# ANNUAL REPORT ON
# SENTINEL AND SERIOUS UNTOWARD EVENTS

## 1 October 2013 – 30 September 2014

## HOSPTIAL AUTHORITY
## HONG KONG

## January 2015

醫院管理局
HOSPITAL AUTHORITY

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# ACKNOWLEDGEMENT

This is the seventh Annual Report on Sentinel and Serious Untoward Events, which represents the HA-wide examination of patient safety incidents. It is important to realise that without the commitment of the dedicated people who work in the HA public hospital system, the information in this report would not be available.

We express sincere appreciation to all the hospitals and individuals who report the incidents and who share learning and feedback from their own organizational reviews. This will help us to focus on changes that are needed to provide the public with the safest possible patient care.

Our patients deserve nothing less.

Patient Safety and Risk Management Department
Quality and Safety Division

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# EXECUTIVE SUMMARY

This annual report summarized all Sentinel Events (SE) and Serious Untoward Events (SUE) reported between October 2013 and September 2014, of which 49 were SE and 94 were SUE. Compared with the last reporting period, there was a rise in SEs from 26 to 49 and a decrease in SUEs from 104 to 94.

**Sentinel Events**

2. The 49 SEs were equivalent to 2.5 per 1,000,000 episodes of patient attendances / discharges and deaths; 41 of them occurred in general acute hospitals with 24-hour accident and emergency (A&E) services.

3. The top three categories of SEs were "retained instruments or other material after surgery / interventional procedure" (20 cases), "death of an inpatient from suicide (including home leave)" (19 cases), and "medication error resulting in major permanent loss of function or death" (5 cases).

4. Other reported SEs were "surgery / interventional procedure involving the wrong patient or body part" (3 cases), "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).

5. Among the 49 SEs, 26 had resulted in mortality: 19 cases of "death of an inpatient from suicide (including home leave)", 5 "medication error resulting in major permanent loss of function or death", 1 "maternal death or serious morbidity associated with labour or delivery" and 1 death resulted from misplacment of nasogastric tube.

6. Of the remaining SEs, 16 had minor / insignificant consequence, and 7 had sustained major / moderate consequence.

7. Of the 20 “retained instruments or other material after surgery / interventional procedure” cases, 12 involved broken instruments / material and 8 were due to incorrect counting. Thirteen of them occurred outside operating theatre.

8. The 19 "death of an inpatient from suicide (including home leave)” events reported were equivalent to 1.8 per 100,000 inpatient admissions. In the general hospitals in the United States, the reported estimated inpatient suicide rates ranged from 5 to 15 per 100,000 admissions.

9. Seven of the 19 "death of an inpatient from suicide (including home leave)” events involved inpatients, 10 were patients on home leave and two were missing patients.

10. The overall assessment and management of the 19 SEs of "death of an inpatient from suicide (including home leave)” were generally considered to be appropriate.

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

## Serious Untoward Events

12. Of the 94 SUEs, 85 were “medication errors which could have led to death or permanent harm” and 9 were “patient misidentifications which could have led to death or permanent harm”.

13. The three most common medication errors were “known drug allergens (KDA)” (49 cases), “insulin” (11 cases) and “anticoagulants” (11 cases). Of all the KDA cases, 23 were related to Penicillin which was the most commonly involved drug.

14. Of the 94 SUEs, 85 had minor / insignificant consequence, 6 had sustained moderate consequence and 3 had temporary major consequence.

15. There were 2 medication errors occurred after the implementation of Inpatient Medication Order Entry (IPMOE) but both were unrelated to the system.

## CHAPTER 1

# INTRODUCTION

16. The Sentinel and Serious Untoward Event Policy (SE & SUE Policy) was implemented in 2010 (Annex I) which dictates hospitals to report Sentinel Events (SE) and Serious Untoward Events (SUE) and set up root cause analyses (RCA) panels. The RCA panels are tasked to review and identify the root causes and to make recommendations for hospital and HAHO management to improve patient safety.

17. This seventh annual report summarized and analysed the SE and SUE reported via the Advance Incident Reporting System (AIRS) between October 2013 and September 2014. The aim of publishing this Annual Report is to share the lessons learnt from SEs and SUEs with a view to improve quality patient-centred care through teamwork.

18. To facilitate understanding on the scope and definition of SEs and SUEs, we will use the following abbreviated caption, highlighted in orange, for categories of SEs and SUEs in the upcoming chapters:

**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]

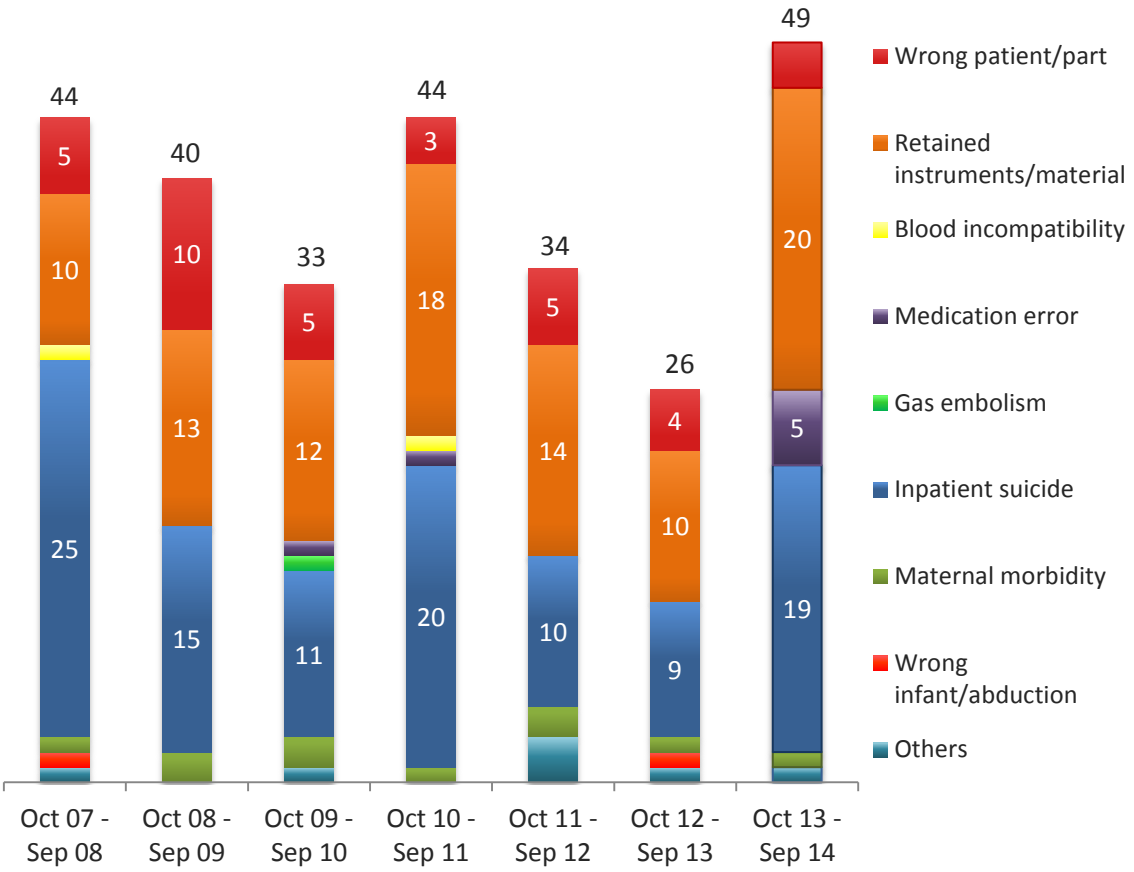
## CHAPTER 2

# SENTINEL EVENTS STATISTICS

### Yearly Trend

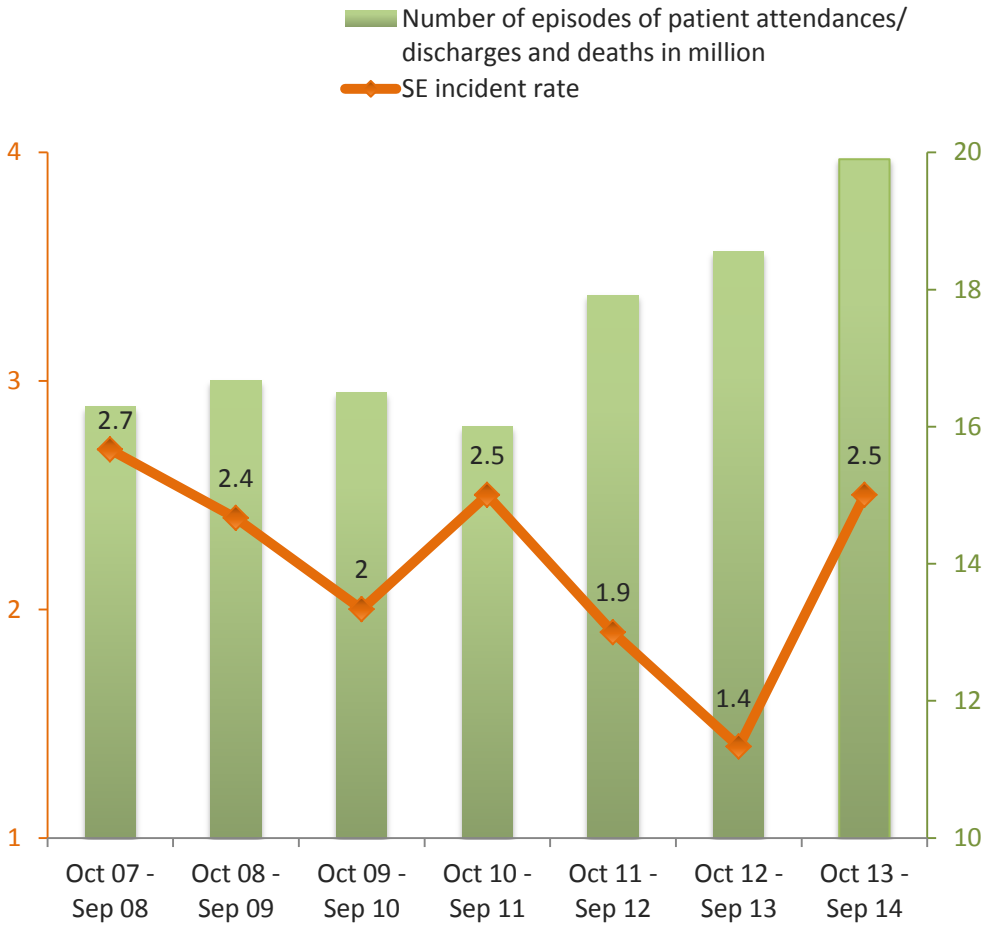
19. Since the implementation of SE Policy in October 2007, there were 270 SEs reported to date. Figure 1 showed the yearly distribution of SEs by category, with the total number of cases for each year and for the top three categories of the year indicated.

**Figure 1: Yearly distribution of SEs from Oct 07 to Sep 14 by category**



20. From October 2007 to September 2014, the annual number of episodes of patient attendances / discharges and deaths had increased from approximately 16 million to 20 million. The number of SEs increased in the current reporting period and it represented 2.5 SEs 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: The SE incident rates with the number of episodes of patient attendances / discharges and deaths in million from Oct 07 to Sep 14**



21. The yearly trend of SEs by category since October 2007 is depicted in Figure 3 and Table 1. Inpatient suicide (109 cases), retained instruments / material (97 cases) and wrong patient / part (35 cases) constituted most of the SEs reported.

22. The number of wrong patient / part kept decreasing from 10 cases in October 2008 – September 2009 to 3 this year. This was probably due to enhanced awareness and sustained vigilance of concerned stakeholders and the continuous system and process improvements in surgical safety.

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

**Figure 3: Yearly trend of SEs from Oct 07 to Sep 14 by category**

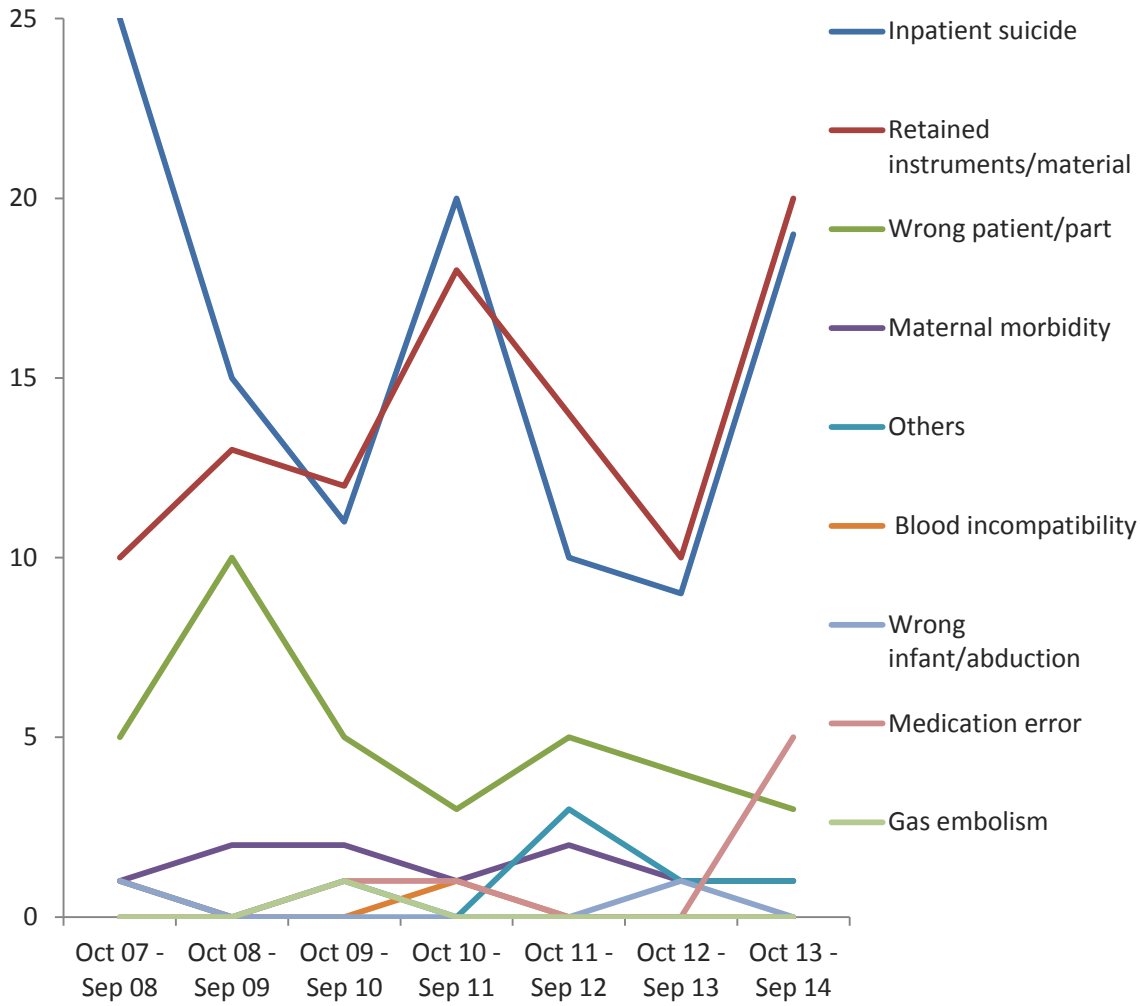


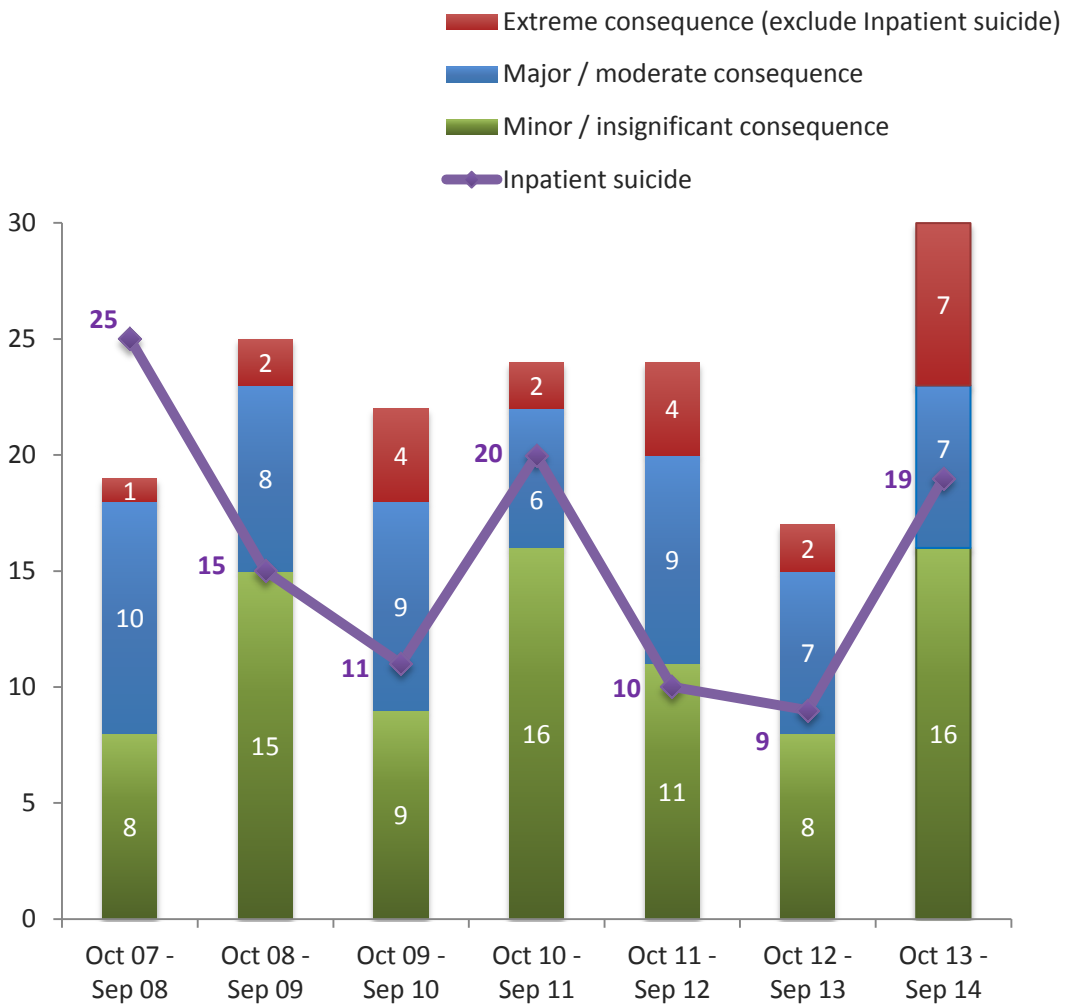
**Table 1: Number of SEs from Oct 07 to Sep 14 by category**

| Category of Sentinel Events | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | Total |
|---|---|---|---|---|---|---|---|---|
| Wrong patient/part | 5 | 10 | 5 | 3 | 5 | 4 | 3 | **35** |
| Retained instruments/ material | 10 | 13 | 12 | 18 | 14 | 10 | 20 | **97** |
| Blood incompatibility | 1 | 0 | 0 | 1 | 0 | 0 | 0 | **2** |
| Medication error | 0 | 0 | 1 | 1 | 0 | 0 | 5 | **7** |
| Gas embolism | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **1** |
| Inpatient suicide | 25 | 15 | 11 | 20 | 10 | 9 | 19 | **109** |
| Maternal morbidity | 1 | 2 | 2 | 1 | 2 | 1 | 1 | **10** |
| Wrong infant/abduction | 1 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Others | 1 | 0 | 1 | 0 | 3 | 1 | 1 | **7** |
| **Total** | **44** | **40** | **33** | **44** | **34** | **26** | **49** | **270** |

Note: The years represented Oct to Sep next year.

24. Of all 270 SEs reported since October 2007, 83 cases had minor or insignificant consequence (i.e. no injury sustained / minor injury), 56 sustained major / moderate consequence (i.e. temporary / significant morbidity) and 131 led to extreme consequence (i.e. major permanent loss of function / disability or death) (Figure 4). A description of the consequences was illustrated at Annex II.

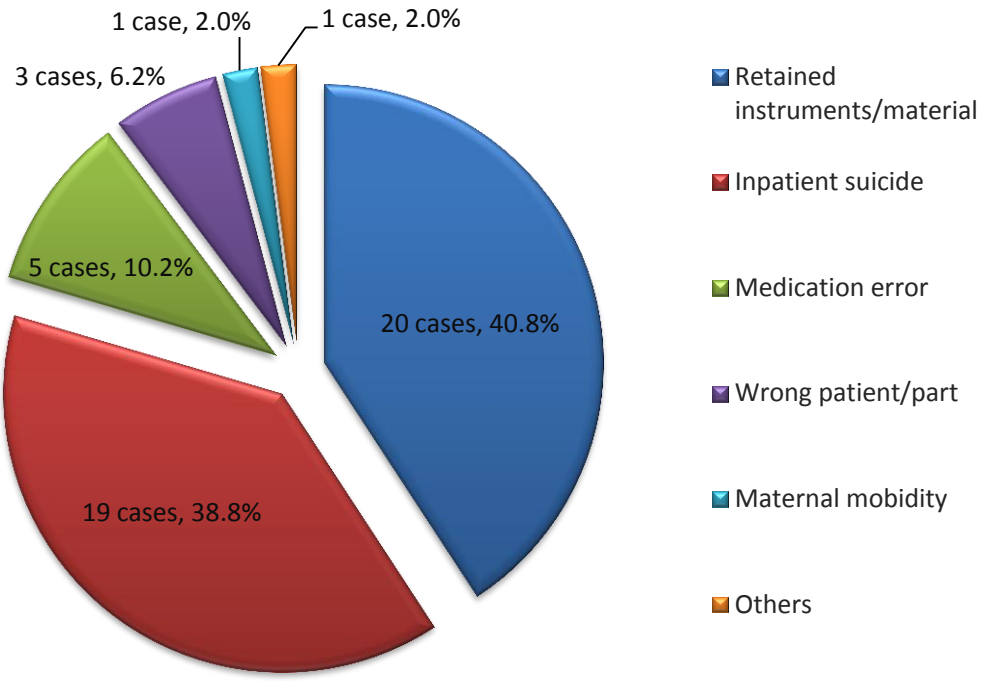
**Figure 4: Outcome of SEs reported from Oct 07 to Sep 14**



## Breakdown of SEs Reported between October 2013 and September 2014

25. The distribution of the 49 SEs by category reported was shown in Figure 5. The three most commonly reported categories of SEs were retained instruments / material (20 cases), inpatient suicides (19 cases) and medication errors (5 cases).

**Figure 5: Distribution of SEs reported between Oct 13 and Sep 14 by category**




26. Out of the 20 retained instruments / material, 12 involved broken instruments / material, while 8 were related to incorrect counting. Thirteen of them occurred outside operating theatre (Table 2).

**Table 2: Distribution of retained instruments / material between Oct 13 and Sep 14**

| | Broken instruments / material | Incorrect counting |
|---|---|---|
| In operating theatre | 5 | 2 |
| Outside operating theatre | 7 | 6 |
| **Total** | **12** | **8** |

27. The quarterly breakdown of the reported SEs by category in the same period was illustrated in Figure 6 and the monthly distribution was shown in Figure 7. There was no substantial variation in the number of SE between quarters and months.

**Figure 6: Quarterly breakdown of SEs between Oct 13 and Sep 14 by category**

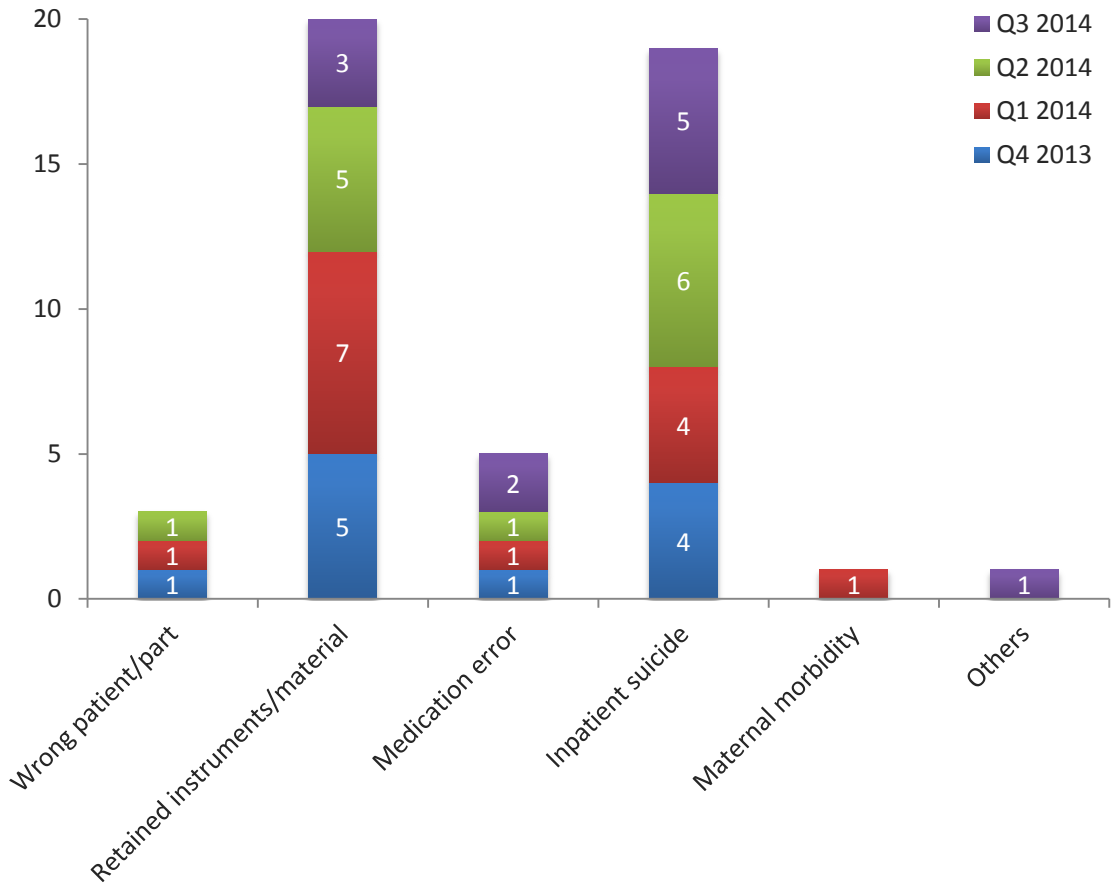
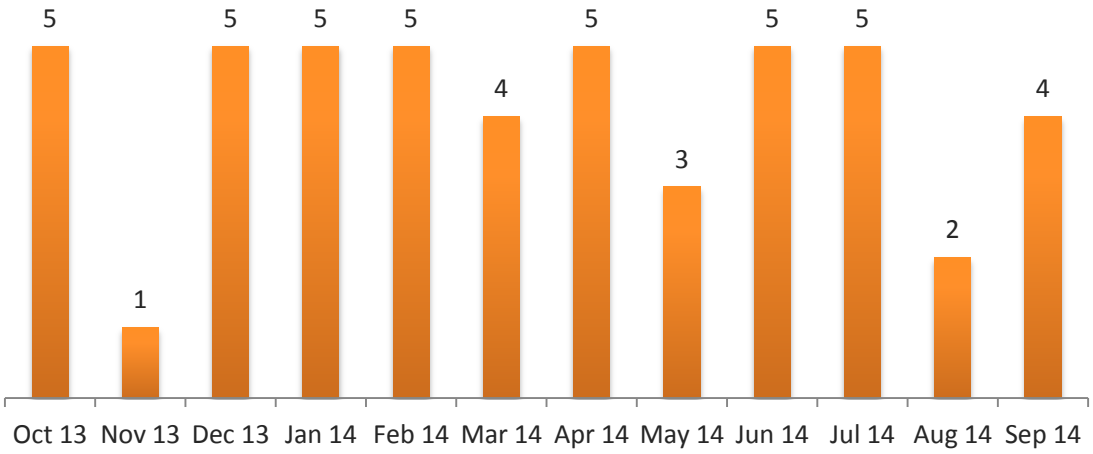



**Figure 7: Monthly distribution of SEs between Oct 13 and Sep 14**



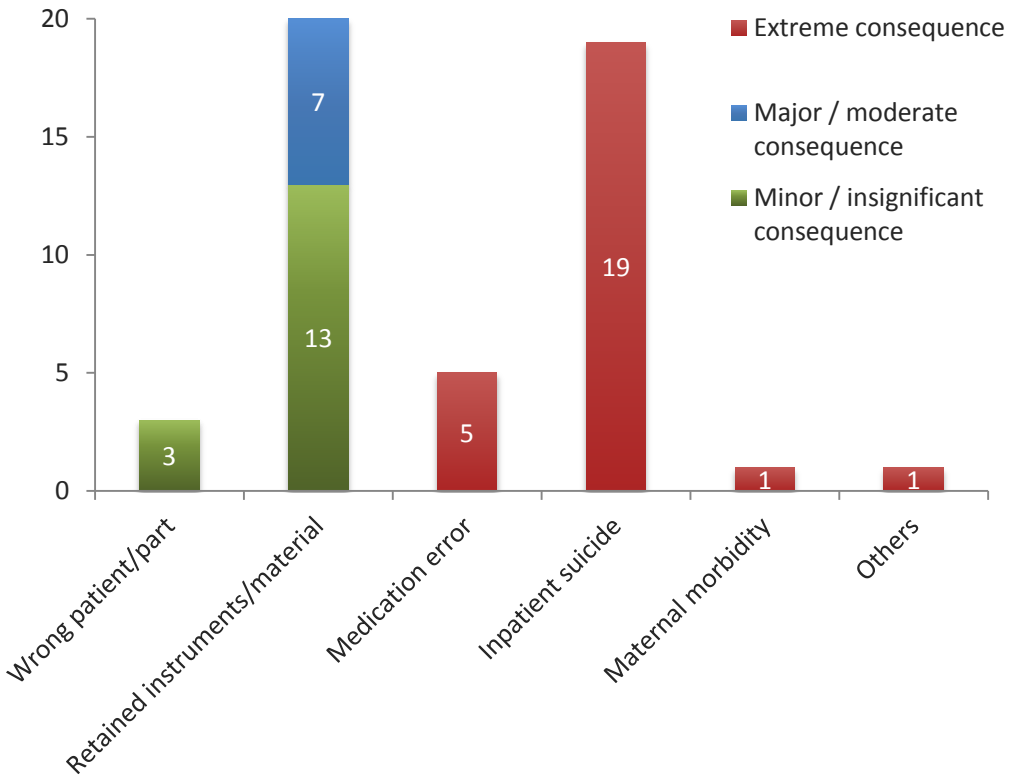
28. The following table showed the distribution of SEs in different hospital settings :

**Table 3: Distribution of SEs between Oct 13 and Sep 14 by hospital setting**

| Hospital Setting | Number of SE | Percentage |
|---|---|---|
| General acute hospitals with 24-hour A&E services | 41 | 83.7% |
| Hospitals with a mix of acute and non-acute services | 3 | 6.1% |
| Hospitals with a mix of acute and non-acute services and psychiatric service | 2 | 4.1% |
| Psychiatric hospitals | 2 | 4.1% |
| Acute hospitals of special nature | 1 | 2% |

29. Among the 49 SEs, 26 cases resulted in mortality: 19 cases of inpatient suicides, 5 medication errors, 1 maternal morbidity and 1 death resulted from misplacement of nasogastric tube. 16 cases of the SEs had minor / insignificant consequence, and 7 cases had sustained major / moderate consequence (Figure 8).

**Figure 8: Outcome of SEs reported between Oct 13 and Sep 14 by category**



## International Sentinel Event Reporting

30. In the United States, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) reviewed 887 SE cases in 2013 and 394 from January to June 2014.[1] The higher 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 that of Western Australia (DH West Australia) was 19 in the same period.[2,3] Notwithstanding the small figures, the relative incident rates of SEs in DH Victoria and DH West Australia were 23.0 and 29.5 per 1,000,000 episodes of care to inpatients respectively.[4,5]

31. Compared with the Australian data, HA had a relatively low SE of 2.5 per 1,000,000 episodes of patient attendances / discharges and deaths (Table 4).

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

| | HA, Hong Kong (Oct 13 – Sep 14) | DH Victoria, Australia (Jul 12 – Jun 13)[4] | DH West Australia, Australia (Jul 12 – Jun 13)[5] |
|---|---|---|---|
| Number of SEs / 1,000,000 patient episodes | 2.5 | 23.0 | 29.5 |

[1] The US Joint Commission, Summary Data of Sentinel Events Reviewed by The Joint Commission: as of June 30, 2014.
[2] Supporting Patient Safety – Sentinel Event Program Annual Report 2011-12 and 2012-13. Department of Health, State Government of Victoria, Australia.
[3] An Integrated Approach to Patient Safety Surveillance in WA Hospitals, Health Services and the Community: 2013. 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 643,834 episodes of care to inpatients in 2012-13 (An Integrated Approach to Patient Safety Surveillance in WA Hospitals, Health Services and the Community: 2013).

32. Table 5 listed the three most common types of SEs reported in HA as compared to that of DH Victoria and DH West Australia. Similar to HA, "inpatient suicide", "retained instruments" and "medication error" were the most commonly reported SEs in Australia.

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

| HA, Hong Kong (Oct 13 – Sep 14) | DH Victoria, Australia (Jul 12 – Jun 13) | DH West Australia, Australia (Jul 12 – Jun 13) |
|---|---|---|
| Retained instruments /material after surgery / interventional procedure (20 cases, 40.8%) | Other catastrophic events including complications (17 cases, 50%) | Suicide of a patient in an inpatient unit (10 cases, 53%) |
| Death of an inpatient from suicide (including home leave) (19 cases, 38.8%) | Suicide in an inpatient unit (9 cases, 26%) | Retained instruments or other material after surgery requiring re-operation or further surgical procedure (3 cases, 16%) |
| Medication error resulting in major permanent loss of function or death (5 cases, 10.2%) | Retained instruments or material (6 cases, 18%) | Medication error resulting in death of a patient (3 cases, 16%) |

33. 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]

34. The 19 inpatient suicides in HA were equivalent to 1.8 per 100,000 inpatient admissions which was lower than that of the general hospitals in the U.S.[7]

[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.

[7] The overall inpatient discharge episodes in HA was 1,043,955 between October 2013 and September 2014.

## CHAPTER 3

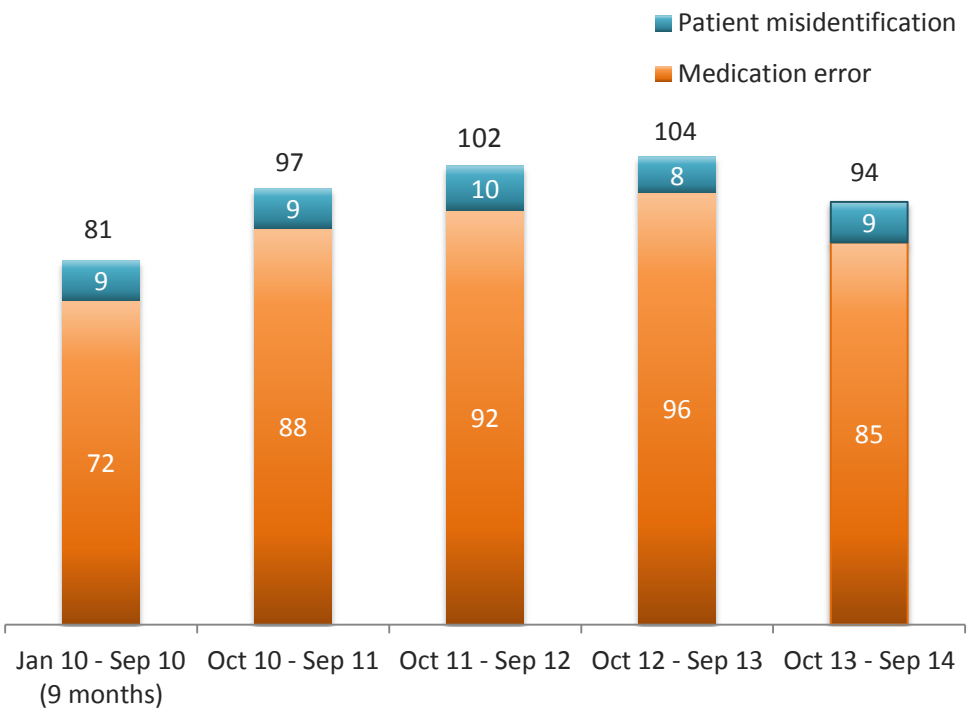
# SERIOUS UNTOWARD EVENTS STATISTICS

### Yearly Trend

35. A total of 94 SUEs were reported between October 2013 and September 2014, revealing a substantial decrease from the past three years. Since the implementation of the SE & SUE Policy in January 2010, a total of 478 SUEs had been reported to date. The yearly distribution of SUEs by category since 2010 was depicted in Figure 9, with the total number of cases each year shown at the top of each bar.

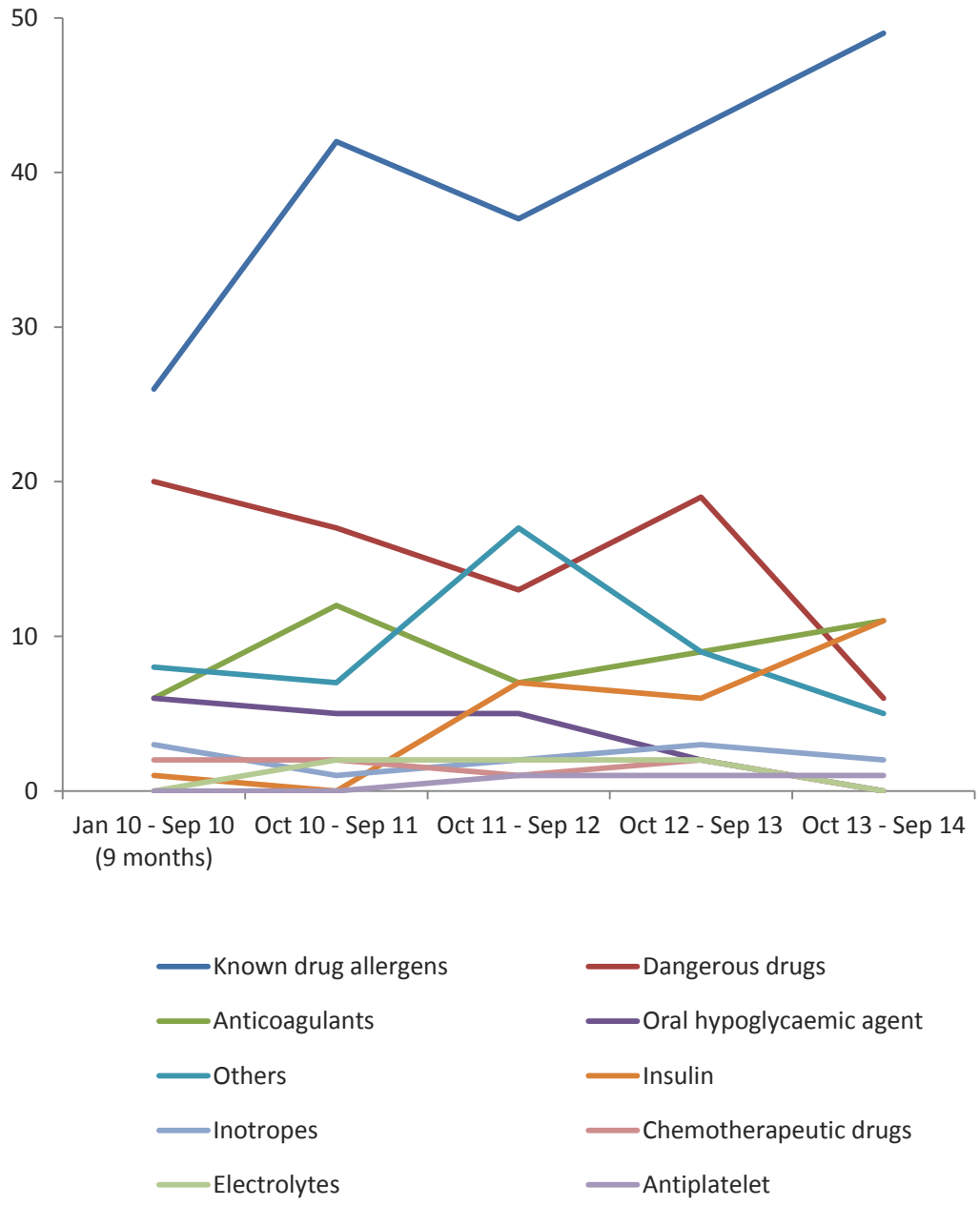
36. Of the 94 SUEs reported this year, 85 cases were due to medication error and 9 cases involved patient misidentification.

**Figure 9: Yearly distribution of SUEs from Jan 10 to Sep 14 by category**



37. The yearly trend of the common drugs involved in medication error was depicted in Figure 10. SUEs involving medications like anaesthetics, neuromuscular blocking agent and vancomycin were grouped under others.

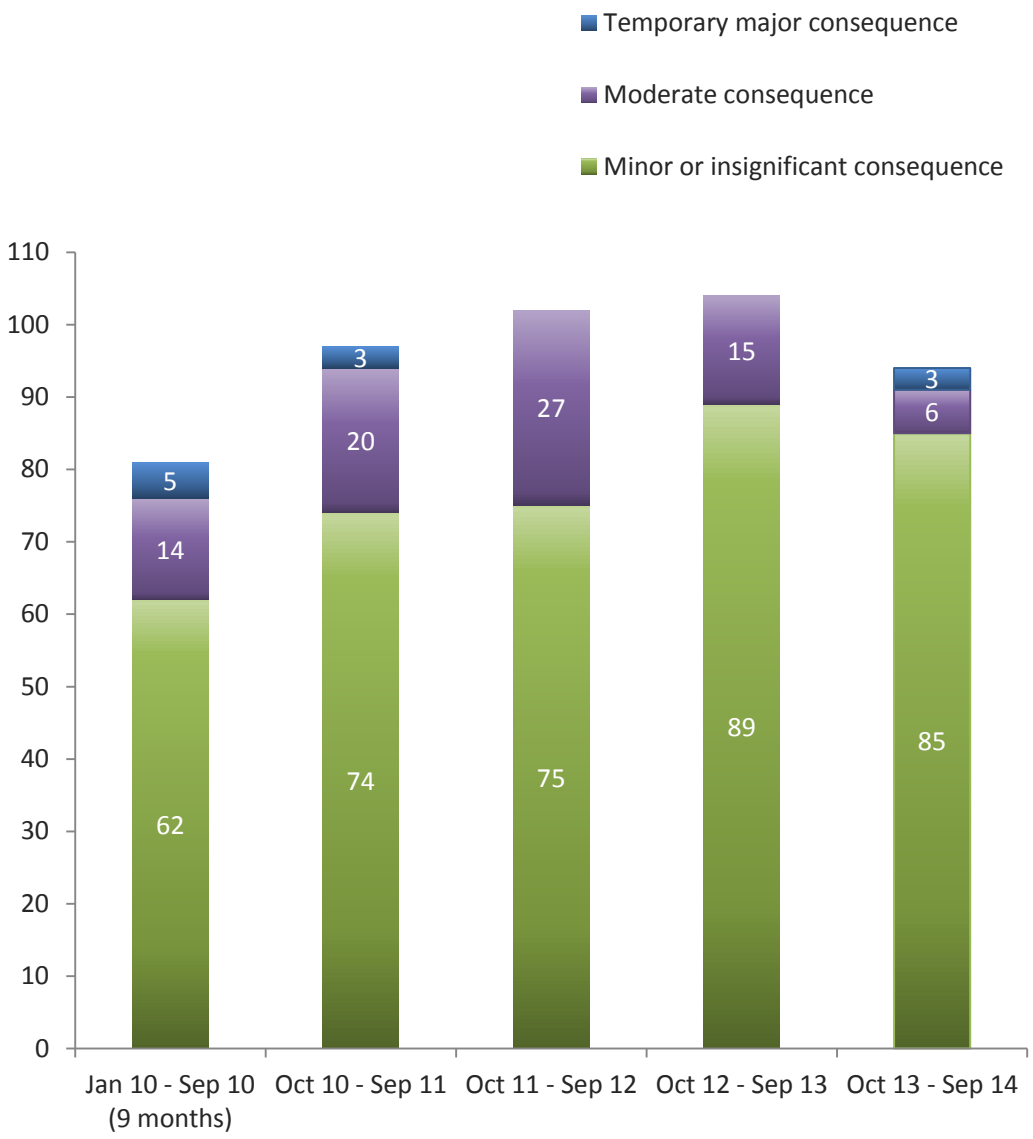
**Figure 10: Yearly trend of common drugs involved in medication incidents from Jan 10 to Sep 14**



38. 385 cases had minor or insignificant consequence, 82 cases had sustained moderate consequence and 11 cases resulted in temporary major consequence (Figure 11).

39. There was a significant decrease in the number of SUEs having moderate or temporary major consequence between October 2013 and September 2014.

**Figure 11: Outcome of SUEs reported from Jan 10 to Sep 14**



## Breakdown of SUEs Reported between October 2013 and September 2014

40. The quarterly breakdown and monthly distribution of SUEs reported were illustrated in Figure 12 and 13 respectively.

**Figure 12: Quarterly breakdown of SUEs between Oct 13 and Sep 14 by category**

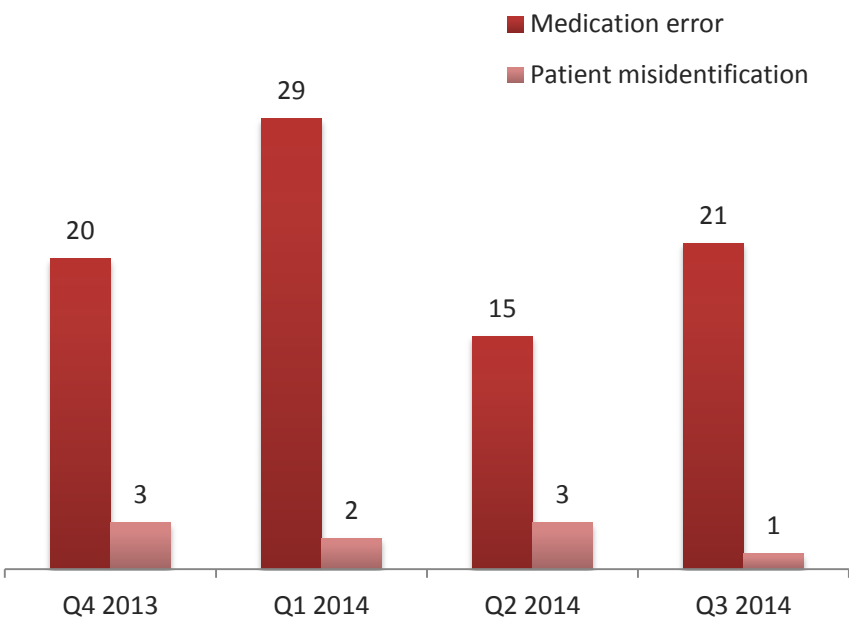
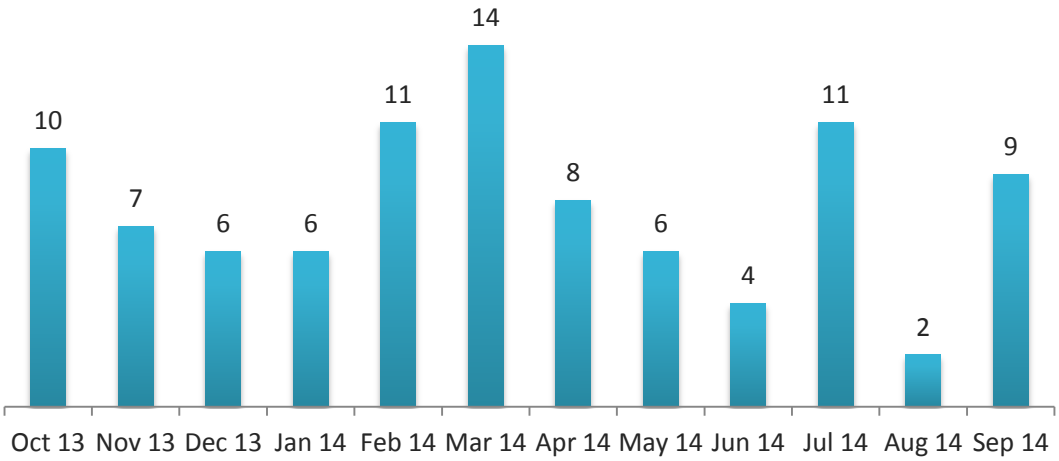


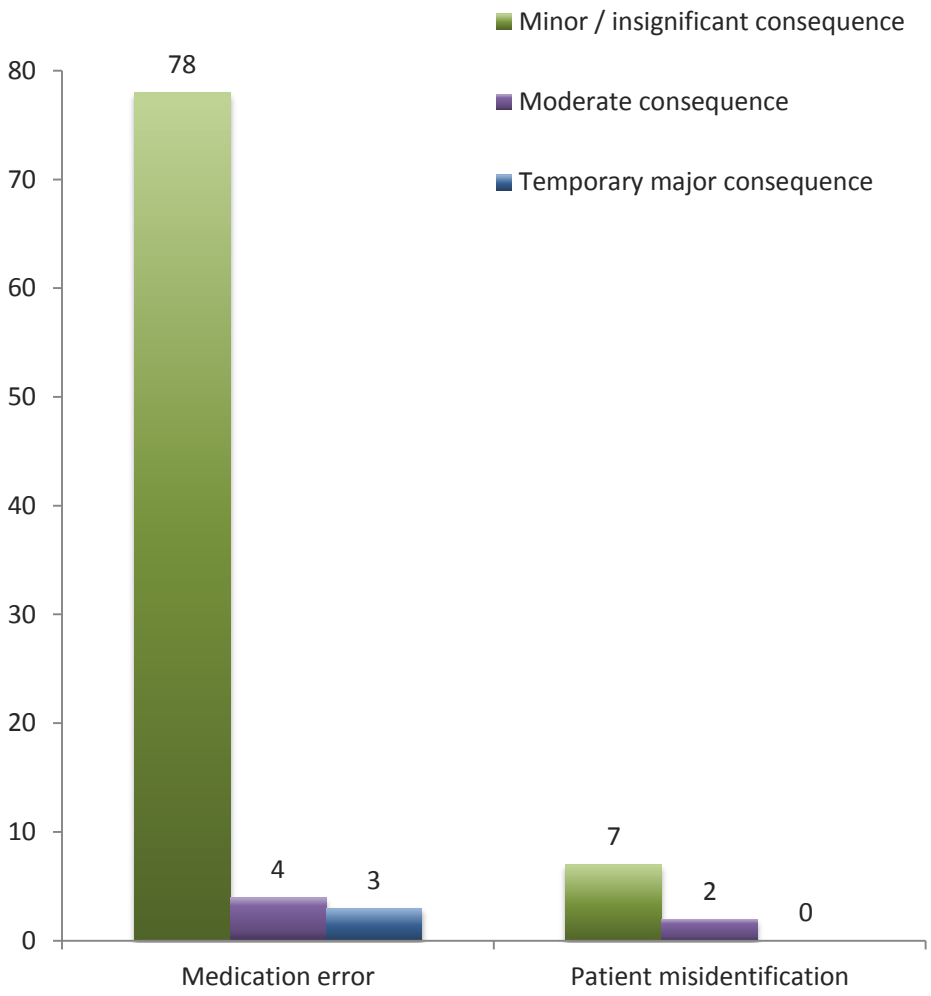

**Figure 13: Monthly distribution of SUEs between Oct 13 and Sep 14**



41. 85 cases of SUEs had minor / insignificant consequence, 6 cases had sustained moderate consequence and 3 cases resulted in temporary major consequence.

42. As shown in Figure 14, there was no patient misidentification case resulted in temporary major consequence.

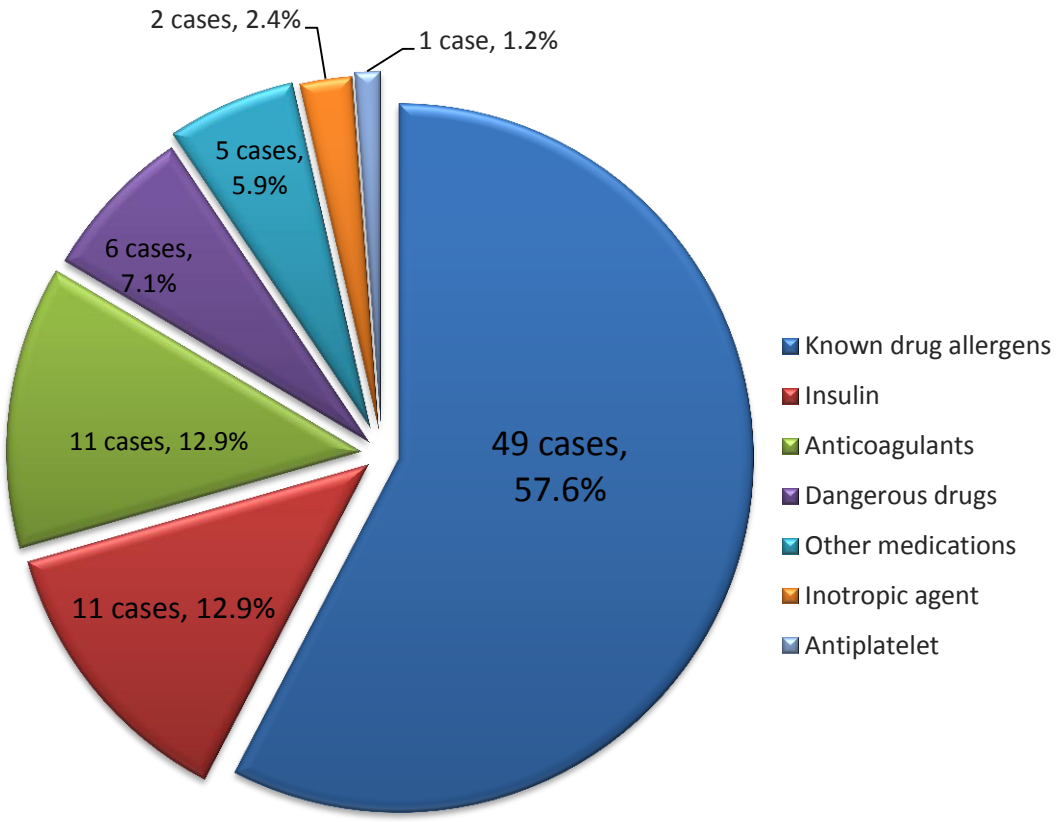
**Figure 14: Outcome of SUEs reported between Oct 13 and Sep 14 by category**



**Medication Error which Could Have Led to Death or Permanent Harm**

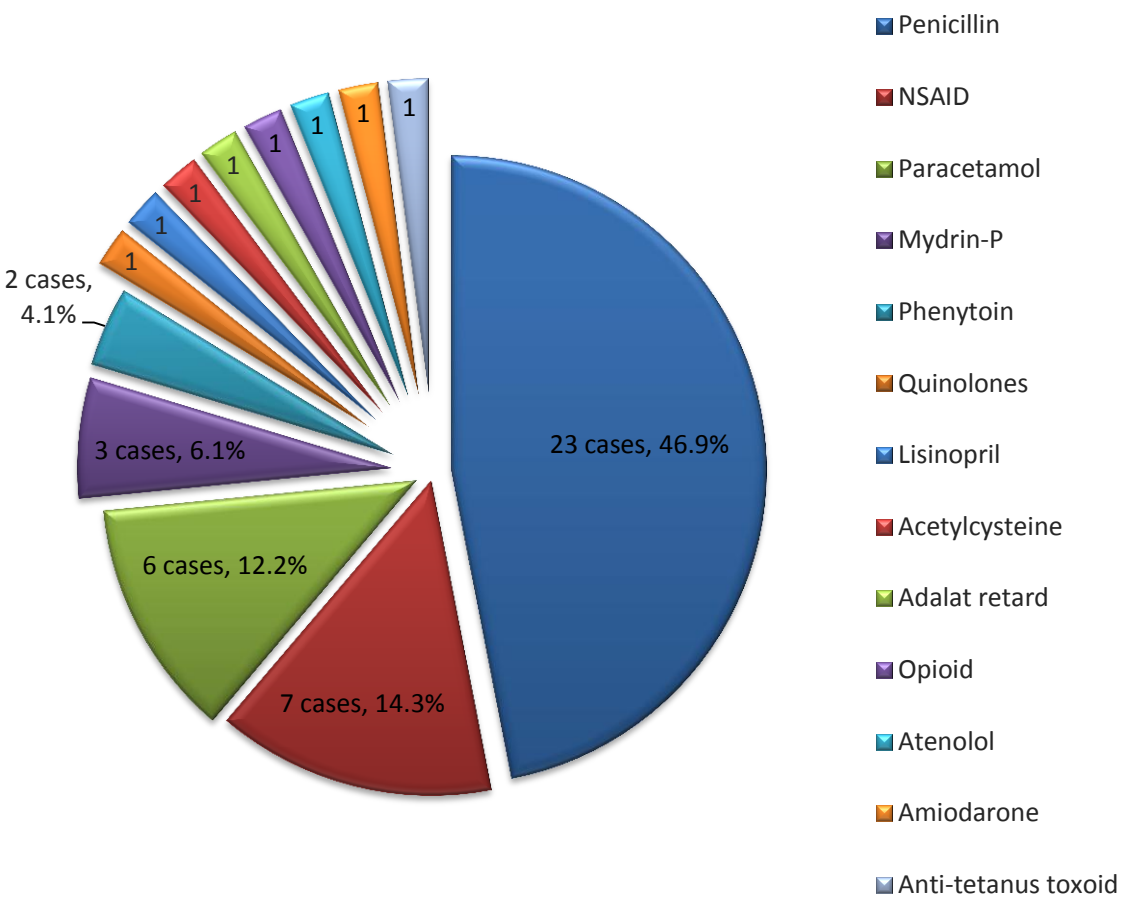
43. The three most common medication errors were "known drug allergens (KDA)" (49 cases), "insulin" (11 cases) and "anticoagulants" (11 cases). The distribution of medication error was shown in Figure 15.

**Figure 15: Distribution of medication error reported between Oct 13 and Sep 14**



44. Of the 49 medication errors related to KDA, the three most commonly involved drugs were penicillin (23 cases), non-steroidal anti-inflammatory drug (NSAID) (7 cases) and paracetamol (6 cases). These three drug groups constituted 73.4% of the total KDA incidents. The distribution of drugs related to KDA was shown in Figure 16.

**Figure 16: Distribution of drugs related to KDA between Oct 13 and Sep 14**




45. Of the 49 KDA, 46 patients had no allergic reactions or minor / insignificant consequence. Of the 3 patients developed allergic symptoms such as skin rash, mild redness, mild numbness and itchiness, 2 had moderate consequence and 1 sustained temporary major consequence. The drugs involved in these 3 cases were penicillin and NSAID.

46. The drugs involved in other drug groups of medication error cases, their respective number of cases and those resulted in moderate or temporary major consequence were summarized in Table 6.

**Table 6: Drugs involved in medication error (excluding KDA) between Oct 13 and Sep 14**

| Drug Group | Drugs involved in Medication Error | No. of Cases | Moderate/Temporary Major Consequence |
|---|---|---|---|
| Insulin | Actrapid | 6 | moderate (1 case) |
| | Protaphane | 4 | - |
| | Lantus | 1 | - |
| Anticoagulants | Warfarin | 6 | - |
| | Heparin | 2 | - |
| | Enoxaparin | 1 | - |
| | Rivaroxaban | 1 | - |
| | Dabigatran | 1 | - |
| Dangerous Drugs | Midazolam | 3 | - |
| | Morphine | 2 | - |
| | Alfentanyl | 1 | - |
| Inotropic Agents | Dopamine | 1 | temporary major |
| | Noradrenaline | 1 | moderate |
| Antiplatelet | Plavix | 1 | - |
| Others | Vancomycin | 3 | - |
| | Chloral Hydrate | 1 | temporary major |
| | Amiodarone | 1 | - |
| **Total** | | **36** | |

**Patient Misidentification which Could Have Led to Death or Permanent Harm**

47. There were 9 SUEs reported which were due to patient misidentification. These included 5 cases of patient misidentification during drug administration, 2 cases of patient misidentification in Clinical Management System (CMS) – Electronic Patient Record (ePR) summary and 2 cases of misfiling patient's laboratory report leading to inappropriate or unnecessary treatment. The quarterly distribution of these cases and their consequences were summarized in Table 7 and 8 respectively.

**Table 7: Quarterly distribution of patient misidentification cases between Oct 13 and Sep 14**

| Description | Q4 2013 | Q1 2014 | Q2 2014 | Q3 2014 |
|---|---|---|---|---|
| Patient misidentification during drug administration | 3 | 1 | 0 | 1 |
| Patient misidentification in CMS – ePR summary | 0 | 1 | 1 | 0 |
| Misfiling patient's laboratory report leading to inappropriate or unnecessary treatment | 0 | 0 | 2 | 0 |

**Table 8: Consequences of patient misidentification cases between Oct 13 and Sep 14**

| Description | Minor / Insignificant Consequence | Moderate Consequence |
|---|---|---|
| Patient misidentification during drug administration | 3 | 2 |
| Patient misidentification in CMS – ePR summary | 2 | 0 |
| Misfiling patients' laboratory report leading to inappropriate or unnecessary treatment | 2 | 0 |

## CHAPTER 4

# ANALYSIS OF SENTINEL EVENTS

48. In this chapter, each category of SEs reported between October 2013 and September 2014 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 were 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 SEs is shown at Annex III.

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| ***Wrong patient / part (3 cases)*** | | |
| **Communication** | - Unclear role delineation in conducting "Time Out" procedure | - Redesigned the "Time Out" procedure to ensure participation of all team members and the patient, whenever possible, in safety checks |
| **Knowledge / skills** | | |
| **Work environment / scheduling** | - Poor lighting when "Time Out" was conducted | - Provided adequate lighting at the time of procedure |
| **Equipment** | | |
| **Policies / procedures / guidelines** | - Absence of guidelines or protocol on how to conduct the procedural checklist<br>- Improper implementation of procedural checklist | - Developed guideline / protocol to ensure staff compliance with the 3 phases (namely, "Sign In", "Time Out" and "Sign Out") of the procedural checklist |

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| ***Retained instruments / material – broken (12 cases)*** | | |
| **Communication** | - Inadequate documentation of surgical drain (length and number of side holes created) used<br>- The record on instrument used was not ready for checking at the end of procedure<br>- Role delineation of staff for surgical safety check was not clear | - Enhanced documentation of wound drain in both the operation record and nursing record<br>- Assigned designated staff and strengthened checking of instruments / material integrity and completeness<br>- Conducted team meetings on role of checking for surgical safety<br>- Reinforced the "speak-up" and "always-kept-informed" culture in the operating theatre |
| **Knowledge / skills** | - Inadequate intra-operative X-ray examination<br>- Trapping of the drainage catheter by a skin stitch<br>- Use of unfamiliar device, e.g. peripherally inserted central catheter (PICC) | - Arranged X-ray examination before implant removal<br>- Encouraged testing the resistance of drainage catheter when anchoring it<br>- Provided orientation<br>- Deployed a designated team to perform procedures using new or complex device and avoided the use of different brands of product for the same procedure |
| **Work environment / scheduling** | | |
| **Equipment** | - Metal fatigue of instruments<br>- Unsatisfactory alignment between metal surfaces of the instrument used in the broaching process | - Alerted staff on the risk of metal fatigue of implants<br>- Sent feedback to the manufacturer to review instrument design for facilitating anchorage and alignment<br>- Updated the existing instrument defect database for high-risk items<br>- Developed a tracking system for detection and replacement of fatigue instruments |
| **Policies / procedures / guidelines** | - Lack of a standardized guideline on endotracheal tube (ETT) shortening and surfactant administration | - Developed a guideline on ETT shortening and surfactant administration |

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| ***Retained instruments / material – incorrect counting (8 cases)*** | | |
| **Communication** | - Lack of clear documentation on the number of wound packing materials packed and removed in wound after the wound dressing procedure<br>- Misinterpretation of the "dressing" gauze as the "packed" gauze | - Strengthened documentation of dressing or packing materials from time of packing to removal, including number of pieces removed and verified against patient's medical record<br>- Performed and signed the counter-checking process by the SAME nurse |
| **Knowledge / skills** | - Small size gauze was used for packing into a relatively big wound | - Used appropriate type and size of dressing material and wound packing method |
| **Work environment / scheduling** | | |
| **Equipment** | | - Used alternative syringe that could reduce the chance of dislodging of catheter tip during operation |
| **Policies / procedures / guidelines** | - Non-compliance with standard practice of confirming surgical packs count before procedure and after removal<br>- Angiocatheter (used with syringe for irrigation during operation) was not included in the accountable item list | - Reviewed the counting mechanism, counting form and documentation of retained materials including added consumables, all gauzes and pads used and packed inside the wound in relevant procedures<br>- Redesigned the "wound assessment form" to include elements of wound management plan<br>- Designed a stamp / label to facilitate documentation on the counting of wound packing materials |
| ***Medication error (5 cases)*** | | |
| **Communication** | - No "Single Use / Fixed Period" and indication for steroid therapy were documented in the initial prescription of steroid therapy in Medication Order Entry (MOE)<br>- Communication breakdown between hospitals on post-percutaneous coronary intervention (PCI) follow up arrangement | - Enhanced the MOE system to prompt the prescriber to verify whenever "long-term" steroid was prescribed and state the intended duration of the steroid therapy<br>- Strengthened communication between the referring hospital and the hospital offering PCI procedure |

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| **Knowledge / skills** | | |
| **Work environment / scheduling** | - Doctors unfamiliar with the post-PCI antiplatelet agent prescription were delegated to follow up patient with PCI done in another hospital | - Revamped the "Alert" system in Clinical Management System (CMS) to specify the regimen and duration of antiplatelet agents to be prescribed for post-PCI patient |
| **Equipment** | | |
| **Policies / procedures / guidelines** | - A high risk cardiac patient had the procedure performed at an out-patient setting where close monitoring was difficult<br>- No formal departmental policy on follow up arrangements for patients with PCI performed in another hospital<br>- Non-compliance with guideline on the use of infusion pump, i.e. confirm the correct infusion rate before starting infusion | - Enhanced identification of high risk patients such as reviewing data collection during computed tomography (CT) booking<br>- Developed a departmental workflow and set up a designated clinic in hospitals to follow up patients after PCI<br>- Reinforced adherence to the guideline on the safe use of infusion pump and reviewed the intravenous drug administration procedure to ensure compliance with "5-rights[8]" |
| ***Inpatient suicide (19 cases)*** | | |
| **Communication** | - Patients' suicidal ideas and plans were unnoticed<br>- Inadequate communication among patients, families and staff | - Reinforced healthcare teams to be vigilant about suicidal risks from patient's expressions and behaviour<br>- Strengthened communication with patients' families on suicidal thoughts and alertness to patients' behaviour<br>- Enhanced the telephone home caring and support service to provide better follow up care during home leave |
| **Knowledge / skills** | | |
| **Work environment / scheduling** | - Presence of environmental risks in patients' toilets / bathrooms | - Minimized any potential anchorage for hanging in toilets / bathrooms |

[8] According to the HA Guideline on Medication Management Administrative Guideline 2012, "5 rights" are right patient, right drug, right route, right dose and right time.

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| **Equipment** | | |
| **Policies / procedures / guidelines** | - Delay in reactivating suicide precaution measures when patients had unstable emotions<br>- Ineffective actions to verify whether a patient was missing during home leave | - Initiated timely referral of at risk patients to palliative care or spiritual support service<br>- Standardized the instructions for handling reports of patients being found missing during home leave |
| ***Others (1 case)*** | | |
| **Communication** | | |
| **Knowledge / skills** | - Misinterpretation of the position of nasogastric (NG) tube | - Consulted gastroenterologist after repeated failures in inserting a NG tube<br>- Included interpretation of X-ray for confirmation of NG tube position in the orientation program for medical trainees |
| **Work environment / scheduling** | | |
| **Equipment** | | |
| **Policies / procedures / guidelines** | | - Promulgated and reinforced the guidance for verifying correct placement of NG tubes |

49. There was one case of maternal morbidity and post-mortem examination revealed that the patient had amniotic fluid embolism.

50. For this maternal morbidity case, the RCA panel concluded that amniotic fluid embolism was a rare but known complication of pregnancy. The treatment and care provided to the patient was found to be timely and appropriate.

## CHAPTER 5

# ANALYSIS OF SERIOUS UNTOWARD EVENTS

51. As mentioned in chapter 3, known drug allergens (KDA) constituted more than half (57.6%) of all the SUEs reported between October 2013 and September 2014. Its common contributing factors and recommendations taken to prevent further recurrence were summarized below. Similar to SEs, SUEs were 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 (49 cases)*** | | |
| **Communication** | | |
| **Knowledge / skills** | - Lack of knowledge on ingredients of over-the-counter drug, e.g. Saridon contains paracetamol, caffeine and propyphenone | - Designed easy reference materials for over-the-counter drugs to raise staff awareness on KDA |
| **Work environment / scheduling** | | |
| **Equipment** | - The drug allergen was entered in free text in CMS which was not subject to system checking for allergy | - Entered the drug allergen in the structured data fields in CMS<br>- Added the link of drug search website provided by Department of Health on the drug allergen page of CMS |

| Factors | Common Contributing Factors | Recommendations |
|---|---|---|
| **Policies / procedures / guidelines** | - Use of ward stocks and left-over drugs from other patients bypassed the vetting system of the pharmacy<br>- Incorrect assumption of valid prescription without checking for the doctor's signature before drug administration<br>- Non-compliance with the "5 rights" principle<br>- Lack of standard good practice on handling un-prescribed drug on the pre-printed Medication Administration Record (MAR) | - Reminded staff not to use left-over drugs from other patients<br>- Reinforced the checking of valid prescription before drug dispensing and administration<br>- Reinforced HA guideline on KDA checking<br>- Established a standardized good practice on handling inappropriate items on the pre-printed MAR |

52. Apart from the above, HAHO had also taken the initiative to develop the Inpatient Medication Order Entry (IPMOE) system. The system is expected to minimize medication error by:

- Re-engineering workflow with the aid of bar-code technology or other advanced technology to enable treatment-patient identification;
- Abolishing transcription error & time lag error by closing the loop of prescribing, dispensing and administering;
- Enabling clinical decision support by providing alerts & information in a timely & context-sensitive manner; and
- Automatic dosage calculation and adjustment.

53. IPMOE had been rolled out in phases since April 2013 for target completion by 2019. During this reporting period, with the IPMOE implemented, there were occurrences of 2 medication errors but both were unrelated to the system.

## CHAPTER 6

# THE WAY FORWARD

54. The increase in the number of SEs, "retained instruments or other material after surgery / interventional procedure" in particular, requires relentless effort in improvement. In view of the changing nature of these incidents, focus will be put on procedures performed outside operating theatre and checking of the completeness of instruments on removal.

55. Over the years, HA has learned substantially from reported SEs and SUEs. We will continue to build learning platforms for rapid dissemination of lessons learned from individual incidents to other hospitals. This will involve active engagement of cluster Service Directors in Quality & Safety to put across patient safety messages in a timely, clear and unambiguous way for further articulation to HA colleagues of all levels. Diversified topics for seminars and overseas training will be organized to equip our staff on various issues related to patient safety in order to meet the need of the ever-changing healthcare environment.

56. Communication is a vital element in patient safety. It is of paramount importance to get the necessary patient safety messages across to all concerned stakeholders. However, the means of communication is forever evolving. Innovative ideas for communication and sharing of important messages on patient safety utilizing the latest technology are being explored. Animated graphics with catchy and concise messages are being developed for promoting surgical safety. They will be ready for rolling out in 2015.

57. Patient safety can be improved by the appropriate use of well-designed technology. A good example is the implementation of the Inpatient Medication Order Entry (IPMOE) system to enhance medication safety by using information technology to support clinical workflow and reduce errors in medication prescription

and transcription. To be prudent, HA will observe if any new risk will occur by adopting this technology.

58. The Patient Safety and Risk Management Department welcomes the recent release of the government consultation document on the regulatory review for private healthcare facilities with a view to strengthening regulation and enhancing standard. This review will focus on high-risk medical procedures and patient safety including medical incidents reporting, which HA attaches great importance to investigation of root causes and open disclosure. These measures will help strengthening HA clinical incident management system in enhancing patient safety, transparency and quality of healthcare services for the benefits of our patients.

# ANNEXES

# ANNEX I

## HA SENTINEL AND SERIOUS UNTOWARD EVENT POLICY

### 1. Purpose

The Sentinel and Serious Untoward Event Policy defines the process for identification, reporting, investigation and management of Sentinel Events (SE) and Serious Untoward Events (SUE) 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

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

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

iii. ABO incompatibility blood transfusion.

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

v. Intravascular gas embolism resulting in death or neurological damage.

vi. Death of an inpatient from suicide (including home leave).

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

viii. Infant discharged to wrong family or infant abduction.

ix. Other adverse events resulting in permanent loss of function or death (excluding complications).

4.2 Serious Untoward Events

i. Medication error which could have led to death or permanent harm.

ii. Patient misidentification which could have led to death or permanent harm.

## 5. Management of SE and SUE

5.1 Immediate response upon identification of an 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 RCA panel in the 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 Half-year Report (to public) and follow-up visits.

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

# ANNEX II

## DESCRIPTIONS OF CONSEQUENCES

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

| Categories of Consequences | Severity Index of Incident | Description |
|---|---|---|
| ***Serious Untoward Events*** | | |
| **Minor / Insignificant** | 1 | - Incident occurred (reached patient) but no injury sustained<br>- Monitoring may be required<br>- No investigation or treatment required |
| | 2 | - Minor injury<br>- Monitoring, investigation or minor treatment required<br>- No change in vital signs |
| **Moderate** | 3 | - Temporary morbidity<br>- Monitoring, investigation or simple treatment required<br>- Some changes in vital signs |
| **Temporary Major** | 4 | - Significant morbidity<br>- Transfer to a higher care level, emergency treatment, surgical intervention or antidote required<br>- 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 Side Fine Needle Aspiration**

A female patient attended Diagnostic Radiology Department for a scheduled ultrasound-guided (USG) fine needle aspiration (FNA) of her LEFT breast nodule. On arrival, the attending nurse checked the patient's identity and read the referral form indicating the site of FNA was 'L2-3H'. The patient stated that she was going to have FNA on the RIGHT side and she was positioned by the attending nurse with RIGHT breast exposed. The radiologist then performed an ultrasound examination on the patient's RIGHT breast but unable to identify any lesion at the 2 – 3 o'clock area. Nevertheless, he performed FNA targeting the background breast tissue. The nurse recognized that a wrong side procedure was performed after cross-checking the request form with the radiographer. The incident was being explained to the patient and FNA on the LEFT side lesion was performed.

***Key Contributing Factors:***

1. Unclear role delineation while conducting the "Time Out" procedure.
2. No verification of the operation side before the procedure.

***Recommendations:***

1. Update the "Time Out" procedure guidelines to better define the roles of team members.
2. Revise the "Time Out" checklist to include verification in side-specific procedures.
3. Reinforce training of staff on vigilant adherence to standard of practice.

**Case 2: Wrong Side Procedure**

A patient attended eye clinic for laser treatment of RIGHT eye glaucoma. Upon arrival, a clinic nurse confirmed the patient's details, type and side of the eye operation. A micropore tape was then applied above patient's RIGHT eye brow as a site marker. In the Laser Procedure Room, doctor A confirmed the patient's identity, operation and the side of operation but did not ask the side of operation again before starting the procedure. Doctor A did not see the site marker clearly, as the marker was covered by the laser machine's headband in the dimmed room. During the procedure, doctor B, the supervisor, recognized the error and stopped doctor A for further laser treatment. The patient received treatment to the RIGHT eye uneventfully afterwards.

***Key Contributing Factors:***

1. Improper conduct of the procedural checklist and lack of guidelines or protocol on how the procedural checklist should be conducted.
2. Site marker covered by the headband of the laser machine.
3. Normal lighting being switched off before the start of the procedure.

***Recommendations:***

1. Involve all staff as part of a team exercise and the patient whenever possible when conducting the procedural checklist.
2. Develop guideline / protocol to ensure staff compliance with the 3 phases (namely, "Sign In", "Time Out" and "Sign Out") of the procedural checklist.
3. Provide adequate lighting at the time of procedure to ensure insertion of contact lens into the intended eye.
4. Explore alternative options to mark the side of operation to prevent wrong side surgery.

**Case 3: Injected Retrobulbar Anaesthetic into the Wrong Eye**

A patient was going to have LEFT eye cataract surgery. The operation site was marked by the surgeon and "Time Out" was performed. However, local anaesthetic was injected into the RIGHT retrobulbar space. The circulating nurse noticed that the injection was done on the wrong side. The condition of the RIGHT eye was found stable. LEFT eye operation was then completed uneventfully.

***Key Contributing Factors:***

1. The site marking was covered by the cap.
2. The injection site was not counter-checked before anaesthetic was administered.

***Recommendations:***

1. The surgical wraps should not cover the surgical site marking.
2. The "Time Out" procedure should be redesigned to ensure participation of all team members in safety checks before administration of anaesthetic and surgery.

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

### Broken Instruments

**Case 1: Incomplete Removal of Metallic Wire**

A patient had partial patellectomy with a metallic wire loop implanted in the right knee in Aug 2011. In Jun 2013, an elective operation was performed to remove the wire loop. No wire was seen in the limited field of intra-operative X-ray. However, a follow up X-ray in Aug 2013 showed that a fragment of broken wire was retained in the tibia. The retained wire segment was then removed uneventfully.

***Key Contributing Factors:***

1. Pre-operative X-ray was not taken.
2. Intra-operative X-ray did not cover the whole knee joint.
3. Metal fatigue of wire after implantation for two years.

***Recommendations:***

1. Arrange X-ray examination before implant removal.
2. Implement team briefings on safety checks.
3. Alert staff on the risk of metal fatigue of implants.

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**Case 2: Broken Fragment of Calcar Planer**

A cementless total hip replacement was performed on a patient. A small part (about 4 x 0.5 mm) of the Calcar Planer (an instrument used to shave bone away) was found missing during assembling in the Theatre Sterile Supply Unit (TSSU). Imaging found that the missing part was retained in the submuscular plane of the hip. The fragment was then removed surgically. The patient had good rehabilitation progress subsequently.

***Key Contributing Factors:***

1. Unsatisfactory alignment between metal surfaces of the instrument used in the broaching process.
2. The staff mainly focused on checking the known defects of the instrument.

***Recommendations:***

1. Feedback to the manufacturer to review instrument design for facilitating anchorage and alignment.
2. Update the existing instrument defect database for high risk items.

**Case 3: Catheter Tip Retained in Newborn's Intestine**

A premature newborn developed respiratory distress after birth and was intubated. Surfactant treatment was given via a multi-access catheter designed for accessing the airway. After endobronchial administration of surfactant, the case doctor retracted the catheter from the endotracheal tube (ETT). The case nurse noticed there was residue surfactant inside the catheter. She thus reinserted the catheter into the ETT and flushed the residue. When the ETT position was found satisfactory, the nurse cut the excessive length of ETT. The nurse was not aware that the catheter was not completely retrieved at the time of ETT cutting. On the next day, X-ray imaging revealed that a suspected fragment of catheter was retained. The 18 mm catheter was passed out with faeces uneventfully after 12 days.

***Key Contributing Factors:***

1. Lack of a standardized guideline on ETT shortening and surfactant administration.
2. Ineffective communication between doctors and nurses.

***Recommendations:***

1. Develop a guideline on ETT shortening and surfactant administration.
2. Educate staff on the safety practice.

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**Case 4: Broken Drill Bit in Hip Replacement Wound**

A patient underwent total hip replacement for osteoarthritis. "TIME-OUT" was performed in the operating theatre and instrument count was checked and correct. The operation was uneventful. After the operation, staff of TSSU revealed a broken drill bit with a loss of 1 cm at the tip. Surgeon was informed and X-ray examination showed a shadow. The broken drill bit was later removed from the patient's lesser trochanter.

***Key Contributing Factors:***

1. Lack of a system to detect fatigue instrument.
2. Failure in detecting the missing part of drill bit after use.
3. Problem of metal fatigue and reuse of instrument.

***Recommendations:***

1. Develop a tracking system for detection and replacement of fatigue instruments.
2. Redesign the instrument checking process to ensure timely integrity check.

**Case 5: Broken Silicone Wound Drain Left in Abdomen**

A patient underwent laparoscopic right hemi-colectomy for colon cancer. A silicone T-tube with three side holes created by the clinical team was used for wound drainage. In the documentations, there were no description of the length and number of side holes created. On post-operation day 9, the drain was pulled out 3 cm by staff. The drain then slipped off the next day and was discarded without checking its integrity. About 3 months later, the patient complained for abdominal pain. X-ray showed a foreign body inside the patient. A remaining 12 cm drain with two side holes was removed surgically.

***Key Contributing Factors:***

1. No standard practice on documentation of the number of side holes created on the wound drain.
2. No standard practice on examination and documentation of the integrity of the removed drain.

***Recommendations:***

1. Enhance documentation of the length of wound drain and number of side holes created in both the operation record and nursing record.
2. Improve the checking and documentation of the integrity of the slipped-off or removed drain.
3. Encourage the use of appropriate commercial surgical wound drain with holes and markings.

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**Case 6: Retained Subdural Drain**

A patient had an emergency burr hole for drainage of subdural haematoma. The subdural drain was removed by a doctor on post-operation day 3. Four days later, a follow up computerized tomography (CT) brain revealed a catheter tip at the frontal area of the patient's brain. The tip was then removed surgically.

***Key Contributing Factors:***

1. Failure to check the integrity of the removed drainage catheter.
2. Unaware of the trapping of the drainage catheter by a skin stitch during insertion.

***Recommendations:***

1. Strengthen the practice of documentation and integrity checking of removed drainage catheter.
2. Encourage testing the resistance of drainage catheter when anchoring it.

**Case 7: Spiral Tip of Fetal Scalp Electrode Left on Infant's Scalp**

A fetal scalp electrode was attached directly to a fetus's scalp by an obstetrician for intrapartum fetal monitoring. The fetal scalp electrode was removed by a midwife after the baby was delivered. About one month later, the parents brought the baby to Accident and Emergency Department for scalp swelling. Skull X-ray revealed a metallic coil in the scalp. A spiral electrode tip of 0.5 cm in diameter was subsequently removed from the baby's scalp.

***Key Contributing Factors:***

1. Failure in checking the completeness of the scalp electrode immediately after removal.
2. Lack of awareness to consider fetal scalp electrode as a countable surgical item in the delivery suite.

***Recommendations:***

1. Include the scalp electrode as a countable surgical item and follow the standard checking process for critical items.
2. Establish a good communication system on checking of critical surgical items.

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**Case 8: Retained Gauze in Complicated Abdominal Wound**

A patient with long history of Crohn's Disease had numerous records of hospitalization. This time, the patient was present with fever. CT abdomen showed ileocolic and enterocutaneous fistula with right psoas abscess. Drainage under USG was performed five times and eventually two pigtail drains were put in place. The patient was then transferred to another hospital for further management. At the receiving hospital, a piece of non-woven gauze entangled at the tip of a pigtail drain was noted when one of the drains was removed.

***Key Contributing Factor:***

A piece of gauze was accidentally entangled during the procedure of inserting the pigtail drains.

***Recommendations:***

1. Keep skin puncture site clear of gauze during skin incision, needle / guide wire / dilator / catheter insertion and exchange procedure.
2. Exercise caution when there is a large amount of oozing of blood or pus during the procedure.

**Case 9: Retained Peripherally Inserted Central Catheter Internal Stiffener Stylet**

A patient had left groin abscess, bilateral ischial decubitus ulcers and infective spondylitis with psoas abscesses. Peripherally inserted central catheter (PICC) was performed for a course of intravenous (IV) antibiotic over a prolonged duration. An unfamiliar brand of PICC was provided to the surgeon for the procedure. A few days after the procedure, a contrast CT of spine was taken to rule out related sepsis. The clinical team reviewed the CT scan film and suspected a PICC migration. The catheter was then removed. It was subsequently confirmed to be the retained PICC internal stiffener stylet which should have been removed at the time of insertion.

***Key Contributing Factor:***

The clinical team was unfamiliar with the device which was used infrequently.

***Recommendations:***

1. Deploy a designated team to perform PICC procedure using new or complex device.
2. Provide orientation and information to staff prior to using a new product.
3. Avoid the use of different brands of product for the PICC procedure.

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**Case 10: Broken Drain Left in Skin Wound**

A patient on regular warfarin after mitral valve replacement had right mastectomy for carcinoma of breast. Three days after the operation, the patient had haematoma which was treated by evacuation and insertion of two silicone drains. Two and six weeks later, the two drains were removed by a nurse in the Breast Clinic separately. Five months later, a nurse noted a foreign body in the patient's small non-healing wound. A doctor then removed a 1 cm broken piece of drain from the wound. The wound healed uneventfully afterwards.

***Key Contributing Factor:***

Failure to properly enforce integrity checking of inserted drain.

***Recommendations:***

1. Enhance the practice of integrity checking of removed drain.
2. Formulate clinical protocol on drain removal with emphasis on the examination of distal end of removed drains.

**Case 11: Broken Malecot Catheter Tip in Kidney**

A patient underwent right percutaneous nephrolithotomy (PCNL) for renal stone under local anaesthesia. The procedure was abandoned because of the patient's severe pain and hypotension. A Malecot catheter was inserted for temporary drainage. The patient underwent the second right PCNL under general anaesthesia. The surgeon performed an antegrade pyelogram through the Malecot drain and blockage was noted. After removing most of the renal stones by retrograde intrarenal surgery, the surgeon decided to remove the right Malecot catheter. The removal was met with resistance. The surgeon examined the removed catheter before discarding it but did not notice any irregularity. Post-operative X-ray showed a retained Malecot catheter tip. The 4.5 cm broken catheter tip was then removed surgically.

***Key Contributing Factors:***

1. Failure in checking the integrity of the Malecot catheter immediately after removal.
2. Lack of conscientious team work and effort.
3. Misplacement of Malecot catheter at drainage site during initial PCNL.

***Recommendations:***

1. Strengthen the checking and documentation procedure for removed or used surgical material.
2. Reinforce the "speak-up" and "always-kept-informed" culture in the operating theatre.

**Case 12: Retained Foreign Body in Peritoneal Cavity**

A patient had medical termination of pregnancy in Oct 2013 and had repeated hospital admissions for abdominal pain since. In Jan 2014, USG drainage of pelvic collection was performed with aspiration of 20 ml clear fluid. Insertion of a pigtail catheter was subsequently attempted but failed. CT scan of abdomen in May 2014 revealed a linear 3 cm hyper dense shadow in the pelvic region, compatible with the tip of guide wire used during the procedure in Jan 2014. The patient was being followed up by the hospital for further management.

***Key Contributing Factors:***

1. Role delineation of staff for surgical safety check was not clear.
2. The record on instrument used was not ready for checking at the end of procedure.

***Recommendations:***

1. Assign designated staff to check instrument integrity.
2. Include surgical safety in staff orientation.
3. Conduct briefing session to staff on role of checking for surgical safety with focus on instrument integrity.

## Incorrect counting of instruments / material

**Case 13: Retained Gauze in Abdomen Wound**

During an operation for closure of colostomy, “lasso knot” with three loose stitches were applied owing to wound contamination, with the aim of closing the skin later on by tightening the stitches in ward. The patient’s wound was packed with one piece of plain non-woven gauze which was then covered with plain gauzes. On post-operation day 1, the case doctor performed wound dressing and documented “changed dressing and gauze removed”. On post-operation day 2, another doctor closed the wound by tightening the loose stitches and ordered daily wound dressing. On post-operation day 13, the stitches were removed because of increasing exudate from the wound. During wound exploration, a piece of plain non-woven gauze was found and removed from the wound.

***Key Contributing Factors:***

1. Small size gauze was used for packing into a relatively big wound.
2. The plain non-woven gauze was not easily identified after being soaked with blood and exudate.
3. Misinterpretation of the “dressing” gauze as the “packed” gauze.

***Recommendations:***

1. Consider using appropriate type and size of dressing material and wound packing method (such as leaving a small bit of packing material outside the wound for easy removal) to prevent retention of dressing and packing material in patient’s wound.
2. Use different types of gauze material for easy differentiation between “wound-packing” gauze and “dressing” gauze in open wound.
3. Verify the number of removed “packed” gauze as indicated in patient’s medical record.

**Case 14: Tampon Found in Episiotomy Wound**

One tampon is included in each delivery set and in episiotomy repair set. During episiotomy repair, a doctor used the tampon to stop bleeding and did not place the cotton thread of tampon outside the wound. Nurses did not notice the missing tampon during the swab count. Afterwards, the patient noticed continuous foul smelling of vaginal discharge. The patient was admitted for suspected retained tampon which was later removed in the ward.

***Key Contributing Factors:***

1. Inadequacy in the counting process and documentation.
2. Improper handling of tampon for wound packing.

***Recommendations:***

1. Review the counting mechanism and documentation of tampon and gauze used in episiotomy wound repair.
2. Strengthen training to new residents on episiotomy wound repair and the use of tampon.

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**Case 15: Extra Dressing Material Found in Sacral Ulcer**

A patient with diabetes, hypertension and advance dementia was under the care of community nursing service (CNS) for sacral pressure ulcer. The patient was hospitalized and the patient's sacral sore was managed with daily wound dressing. The patient continued to receive wound care by CNS after discharge. Different wound dressing materials were used to pack the wound at different times. On the fourth home visit, an extra piece of dressing which was not documented in the clinical management sheet was found inside the patient's wound.

***Key Contributing Factor:***

Lack of clear documentation on the number of wound packing materials packed and removed in wound after the wound dressing procedure.

***Recommendations:***

1. Redesign the "wound assessment form" to include elements of wound management plan.
2. Design a stamp / label to facilitate documentation on the counting of wound packing materials.

**Case 16: Abdominal Pad Retained in Abdomen**

Towards the end of a caesarean section, the doctor asked for an extra abdominal pad while nurses were performing the counting process. The extra abdominal pad was not documented in the count sheet. Two days after the operation, the patient had left abdominal pain. Ultrasound revealed a radio-opaque thread-like shadow. The abdominal pad was eventually removed surgically.

***Key Contributing Factors:***

1. Non-compliance with the counting process.
2. Ineffective communication among team members.

***Recommendations:***

1. The counter-checking process should be performed and signed by the SAME nurse.
2. The count sheet should be revised to include all gauzes and pads used and packed inside the wound.

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**Case 17: Retained Angiocatheter in Abdominal Cavity**

A patient had a two-stage operation for carcinoma of rectum with liver metastasis. At the first stage operation of partial hepatectomy, angiocatheter and syringe were used for flushing and irrigation. At the second stage operation of laparoscopic low anterior resection of rectum, an angiocatheter was found in the abdominal cavity and was removed immediately.

***Key Contributing Factor:***

The angiocatheter was not included in the accountable item list in this case.

***Recommendations:***

1. Improve the record system and the counting of added consumable items.
2. Consider using alternative syringe that could reduce the chance of catheter tip dislodgement.

**Case 18: Tampon not Removed After CT Pelvis**

A patient had CT thorax, abdomen and pelvis. A tampon was inserted into vagina for locating pelvic position. The tampon was documented on CT examination report. Three days later, the patient noticed a string coming out from the vagina. The tampon was removed uneventfully.

***Key Contributing Factor:***

Inadequate documentation and counting of consumables used in radiological procedures.

***Recommendations:***

1. Redesign the counting form to facilitate counting of consumables.
2. Identify indications for tampon insertion to alert relevant staff.

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**Case 19: Retained Paraffin Gauze in Tracheostomy Wound**

A patient had an emergency tracheostomy by an ear, nose and throat (ENT) surgeon. The doctor documented "packed with sulfatulle (paraffin) X 2" in the operation record. On post-operation day 2, a nurse followed the post-operation order and removed a piece of paraffin gauze covered with copious sputum. On post-operation day 6, ENT team was consulted for wound discharge from the patient's tracheostomy. An ENT surgeon spotted and subsequently removed one piece of paraffin gauze which was left inside the tracheostomy wound.

***Key Contributing Factors:***

1. No proper counting of paraffin gauze after removal of packing.
2. Complex patient condition (patient had a short neck, a relatively large tracheostomy wound, and firm anchoring stitches for new tracheostomy) hindered wound inspection process.

***Recommendations:***

1. Educate staff on proper counting of gauze used in surgical procedure.
2. Strengthen documentation of dressing removal, including number of pieces of dressing material removed.
3. Apply safety measure on tracheostomy packing, such as leaving gauze tail outside the wound.

**Case 20: Merocel Left in Patient's Nose**

A patient had an elective bilateral functional endoscopic sinus surgery (FESS) and septoplasty for nasal sinus polyp and deviated nasal septum. Doctor A divided two pieces of Merocel into four halves and packed two pieces into each nostril. Doctor B documented "nasal packing with trimmed Merocels (2 pieces on each side)" in the operation record. Doctor C did not read the operation record and removed one piece of Merocel on each side of the patient's nasal cavity as usual. Doctor C then examined the patient's nasal cavity with the aid of headlight and discharged the patient with normal saline nasal douching. One week later, the patient informed doctor B of foul smelling at the nostrils and difficulty in performing nasal douching. Doctor B found and removed a piece of Merocel from each nostril subsequently.

***Key Contributing Factors:***

1. Lack of a clear process and documentation system for nasal gauze packing and removal.
2. Non-compliance with standard practice of confirming surgical packs count before procedure and after removal.

***Recommendations:***

1. Establish a clear process and accurate documentation of wound dressings from time of packing to removal to prevent unintentional retention of packed gauze.
2. Redesign system to enhance surgical safety and provide training to ensure compliance with correct pre- and post- surgical gauze counting.

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

**Case 1: Clopidogrel (Plavix) was not Prescribed after Percutaneous Coronary Angioplasty**

A patient, with underlying diabetes, was admitted to hospital A for coronary syndrome (ACS). The patient was referred to hospital B for percutaneous coronary intervention (PCI) and drug eluting stents were implanted. Dual antiplatelet agents therapy (Plavix and Aspirin) for one year was planned. Upon discharge, the patient was prescribed with the required medications for three weeks until the scheduled follow up in hospital A. During the two subsequent follow up visits in hospital A, the attending doctor only managed the patient's insulin regimen. The doctor assumed hospital B would prescribe Plavix. One day after the second follow up in hospital A, the patient was admitted because of ACS and emergency investigation showed stent thrombosis. The patient died despite emergency PCI.

***Key Contributing Factors:***

1. Communication breakdown between hospitals on post-PCI follow up arrangement.
2. No formal departmental policy on follow up arrangement for patients with PCI performed in another hospital.
3. Doctors unfamiliar with the post-PCI antiplatelet agent prescription were delegated to follow up patient with PCI done in another hospital.

***Recommendations:***

1. Set up a designated clinic in hospitals to follow up patients for the first time visit after PCI.
2. Develop a departmental workflow in hospitals to ensure proper follow up arrangement for patients with PCI done, especially for those who have procedures done in another hospital.
3. Strengthen follow up arrangement and communication between the referring hospital and the hospital offering PCI procedure, especially regarding the regimen of dual antiplatelet therapy regimen.
4. Revamp the "Alert" system in Clinical Management System (CMS) to specify the regimen and duration of antiplatelet agents to be prescribed for post-PCI patient.

**Case 2: Wrong Flow Rate of Dopamine Infusion**

A patient was put on dopamine infusion for congestive heart failure. The intended prescription was 200 mg dopamine in 100 ml saline infused at a rate of 3 ml / hour. Before changing the dopamine infusion set and preparing the drug, two nurses checked the volume of saline and dosage of dopamine. After connecting the new infusion set, the nurse set the "set rate" instead of "volume to be infused" to 100 ml. The nurse noticed the incident when 100 ml dopamine infusion was completed after an hour. The patient passed away on the next day.

***Key Contributing Factor:***

Non-compliance with the guideline on use of infusion pump which requires confirmation of the correct infusion rate before starting infusion.

***Recommendations:***

1. Reinforce adherence to the guideline on the safe use of infusion pump.
2. Arrange refresher training on the use of infusion pump for staff.

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**Case 3: Administered Double Dose of the Prescribed Amount of $NaHCO_3$**

A patient with history of ACS and congestive heart failure was admitted for PCI. However, the patient's condition continued to deteriorate. 200 mL of 8.4% sodium bicarbonate ($NaHCO_3$) was prescribed. Four bottles of $NaHCO_3$ (100 mL each) were taken to the bedside. Nurses administered all four bottles of $NaHCO_3$ (assumed total to be 200 mL) to the patient. The patient's condition further deteriorated and the patient subsequently succumbed. On the next day, a nurse discovered that 400 mL instead of 200 mL of $NaHCO_3$ had been administered to the patient.

***Key Contributing Factors:***

1. Non-compliance with the principle of "5 rights".
2. Ineffective process for safety checks in IV drug administration.

***Recommendations:***

1. Review the IV drug administration procedure to ensure compliance with "5-rights".
2. Enforce the system of independent checking to enhance safety.
3. Improve the system of drug shelf labeling to alert staff of drug preparation.

**Case 4: Unintended Continuous Steroid Prescription**

A patient with underlying end stage renal failure, hypertension and ischaemic heart disease was admitted for removal of Tenckhoff catheter. Incidental finding of "acute bronchitis" was diagnosed by the attending doctor. The patient was discharged after a brief stay on a regimen of steroid (prednisolone 25 mg daily), antibiotics and a number of other medications. Steroid was planned to be prescribed for six days, until symptoms settled down. The patient returned eight days later for haemodialysis treatment. The same dose of steroid was prescribed with the other medications until the next follow up, which was 96 days later. Two months later, the patient was admitted for severe pneumonia. Despite initial clinical improvement, the patient succumbed 11 days after admission.

***Key Contributing Factors:***

1. No "Single Use / Fixed Period" was specified for the initial prescription of steroid therapy in Medication Order Entry (MOE).
2. No indication for steroid therapy documented in the initial prescription of steroid therapy.
3. No verification mechanism for oral steroid in the MOE carry-forward instruction.

***Recommendation:***

Enhance the MOE system to prompt the prescriber to verify whenever "long-term" steroid is prescribed and state the intended duration of the steroid therapy.

**Case 5: Missed the Reduced Dosage Instruction for Betaloc**

A patient was admitted for congestive heart failure and underwent CT coronary angiogram after discharge. The recommended instruction for reduced dosage of Betaloc (12.5 – 25 mg) printed on the upper right corner of the second page of the request form was obscured by the patient's labels stapled on top of it. Standard adult Betaloc loading dose of 50 mg was prescribed and administered to obtain optimal heart rate and image quality. The patient was allowed to leave after removal of IV catheter. The patient collapse at home on the same day and was admitted. The patient died 6 days later despite intensive care.

***Key Contributing Factor:***

The procedure was performed for a high risk cardiac patient in an out-patient setting where close monitoring was difficult.

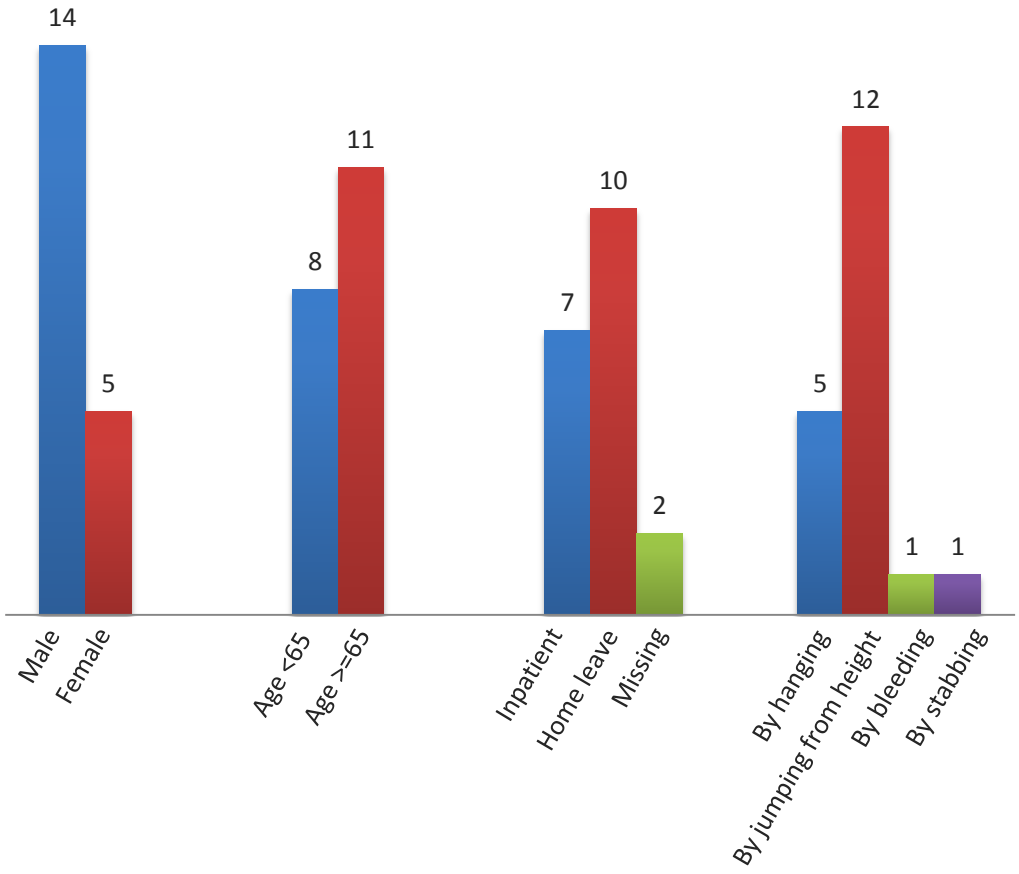
***Recommendations:***

1. Stratify patients into high risk and low risk when arranging CT coronary angiogram.
2. Enhance identification of high risk patients, such as reviewing data collection for CT coronary angiogram booking and streamlining various forms and checking procedures for CT coronary angiogram.
3. Redesign the request form for prominent display of important information.

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

Figure 17 showed a breakdown of the 19 inpatient suicide cases (including home leave) during the reporting period. Of the 19 inpatient suicides, 7 inpatients committed suicide by hanging (at curtain rail, door beam or metal rods in toilets / bathrooms using waist belt, strip of cloth torn from bed linen, nylon rope or plastic chain), by bleeding or by stabbing. The other 12, who were either on home leave or missing, committed suicide by jumping from height. All of them had malignancies, chronic illness or psychiatric illness. The common contributing factors for inpatient suicides and recommendations for improvement were illustrated in chapter 4.

**Figure 17: Breakdown of inpatient suicide cases (including home leave) between Oct 13 and Sep 14**



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

**Maternal Death**

A pregnant woman at gestational age of 40 weeks was admitted for past term induction. Shortly after delivery, the patient developed cardiac arrest and had disseminated intravascular coagulopathy. She was then transferred to intensive care unit (ICU) for further management. Whilst on inotropic support, she developed cardiac arrest and succumbed despite resuscitation. A post-mortem examination revealed that the patient had amniotic fluid embolism.

***Concluding Remarks:***

1. Amniotic fluid embolism is a rare but known complication of pregnancy.
2. The treatment and care provided to the patient was found to be timely and appropriate.

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

**Misplaced Nasogastric Feeding Tube**

A bed-ridden patient was on long-term nasogastric (NG) tube feeding. The NG tube slipped out. On reinsertion of NG tube, whoosh test was performed (whoosh test is performed by rapidly injecting air down an NG tube while auscultating over the epigastrium. Gurgling is indicative of air entering the stomach). Aspirate from the NG tube was tested pH neutral. No bubbling at the end of the NG tube was observed when it was immersed into water. No immediate respiratory distress was noted. A chest X-ray (CXR) was then requested to confirm the NG tube position. NG tube feeding was started after doctor examined the CXR. The patient developed respiratory failure on the start of NG tube feeding and died on the next day.

***Key Contributing Factor:***

Misinterpretation of the NG tube position.

***Recommendations:***

1. Promulgate and reinforce the Guidance for Verifying Correct Placement of NG tube.
2. Include interpretation of X-ray for confirmation of NG tube position in the orientation program for medical trainees.
3. Consult gastroenterologist for failure to insert a NG tube on repeated attempts.

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