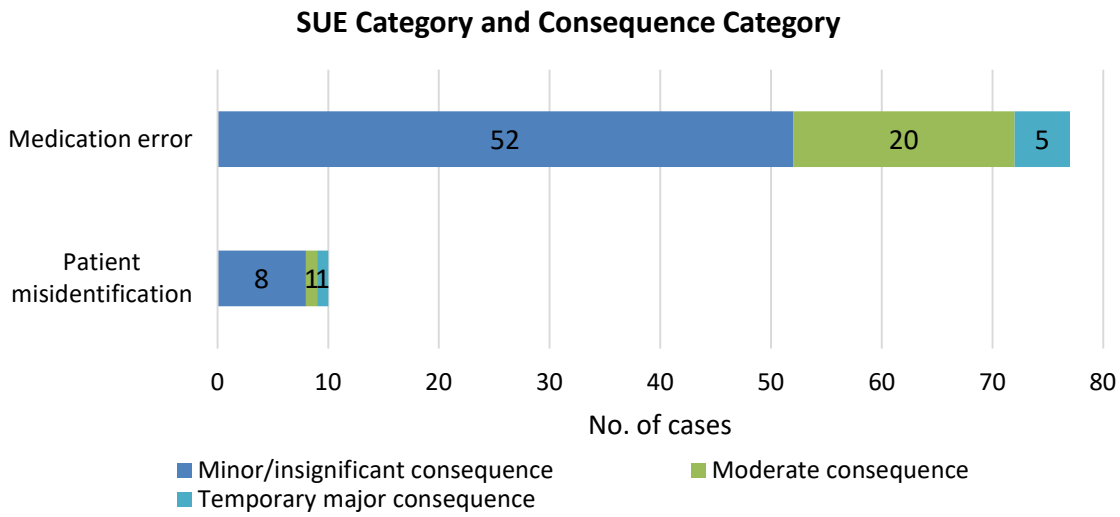


Figure 18



4.2.2 Category: Medication Error

The four most common drug categories involved in medication error were *anticoagulants* (15 cases), *known drug allergy* (11 cases), *dangerous drug* (eight cases), and *insulin* (six cases) (Figure 20). Drugs such as losartan and lignocaine are grouped under other medications.

Distribution drugs involved in medication error

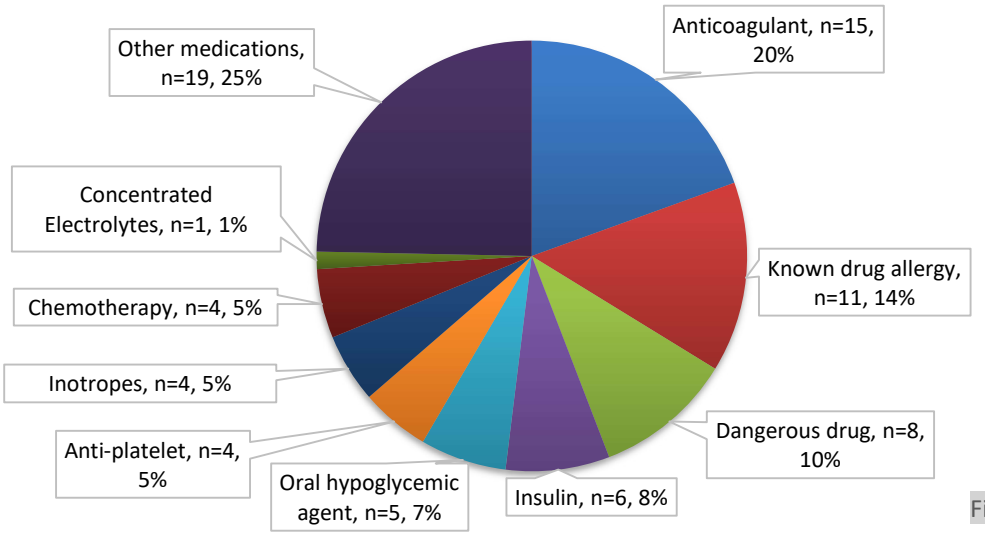


Figure 20

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

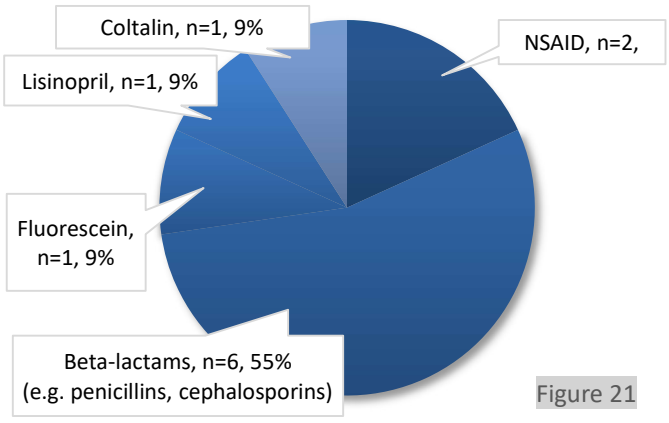


Figure 21

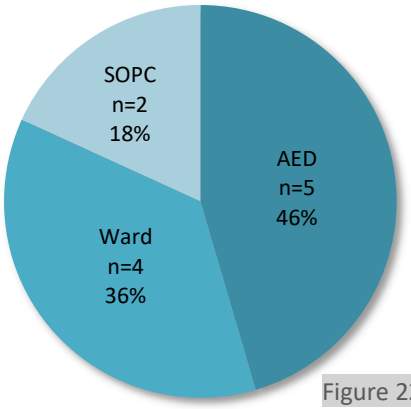


Figure 22

Of the 11 *medication errors* related to *known drug allergy*, the most commonly involved drugs were beta-lactams (six cases) (Figure 21). Of the 11 *known drug allergy* cases, the two most common locations of occurrence were Accident & Emergency Department (AED) (five cases) and ward (four cases). The remaining two cases occurred in Specialist Outpatient Clinic (SOPC) settings (Figure 22). Of the 11

known drug allergy cases, 10 had minor / insignificant consequences and one case had temporary major consequence.

4.2.3 Category: Patient Misidentification

A total of 10 SUE due to *patient misidentification* were reported. The top two scenarios included four cases of patient misidentification due to incorrect patients' labels being used and three cases during drug administration (Table 6).

Quarterly distribution of patient misidentification by scenarios

Patient misidentification scenarios	4Q21	1Q22	2Q22	3Q22
During drug dispensing	1	0	0	0
During drug administration	1	0	0	2
Blood collection	0	1	0	0
Referring to a wrong bed number	1	0	0	0
Wrong patient's labels were used	2	0	1	1
Total	**5**	**1**	**1**	**3**

Table 6

Of the 10 *patient misidentification* cases, eight had minor / insignificant consequences, one had moderate consequence, and one had temporary major consequence (Table 7).

Consequences of patient misidentification

Patient misidentification scenarios	Minor / Insignificant	Moderate	Temporary Major
During drug dispensing	0	0	1
During drug administration	3	0	0
Blood collection	0	1	0
Referring to a wrong bed number	1	0	0
Wrong patient's labels were used	4	0	0
Total	**8**	**1**	**1**

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 were being followed up by Clusters / hospitals to prevent recurrence) for each category of SE reported in 4Q21 – 3Q22 are analysed. HAHO will continue to work with Clusters and hospitals to improve and redesign systems or work processes to enhance patient safety. A brief description of individual SE can be found in Annex IV.

Category 1 - Wrong patient / part (total three cases)

The contributing factors in all cases involved various degrees of team communication breakdown. Information on mode of anaesthesia or laterality of procedure was lost or misinterpreted, leading to wrong procedure being performed. Apart from the routine reinforcement of proper sign-in and various clinical cross-checking, what appears equally important would be the optimisation of procedure booking workflows, document system improvements (e.g. e-consent, appropriate items in checklists), and also the speak up culture. If members of the operating team and the patient can be better informed and empowered, it may allow them to speak up when in doubt and avert these incidents.

Category 2 - Retained instruments / material (total 16 cases)

Apart from the commonly implicated items such as gauze and packing material (three cases), broken suction catheter or nasogastric tubes (three cases) and guide wires and stiffening cannulas (four cases), for which risk mitigation measures have been on-going, two types of retained instruments / material are particularly highlighted this year. The first type pertains to implant or instrument fragments in Orthopaedic surgery (four cases). While vigilance in reviewing intraoperative X-rays, enhanced alertness and documentation of such fragments may further reduce the incidence of this type of retained material, it is also recognised that some of these incidents may be practically unavoidable, in view of the inherent risk of instruments' wear and tear during high-friction contact at surgery and difficulty in identifying minute fragments. The second type of retained material highlighted in this report is Tenckhoff catheter segment (two cases), inadvertently left in the patients' body after supposedly complete catheter removal procedure. This appeared to be an uncommon type of retained material. On this aspect, clinical experts of the RCA investigation panels have provided practical tips, e.g. avoid cutting of catheter during removal and confirmation of complete Tenckhoff catheter (including both inner and outer cuffs) removal by palpation and visualisation, that could help avoid similar incidents in the future.

Category 4 - Medication error (total one case)

The case involved omission of oral corticosteroid replacement in a patient with adrenal insufficiency, after the regime was switched to an intravenous stress dose in an episode of sepsis. This incident prompted the need for better clinical documentation and electronic system improvement. Apart from potential side effects of high dose corticosteroid therapy, the potential effect of inadvertent omission of long-term steroid replacement – due to misunderstanding of clinical intent – can also be life-threatening.

Category 6 - Inpatient suicide (total four cases)

In the reporting period, 2 cases involved: plastic bag in ward (for wrapping of disposable urinal) and mounting rod in isolation room toilet. One involved breaking bad news breaking by isolation ward telephone to a patient. It is hoped that the risks uncovered in these incidents could allow more comprehensive control measures in the future.

Category 7 - Maternal morbidity (total two cases)

In the two cases, no root cause could be identified, and the multidisciplinary treatments given in both cases were considered timely and appropriate. Nevertheless, as both cases involved sudden and quite unpredicted patient deterioration, RCA investigation panels made the additional observation that simulation training or drills, an Obstetric crash call system, and early involvement of Anaesthesiology in managing severe pre-eclampsia may help improve future outcomes of similar patients.

Having analysed the SE reported in 4Q21 – 3Q22, we observe that new and emerging risks continue to arise in our clinical environment. While reinforcing existing risk mitigation measures could help to avoid incidents, recognition of emerging risks and leveraging new tools and technologies for incident prevention are equally important.

6. Analysis of Serious Untoward Events

Of the total 87 cases reported in the period, **Category 1 - Medication error** related to anticoagulant (17%), insulin & OHAs (13%) and known drug allergy (13%) contributed most significantly to the number of SUE reported in 4Q21 – 3Q22. On the other hand, there were 10 cases of **Category 2 - Patient misidentification** incidents, accounting for another 11% of all SUE reported. These selected types of SUE are discussed below, highlighting certain important recommendations and safety messages.

Category 1 - Medication error (77 out of 87 SUE)

The number of medication items dispensed in HA per year was 48.8 million in the first nine months of 2022 compared to 64.8 million for the whole of 2021. The rate of number of medication incidents reported (including medication incidents classified as SUE) per 1 million medication items dispensed was 11.6 for the first nine months of 2022, compared to 15.5 for 2021. For 2011 to 2018, the rate was above 17. This decline has coincided with the gradual introduction of IPMOE in HA since 2013.

Medication error: *Anticoagulant* (total 15 cases)

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

<u>Recommendations related to prescription</u>

i. Reinforce staff knowledge on warfarin titration.
ii. Explore the feasibility of developing an automatic warfarin dosage calculator in Clinical Management System (CMS).
iii. Promulgate diligent reviewing of / Explore the feasibility of system enhancement in prompting, the latest INR in CMS before warfarin prescription and administration, instead of relying solely on hard copy report.
iv. Reinforce the practice of documenting the specified criteria of conditional dose administration / Promulgate the use of the "Add a Note" feature in the "In-Patient Medication Order Entry" (IPMOE) system.
v. Perform independent double check for all new / modified prescription in both integrated patient record and IPMOE.

Recommendations related to clinical management

vi. Specify the intended urgency of blood taking as clinically indicated.

vii. Reinforce the timely follow up of blood test results.

Medication error: *Insulin and OHAs* (total 11 cases)

Insulin and OHAs constituted 8% and 6% of all reported medication error SUE, respectively. Among these incidents, administration of insulin or OHAs during fasting emerged as notable theme (five cases). Recommendations from investigations of these cases are summarised below.

Recommendations regarding clinical management

i. Promulgate reviewing of drug profile during fasting prescription especially NPO except medication.

ii. Consider the risk of hypoglycaemia in diabetes mellitus (DM) patients who require fasting, and adjust / withhold their DM drug regimens as clinically indicated.

iii. Consider prescribing maintenance IV fluid to fasting patient.

Recommendations on good nursing practices to reinforce

iv. Clarify prescription with the prescriber when in doubt.

v. Monitor blood glucose level regularly for fasting patients and check reading before administration of oral hypoglycaemic drug.

vi. Document and record the details after patient's condition change.

vii. Verify patients' feeding status and intake before administration of DM drugs.

viii. Check the anaesthetic record or pre-procedural instruction for patient pending operation / interventional procedure.

Medication error: *known drug allergy* (total 11 cases)

With the continued roll-out of electronic Medication Order Entry and structured alerts for known drug allergy history in CMS, incidents related to unintended administration of drug to patient with known allergy have been on downward trend. Nevertheless, this type of incidents still accounted for 14% of all medication SUEs in the reporting period. RCA investigations revealed specific recommendations, which recommended further actions and reinforcements to address these incidents.

Recommendations related to reviewing of patient record and prescription

i. Reinforce staff compliance on drug allergy checking for prescribing and administration of medications, especially for patients having known drug allergy history inputted in free-text entry in CMS and / or the allergens are compound or over-the-counter drugs.
ii. Enhance staff awareness of the cross-allergy nature among drug groups and encourage the proper practice of complete checking of allergen ingredients by using reliable drug databases.
iii. Promulgate use of "drug discontinuation" function for known allergy drug on the "prescription history list with drugs on hand" to ensure accurate clinical documentation and prevent unintentional prescription of these drugs.
iv. Promulgate use of "check ID" button to search admission episode under Pseudo ID for reference.
v. Request relatives to verify the Pseudo ID during that admission episode as soon as possible.

Recommendations related to drug administration

vi. Make use of visual alerts, such as drug cart drawer tags / cue cards to serve as cross allergy reminder.
vii. Do not bypass pharmacy's vetting of prescription before medication administration, even if the medications are ward-stock items.
viii. Confirm with patients about their drug allergy status before medication administration.
ix. Revisit the workflow of faxing the Prescription Sheet to Pharmacy for drug allergy checking.

Category 2 - Patient misidentification (10 of 87 SUE)

The use of printed patient labels has removed the need of human transcription, enhanced efficiency and eliminated a common source of error in laboratory and hospital medicine. The use of 2D barcode for patient identification has additionally afforded a high-level of reliability not achievable by codes with letters and numbers. However, five out of the 10 cases of patient misidentification SUE in the reporting period still involved "wrong label". None of them, however, was due to machine or software failure. Examination of the individual cases revealed that these cases were due to operator bypass (e.g. using GCRS label printer for outpatient to bypass 2D barcode waistband verification in an inpatient setting), distraction (e.g. using leftover label on the printer for the next patient), and failure to verify patient identity again when the identification-labelling workflow was disrupted (e.g. using a loose label close to a patient, and assuming the label belongs to the patient). Strict compliance with proper patient identification procedures and restarting of the patient identification process when interrupted should help to avoid these incidents.

There were two cases of inadvertent connection of prepared or leftover medication to another patient's infusion line. Using assumption to replace verification might have saved a few seconds of checking in these cases, but that unfortunately caused errors that had potential harm on patients.

Despite repeated safety messages in various platforms, a SUE related to the use of bed number as patient identifier was reported. It resulted in the unnecessary knee tapping of a patient. The clinical environment is understandably busy, often with significant stress to complete multiple concurrent tasks. In performing critical clinical tasks, it is of paramount importance to avoid use of patient identification shortcut or shorthand (e.g. bed number) as it can easily lead to patient misidentification..

7. Ongoing Risk Reduction Measures

Various risk reduction measures have been implemented or are being adopted to enhance patient safety. Highlights of these measures are set out below:

7.1 Medication Safety

a) Known Drug Allergy

- Implementation of Inpatient Medication Order Entry (IPMOE) system was completed in 38 hospitals by end of 2022, out of 40 hospitals targeted for eventual implementation. The remaining two hospitals, Kwong Wah Hospital and Kwai Chung Hospital are currently undergoing redevelopment. The IPMOE system has also extended its application to Accident & Emergency (A&E) Departments in United Christian Hospital and Princess Margaret Hospital, and Intensive Care Unit (ICU) in Caritas Medical Centre.

- IPMOE training is provided as an essential component of the Clinical Management System (CMS) training in the Pre-Internship Block, aiming to facilitate smooth transition of medical students to interns at HA hospitals.

- To minimise the risk due to free-text documentation of drug allergy alerts, a mechanism between Medication Safety Committee (MSC) and Information Technology & Health Informatics Division is in place to regularly screen and convert free-text drug allergy records in the CMS to structured drug alerts with automatic cross-checking and system prompt on prescription. In 2022, 113 free text allergy records were converted to structured drug alerts in the CMS.

b) Anticoagulants and Antithrombotic Agents

- In 2022, system auto-flagging alert for patients on anticoagulants and / or antiplatelets has been implemented.

- Patient's specific cardiac status, for example post-percutaneous coronary intervention (post-PCI) with dual anti-platelet requirement, tagged and displayed by "Genie" in Out-patient Medication Order Entry (MOE), has been rolled out since September 2022.

- A corporate-wide Warfarin Safety Campaign was launched in June 2022 to raise staff awareness of warfarin safety and to explore potential enhancements to mitigate the risks on use of anticoagulants and antithrombotic agents. A total

of 189 proposals were received, with participants from various staff groups including doctors (12%), nurse (56%), and pharmacists (23%).

- In October 2022, the Clinical Practice Guideline for Thromboembolism Prevention with Novel Oral Anticoagulants in Patients with Atrial Fibrillation (version 2.0) was issued. It currently applies to all HA hospitals and clinics.

- A Staff Webinar was held on 19 August 2022. The six finalists were invited to present their proposals, and a live poll for the best idea on improving warfarin safety in HA was conducted. A video of the Webinar has been made available on HA's e-Learning Centre.

c) Concentrated Electrolytes

- Review of supply mechanism of concentrated Potassium Chloride (KCl) by MSC was completed in December 2021.

- Stocktaking on storage of concentrated KCl was completed in January 2022.

- Cease of exceptional permission for stocking of concentrated KCl in Paediatric non-critical clinical areas has been agreed and reviewed by MSC in 2022.

- The HA Guideline on Safe Management of Potassium Chloride IV Solutions would be updated.

7.2 Surgical Safety

Surgical Instrument Tracking System (SITs)

- Electronic Count Sheet of the SITs was implemented in the operating theatres of Pamela Youde Nethersole Eastern Hospital, Tseung Kwan O Hospital (TKOH), and Tin Shui Wai Hospital. It would be further rolled out in 2023 in order to enhance the counting and documentation process in OTs.

- The Workgroup and Task Group of SITs was formulated to support the development and implementation of SITs Mobile. Additional functions including ad hoc request and maintenance, are under development.

7.3 Prevention of Retained Guide Wire

- The Taskforce on Prevention of Retained Guide Wire has commissioned an animation video to highlight and reinforce safe practice in various critical points in the central venous catheter insertion procedure. The animation video was produced and released in early 2022.

- The "Zero retained guide wire" intranet webpage was created to enhance staff awareness on guide wire safety. The cumulative number of incidents related to retained guide wire in different clusters would be displayed on the webpage starting in January 2023.

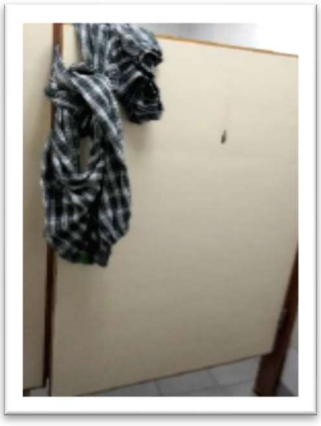
7.4 Prevention of Inpatient Suicide

- A special issue of Patient Safety Express on effective breaking of bad news was issued in November 2022.
- AI smart motion sensor to detect potential hanging at ward ceiling hoist was piloted in Kowloon Central Cluster.

From Patient Safety Express Issue 3

AI smart motion sensor

- A cluster-led stocktaking of clinical toilet door was performed and presented at COC in Psychiatry and Subcommittee on Prevention of Inpatient Suicide. Safer toilet door design would be explored to reduce ligature risk.



Potentially dangerous door design

Enhanced toilet cubicle door with anti-ligature design

7.5 Promotion of Correct Patient Identification

- A HA-wide creative writing campaign was held in September 2022 to tap on staff's creativity, to help promote correct patient identification throughout patient's healthcare journey.
- A total of 96 submissions were received. Winners of the campaign were announced in October (Instagram Link).

8. Learning and Sharing

In 2021-22, HAHO Patient Safety and Risk Management Department (PS&RM) conducted four staff forums on SE and SUE sharing, participated by over 2 800 colleagues. Participants of these forums included hospital senior executives, safety managers, frontline doctors, nurses and supporting staff.

Apart from four regular issues of HA Risk Alert (HARA), a special issue of Patient Safety Express was released in November 2022 via mass email circulation and HA Chat.

PS&RM officially launched its Instagram page in July 2022, to better engage staff, increase awareness and improve accessibility of patient safety information.

On top of the Warfarin Safety Webinar and Correct Patient Identification Campaign (Section 7), a post-forum sharing webinar for the "International Forum on Quality and Safety in Healthcare 2022" was held on 14 September 2022. In the webinar, delegates of the Forum shared their learning and insights from attending the international event.

As invited by the Chinese University of Hong Kong (the institution coordinating intern training in 2022) and the University of Hong Kong, medical staff of the PS&RM department delivered lectures on clinical incidents for pre-interns and medical students. Important lessons on patient safety measures were presented, with a view to building a safety-aware culture from ground up.

9. The Way Forward

A number of initiatives have been planned for 2023 to enhance safety practice at HA hospitals:

9.1 Medication Safety

- In 2023, IPMOE will be implemented in Kwong Wah Hospital and extended to A&E Departments of Tuen Mun Hospital and Alice Ho Miu Ling Nethersole Hospital, and ICU of TKOH.
- The "Chemo Module" of IPMOE is expected to be implemented in all HA chemotherapy centres in 2023.
- Following structured alerts and system auto-flags for anticoagulants and antithrombotic agents, upcoming enhancements in 2023 will include allowing clinicians' input of "clinical intent" for these drugs, and having Genie's prompt of relevant blood results in the administration module before the administration of warfarin.
- Efforts to improve warfarin safety by revolutionizing the prescription module for warfarin using standardized dose regime will continue, with ongoing engagement with clinicians.

9.2 Surgical Safety

- A Corporate-wide Electronic Wound, Packing and Drain Management System is now being piloted in inpatient setting in Kowloon West Cluster. It aims to improve the communication and handover of patient's wound condition throughout patient journey. Evaluation result of the pilot is expected in 2023.

9.3 Prevention of Inpatient Suicide

- Environmental risks in isolation room setting will be continuously reviewed and monitored.
- Current and emerging suicide risk assessment tools would be continuously evaluated and monitored, so as to enhance early intervention and support of patients.
- There would also be on-going review of risk mitigation measures for potentially dangerous bedside items, e.g. cable, wire and cannula.

9.4 Promotion of Correct Patient Identification

- An animation video to promote staff awareness on correct patient identification throughout patient care, including but not limited to Type and Screen, blood transfusion, drug administration, blood and laboratory specimen taking and last offices, will be produced in 2023. Winning ideas from the 2022 campaign will be incorporated in the video.

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 organization'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 labor 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 minimize 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 / counseling 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 scrutinized 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, anesthetic 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 anesthesia.

   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 hemodialysis 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 labor 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: Incorrect Side Ureteroscopy

A 67-year-old male with left ureteric stone was followed up in a urology clinic. During consultation, ureteroscopic lithotripsy (URSL) was scheduled by the attending surgeon, but right instead of left side was booked. Patient proceeded with surgery. The incorrect side was discovered by the operating surgeon after right side ureteroscopy was performed, and patient's profile and computed tomography (CT) images were reviewed. Procedure was carried out uneventfully on the left side in the same session.

Why did it happen?

1. Informed consent was not conducted in conjunction with clinical consultation, proper patient assessment and careful reconciliation of clinical information
2. Failure to speak up and clarify for the discrepancy in clinical information

How to prevent?

1. Ensure that the informed consent is conducted in clinic consultation preferably by the booking surgeon
2. Cross check Clinical Management System (CMS) notes and relevant radiology images during consent taking and subsequent verification procedure
3. Display relevant radiology images in operating theatre to raise staff alertness towards the indicated operative side

Case 2: Nasal Biopsy on Incorrect Side

A patient with incidental finding of right posterior inferior turbinate polypoidal lesion on computed tomography (CT) had biopsy arranged in Ear Nose Throat (ENT) clinic. Endoscopic examination showed right inferior turbinate polypoidal lesion and clear left nasal cavity.

On the day of minor operation (MOT), consent for left nasoendoscopy and biopsy was signed by doctor instead. Following sign-in and time out, left nasoendoscopy with biopsy was performed. The incident was discovered in the follow-up clinic. Right sided biopsy was arranged which revealed a benign lesion on pathology.

Why did it happen?

1. Failed to pick up the correct laterality from clinical records
2. Consent taken on the day of procedure, not by the doctor making endoscopic diagnosis on the day of booking

How to prevent?

1. Develop and print out the "List of Procedures" for elective minor procedures – including the laterality and name of procedures
2. Write on "Procedure Booking Information Form" and the "MOT Booking List" for elective minor procedures – including the laterality and name of procedures
3. Reinforce communication among staff and with patients

Case 3: Spinal Anesthesia instead of General Anesthesia

A patient attended the nurse preanaesthetic clinic (NPAC) in July 2022 and was briefed on the risk of Spinal Anaesthesia (SA) and General Anaesthesia (GA) in which she indicated that she preferred SA and was documented. On the same day, she attended a preoperative anaesthetic clinic (POAC) with the anaesthesia plan further explained by anesthesiologist and consent signed for GA.

On the day of operation, patient's GA consent was verified at the Operating Theatre reception. But list anaesthetists were pre-occupied with the NPAC note and proceeded with SA for the patient. After SA was completed, patient verbalized that she had consented to GA. After the operation, patient was discharged on the same day uneventfully.

Why did it happen?

1. Incomplete pre-induction review
2. Confusing documentation in the Pre-Operative Anaesthetic Consultation summary

How to prevent?

1. Ensure comprehensive pre-induction review
2. Ensure proper sign-in process
3. Add "mode of anaesthesia" for checking in Surgical Safety Checklist
4. Prevent confusing documentation in the Pre-Operative Anaesthetic Consultation summary

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

Incorrect Counting of Instruments / Material

Case 1 and 2 involved retention of gauze.

Case 1: Undocumented Gauze

A post-mastectomy patient was noted to have wound infection. Surgical exploration was performed, followed by daily wound dressing. A week later, a piece of retained plain gauze was retrieved from the wound cavity during wound dressing.

Why did it happen?

1. Plain gauzes in the dressing set (5cm x 5cm) are small, and have higher risk of unintentional retention in deep wound cavity.

How to prevent?

1. Pay special attention when managing wounds of large or deep wound cavities with small sized dressing materials like plain gauzes or wound applicators to prevent unintentional retention

Case 2: Retention of A Small Piece of BIPP* Gauze in A Patient's Left Nostril

A patient underwent septoplasty and turbinate reduction under general anesthesia. Due to persistent intra-operative bleeding, BIPP gauze packing was planned. A paraffin gauze roll was trimmed into 4 pieces from 15cm to about 4 cm each and admixed with BIPP. A total of two pieces were packed into patient's nasal cavities.

Postoperative day 1, difficulty was encountered during BIPP gauze removal and the two gauzes were removed in pieces. During an out-patient follow up one month later, a piece of gauze fragment (3cm) was retrieved from patient's left nasal cavity.

Why did it happen?

1. The gauze structure may be damaged when the paraffin gauze is sliced into thinner stripes along the roll, increasing risk of incomplete removal.

How to prevent?

1. Develop reference guide for preparation of BIPP paraffin gauze for nasal packing

*BIPP – Bismuth Iodoform Paraffin Paste

Case 3 involved retention of radio-opaque fragments.

Case 3: Radio-opaque fragment showed in X-ray after cemented hemi-arthroplasty

Patient A underwent an uneventful cemented right hip hemi-arthroplasty for fractured neck of femur on 2 September 2021. During a follow up 3 months later, a 1mm radiopaque shadow inside the femoral canal was detected on X-ray. Upon investigation, a 1-2mm defect with irregular surface was identified on a femoral canal rasp used during OT.

Cases who had been operated with same set of instrument since 2 September were reviewed. Among them, Patient B was also found to have a less than 1mm radiopaque shadow inside the femoral canal on X-ray.

Both patients were well. Removal of the metallic fragments was considered unnecessary.

Why did it happen?

1. Exact source of the radio-opaque fragment cannot be ascertained despite a thorough and comprehensive investigation. Metal debris from instruments e.g. rasp, and glass fragment from opening of cement bottles could be possible sources.
2. Such minute fragment is considered an inherent risk from instruments' wear and tear in orthopedic surgery.

How to prevent?

1. Document any finding of radiopaque foreign body in the intraoperative fluoroscopic view on OT record, if indicated
2. Enhance intraoperative alertness of foreign body and document the surgical decisions as necessary
3. Reinforce staff's awareness on instruments' wear and tear before and after surgical procedure. Staff should report on site promptly if there is any suspicion

Case 4 involved retention of throat pack.

Case 4: Throat pack was left in the patient's mouth

An 11-year-old patient underwent excision and extraction of teeth under general anaesthesia. During the operation, a throat pack was cut into two, with one part inserted into patient's oral cavity during the procedure.

The throat pack remained as "1" unit on the count sheet. Soon after the first count was completed and checked correct, the doctor completed wound closure and removed the surgical drapes. Scrub nurse

assumed that the throat pack was taken out and performed the final count with circulating nurse, who assumed that the scrub nurse had discarded the throat pack. Patient was sent to recovery room. A cut throat pack was discovered and removed uneventfully from patient's oral cavity.

Why did it happen?

1. Surgical team did not fully comply with the practice of final counting:
    - Visually check the presence of accountable items
    - Complete the final count of throat pack before removal of surgical drapes

How to prevent?

1. Ensure the completion of final count before removal of surgical drapes
2. Adopt the "count away" technique throughout the operation
3. Review the counting workflow
4. Promote a speak-up culture to enhance team communication

Case 5, 6 and 7 involved retention of guide wire.

Case 5: Retention of chest drain guide wire

A 50-year-old patient developed left pleural effusion during hospitalization. Seldinger chest drainage system insertion was performed at bedside by a doctor, assisted by two nurses. While one nurse helped support and monitor the patient, the other nurse assisted the procedure and was simultaneously engaged with the care of other patients. The doctor retrospectively signed the bedside procedure safety checklist. One of the assisting nurses also assumed that the guide wire had been discarded in the sharps box. Review of the chest X-ray on the same day noted a retained guide wire, which was then removed en bloc with the chest drain.

Why did it happen?

1. Did not countercheck or confirm that the guide wire had been discarded in the sharps box
2. Failed to complete post-procedural sign out before completion of procedure

How to prevent?

1. Adhere to the Sign Out procedure especially on guide wire removal
2. Enhance training on chest drain insertion and reiterate procedural safety

Case 6: A guide wire was noted during CVC removal

A 74-year-old patient required insertion of Dual Lumen (DL) catheter and central venous catheter (CVC) for Continuous Veno Venous Hemofiltration (CVVH) and close monitoring. After insertion of DL catheter via right femoral vein and confirmation of guide wire position, resistance was noted. Patient then

developed hypotension, and the right femoral site was switched for CVC insertion instead, using the existing DL guide wire. Left femoral DL insertion was performed subsequently, and the DL guide wire on left side was removed. The procedure was performed by a total of four doctors and one nurse inside an Airborne Infection Isolation Room (AIIR). An assisting nurse outside communicated with the team via the audio system. A total of three sets of CVC catheters were opened.

Patient's condition later improved. Right femoral CVC and left femoral DL were removed. A guide wire was noted upon removal of right femoral CVC.

Why did it happen?

1. Communication gap among doctors, and nurses inside and outside AIIR.
2. Two vascular accesses (DL and CVC), one at each femoral vein, and more than one guide wire used.

How to prevent?

1. Enhance the bedside procedure checklist to include number of guide wires used and independent checking
2. Perform catheter insertion procedures one at a time, if clinical situation allows
3. Reinforce documentation of bedside procedure checklist
4. Reinforce refresher training on CVC insertion

Case 7: A guide wire was noted during bedside chest drain insertion

An elderly patient with left pneumothorax underwent bedside chest drain insertion (Seldinger Chest Drain Kit). The first attempt of distal catheter insertion failed. The second attempt was performed over the same guide wire. Clear yellowish pleural fluid was drained. The doctor believed that he had removed the guide wire. When tidying up the trolley, the assisting nurse noted that the waste bags had been disposed. Visual confirmation of the guide wire was not done. The Bedside Procedure Safety Checklist was later signed by the case doctor and a senior nurse without visual counter-check of the removed guide wire.

Post-procedure CXR and computed tomography revealed a guide wire coiled at the patient's left lung. Patient underwent operative procedure for removal of guide wire.

How to prevent?

1. Staff skills: enhance senior support in handling complex cases and the chest drain insertion with the Seldinger Chest Drain Kit
2. Checking procedure: enhance training material by showing the contents of the Seldinger Chest Drain Kit (including a metal guide wire and a plastic stiffener)

Case 8 involved retention of stiffening cannula.

Case 8: A Stiffening cannula was kept inside one of the two PTBD after replacement

A patient with history of hepatocellular carcinoma and recurrent cholangitis on two long-term Percutaneous Transhepatic Biliary Drainage (PTBD catheters), was repeatedly admitted for fever and blockage of PTBD catheters requiring frequent revision. In May 2022, elective cholangiography and revision of both PTBD catheters were done. The superior and inferior PTBD catheters were exchanged with Fr 8.5 PTBD catheters. However, the superior PTBD remained to have nil output while the inferior PTBD was functioning well. During subsequent revision, doctor discovered upon opening of dressing that the stiffening cannula of the superior PTBD had not been removed. The superior PTBD was eventually removed together with the cannula. Reinsertion of new PTBD was performed a few days later.

Why did it happen?

1. Low alertness for foreign body retention
2. Communication breakdown between surgeon and assisting nurses
3. Message on warning tag prompting cannula removal was deemed too small
4. PTBD exchange requires both guide wire and stiffening cannula to be removed, while many other percutaneous procedures involve only guide wire removal.

How to prevent?

1. Doctors performing the endoscopic or percutaneous procedures must be involved in the Sign Out and counting process
2. Integrated Endoscopy Unit nurses should be reminded to specifically check for both guide wire and stiffening cannula in PTBD procedures

Broken Instruments / Material

Case 1, 2, 3 and 4 involved retention of tubing.

Case 1: Retained of a tubing in patient's lower trachea

A patient who had temporary tracheostomy done around one month before the incident was found to have the tube dislodged. A suction catheter with its thumb port pre-cut was used as an introducer during a bedside attempt of tube reinsertion. The attempt failed and ENT was consulted with successful reinsertion performed. Post-insertion endoscopy revealed a tubing in patient's trachea down to right main bronchus. The catheter was removed under general anaesthesia (GA) and patient's condition remained stable afterwards.

Why did it happen?

1. Suction catheter is not recommended as the first-line choice of introducer for tracheostomy tube reinsertion

How to prevent?

1. Enhance staff training on proper tracheostomy tube insertion technique and selection of appropriate introducer
2. Enforce counter-checking by two staff of the integrity of suction catheter after use

Case 2: A plastic tube was found in the patient's stool

A bed-bound patient on nasogastric tube feeding stayed in three hospitals over a course of two months. Due to underlying condition, oro-nasal suction by nurses and physiotherapists was required from time to time. During a napkin round, a 7cm long brownish plastic tube was found in the patient's stool. After investigation, the plastic tube was likely part of a suction catheter.

Why did it happen?

1. Inadequate awareness on checking the integrity of catheter used after procedure
2. Inadequate awareness of the risk of catheter breakage during suctioning as patient had intermittent agitation and struggling

How to prevent?

1. Enhance staff awareness and communication on:
    - Risk of catheter breakage
    - Practice of checking equipment integrity before and after use
    - Patients' fitness for oral suctioning during handover and transition of care

Case 3: Nasogastric tube was retained at the patient's right side of epiglottis

An old aged home resident on long-term nasogastric tube (NGT) feeding was sent to Accident and Emergency Department (AED) for NGT blockage. After removal of the blocked NGT and insertion of a new NGT, chest X-ray (CXR) showed the tip of NGT above the diaphragm. The NGT was advanced, but subsequent CXR revealed kinking of the tube in esophagus. The NGT was eventually removed and patient was admitted for further management.

During an oesophago-gastro-duodenoscopy (OGD) for NGT insertion, a 38cm long broken NGT was retrieved from patient's right side of epiglottis. The retained NGT was of the same type used in AED. An entriflex NGT was inserted afterwards. Patient was later discharged.

Why did it happen?

1. No thorough integrity checking on the removed NGT

How to prevent?

1. Reiterate the importance of thorough checking of NGT completeness
2. Review procedural guideline to elaborate features of an intact NGT
3. Reinforce a proper nursing documentation

Case 4: Broken Fragment Chipped from Instrument

A patient was admitted for elective spinal surgery. Six pedicle screws were inserted into the pedicles of L3-L5 vertebrae uneventfully. The integrity of the used instruments was checked before and after each use. Intraoperative X-ray was done to review the position of pedicle screws. Final surgical count revealed no abnormality.

On postoperative Day 5, a hemi-circular object near the right L3 pedicle screw was noted on the spinal X-ray. The reprocessed instruments were retrieved. A defect was found at the tip of one of the retaining sleeves. The patient's condition remained stable without any adverse effect. Surgical removal was considered unnecessary.

Why did it happen?

1. The foreign body was likely a small fragment chipped from the tip of the retaining sleeve during insertion of the last pedicle screw

Case 5: A threadlike foreign body was retained in a patient after removal of implants

A patient with history of revision open reduction and internal fixation (ORIF) for left femoral shaft fracture in 2020, underwent implant removal.

During the operation, all 16 screws and 2 plates were removed. Integrity of removed implants and used instruments was checked by the operating team. Intraoperative fluoroscopic screening confirmed no new fracture. Postoperative Day 1, X-ray revealed a threadlike object inside the medullary cavity of the patient's proximal femur. The thread-like metallic fragment was likely chipped off from the edge of the hole of the plate with high friction while drilling, during the previous operation in 2020. Surgical removal of the thread was considered unnecessary. Patient was discharged on Day 4.

Why did it happen?

1. Proximal location of the concerned plate hole with tight soft tissue around and difficulty of surgical exposure
2. Obscured by the implants, the foreign body could not be detected in postoperative routine X-ray images in 2020
3. The shape of foreign body was similar to the screw holes, difficult to be discerned in intraoperative X-ray images

Learning Points of Case 4 and 5

1. Retained broken fragments from instruments are not totally avoidable in view of the inherent risk of instruments' wear and tear
2. X-ray checking at different angles (with zoom-in function) before wound closure should be performed as far as possible for any clinical suspicion of foreign body
3. Be particularly alert when checking the integrity of instruments, especially those instruments at high risk of wear and tear, e.g. cannulated instruments, and consider prompt replacement when appropriate

Case 6 and 7 involved retention of Tenckhoff catheter cuff / segment.

<u>Case 6: Retained Tenckhoff catheter cuff</u>

A 60-year-old male patient with history of end stage renal failure had double-cuffed Tenckhoff catheter inserted in 2017 for Continuous Ambulatory Peritoneal Dialysis (CAPD). In 2021, patient was admitted for peritonitis. Emergency Tenckhoff catheter removal was done and patient was discharged.

Since then, patient had repeated episodes of old Tenckhoff catheter exit site infection. During a haemodialysis session 2 months post-removal, an abdominal mass was noted under the old wound. Ultrasound and CT confirmed a short segment of tubular structure at the subcutaneous layer, compatible with the retained part of a Tenckhoff catheter. Emergency operation for removal was performed. It was a segment of outer cuff together with the Tenckhoff tubing.

Why did it happen?

1. The usual practice of integrity check on the retrieved Tenckhoff catheter including the inner and outer cuffs had not been fully complied with.

How to prevent?

1. Vigilant integrity check on the retrieved Tenckhoff catheter including both inner and outer cuffs, e.g. by palpation and visualization

Case 7: Retained subcutaneous segment of Tenckhoff catheter

A patient with end stage renal failure was admitted for acute Continuous Ambulatory Peritoneal Dialysis (CAPD)-related peritonitis. Emergency operation for removal of Tenckhoff catheter was performed and patient was discharged after a course of rehabilitation.

A year later, patient was admitted for fluid overload. X-ray abdomen and pelvis showed a 3.4cm tubular opacity in left lower abdomen. CT confirmed a short segment of Tenckhoff catheter in the subcutaneous layer of abdominal wall. Retained segment along with the external cuff were removed under local anaesthesia. Patient was discharged afterwards.

Why did it happen?

1. Failed to identify missing fragment during integrity checking of the removed catheter
2. Fragmented removal of Tenckhoff catheter leading to difficulty in checking integrity
3. No documentation on the type of Tenckhoff catheter during insertion

How to prevent?

1. Document the type of Tenckhoff catheter used i.e. single / double cuffed, straight / curved tip, both during insertion and after removal.
2. Avoid cutting through catheter during removal. Extend wound for adequate exposure to preserve integrity.
3. Avoid sending out part of the catheter as specimen before completion of integrity checking.

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

Case 1: Hydrocortisone prescription was omitted in a patient with adrenal insufficiency

An 81-year-old male with multiple medical problems, was put on oral hydrocortisone since 2014 for adrenal insufficiency. Patient was later admitted for chest infection and septic shock, and oral medications were withheld. He was given IV hydrocortisone for replacement. His condition improved and IV hydrocortisone was stopped. However, oral hydrocortisone was not continued. A day later, he was found unarousable. The patient succumbed despite resuscitation.

Why did it happen?

1. Low alertness to the importance of reviewing patient's past medical history before stopping an important medication
2. Hydrocortisone was mistaken to be for septic shock treatment, rather than long term replacement

How to prevent?

1. Develop structured alert for patient on long term steroid replacement
2. Improve documentation when prescribing long term steroid
3. Review patient's past history before prescribing / stopping medication

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

The 4 *inpatient suicide* cases are summarised below:

Inpatient Suicide

Case 1

A patient was admitted to a psychiatric ward for depressive symptoms. Upon admission, patient was put on high suicidal observation and anti-depressants were adjusted. After hospitalization of two weeks, the suicidal risk was adjusted from high to intermediate according to patient's condition.

Two days later, patient was found hanging in toilet in a morning using patient trousers hooked on the edge of a toilet door. Despite resuscitation, patient succumbed. The case was reported to the Police and Coroner.

Learning points:

1. Re-design toilet doors to minimize hanging risk
2. Arrange designated staff to perform ward patrol
3. Enhance psychiatric observation and intervention for patients with intermediate suicidal risk
4. Monitor linen distribution during shower round

Case 2

A patient with repeated hospitalization was admitted to a medical ward for shortness of breath and epigastric pain. No suicidal risk was identified during assessment. Patient appeared calm and cooperative. While waiting for COVID-19 test result, he was attended by doctor and nurses in the isolation room for clinical examination, blood sampling and cardiac monitoring.

In the same afternoon, when a staff entered the room to serve meal, patient was found sitting on toilet floor with oxygen cannula around the neck. Despite resuscitation, patient succumbed. The case was reported to the Police and Coroner.

Learning points:

1. Remove mounting rods with protruding base from isolation rooms and toilets
2. Enhance staff training on suicidal risk screening and assessment
3. Facilitate communication with family for deeper understanding of patient's mood and emotion before admission

Case 3

An elderly ambulatory male was admitted for shortness of breath, chest discomfort and bilateral lower limb edema. After admission, he underwent a CT scan and was suspected to have metastatic lung cancer. Next morning, the case doctor disclosed the CT result to patient, phoned his wife and referred the patient to medical social worker. Blood tests for tumour markers were arranged. Due to in-patient COVID-19 contact, the patient was transferred to an isolation cubicle and requested to stay in the cubicle. Disposable urinal in plastic bag was provided. Blood results of the tumour markers were available in a late afternoon. Nurse reported the findings to on-call doctor at night. The on-call doctor then disclosed the news to patient by ward telephone shortly. Two days later, in early morning, patient was found unconscious in bed with his head covered in a plastic bag. Despite resuscitation, patient eventually succumbed and the case was reported to Coroner.

During bereavement interviews, patient's family recalled that the patient had expressed trouble sleeping and about pain.

Learning points:

1. Eliminate any item imposing risk of misuse for self-harm
2. Enhance communication and support to the patient and family proactively after breaking bad news
3. Enhance the process of breaking bad news

Case 4

An elderly female with metastatic lung cancer was admitted for cord compression. Do-Not-Attempt Cardiopulmonary Resuscitation was agreed by the patient. Clinical psychologist (CP) was consulted for low mood. Noting patient's suicidal ideation, the CP recommended the clinical team to take precaution and refer the patient for psychiatric assessment. Patient was then transferred to an Oncology ward and under the care of Palliative Care Service (PCS). Patent was reassessed by another CP but the suicidal risk was not effectively communicated within the PCS team. On the day of the incident, the patient complained of upper limb weakness at 06:30. At 06:55, patient was found unconscious with plastic bag covering her head and blue tablets inside her mouth. The plastic bag was removed at once. The patient further deteriorated and succumbed on the same day.

Learning points:

1. Strengthen verbal and written communication of important messages between clinical psychologist team and the clinical team
2. Standardise the documentation of summary and key messages from PCS case conference
3. Reinforce the importance of proper documentation after care / consultation is given

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

Case 1: Pregnant lady at 41st week of gestation developed cardiac arrest

A lady with unremarkable antenatal history was admitted for show at 41st week of gestation. Leaking was noted and patient was transferred to Delivery Suite. Twenty minutes later, patient suddenly developed tonic seizure followed by cardiac arrest. Two doctors were at patient's bedside at time of event and cardio-pulmonary resuscitation was immediately started. Senior O&G doctor, Anaesthetist, Pediatrician and ICU doctor were promptly informed for on-site support. Emergency peri-mortem Caesarean section was performed and baby was delivered promptly.

Despite a return to spontaneous circulation with active resuscitative efforts, patient succumbed eventually. The baby survived and was well.

Conclusion:

Multi-specialty team performed timely resuscitation of the mother and delivery of the newborn. Obstetric crash call could be introduced to allow even more efficient communication in emergency setting.

Case 2: Brain death after pre-eclampsia with crash C-section

A 37-year-old lady at 31+3 weeks of gestation followed up at Maternal and Child Health Centre, had unremarkable antenatal history. In a morning, she was admitted for shortness of breath and epigastric pain. High blood pressure (BP) was noted upon admission and severe pre-eclampsia was suspected. Pre-eclampsia management including pharmacological treatment was initiated and emergency caesarean section was planned. Patient suddenly became unconscious in ward with persistently high BP. Obstetric Crash Call was activated. Clinical team proceeded with crash Lower Segment Caesarean Section (LSCS), and a live baby was delivered. During the operation, the patient was noted to have bilateral fixed and dilated pupils. Post-operative CT of brain revealed extensive intracranial bleeding. Patient succumbed 5 days later.

Conclusion:

In this unfortunate event, the multidisciplinary treatments to the mother and the new born were deemed timely and appropriate by the Root Cause Analysis team.

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