ANNUAL REPORT ON
SENTINEL AND SERIOUS UNTOWARD EVENTS

October 2014 – September 2015

HOSPITAL AUTHORITY
HONG KONG

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醫院管理局
HOSPITAL AUTHORITY

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Acknowledgement

This eighth Annual Report on Sentinel and Serious Untoward Events has consolidated and encapsulated the Hospital Authority's (HA) effort on reporting and addressing patient safety incidents in the year. Marking its 10th year of Advance Incident Reporting System (AIRS) reporting in 2014, HA has continued to work on improving patient safety through incident analysis and learning. By September 2015, the number of reports submitted through AIRS was over 117,000 and the momentum is growing.

We express our sincere appreciation to all colleagues who have reported, investigated and learnt from the incidents. Without their support, perseverance and dedication, it would not have been possible for us to build a patient safety culture in our organization.

Patient Safety and Risk Management Department

Quality and Safety Division

Contents

Executive Summary

This annual report summarized all Sentinel Events (SE) and Serious Untoward Events (SUE), comprising 39 SE and 68 SUE, reported between October 2014 and September 2015. Compared with the last reporting period, there was a substantial decrease in SE from 49 to 39 and a record low in SUE from 94 to 68.

Sentinel Events

2. The 39 reported SE represented an incident rate of 1.9 per 1,000,000 episodes of patient attendances / discharges and deaths. Of these SE, 28 occurred in general acute hospitals with 24-hour accident and emergency (A&E) services.

3. The top three categories of SE were "retained instruments or other material after surgery / interventional procedure" (19 cases), "death of an inpatient from suicide (including home leave)" (15 cases), and "surgery / interventional procedure involving the wrong patient or body part" (3 cases).

4. Other reported SE were "maternal death or serious morbidity associated with labour or delivery" (1 case) and "other adverse events resulting in permanent loss of function or death" (1 case). No "medication error resulting in major permanent loss of function or death" was reported this year as compared with 5 cases (the third highest) in the last reporting period.

5. Among the 39 SE, 17 had resulted in mortality (comprising 15 cases of "death of an inpatient from suicide (including home leave)", 1 case of "retained instruments or other material after surgery / interventional procedure" and 1 case of "maternal death or serious morbidity associated with labour or delivery"). One "other adverse events resulting in permanent loss of function or death (excluding complications)" involving unnecessary right lower lobe lobectomy had resulted in extreme consequence.

6. Of the remaining SE, 3 had sustained major / moderate consequence, and 18 had minor / insignificant consequence.

7. Of the 19 “retained instruments or other material after surgery / interventional procedure” cases, 10 involved broken instruments / material and 9 were due to incorrect counting. Thirteen of them occurred outside operating theatre.

8. The 15 reported cases of "death of an inpatient from suicide (including home leave)” represented a suicide rate of 1.4 per 100,000 inpatient admissions. In comparison, the reported estimated inpatient suicide rates in general hospitals of the United States ranged from 5 to 15 per 100,000 admissions.[6]

9. Of the 15 "death of an inpatient from suicide (including home leave)” events, 4 involved inpatients, 10 were patients on home leave and 1 was a missing patient.

10. The overall assessment and management of the 15 SE of "death of an inpatient from suicide (including home leave)” was generally considered to be appropriate.

11. The major contributing factors of SE were grouped into communication, knowledge / skills, work environment / scheduling, use of equipment and policies / procedures / guidelines. Recommendations were made to address these factors.

Serious Untoward Events

12. Of the 68 SUE, 57 were “medication errors which could have led to death or permanent harm” and 11 were “patient misidentifications which could have led to death or permanent harm”.

13. The three most common medication errors were “known drug allergens (KDA)” (26 cases), “dangerous drugs” (8 cases) and “anticoagulants” (8 cases). Of all the KDA cases, 11 were related to Penicillin group which was the most commonly involved drugs.

14. Of the 68 SUE, 58 had minor / insignificant consequence, 8 had sustained moderate consequence and 2 had temporary major consequence.

15. There were 5 medication errors occurred after implementation of Inpatient Medication Order Entry (IPMOE). None of these errors were related to the system.

Introduction

16. The Sentinel and Serious Untoward Event Policy (SE & SUE Policy) was implemented in 2010 and updated in July 2015 (Annex I). The updates included a supplementary note on definitions and qualification criteria of SE as well as new Chinese translations of SE and SUE.

17. SE & SUE Policy dictates hospitals to report Sentinel Events (SE) and Serious Untoward Events (SUE) and set up root cause analysis (RCA) panels. The RCA panels are tasked to review and identify the root cause(s) and to make recommendations for hospital and Hospital Authority Head Office (HAHO) management to improve patient safety.

18. This eighth annual report summarized and analysed the SE and SUE reported via the Advance Incident Reporting System (AIRS) between October 2014 and September 2015. The aim of publishing this Annual Report is to share the lessons learnt from SE and SUE with a view to improving quality patient-centred care through teamwork.

19. To facilitate understanding on the scope and definition of SE and SUE, the following abbreviated captions for various SE and SUE categories, highlighted in green, will be used in this report:

Sentinel Events (9 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 (2 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]

Learning and Sharing

Policy / Manual

20. In 2014/15, HAHO had consolidated its experience on management of clinical incidents to ensure consistent interpretation and integration of SE in daily practices by:

a. Updating the SE & SUE Policy; and

b. Issuing a Clinical Incident Management Manual.

21. Two forums had been held for the updated SE & SUE Policy and about 200 colleagues attended.

Education

22. In 2014/15, HAHO had intensified its efforts to reach out to and educate more colleagues on SE & SUE by extending these educational sessions to clusters and hospitals.

23. HAHO had conducted 14 staff forums for almost 2,300 colleagues in 2014/15. Audiences for these sessions included hospital leadership, patient safety managers, doctors, nurses, and many others.

24. Each program was evaluated by the participants, and these responses were incorporated into program improvement and future planning.

25. The incidents were also shared in different Coordinating Committees (COC), Central Committees (CC), Speciality Advisory Groups (SAG), Safety Committees (SC) and other working groups and 35 sessions had been conducted in the year.

26. In Hospital Authority Risk Alert (HARA) issue 39, cartoon was used for the first time to present a SE case in the second quarter (Q2) of 2015 to enable healthcare professionals to understand the case situation and key learning points more easily. It received good feedback and would be used to elaborate future cases in HARA where appropriate.

27. Electronic platform had been used to promote and disseminate information on patient safety issues. Three surgical safety videos were produced in early 2015 and put on Patient Safety and Risk Management Department (PSRM) website to promote checking of completeness and counting of surgical instruments for procedures performed both inside and outside operating theatre.

28. Clinical incident statistics including number of SE & SUE and their outcome, number of falls and missing patients, number of medication incidents reported in AIRS and their severity level, distribution of SUE related medication incidents and known drug allergy were promulgated on the PSRM website.

29. The latest safety alerts and a list of broken instruments related to SE were available. They were placed on PSRM website, which would be kept updated for learning and sharing.

Sentinel Events Statistics

Yearly Trend

30. Since the implementation of SE Policy in October 2007, there were 309 SE reported to date. Figure 1 shows the yearly distribution of SE by category, with the total number of cases for each year and for the top three categories of the year indicated.

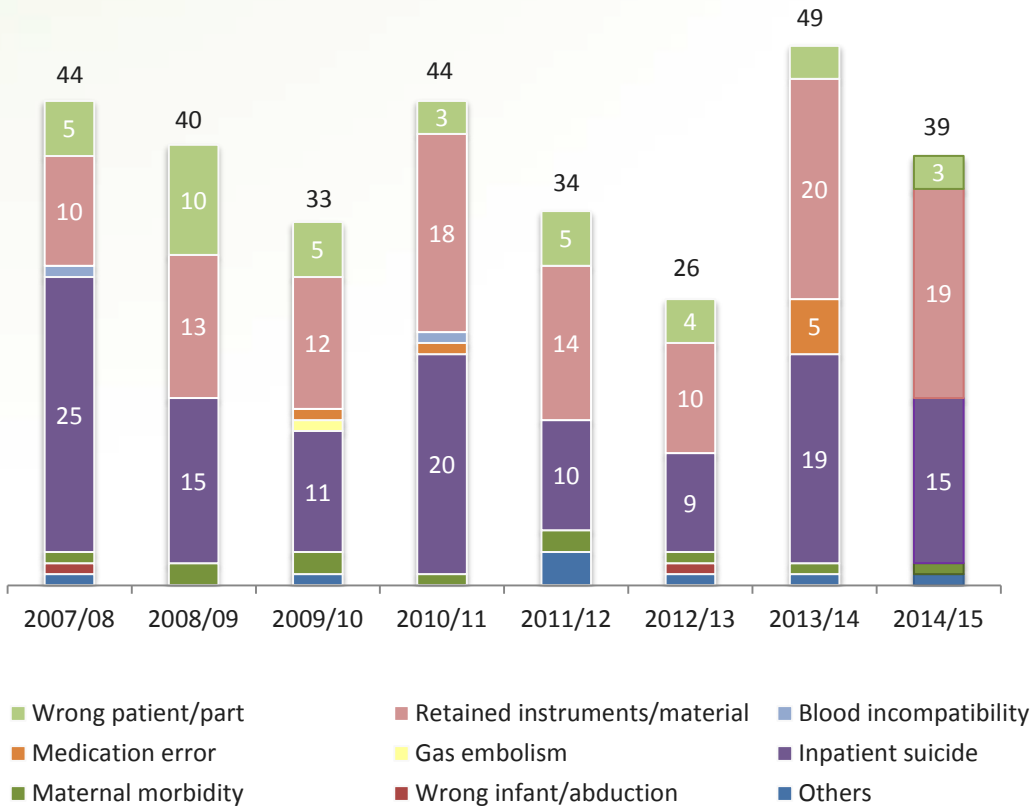

Figure 1: Yearly distribution of SE by category

31. From 2007 to 2015, the annual number of episodes of patient attendances / discharges and deaths had increased from approximately 16 million to 20 million. The number of SE decreased in the current reporting period and it represented 1.9 SE per 1,000,000 episodes of patient attendances / discharges and deaths (the SE incident rate) (Figure 2). When compared to other countries (see International Sentinel Event Reporting, p. 20), the SE incident rates in HA were relatively low.

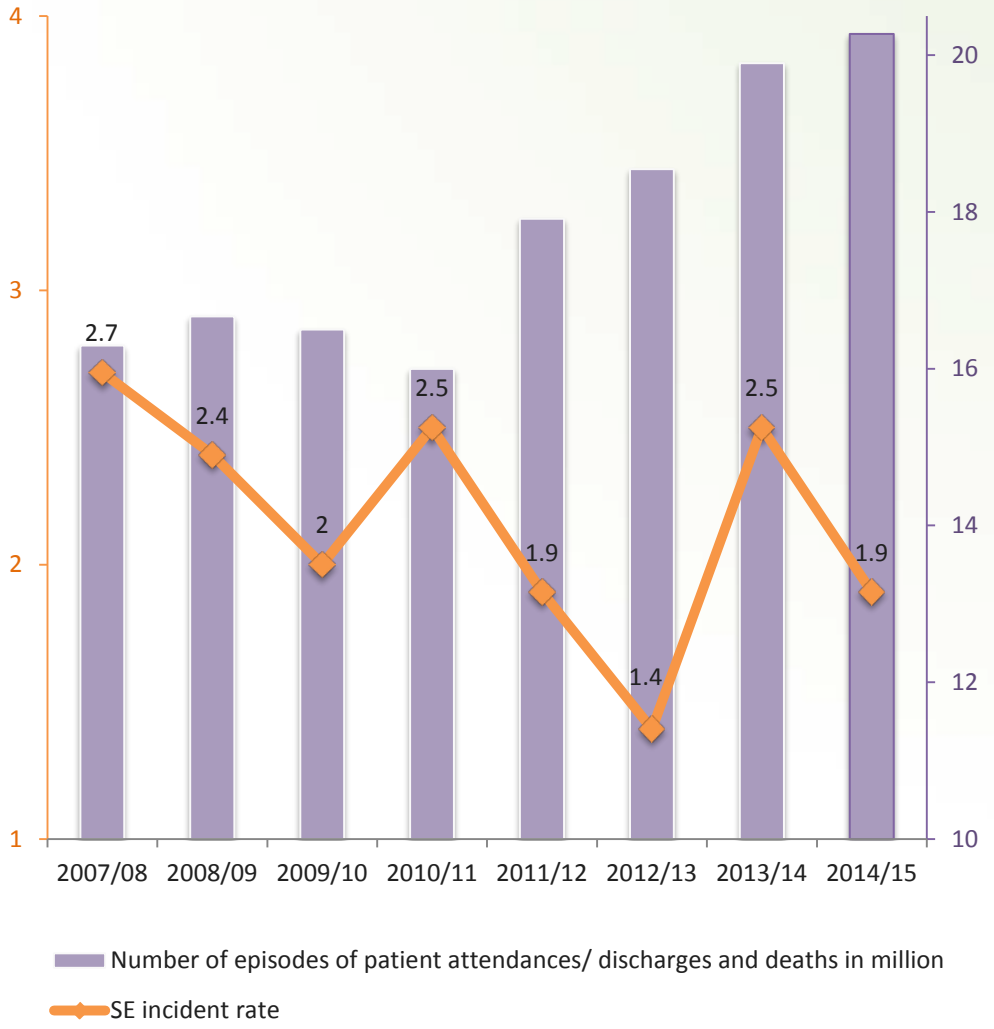

Figure 2: Yearly SE incident rates with the number of episodes of patient attendances / discharges and deaths in million

32. The yearly trend of SE by category is depicted in Figure 3 and Table 1. Inpatient suicide (124 cases), retained instruments / material (116 cases) and wrong patient / part (38 cases) constituted most of the SE reported.

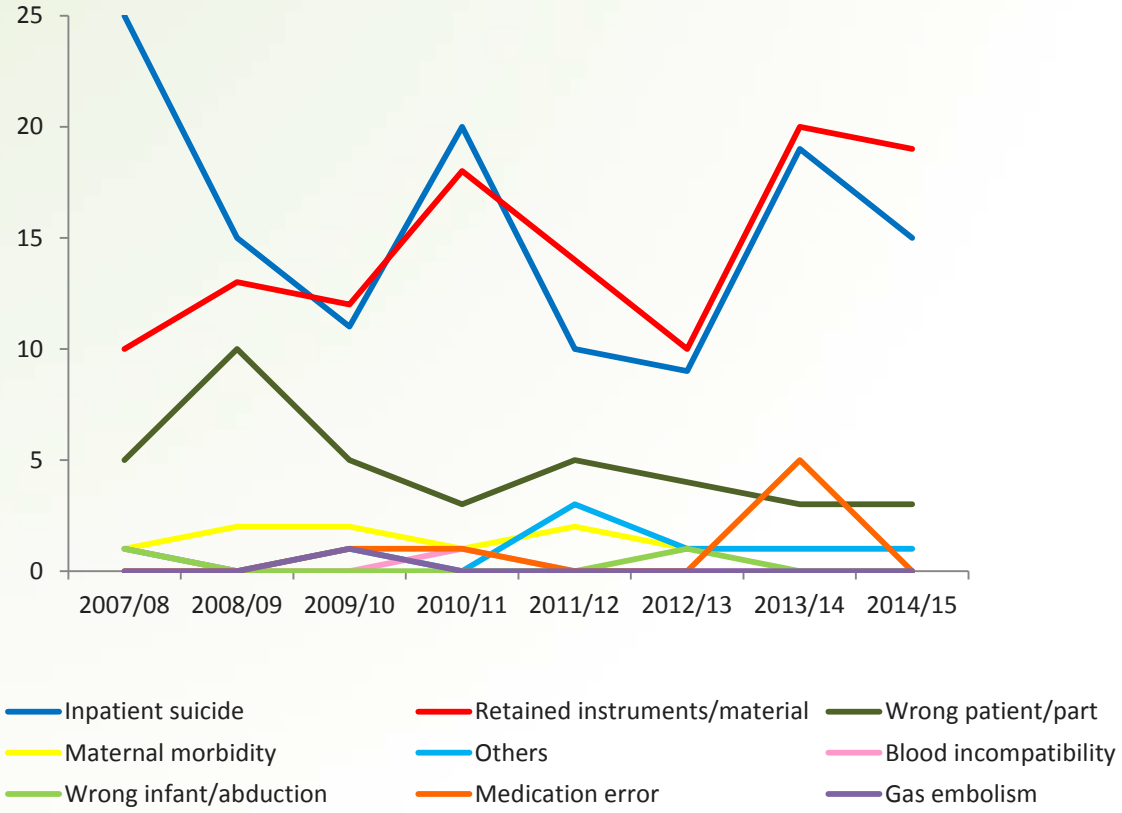

Figure 3: Yearly trend of SE by category

33. The number of SE caused by medication error dropped to 0 this year. HA took strong actions to educate staff and made systemic improvements including:

a. Use of structured allergen group for non-steroidal anti-inflammatory drugs (NSAID) in Clinical Management System (CMS) since August 2014;

b. Enhancement of medication order entry (MOE) for prescription of long term high dose steroid implemented in May 2015; and

c. Conversion of free text NSAID entries to structured alert completed in September 2015.

34. No gas embolism and blood incompatibility were reported since October 2010 and October 2011 respectively.

35. The number of wrong patient / part remained at a low level of 3 as it gradually decreased from 10 in 2008/09. None of them occurred in operating theatre.

Category	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Total
Wrong patient/part	5	10	5	3	5	4	3	3	**38**
Retained instruments /material	10	13	12	18	14	10	20	19	**116**
Blood incompatibility	1	0	0	1	0	0	0	0	**2**
Medication error	0	0	1	1	0	0	5	0	**7**
Gas embolism	0	0	1	0	0	0	0	0	**1**
Inpatient suicide	25	15	11	20	10	9	19	15	**124**
Maternal morbidity	1	2	2	1	2	1	1	1	**11**
Wrong infant /abduction	1	0	0	0	0	1	0	0	**2**
Others	1	0	1	0	3	1	1	1	**8**
Total	**44**	**40**	**33**	**44**	**34**	**26**	**49**	**39**	**309**

Table 1: Number of SE by category

36. Of all 309 SE reported since October 2007, 101 cases had minor or insignificant consequence (i.e. no injury sustained / minor injury), 59 sustained major / moderate consequence (i.e. temporary / significant morbidity) and 149 led to extreme consequence (i.e. major permanent loss of function / disability or death) (Figure 4). Out of the 149 cases leading to extreme consequence, 124 were due to inpatient suicide. A description of the consequences is illustrated at Annex II.

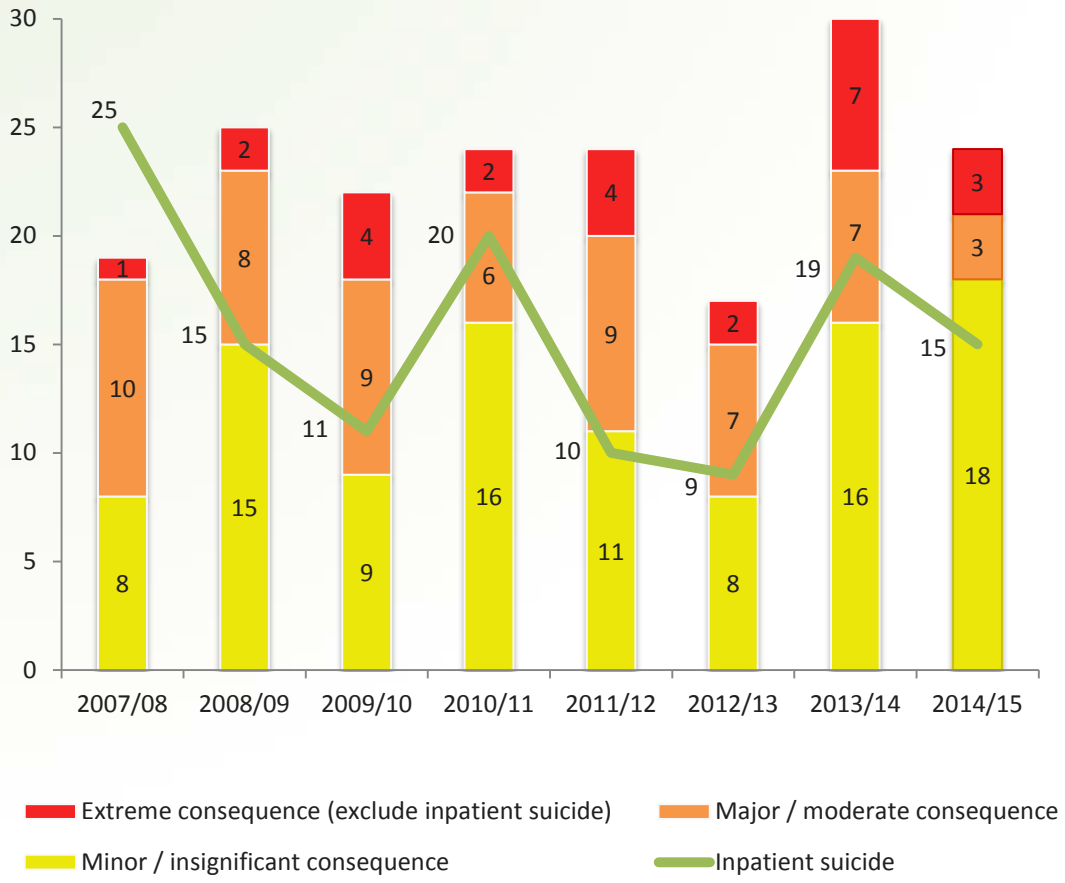

Figure 4: Yearly outcome of SE

SE Reported in 2014/15

37. The distribution of the 39 reported SE in 2014/15 by category is shown in Figure 5. The three most commonly reported categories were retained instruments / material (19 cases), inpatient suicide (15 cases) and wrong patient / part (3 cases).

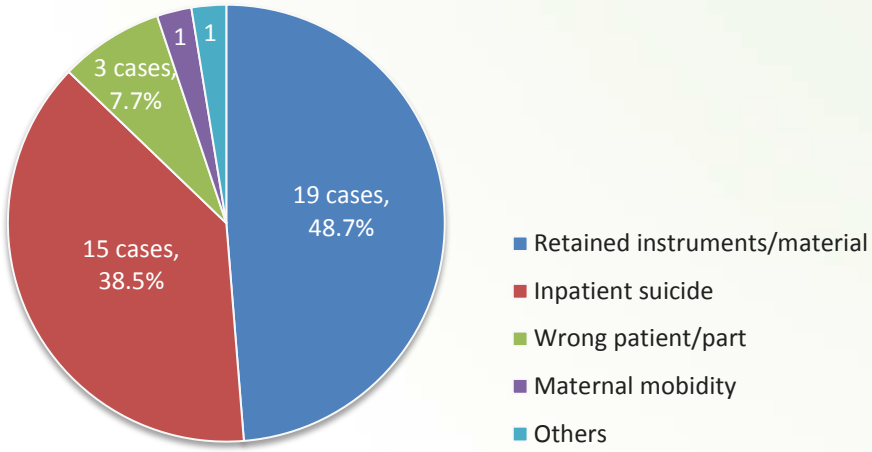

Figure 5: Distribution of SE by category

38. The quarterly and monthly distributions of the reported SE in 2014/15 are illustrated in Figure 6 and Figure 7 respectively. There was no substantial variation in the number of SE between quarters and months.

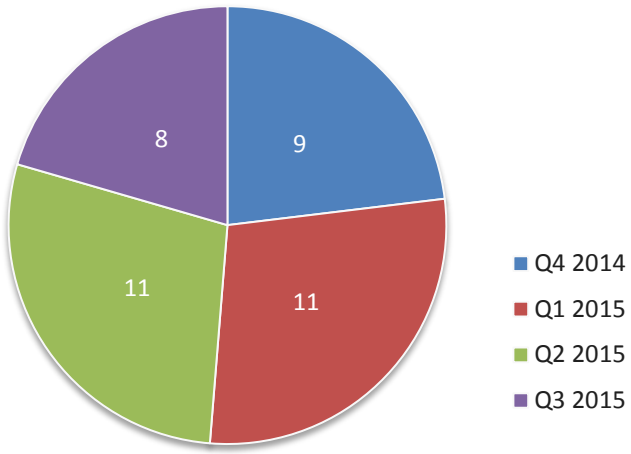

Figure 6: Quarterly distribution of SE

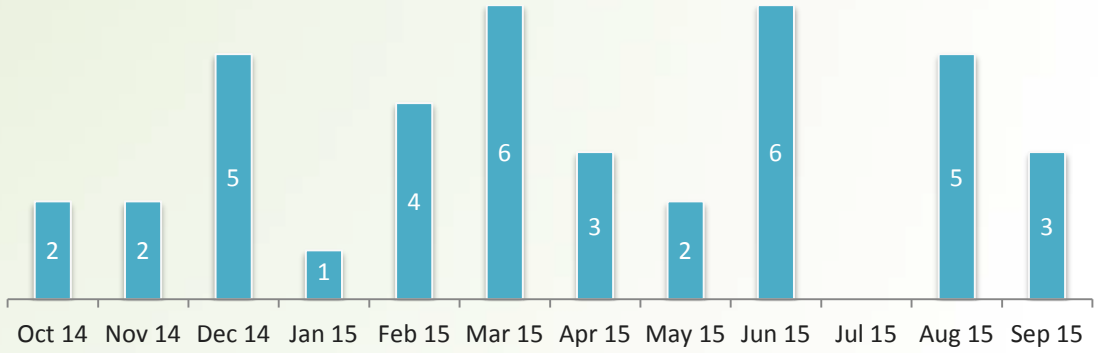

Figure 7: Monthly distribution of SE

39. The following table shows the distribution of SE in different hospital settings :

Hospital Setting	Number of SE	Percentage
General acute hospitals with 24-hour Accident and Emergency (A&E) services	28	71.8%
Hospitals with a mix of acute and non-acute services	4	10.3%
Hospitals with a mix of acute and non-acute services and psychiatric service	4	10.3%
Psychiatric hospitals	3	7.6%

Table 2: Distribution of SE by hospital setting

40. Among the 39 SE, 17 cases had resulted in mortality: 15 cases of inpatient suicides, 1 retained instruments / material and 1 maternal morbidity. 1 case had resulted in extreme consequence, 3 had sustained major / moderate consequence, and 18 (46%) had minor / insignificant consequence (Figure 8).

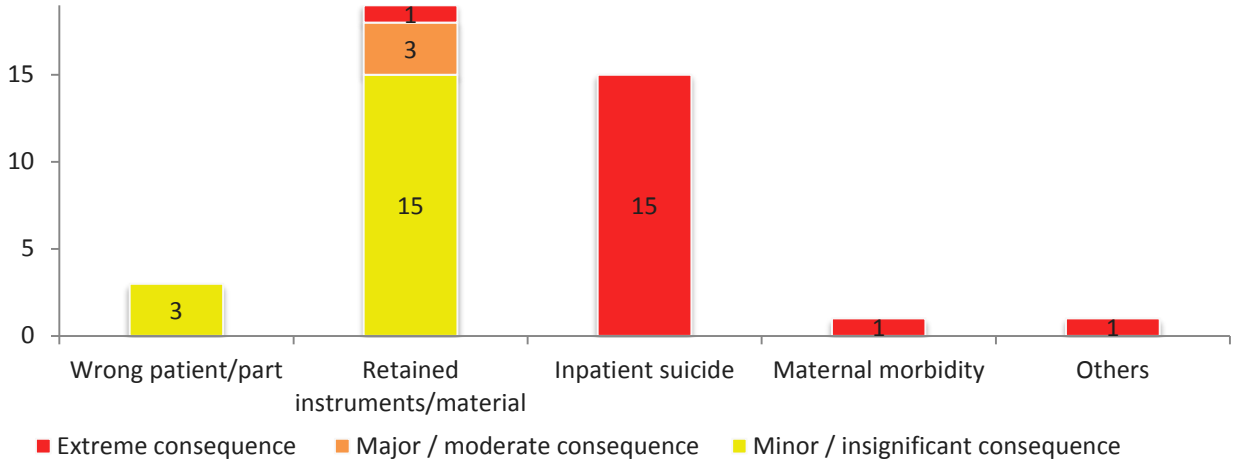

Figure 8: Outcome of SE by category

Retained instruments / material

41. Out of the 19 retained instruments / material, 10 involved broken instruments / material, while 9 were related to incorrect counting. Thirteen of which occurred outside operating theatre (Table 3). Their quarterly distribution is shown in Figure 9.

	Broken instruments / material	Incorrect counting	Total
In operating theatre	4	2	6
Outside operating theatre	6	7	13
Total	**10**	**9**	**19**

Table 3: Distribution of retained instruments / material

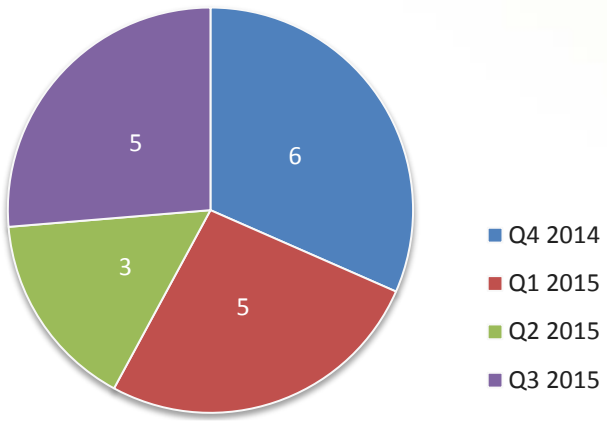

Figure 9: Quarterly distribution of retained instruments/material

42. Five of the 9 incorrect counting cases involved guide wire, of which 4 happened under emergency situations with interruptions during the central venous catheter (CVC) insertion procedure.

Inpatient suicide

43. Figures 10 - 14 show the distribution of the 15 inpatient suicide cases by different categories during the reporting period. Seven of them admitted for psychiatric illness. The 4 inpatients committed suicide either by hanging, suffocation, strangulation or jumping from height. The other 11 patients, who were either on home leave or missing, committed suicide by drowning or jumping from height.

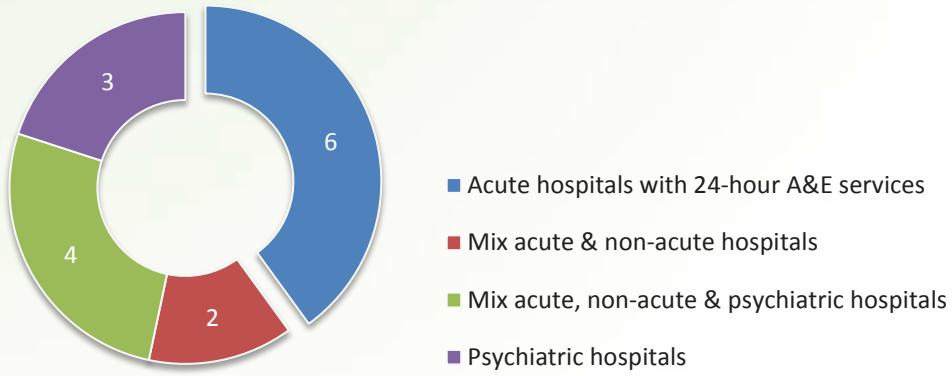

Figure 10: Hospital setting

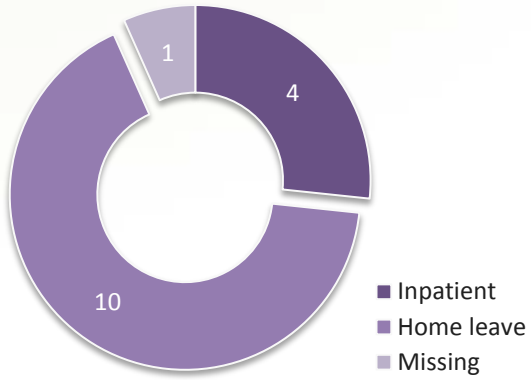

Figure 11: Location

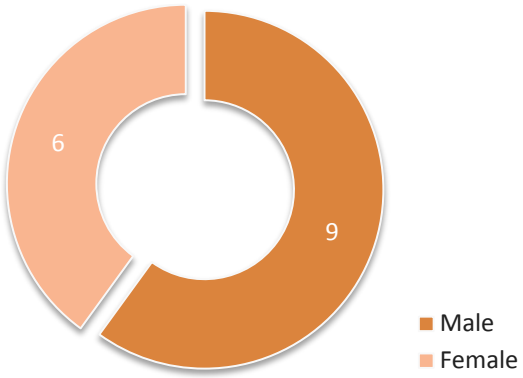

Figure 12: Gender

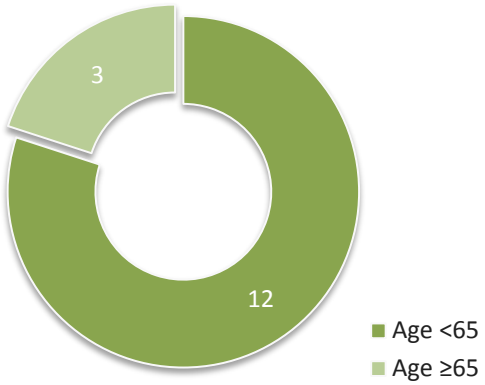

Figure 13: Age

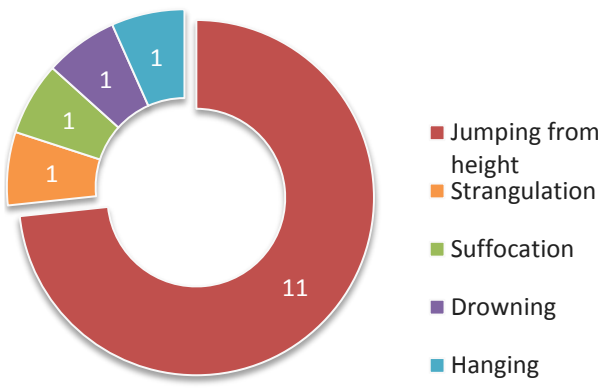

Figure 14: Method

44. The occurrence of 15 inpatient suicides in 2014/15 represented an inpatient suicide incident rate of 1.4 per 100,000 inpatient admissions (Figure 15).

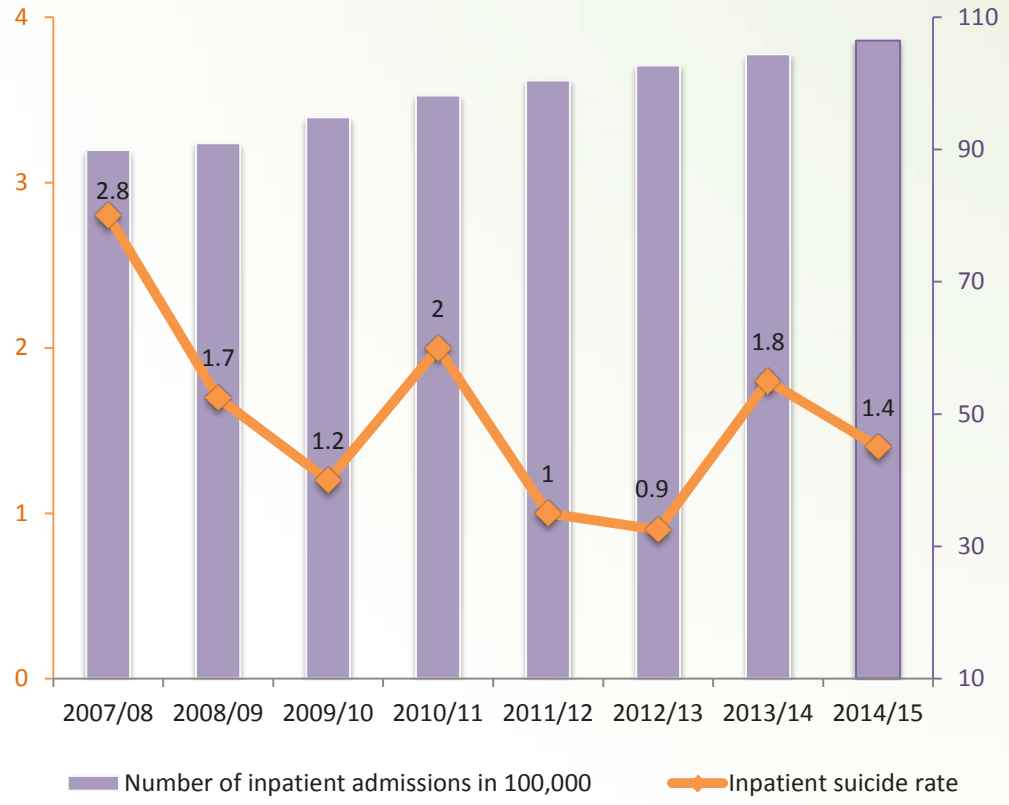

Figure 15: Yearly inpatient suicide incident rates per 100,000 inpatient admissions

International Sentinel Event Reporting

45. In the United States, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) reviewed 764 SE cases in 2014 and 731 from January to September 2015.[1] The high number might be due to its much broader definition of SE. Australia, on the other hand, adopted a very similar definition of SE as HA. The number of reported sentinel events recorded by the Department of Health, State Government of Victoria, Australia (DH Victoria) was 34 in 2012 – 2013 and Western Australia (DH West Australia) was 12 in 2013 – 2014.[2,3] Notwithstanding the small figures, the relative incident rates of SE in DH Victoria and DH West Australia were 23.0 and 21.6 per 1,000,000 inpatient episodes of care respectively.[4,5]

46. Compared with the Australian data, HA had a relatively low SE incident rate of 1.9 per 1,000,000 episodes of patient attendances / discharges and deaths (Table 4).

	HA, Hong Kong (Oct 14 – Sep 15)	DH Victoria, Australia (Jul 12 – Jun 13)[4]	DH West Australia, Australia (Jul 13 – Jun 14)[5]
Number of SE / 1,000,000 patient episodes	1.9	23.0	21.6

Table 4: SE incident rates in HA, DH Victoria and DH West Australia

[1] The US Joint Commission, Summary Data of Sentinel Events Reviewed by The Joint Commission: as of October 26, 2015.

[2] Supporting Patient Safety – Sentinel Event Program Annual Report 2011-12 and 2012-13. Department of Health, 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: 2014. Department of Health, State Government of Western Australia, Australia.

[4] Department of Health, State Government of Victoria, Australia recorded 1.477 million admissions in 2012-13 (Supporting Patient Safety – Sentinel Event Program Annual Report 2011-12 and 2012-13).

[5] Department of Health, State Government of Western Australia, Australia recorded 555,339 hospital separations in 2013-14 (Your Safety in our Hands in Hospital - An Integrated Approach to Patient Safety Surveillance in WA Hospitals, Health Services and the Community: 2014).

47. Table 5 lists the three most common types of SE reported in HA as compared to that of DH Victoria and DH West Australia. Similar to HA, "inpatient suicide" and "retained instruments" were the most commonly reported SE in Australia.

HA, Hong Kong (Oct 14 – Sep 15)	DH Victoria, Australia (Jul 12 – Jun 13)	DH West Australia, Australia (Jul 13 – Jun 14)
Retained instruments /material after surgery / interventional procedure (19 cases, 48.7%)	Other catastrophic events including complications (17 cases, 50%)	Suicide of a patient in an inpatient unit (3 cases, 25%)
Death of an inpatient from suicide (including home leave) (15 cases, 38.5%)	Suicide in an inpatient unit (9 cases, 26%)	Medication error resulting in death of a patient (2 cases, 17%)
Surgery / interventional procedure involving the wrong patient or body part (3 cases, 7.7%)	Retained instruments or material (6 cases, 18%)	Procedure involving wrong patient or wrong body part resulting in death or major permanent loss of function (2 cases, 17%)
		Infant discharged to wrong family or infant abduction (2 cases, 17%)

Table 5: The most common types of SE reported in HA, DH Victoria and DH West Australia

48. Inpatient suicide rates varied substantially worldwide and depended on the type of hospital and estimation methods. Different studies estimated the range to be 5 – 15 per 100,000 admissions in general hospitals in the United States.[6] The rate of HA (0.9 – 2.8) was lower than that of the general hospitals in the United States.

[6] S. Shapiro, H. Waltzer. Successful suicides and serious attempts in a general hospital over a 15-year period. General Hospital Psychiatry, 2 (1980), pp. 118–126.

Serious Untoward Events Statistics

Yearly Trend

49. A total of 68 SUE were reported in 2014/15, a record low since the implementation of the SE & SUE Policy in January 2010. A total of 546 SUE had been reported to date. The yearly distribution of SUE by category since 2010 is depicted in Figure 16, with the total number of cases each year shown at the top of each bar.

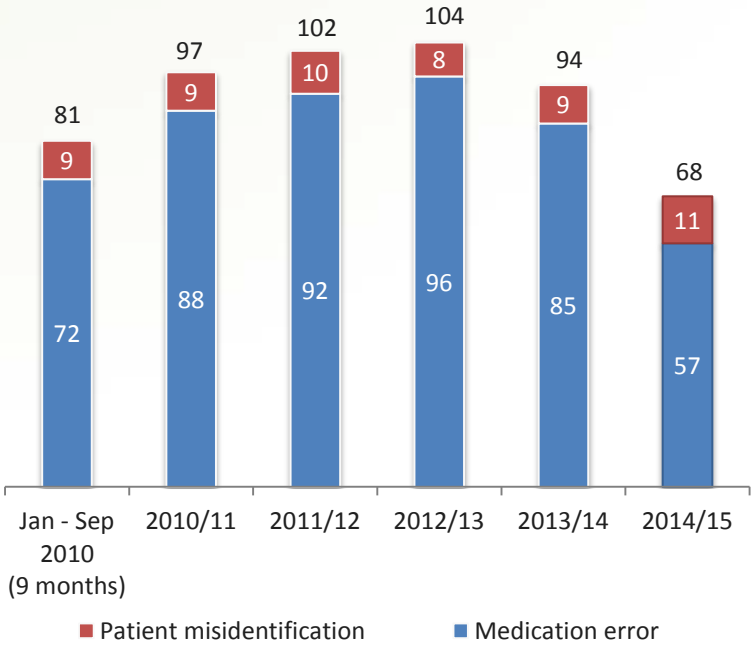

Figure 16: Yearly distribution of SUE by category

50. Of the 68 SUE reported this year, 57 cases were due to medication error, a record low since 2010, and 11 involved patient misidentification. As mentioned in the last chapter, HAHO took strong actions to educate staff and made systemic enhancement in CMS especially related to NSAID and steroid.

51. The yearly trend of the common drugs involved in medication error is depicted in Figure 17. There was a significant decrease in the number of cases on known drug allergens (KDA) and Insulin. The number of cases on dangerous drugs and oral hypoglycaemic agent was on a decreasing trend since 2010. SUE involving medications such as paracetamol and phosphate solution were grouped under others.

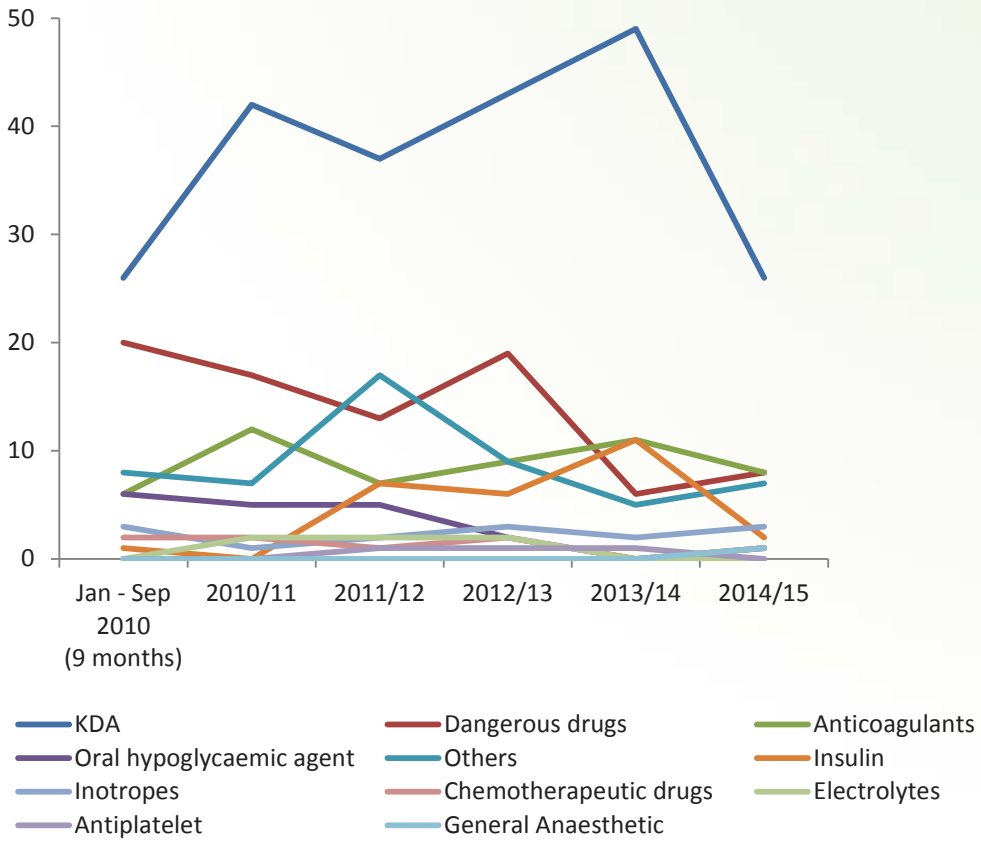

Figure 17: Yearly trend of common drugs involved in medication incidents

52. As to date, 443 (81.1%) SUE cases had minor or insignificant consequence, 90 (16.5%) cases sustained moderate consequence and 13 (2.4%) cases resulted in temporary major consequence (Figure 18).

53. The number of SUE having minor or insignificant consequence reached a bottom in 2014/15, and those having moderate and temporary major consequence remained at a low level.

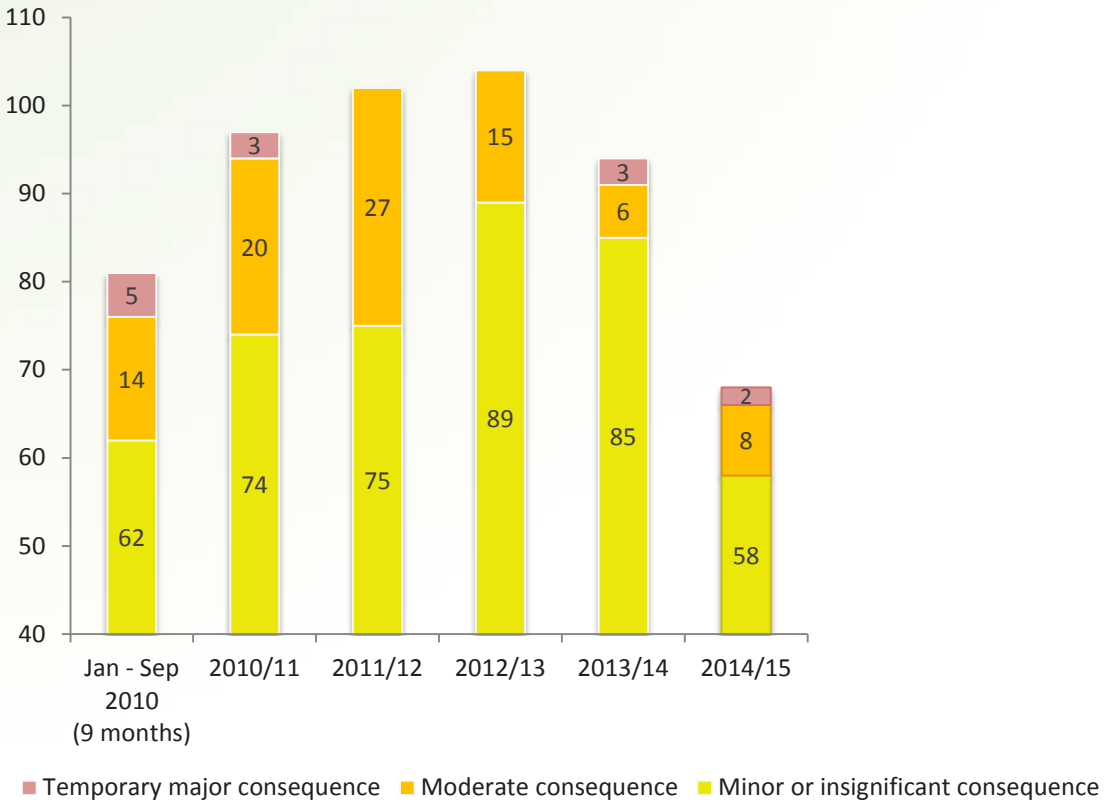

Figure 18: Yearly outcome of SUE

SUE Reported in 2014/15

54. The quarterly and monthly distribution of SUE reported are illustrated in Figures 19 and 20 respectively.

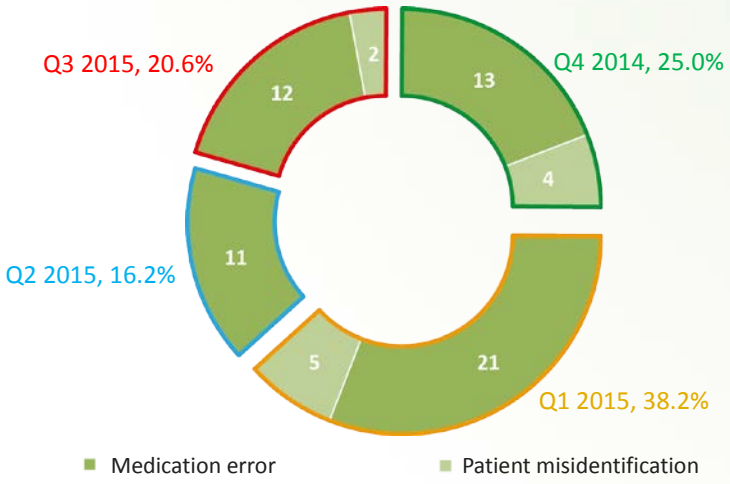

Figure 19: Quarterly distribution of SUE by category

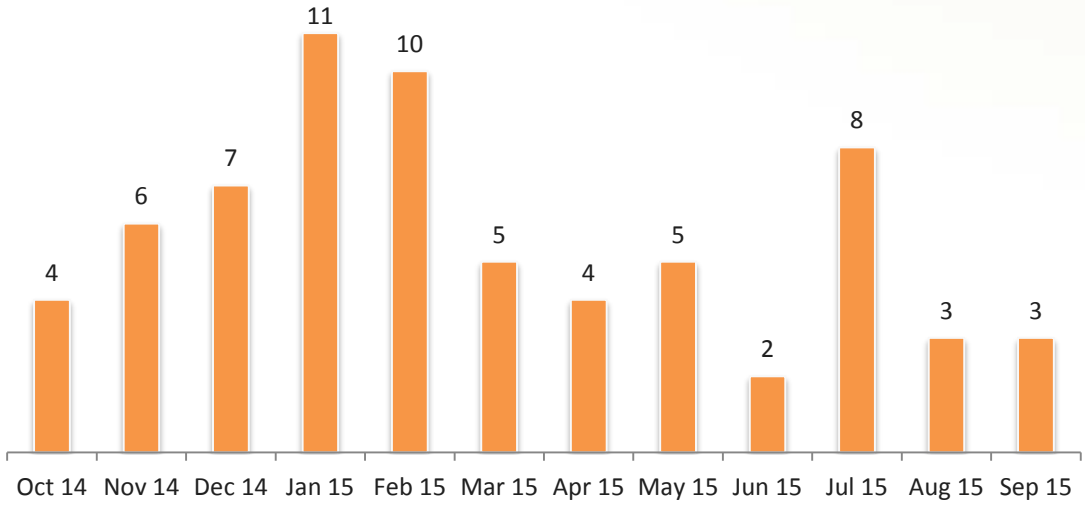

Figure 20: Monthly distribution of SUE

55. 58 cases of SUE had minor / insignificant consequence, 8 cases sustained moderate consequence and 2 cases resulted in temporary major consequence.

56. As shown in Figure 21, there was no patient misidentification case resulted in temporary major consequence.

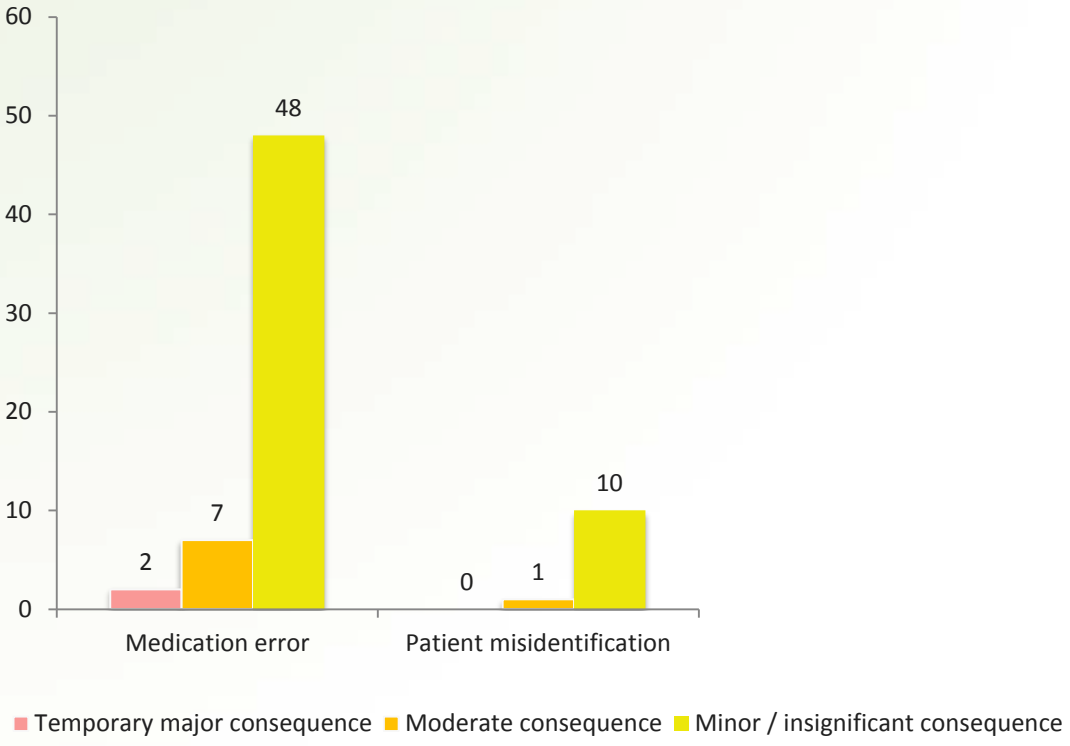

Figure 21: Outcome of SUE by category

Medication Error

57. The three most common medication errors were "KDA" (26 cases), "dangerous drugs" (8 cases) and "anticoagulants" (8 cases). The distribution of drugs, quarterly and monthly distributions are shown in Figures 22 – 24.

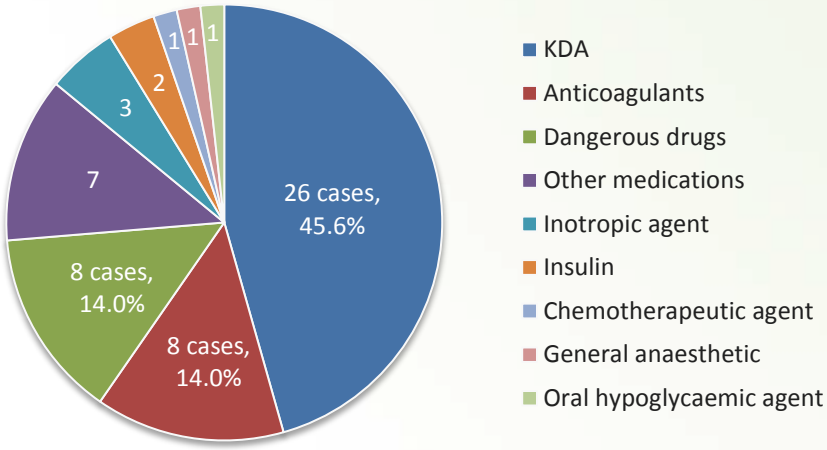

Figure 22: Distribution of medication error

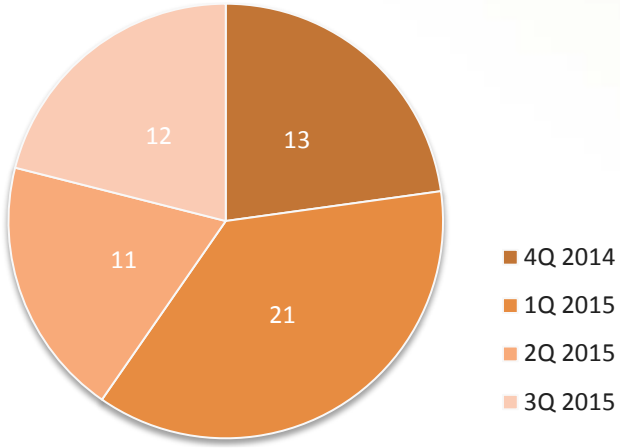

Figure 23: Quarterly distribution of medication error

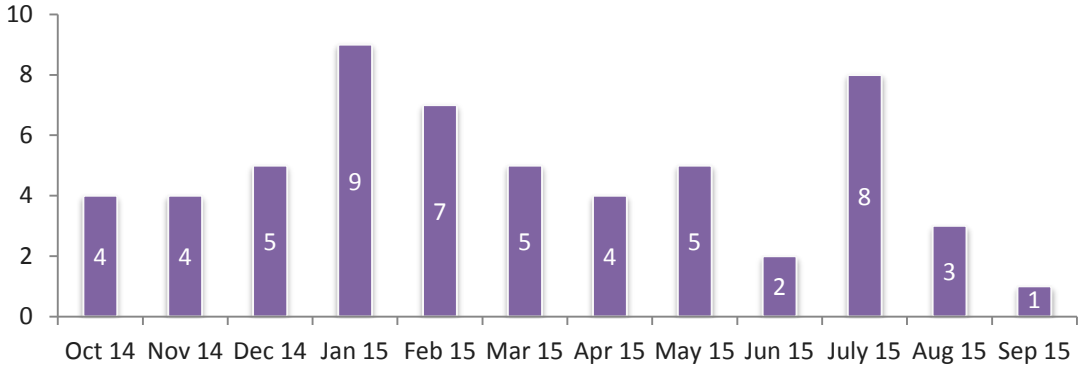

Figure 24: Monthly distribution of medication error

KDA

58. Of the 26 medication errors related to KDA, the three most commonly involved drugs were penicillin group (11 cases), NSAID (6 cases) and paracetamol (5 cases). These three drug groups constituted 84.6% of the total KDA incidents. The distribution of drugs related to KDA and the quarterly distribution are shown in Figures 25 – 26.

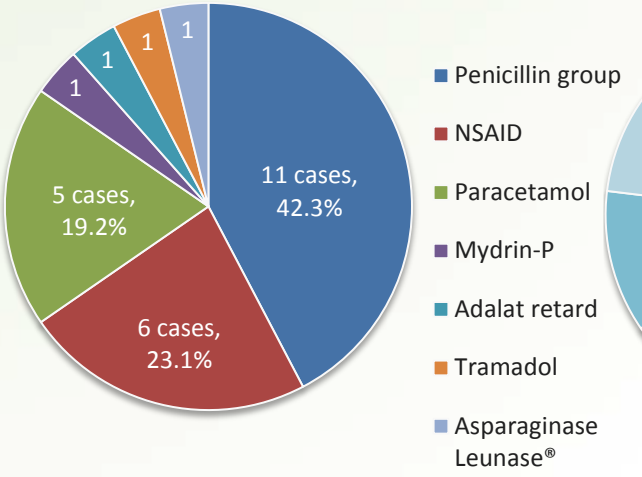

Figure 25: Distribution of drugs related to KDA

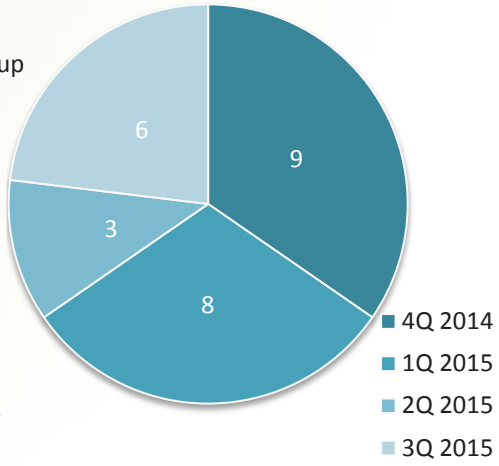

Figure 26: Quarterly distribution of KDA

59. Of the 26 KDA, 24 patients had minor / insignificant consequence (Figure 27). Two patients had moderate consequence and the drugs involved were NSAID and Asparaginase Leunase®.

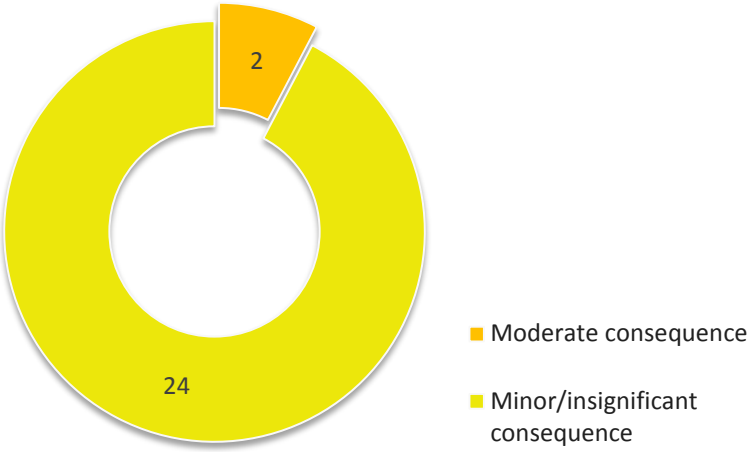

Figure 27: Outcome of KDA

Other medication error

60. The details of other drugs involved in medication error cases, excluding KDA, are summarized in Table 6.

Drug Group	Drug involved	No. of Cases	Moderate/Temporary Major Consequence
Insulin	Actrapid	1	
	Protaphane	1	-
Anticoagulants	Warfarin	6	-
	Heparin	1	-
	Tinzaparin	1	-
Dangerous drugs	Midazolam	2	temporary major (1 case)
	Morphine	3	-
	Lorazepam	1	-
	Methadone	1	
	Morphine / Midazolam / Hyoscine	1	
Inotropic agents	Dopamine	3	moderate (2 cases)
General anaesthetic	Thiopentone	1	-
Chemotherapeutic agent	Docetaxel / Doxorubicin / Cyclophosphamide	1	moderate
Oral hypoglycaemic agent	Metformin	1	
Others	Dextrose-Insulin drip	1	moderate
	Isosorbide dinitrate	1	
	Phosphate solution	1	-
	Prednisolone	1	moderate
	Paracetamol	1	
	Diltiazem controlled release	1	temporary major
	Valganciclovir	1	
Total		**31**	

Table 6: Details of other drugs involved in medication error (excluding KDA)

Patient Misidentification

61. There were 11 SUE reported which were due to patient misidentification. These included 4 cases of patient misidentification during drug administration and 3 cases during radiological investigations. Their quarterly and monthly distributions are summarized in Table 7 and Figure 28 respectively.

Patient misidentification scenarios	Q4 2014	Q1 2015	Q2 2015	Q3 2015
During drug prescription	0	1	0	0
During drug dispensing	0	0	0	1
During drug administration	3	1	0	0
Upon discharge (private drugs)	0	1	0	0
For a bedside procedure (drain removal)	0	0	0	1
For radiological investigations	1	2	0	0
Total	**4**	**5**	**0**	**2**

Table 7: Quarterly distribution of patient misidentification by scenarios

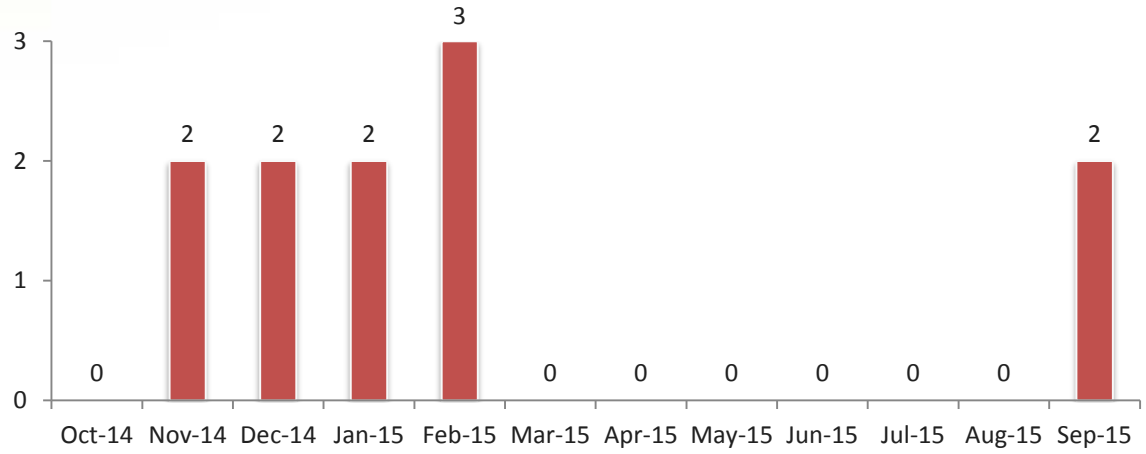

Figure 28: Monthly distribution of patient misidentification

62. Of the 11 patient misidentification cases, all except 1 patient had minor / insignificant consequence (Table 8). The patient having moderate consequence developed hypoglycaemic symptoms.

Patient misidentification scenarios	Minor / Insignificant Consequence	Moderate Consequence
During drug prescription	0	1
During drug dispensing	1	0
During drug administration	4	0
Upon discharge (private drugs)	1	0
For a bedside procedure (drain removal)	1	0
For radiological investigations	3	0
Total	**10**	**1**

Table 8: Consequences of patient misidentification

Analysis of Sentinel Events

63. In this chapter, each category of SE reported in 2014/15 would be further discussed for their common contributing factors and recommendations revealed by the RCA panels, which had been implemented or were being followed up by clusters / hospitals to prevent further recurrence. The common contributing factors and recommendations are grouped into communication, knowledge / skills, work environment / scheduling, equipment and policies / procedures / guidelines. HAHO would also work with clusters and hospitals to improve and redesign systems or work processes at the corporate level to enhance patient safety. A summary of individual SE is shown at Annex III.

Factors	Common Contributing Factors	Recommendations
Wrong patient / part (3 cases)		
Communication	Unclear role delineation for time-out	Review departmental guidelines and role delineation regarding time-out
Knowledge / skills	Suboptimal awareness on the importance of correct patient identification	Strengthen patient identification before procedures
Work environment / scheduling	Small in-room monitor for computer display of patient information	Replace in-room monitor with larger size
Equipment	-	-
Policies / procedures / guidelines	Lack of a checklist to facilitate time-out	Derive a checklist for time-out
	Lack of a system to verify information between clinical notes, consent form and patient	Review the system of workflow
	Ineffective process to ensure proper compliance with the Procedural Safety Checklist	Follow Procedural Safety Checklist by team approach

Factors	Common Contributing Factors	Recommendations
Retained instruments / material – incorrect counting (9 cases)		
Communication	Unclear role delineation during CVC insertion	Delineate roles and responsibilities of team members in safety checking procedure
	No visual inspection of the integrity of guide wire and verification by another doctor / nurse after CVC insertion	Check the correct number and integrity of guide wire by a second healthcare professional upon removal and before starting CVC intravenous infusion
	Ineffective communication between team members	Reinforce "read back" to acknowledge important information especially during wound packing and gauze removal
Knowledge / skills	Failure to hold guide wire at all times during CVC placement	Reinforce the importance of holding the end of guide wire once seen
	Insufficient vigilance	Enhance staff vigilance
	Knowledge deficit in different types of gauze	Revise the "Preceptorship Program for Registered Nurse"
	Unaware of the safe practice to use one gauze at a time	Educate staff on the good and safe practice on handling and clamping one plain gauze at a time
	Unaware of the potential risk of retained gauze associated with speculum examination	To enhance awareness of doctors on surgical counting and risk of retained gauze, even during a non-surgical procedure
Work environment / scheduling	Misleading visual counting	Use tactile counting instead of visual counting
	Distraction by deterioration of patient condition	Strengthen staff training
	Unable to attend the whole CVC insertion procedure by nurse	Explore the possibility of deploying additional manpower during busy situations

Factors	Common Contributing Factors	Recommendations
Equipment	-	-
Policies / procedures / guidelines	Lack of a standardized safety check for CVC insertion	Review Bedside Procedure Checklist to include post-procedure checking
	No explicit standard procedure to verify stent deployment	Establish a standard practice for staff guidance, e.g. examination of retrieval by two staff
	Failure to use Safety Checklist for Bedside Procedures	Reinforce compliance to the use of Safety Checklist for Bedside Procedures and attach the checklist on each set of CVC
Retained instruments / material – broken (10 cases)		
Communication	Lack of communication between doctor and nurse on the cut catheter	Review the counter checking system for removal of catheter and drains Develop a guideline on insertion of suprapubic catheter
	Lack of written documentation and handover of incident	Reinforce complete documentation of surgical procedures and improve clinical handover with ward staff
Knowledge / skills	Unfamiliar with the design of the device and unaware of the risk of retained thread after cutting the "hub" off the catheter	Develop protocol to confine the use of percutaneous nephrostomy with suture locking mechanism to situations with increased risk of catheter displacement
	Inadequate training and supervision on removal of a pig tail catheter with suture locking mechanism	Enhance staff training and alert staff on risk of broken instruments
Work environment / scheduling	Difficult to confirm completeness of instrument, e.g. broken coating by visual checking, broken drain on X-ray, breakage of tip of K wire by naked eyes	Inspect completeness of instrument upon removal, e.g. checking the completeness of used pin against other pins Consider additional measures, e.g. use of magnifying glass, when needed Perform intra-operative X-ray if material is suspected to be retained and alert doctors on retained foreign body when reading post-operative X-ray
Equipment	-	-

Factors	Common Contributing Factors	Recommendations
Policies / procedures / guidelines	No documentation of details of the drain	Record details of drain, e.g. length, for reference to facilitate checking of completeness after removal
Inpatient suicide (15 cases)		
Communication	-	-
Knowledge / skills	Knowledge deficit on management of chronic illness	Provide training on management and counselling of patients with malignancy or chronic illness
	Concealed suicidal thought of patients unnoticed by healthcare professionals	Enhance training on use of suicidal risk assessment tools
Work environment / scheduling	Presence of high risk facilities in old hospital premises	Conduct safety walk round to identify high risk facilities and submit renovation plan for improvement of patient toilet and bathroom
		Explore exit control to prevent patients from leaving hospital
Equipment	-	-
Policies / procedures / guidelines	-	-

64. There was 1 others case reported which involved right lower lobe lobectomy. The RCA panel identified the following high risk areas where the contamination could occur:

a. During biopsy collection;

b. During tissue wrapping in laboratory; and

c. During embedding in laboratory.

65. Recommendations for this case were:

a. Department of Radiology

- Ensure specimen bottle will not be used once the seal was broken / removed;
- Redesign the biopsy set-up to eliminate the additional use of rinsing bottle for biopsy procedure;
- Label the specimen bottle once it's designated to a patient; and
- Enhance the documentation of specimen nature and quantity.

b. Department of Pathology

- Ensure adequate checking and traceability in laboratory by (i) implementing double checking mechanism for tissue wrapping; and (ii) ensuring traceability in the entire specimen processing, in particular tissue wrapping and embedding procedures;
- Enhance documentation of specimen nature and quantity;
- Stagger the sequence of handling specimen of similar nature whenever possible; and
- Review workflow and bench set up to facilitate the ease of single use of forceps in tissue wrapping and embedding.

66. There was one case of maternal morbidity reported where the patient had HELLP syndrome – Haemolysis, Elevated Liver enzymes and Low Platelet count. The clinical management was reviewed and found to be appropriate.

Analysis of Serious Untoward Events

67. Since KDA constituted nearly half (45.6%) of all the SUE reported in 2014/15, its common contributing factors and recommendations taken to prevent further recurrence are summarized below. Similar to SE, SUE are also analysed from the perspective of communication, knowledge / skills, work environment / scheduling, equipment and policies / procedures / guidelines.

Factors	Common Contributing Factors	Recommendations
Medication error – known drug allergens (26 cases)		
Communication	No communication of patient's drug allergy status throughout the process	Update drug allergy status and alert measures promptly and simultaneously
	Incomplete entry of patient's drug allergy history in A&E record	Relocate the drug allergy alert label in the A&E record
Knowledge / skills	Lack of knowledge to override allergic information safely	Enhance clinicians' knowledge and practice in properly overriding allergic information, in particular the newly recruited staff
	Inadequate knowledge on drug ingredients and drug classes with cross-sensitivity	Remind staff to check ingredients of pharmaceutical products before dispensing, especially to patients with allergic history Post the drug allergy card in ward and CMS station Conduct education forum and sharing session
Work environment / scheduling	Non-eye catching of the drug allergy alert	Discuss with HA Information Technology (IT) Team for designing more eye catching allergy alert on CMS printouts Redesign form to ensure easy referencing and alert staff of drug allergy information
	Failure to prominently display the drug allergy card in patient's record folder	Display prominently the drug allergy card in patient's record folder

Factors	Common Contributing Factors	Recommendations
Work environment / scheduling *(con't)*	No unique locator to separate the drugs in drug store cold room, especially for drugs of similar names	Design unique locator for each drug in drug store cold room to facilitate identification of drugs Introduce special alert labels to bin shelves for drugs with similar names
		Alert staff on the risk of delinking clinical information, such as drug allergy, for patients bearing pseudo-identity (ID)
Equipment	Failure of allergy checking by IT system because the drug allergy information was entered in free-text	Convert free text entries into structured allergy alert Liaise with Chief Pharmacist's Office (CPO) to explore the feasibility of enlarging the space of "alert information from CMS" and display all free text allergens in red in the Computerized Automatic Refill System (CARS) prescription entry screen
	Lack of system support for allergy checking in Pharmacy Management System (PMS)	Create automatic prompt on allergy history in PMS Alert dispensers, pharmacists and doctors on drug allergy checking
Policies / procedures / guidelines	Non-compliance to verifying illegible drug allergy information before drug administration	Reinforce strict adherence to allergic information verification whenever in doubt and evaluate staff compliance by audits Reinforce compliance to known drug allergy checking Recirculate drug allergy card for posting in ward and CMS station
	Lack of a system for dispensing NSAID from A&E ward stock	Enhance measures for NSAID administration in A&E
	Non-compliance to HA Guidelines on Medication Management	Remind not to use leftover drugs
	Administration of drug before verification by Pharmacy	Reinforce the need of verification by Pharmacy

68. Apart from the above, HAHO had also taken the initiative to develop the In-patient Medication Order Entry (IPMOE) system. The system can minimize medication error by:

a. Re-engineering workflow with the aid of bar-code technology or other advanced technology to enable treatment-patient identification;

b. Abolishing transcription error & time lag error by closing the loop of prescribing, dispensing and administering;

c. Enabling clinical decision support by providing alerts & information in a timely & context-sensitive manner; and

d. Providing automatic dosage calculation and adjustment.

69. IPMOE had been rolling out in phases since April 2013 for target completion by 2019. During this reporting period, with the IPMOE implemented, there were occurrences of 5 medication errors but all were unrelated to the system.

The Way Forward

70. In 2014/15, there was no SE related to medication error, while the number of SUE related to medication error dropped to a record low. This could be due to the prompt action taken by HA to educate staff, focusing on the occurrence and prevention of medication error. This involved system changes with IT enhancement and the implementation of IPMOE to minimize transcription errors and facilitate timely review of orders. Drug allergy checking was also simplified. This is encouraging and HA will monitor the practice of safe and effective delivery of care.

71. The IPMOE will continue to spread to more hospitals and to wards of various specialties. HA will continue to observe if any new risk will occur by extending its use to some specialty areas, e.g. intensive care unit and neonatal intensive care unit.

72. There were 5 cases of retained guide wire of central venous catheter in 2014/15. Most of them were inserted in emergency clinical situations and distraction by colleagues was a possible contributing factor. In response to these incidents, many hospitals developed checklists to prompt the operator to inspect the guide wire after removal. This measure is certainly useful but may not be a risk-proof solution. It is because maintaining stringent control of the guide wire continuously throughout the procedure is still difficult to mitigate the risk due to human error. We urge the clinical experts and relevant stakeholders to explore alternative features in the design of the central line kits.

73. The publication of the Clinical Incident Management Manual in July 2015 answered the call to standardizing the management of clinical incident in HA, such as reporting, investigating, analyzing and disclosing of information. A timely monitoring in the near future might be the order of the day.

74. The issue of patient safety was also touched in the Government's "Report of the Steering Committee on Review of Hospital Authority" (the "HA Review"). In response, HA will strengthen the roles of COC/CCs on clinical governance to achieve a more standardized service quality and treatment and to ensure patient safety, and also review the role of Chief of Service (COS) with emphasis on clinical governance.

75. In addition, while HA continues to examine the root cause of the occurrence of a medical incident, it will develop an electronic platform to strengthen the sharing of lessons learnt among clusters to minimize the possibility of its recurrence, and also strengthen staff's awareness to enhance communication with and support for patients.

76. HA has been invited to join the Imperial College's patient safety initiative, which will focus on safer care and how different healthcare providers use information to assess patient safety. Besides networking with established organizations on patient safety and sharing HA's experience and best practices, other benefits include:

a. Acquiring knowledge and tools needed to assess patient safety; and

b. Filling the gaps as needed to drive sustained improvement.

77. HA will continue to strive for quality healthcare for our patients by encouraging and supporting the concept of learning from mistakes. By adhering to this concept in the management of the clinical incidents, we believe it will lead to a further improvement in patient safety in HA.

ANNEXES

ANNEX I

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 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 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 handling, (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 Hospitals 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 of 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 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 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 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.

<u>Not to be included</u>

- 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

DESCRIPTIONS 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

SUMMARY OF INDIVIDUAL SENTINEL EVENTS

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

Case 1: Wrong Radiotherapy Plan

Patient X had rectal cancer and required radiotherapy after Hartmann's operation. Patient X was prepared by staff A & B for the administration of the 21st fraction of radiotherapy. Another patient's treatment plan for radiotherapy to a similar region was inadvertently uploaded into the computer system that controls the treatment machine. Pre-intervention checks performed in treatment room failed to pick up the error and staff A left for lunch after patient set-up. Staff B & C performed "time out" against the hardcopy of patient X's treatment record but not with the treatment machine computer monitor display. Radiotherapy was given according to the wrong plan. Immediately after the treatment, it was realized that treatment plan of another patient was used wrongly for patient X. Remedial actions in dose adjustment of subsequent treatment fractions were done and the overall dose was not significantly different from the planned dose.

Key Contributing Factors:

1. Suboptimal awareness on the importance of correct patient identification.
2. Unclear role delineation for "time out" and lack of a checklist to facilitate its conduction.
3. Small in-room monitor for computer display of patient information.

Recommendations:

1. Review departmental guidelines and role delineation regarding "time out".
2. Derive a checklist for "time out".
3. Replace in-room monitor with larger size.

Case 2: Injection of Dexamethasone to Wrong Patient

Two female patients were waiting to see ear, nose and throat (ENT) doctor outside the same treatment room. Patient A was for explanation of computed tomography (CT) report taken for persistent sense of foreign body at the right side of throat. Patient B was for right intra-tympanic injection of steroid for hearing loss. Nurse called patient B. Patient B did not respond but patient A raised her hand. Nurse then asked which ear of patient A required injection, she confirmed "right side". The nurse applied xylocaine spray (local anaesthetic) to the right ear of patient A. Patient A complained of discomfort over right side of her throat but was assured to be the effect of xylocaine by the nurse. The ENT doctor asked patient A which ear required injection and patient A replied right side. The doctor did not check the patient's identity against the consent form and injected 4mg dexamethasone to her right ear. Then the nurse called for patient A and no one responded. The nurse checked the identities of both patients and realised the error.

Key Contributing Factor:

Lack of a stringent patient identity checking process.

Recommendation:

Strengthen on correct patient identification before procedures.

Case 3: Percutaneous Nephrostomy at the Wrong Side

A patient consented to an urgent LEFT percutaneous nephrostomy (PCN) for hydronephrosis. Doctor wrongly requested a RIGHT PCN. Two radiologists and a radiographer conducted safety check against the request form. After the procedure, CT revealed PCN was performed on the wrong side.

Key Contributing Factors:

1. Lack of a system to verify information between clinical note, consent form and patient.
2. Ineffective process to ensure proper compliance with the Procedural Safety Checklist.

Recommendations:

1. Review the system of workflow, which includes:
   a. filing a copy of procedure request form in patient record;
   b. performing site marking by the referring department; and
   c. involving patient for safety check whenever possible.
2. Follow Procedural Safety Checklist by team approach.

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

Broken Instruments

Case 1: Broken Tube in Nasopharynx

A patient required oesophago-gastro-duodenoscopy (OGD) guided insertion of feeding tube. 5 days later, the patient pulled out the feeding tube. A nurse confirmed the tube was intact. A new feeding tube was inserted but had to be removed because it was not in the right place. On subsequent OGD guided feeding tube insertion, a 9cm long broken tube segment was noted in the nasopharynx and was removed. The tube was confirmed to be a broken segment of a suction catheter.

Key Contributing Factor:

Broken suction catheter was not noted on removal.

Recommendations:

1. Reinforce staff alertness to the risk of breakage of suction catheter during use.
2. Promote routine checking of the completeness of instruments / consumables on removal.

Case 2: Retained Tip of Stryker® Pin

A patient had high tibial osteotomy. Two pins (Stryker Ortho Lock Ex-pin 3mm) were used for temporary holding of trackers and were removed during the operation. The post-operation course was uneventful and the patient was discharged 5 days later. Followed up 17 days later, the patient had a routine X-ray of "left knee and long leg length". The X-ray revealed a 2 – 3 mm metallic foreign body at the lower one third of the tibia, which was likely to be the tip of the pin used for holding the trackers. Removal of the foreign body was not advised after clinical assessment.

Key Contributing Factor:

Failure to check the completeness of instrument upon removal.

Recommendations:

1. Inspect for completeness of instrument upon removal (e.g. checking the completeness of the used pin against other pins).
2. Examine by intra-operative X-ray whenever broken instrument in patient is suspected.

Case 3: Broken Urinary Catheter

A patient was on long term urinary catheter. After failed attempts of inserting transurethral urinary catheter, the urologist decided to insert suprapubic catheter (SPC). During the procedure, Dr E's finger and the SPC were cut by the trocar. Dr E removed the SPC but did not check its completeness. Dr E successfully inserted another SPC. The nurse assisting in the procedure did not notice the cut SPC. 7 days after the procedure, the SPC was blocked. Upon removal, it was checked intact and so documented. Transurethral urinary catheter was then inserted successfully. 4 days later, cystoscopic examination revealed a 29cm segment of the cut SPC which was subsequently removed.

Key Contributing Factors:

1. The doctor was distracted by the cut injury when removing the trocar.
2. The doctor did not communicate with the nurse on the cut SPC.

Recommendations:

1. Review the counter-checking system for removal of catheters and drains.
2. Develop a guideline on insertion of SPC.

Case 4: Retained Segment of Feeding Tube

A patient required long-term tube feeding. Feeding tubes were changed when necessary. An abdominal X-ray taken for patient's fever revealed a radio-opaque line in right lower quadrant. A 36cm segment of silicone feeding tube was removed via colonoscopy uneventfully.

Key Contributing Factor:

Failure to check the completeness of tube upon removal.

Recommendations:

1. Inspect for completeness of tube upon removal.
2. Examine by X-ray whenever broken tube in patient is suspected.

Case 5: Retained Tip of COOLPULSE® Electrode

A patient underwent right arthroscopy for repair of rotator cuff. A COOLPULSE® electrode was used for haemostasis. The suction channel of electrode was blocked and the surgeon requested a replacement. The operation was uneventful. The completeness of both electrodes used was not checked. Post-operative X-ray showed a 4mm metallic foreign body inside the right shoulder joint. The foreign body removed surgically was a part of the COOLPULSE® electrode tip.

Key Contributing Factor:

Failure to check the completeness of used instrument during the operation.

Recommendations:

1. Include single-use devices (SUD) and endoscopic instruments in instrument checking process.
2. Alert staff on the risk of possible damage of SUD.

Case 6: Retained Guide Wire Coating

A patient underwent elective right PCN lithotripsy under X-ray guidance. During operation, the hydrophilic plastic cover of the Terumo guide wire was torn by the punctured needle. The broken fragments were retrieved accordingly. Fluoroscopic examination did not show any retained fragment. Renal stone was removed and a PCN was inserted. The incident was not documented and communicated with the case doctor. Seven days later, the patient was discharged after the PCN was removed. At follow up, doctor noticed a U-shaped foreign body at the lower pole of right kidney on X-ray. Subsequent investigation suggested the foreign body was likely a fragment of the Terumo guide wire coating. Patient was monitored and followed up regularly.

Key Contributing Factors:

1. Difficult to confirm completeness of coating by visual checking.
2. Lack of written documentation and handover of the incident.

Recommendations:

1. Avoid bending of guide wire over the sharp tip of needle.
2. Perform intraoperative X-ray if coating material is suspected to be retained.
3. Reinforce complete documentation of surgical procedures.
4. Improve clinical handover with ward staff.

Case 7: Retained Drain After Total Knee Replacement

A patient had total knee replacement and two wound drains were placed during the operation. Both drains were removed on day 2. Post-operative X-ray on day 3 did not reveal any abnormality. On day 11, the patient was discharged. Two months later, the patient was admitted for prosthesis-related joint infection and open debridement was performed. A 1.5cm segment of drain was found inside the joint space and was removed. The patient was managed with a prolonged course of antibiotics.

Key Contributing Factors:

1. Exact cause of drain fracture could not be identified.
2. No documentation of details of the drain.

Recommendations:

1. Record details of drain, e.g. length, for reference to facilitate checking of completeness after removal.
2. Alert staff on the risk of broken instruments while reviewing post-operative X-ray.

Case 8: Retained Broken Drain After Spinal Surgery

In 2009, a patient had elective surgery for spinal stenosis and 3 wound drains were placed during the procedure. Two drains were removed on day 1 and the remaining drain was removed on day 4 of the procedure. On day 7, the patient was discharged and followed up at specialist out-patient clinic (SOPC) regularly. In 2015, doctor suggested another spinal surgery to treat further spine degeneration. During the operation, a 4cm broken piece of drain was found and removed.

Key Contributing Factors:

1. Exact cause of broken drain could not be identified.
2. Detection of broken drain on X-ray was difficult.

Recommendations:

1. Avoid cutting the drain across the drainage holes.
2. Measure and document length of drain inserted in operative record.
3. Reinforce checking and documentation of completeness of drains upon removal.
4. Alert doctors of retained foreign body on reading post-operative X-ray.

Case 9: Retained Thread of Self-locking Drainage Catheter

A patient required bilateral PCN. 2 self-locking pigtail catheters were inserted at the radiology department. Instruction on removal of the catheters was marked in the radiology report "Cut the catheter shaft close to the hub and pull out the remaining catheter and thread. The thread can be removed by pulling either one end." 3 days later, Dr A removed both PCNs: left PCN was removed and checked to be complete; on removing the right PCN, part of the thread was noticed at the wound site. Dr A pulled out the whole thread smoothly. At the follow-up 11 days later, patient complained of left PCN wound discomfort. A 5cm long thread was seen at the wound site and a 35cm thread was then removed.

Key Contributing Factors:

1. Staff was unfamiliar with the design of the device and unaware of the risk of retained thread after cutting the "hub" off the catheter.
2. Staff had inadequate training and supervision on removal of a pigtail catheter with "suture locking mechanism".

Recommendations:

1. Develop protocol to confine the use of PCN with "suture locking mechanism" to situations with increased risk of catheter displacement.
2. Enhance staff training and supervision on removal of the self-locking PCN.

Case 10: Retained K-wire Fragment After Wrist Arthroscopy

A patient underwent wrist arthroscopic operation for an injury. Two 1.2mm diameter flexible K-wires were used in the procedure. The number and completeness of instruments were checked before and after use. Post-operative course was uneventful. A follow-up X-ray of the wrist taken at SOPC revealed a 1mm metallic foreign body. The foreign body was removed surgically and confirmed to be part of a K-wire.

Key Contributing Factor:

Failure to recognize the breakage of the tip of K-wire by naked eyes.

Recommendations:

1. Enhance awareness.
2. Consider additional measures e.g. use of magnifying glass when needed.

Incorrect counting of instruments / material

Case 11: Retained Coronary Stent After Percutaneous Coronary Intervention (PCI)

A patient underwent PCI where deployment of three coronary drug-eluting stents was planned for improving blood flow in the coronary arteries. The patient deteriorated during the procedure and required use of inotrope and supplement oxygen. One of the stents could not be deployed to the intended site, thus it was retrieved with the whole stent delivery system. The cardiologist did not visualize the dislodged stent on angiogram because of heavy calcification of the coronary vessels. This was followed by the successful placement of the other two stents. On the next day, patient deteriorated and angiogram revealed a dislodged stent. A second PCI was performed uneventfully. The patient passed away on post-PCI day 6.

Key Contributing Factors:

1. Insufficient vigilance.
2. Distraction by deterioration of patient's condition.
3. No explicit standard procedure to verify stent deployment.

Recommendations:

1. Enhance staff vigilance.
2. Strengthen staff training.
3. Establish a standard practice for staff guidance (e.g. examination of retrieved stent by two staff independently).
4. Use of alternative measure (e.g. stent boost function) to ensure proper stent deployment whenever necessary.

Case 12: Retained Plain Gauze in Vagina

A pregnant lady, due for delivery, was admitted for suspected leaking. In the pre-natal ward, a doctor performed speculum examination. The doctor saw a pool of liquor obscuring the view and requested two packs (10 pieces) of plain gauze. The doctor used a sponge forceps to hold a pile of plain gauzes to absorb the fluid in the vagina repeatedly and disposed the gauzes immediately after use. The patient was transferred to labour ward for induction of labour and a piece of plain gauze was found in the vagina.

Key Contributing Factors:

1. Unaware of the potential risk of retained gauze associated with speculum examination.
2. Unaware of the safe practice of using one gauze at a time.

Recommendations:

1. Enhance awareness of doctors on surgical counting and risk of retained gauze, even during a non-surgical procedure.
2. Educate staff on the good and safe practice of handling and clamping one plain gauze at a time.

Case 13: Retained Guide Wire

A paediatric patient with multiple co-morbidities was admitted for chest infection. The patient deteriorated and required insertion of central line for inotropic support. Nurse A asked nurse B for the checklist of "Insertion of Central Line with Guide Wire" for time-out. Nurse B was preparing urgent medication for the patient and did not hear nurse A. The doctor and the nurse A went on with the emergency procedure and did not follow the process of time-out. The procedure trolley was moved away before instruments had been counted and checked. Inotropes and intravenous fluid were given via the central line immediately. Occlusion alarm of the infusion pump beeped repeatedly. About 1.5 hour later, a guide wire was found in the catheter and it was removed.

Key Contributing Factor:

Staff did not comply with HA Safety Policy on Bedside Procedures.

Recommendations:

1. Alert staff to comply with the HA Safety Policy on Bedside Procedures.
2. Develop a mechanism to facilitate holding of guide wire, such as clamping with forceps.

Case 14: Retained Guide Wire During Insertion of a Triple Lumen CVC

Doctor A was assisted by nurse B for the insertion of a triple lumen CVC at bedside. Nurse B did not attend the whole procedure but returned when the procedure was finished. Safety Checklist for Bedside Procedures was not used and post-procedure counting was not performed. Patient was transferred to Intensive Care Unit (ICU) immediately after the procedure. Chest X-ray in ICU showed retained guide wire, which was eventually removed together with the catheter.

Key Contributing Factors:

1. Safety Checklist for Bedside Procedures was not used.
2. Lapse of concentration in high stress situation.
3. Nurse did not attend to the whole CVC insertion procedure.

Recommendations:

1. Reinforce the compliance on use of Safety Checklist for Bedside Procedures.
2. Attach a Bedside Procedure Checklist on each set of CVC.
3. Explore the possibility of deploying additional manpower during busy situations.

Case 15: Retained Guide Wire During Inotropic Therapy

A patient receiving mechanical ventilator support required inotropic therapy. Dr A inserted the CVC via internal jugular vein under the supervision of Dr B. During insertion, the patient deteriorated and Dr B performed cardioversion and fluid resuscitation. Dr A affirmed that the CVC guide wire was removed when asked by a nurse. On the next day, Dr B examined the chest X-ray and noticed the CVC guide wire had migrated to the inferior vena cava. The guide wire was subsequently removed.

Key Contributing Factors:

1. Lack of a standardized safety check for central venous catheterization.
2. Unclear role delineation.

Recommendations:

1. Review the procedure and implement way(s) to prevent the guide wire from migrating into the catheter completely during catheterization.
2. Standardize safety checking procedure.

Case 16: Retained Guide Wire at Operating Theatre

A patient had a CVC inserted in the operating theatre. The patient was well and discharged with regular follow up. Subsequent X-ray examination revealed a 40cm guide wire. The guide wire was removed subsequently.

Key Contributing Factors:

1. Lack of robust process to ensure correct counting of guide wires after use.
2. Lack of effective communication among the team members in correct counting and documentation on number of guide wires removed.

Recommendations:

1. Review the procedure and develop guidelines on the use of guide wires.
2. Delineate the roles and responsibilities of team members in procedural safety checking.

Case 17: Retained Gauze After Caesarean Section

10 long raytec gauzes were prepared for use. 1 long raytec gauze was used and returned to the scrub nurse. Doctor asked for 2 long raytec gauzes. 1 was used to pack between the uterus and bladder. This was not noticed by the scrub nurse. Two nurses counted raytec gauzes during wound closing: 8 in swab safe, 1 in kidney dish, 1 on operating theatre table. Wound was closed, only 9 long raytec gauzes were found. X-ray confirmed a long raytec gauze was retained in patient's abdomen. It was removed surgically.

Key Contributing Factors:

1. Misleading visual counting.
2. Ineffective communication between the surgeon and the nurses.

Recommendations:

1. Use tactile counting instead of visual counting.
2. Reinforce "read back" to acknowledge important information especially during wound packing and gauze removal.

Case 18: Retained Raytec Gauze in Vagina

A raytec gauze was packed in a patient's vagina during an operation. "Long R/G (raytec gauze) packed in vagina" was marked at peri-operative nursing record. Doctor ordered "off vaginal packing" on post-operation day 1. Nurse removed a plain gauze from the patient's vulva. The patient removed a raytec gauze from her vagina after discharged at home.

Key Contributing Factors:

1. Knowledge deficit in different types of gauze.
2. Unclear role delineation.

Recommendations:

1. Revise the "Preceptorship Program for Registered Nurse".
2. Develop a competency matrix for job delineation.

Case 19: Retained Guide Wire During Intravenous Infusion

A patient developed sepsis 2 weeks after Hartmann's operation for perforated sigmoid colon. Dr X inserted a triple lumen CVC under ultrasound guidance supervised by Dr Y, and succeeded at the second attempt. Intravenous infusion via the CVC was then started. Occlusion alarm of the infusion pump sounded repeatedly. After about 20 minutes, the CVC was removed and the guide wire was found inside it.

Key Contributing Factors:

1. Failure to hold the guide wire at all times during CVC placement.
2. Lack of visual inspection to check the integrity of the guide wire and verification by another doctor / nurse after CVC insertion procedure.

Recommendations:

1. Reinforce the importance of holding the end of the guide wire once seen emerging out from the distal lumen port.
2. Review the Bedside Procedure Checklist in Clinical Information System currently used by ICU to see if it contains all the salient guidelines in the hospital checklist including post-procedure checking ("sign out").
3. Check the correct number and integrity of guide wire by a second healthcare professional upon removal and before starting the CVC intravenous infusion.

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

7 of the 15 patient suicides cases were highlighted below:

Inpatient

Case 1

A patient had underlying chronic lung disease and was admitted for chest infection. One day after admission, doctor planned to discharge the patient. Patient was found hanged in the toilet after lunch.

Case 2

A patient, having bipolar affective disorder, was admitted for psychiatric care. Three weeks later, the patient was allowed strolling within hospital compound daily as part of clinical management. The patient was mentally stable, with no psychotic or depressive symptoms during his five months' hospital stay. One day, patient did not return to ward after his usual afternoon stroll and was found dead fallen from height at a building near hospital.

Case 3

A patient with advanced lymphoma was given chemotherapy with curative intent. The patient developed multiple complications: infection, gastrointestinal bleeding and partial intestinal obstruction. After starting the second cycle of chemotherapy, the patient developed neutropenic fever and was placed in a single room for reverse isolation. One day at about 5am, a patient care assistant found that the patient had committed suicide by suffocation.

Home Leave

Case 4

A schizophrenic patient had multiple admissions for psychiatric care over the last 27 years. Two months after the last hospital admission, the patient underwent different rehabilitation programs and attended full day training for occupational therapy. Patient was mentally stable and denied any psychotic symptoms. On day 119 after admission, both patient and family requested day leave. On day 121 after admission, patient was mentally stable and granted a day leave. Family reported that the patient had left home alone and jumped on the same day.

Case 5

A patient had stomach cancer with metastasis and was admitted repeatedly for symptoms of sub-acute intestinal obstruction. The patient was assessed by clinical psychologist and palliative care nurse. No suicidal risk was noted. Pain was assessed and managed accordingly and was "acceptable" by the patient. The patient was granted home leave with pain control medication (continuous morphine injection via a syringe driver). The patient returned to the hospital for shortness of breath on the next day. Two days later, the patient requested home leave again which was granted. The patient jumped from height on the same evening.

Case 6

A patient suffered from chronic pain and depression was admitted to a psychiatric hospital for suicidal attempt. Day leaves were granted since Day 10 after admission. The patient was mentally stable during the hospital stay. 6 months after admission, a day leave (9^{th} day leave) was granted for family gathering. Patient was found fallen from height at family's home.

Missing

Case 7

A patient attended emergency department for fever and chronic diarrhea. 10 days later, the patient was called back for increased white cell count and was then hospitalised. 3 days after admission, the patient was suspected to have a chronic illness and further investigations were required. The patient was found missing in ward at around 5am one day and hospital security helped searching for the patient. An hour later, police confirmed that the patient had fallen from height at a building near hospital.

Common Key Contributing Factors:

1. Presence of high risk facilities in old hospital premises.
2. Knowledge deficit on management of chronic illness.

Recommendations:

1. Conduct safety walk round to identify high risk facilities.
2. Submit renovation plan for improvement of patient toilet and bathroom.
3. Explore exit control to prevent patients from leaving hospital.
4. Provide training on management and counseling of patients with malignancy or chronic illness.
5. Enhance training on use of suicidal risk assessment tools.

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

Maternal Death

A maternal death due to HELLP syndrome was reported. HELLP syndrome is a group of symptoms that occur in pregnant women who have:

- H – Haemolysis;
- EL – Elevated Liver enzymes; and
- LP – Low platelet count.

Concluding Remarks:

The clinical management was reviewed and found to be appropriate.

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

Contaminated Lung Biopsy

Two patients had CT-guided lung biopsy performed in the Department of Radiology in the same morning. Pathology reports confirmed both patients had the same type of lung cancer. On subsequent assessment, one patient was referred to the Department of Cardiothoracic Surgery in another hospital for further management. The patient had surgical removal of the right lower lung lobe. Pathological examination of the excised lung tissue revealed features of tuberculous infection instead of lung cancer. Contamination of the patient specimen which led to the wrong diagnosis was confirmed by laboratory testing.

Key Contributing Factor:

The panel concluded that three factors might contribute to the contamination of the specimen, including biopsy collection, tissue wrapping and embedding in the laboratory.

Recommendations:

1. To ensure that specimen bottle will not be used once the seal is broken or removed; to eliminate the additional use of rinsing bottle for biopsy procedure; to label the specimen bottle once it's designated to a patient and to enhance the documentation of specimen nature and quantity.
2. To stagger the sequence of handling specimen of similar nature whenever possible and to facilitate the ease of single use of forceps in tissue wrapping and embedding.
3. To ensure adequate checking and traceability in laboratory, including double checking mechanism for tissue wrapping; and to ensure traceability in the entire specimen processing, in particular during tissue wrapping and embedding procedures.

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