Quality Improvement Committee

Serious and Sentinel Events in New Zealand Hospitals

2007–2008

Disclaimer

The Quality Improvement Committee prepared this report.

This report does not necessarily represent the views or policy decisions of the Ministry of Health.

Citation: The Quality Improvement Committee. 2009. Sentinel and Serious Events in New Zealand Hospitals 2007–2008. Wellington: The Quality Improvement Committee.

Published in 2009 by the Quality Improvement Committee
PO Box 5013, Wellington, New Zealand

ISBN 978– 0– 478–31911-8

This document is available on the Committee's website at:
www.qic.health.govt.nz

Foreword

This report signifies an important step on the road to improving health outcomes for New Zealanders. In February 2008 the first information about serious and sentinel events was released. The information contained in this latest report relates to events reported by District Health Boards from July 2007 to June 2008. It does not include information about adverse events in the primary or private health care sectors.

The environment of continuous quality improvement is less about mandatory actions and more about shared learning to move towards best practice solutions. A key to this broader national approach is the development of a culture of shared learning throughout the system. Underpinning the integrity of this learning process is a high level of voluntary reporting by clinicians.

Voluntary reporting by clinicians is essential if we are to learn from mistakes. It is not an easy or comfortable process for anyone who is involved in a situation where something has gone wrong, and it takes the right sort of environment to help make reporting easier. This environment is based on trust and support.

For the reporting year 2007/08 District Health Boards reported 258 people treated in their hospitals were involved in a serious or sentinel adverse clinical event that was actually or potentially preventable. Of this total, 76 died during the admission or shortly afterwards, though not necessarily as a result of the event. Over the same period, nearly 900,000 people were treated and discharged by our hospital staff working very hard to relieve suffering and improve health and quality.

I strongly support the aim of doing all we can to support voluntary reporting of adverse events and I will be encouraging the same level of reporting from primary care and private hospitals.

The Quality Improvement Committee's National Quality Improvement Programmes[1] that are now underway include five main programmes aimed at increasing patient safety in a number of key areas. All of these programmes address quality problems identified in events reported.

One of the programmes is a nationally co-ordinated programme to standardise event recording and investigation in District Health Boards. It will provide a mechanism for reporting and managing the kinds of serious and sentinel events contained within this report and for assisting with the learnings from the reported events to prevent similar events from happening again.

Reducing the rate of hospital-acquired infections is the goal of another national programme. International studies identify proven actions that can reduce these

[1] www.qic.health.govt.nz

rates considerably. A study has shown that around 10% of patients admitted to New Zealand hospitals may acquire one or more infections[2].

The most far-reaching National Quality Improvement Programme aims to improve medication safety. Given that medication is the most frequent clinical intervention, medication errors are a relatively common adverse event. This programme encompasses all the steps in the medicines chain including the charting and dispensing of a drug, the checking and giving of a medicine to a patient, and observation as to whether the drug has the correct effect.

The aim of the fourth programme is to establish a New Zealand adult mortality review committee that will look at all deaths of surgical patients and determine if there were any actions that the health services could have taken to prevent them.

The last programme seeks to improve the management of patients, particularly those with chronic illnesses such as diabetes, asthma or depression, as they move through the health system. It will achieve such improvements by looking at the experience of these patients from the time they present at the hospital to their discharge.

Patients are the first to say that they want to prevent similar events happening in future to both themselves and other people. They encourage and support the concept of learning from mistakes. For this reason, I am sure that this report will be well received because it provides the basis for learning not only within individual District Health Boards, but also nationally across all services. Thank you to all those people in the District Health Boards and the Ministry of Health who have collectively contributed to the learning in this report.

This report contains many tragic and sad events that have happened to patients in our care. We owe it to them to take every possible step to learn from these events and limit the chance of the recurrence of any similar events. We must be spurred on to encourage open and frank discussion of how these may have happened and to develop even safer health systems that the people of New Zealand can trust. We have great health professionals, managers and support staff and we must support them to continue to deliver safe and effective care.

Pat Snedden
Chair
Quality Improvement Committee

[2] Graves N. Nicholls TM. Wong CGS. Morris AJ. The prevalence and estimates of the cumulative incidence of hospital-acquired infections among patients admitted to Auckland DHB hospitals in New Zealand. Infection Control and Hospital Epidemiology. 2003 Jan; 24(1): 56-61. (17 ref)

Contents

Key Messages in this Report

This report and the concept of collecting and reporting nationally on serious and sentinel events using standardised definitions and data are new to New Zealand. Work is underway to further improve the definitions and processes for national reporting. However it is important to start with what we have. The process for improving national reporting began with the release of the *Reportable Events: Guidelines* and the *Sentinel Events Workbook* in 2001. DHBs have responded to these initiatives with the result that their systems have improved.

In the 2007/08 reporting year approximately 0.03% (3 in ten thousand) of total admissions to DHBs were reported as involving a potentially preventable serious or sentinel event. International experience with event reporting shows that the process of increasing awareness often results in a rise in the number of events reported. For that reason, the number of events reported nationally may well continue to rise over the next few years.

The majority of events (42%) in 2007/08 were the result of a clinical management problem. These are events where there is a serious deterioration in a patient's condition that is not due to the natural course of their illness, or differs from the expected outcome of treatment.

One useful way of investigating complex events is that used in other industries - 'root cause analysis'. This method is used to investigate and analyse a serious or sentinel event with the aim of identifying the underlying causes and any contributing factors and recommending actions to reduce the chance of a similar occurrence. Its power is in ensuring that those actions are directly related to the causes identified. In the events reported that involved the clinical management area this year, such actions included:

- changes to patient monitoring and care delivery processes
- changes to the physical environment
- increased supervision of staff
- staff education
- development of new policies, protocols or guidelines
- purchase of new equipment.

The second largest category of events comprised falls (23%). The majority of events in this category were falls that occurred when the patient was medically unwell and/or when an elderly patient was mobilising without assistance.

For reducing the numbers of such falls, recommended actions included:

- improving the use of falls risk tools to assess the patient's risk of falling, as well as the use of care plans
- implementing hourly nursing rounds to anticipate toileting and other needs
- educating staff on falls prevention and management policy in this area
- maintaining equipment.

The third largest category of events reported in 2007/08 was medication errors (8%). Over half of the medication errors were either overdoses or wrong doses. In many cases issues such as the similarity of packaging for different doses of the same medication contributed to the error occurring.

To reduce medication errors, the recommended actions include adopting more rigorous checking procedures and investigating the feasibility of using technology that may assist in reducing these errors.

In the other event categories, strategies to improve care and prevent similar events happening in the future included:

- improving assessment of patients at risk
- increasing supervision of staff
- educating to increase the level of knowledge of clinical staff
- reviewing physical risk areas and reconfiguring clinical areas
- improving communication between hospital teams and with families.

This report provides a national overview of serious and sentinel events and offers the opportunity for accelerating learning from sharing experiences and avoiding the same mistakes in other DHBs. To assist this process, some important national quality improvement programmes and initiatives are underway. Among them are the initiatives taken by the Quality Improvement Committee, notably those relating to incident reporting and safer medicines.

The key to preventing adverse events in hospitals is to encourage learning from mistakes when they happen. The first step in this chain is to encourage the development of a culture that supports disclosure of any adverse event.

Introduction

The purpose of recording and investigating preventable adverse events in hospitals is to improve patient safety. The aim of this process is to understand why these events have occurred and to take action to try to prevent similar events from happening in the future.

National and international studies have shown that 10–15% of hospital admissions are associated with an adverse event, but half of these events occur before the patient is hospitalised.[3]

The vast majority of events reported are minor and do not result in harm or permanent harm to the patient. For example, they may involve missed medication or medication errors that do not harm the patient.

A serious or sentinel event however has, or has the potential to result in, serious lasting disability or death that is not related to the natural course of the patient's illness or underlying condition (see the next section for more specific definitions). Such events are rarely the result of one unsafe act. Rather, most are the consequence of a chain of events set off by small breakdowns in the safety nets built into the process of caring for patients. Unfortunately the consequences can be tragic.

In February 2008 the Quality Improvement Committee released the first sentinel and serious events report. Although hospitals have always collected data about such incidents, that report for 2006/07 represented the first consolidated report about serious and sentinel events across New Zealand's 21 District Health Boards. The detail of reporting – which included detailed summaries of each serious and sentinel event – was unprecedented in New Zealand.

One aim of releasing this information in these serious and sentinel event reports is to improve safety by encouraging open and transparent reporting of incidents when something goes wrong. A second aim is to improve knowledge among those providing care of how to prevent similar events from happening in the future.

In 2001 the *Reportable Events: Guidelines* and *Sentinel Events Workbook* were released. DHBs have responded to these guidelines and improved their systems to the point where we can start to look at the events at a national level.

The release of this data is a starting point for a national reporting system. It does not capture every event. However with initiatives to encourage open disclosure, improved definitions and encourage learning, we will see the development of a culture of reporting events.

---

[3] E N De Vries, et al., *The incidence and nature of in-hospital adverse events: a systematic review.* Quality and Safety in Health Care, 2008. **17**: p. 216-223

As emphasised above, the purpose of the reporting system is to learn from incidents. It is not to apportion blame or rank hospitals. Clinical staff have always been accountable for their practice to their patients, their profession, their colleagues and the organisations that employ them.

The health sector must use this data in a way that encourages learning; using it in any other way would adversely affect the culture of safety and openness that we are trying to foster in DHBs. If clinicians believe that the information would be used against them, or their DHB, they may be less willing to report on such events. If clinicians believe that the information will be used for learning and improvement they will more readily report adverse events.

Definitions: What are Serious and Sentinel Events?

Every year in New Zealand, nearly 900,000 people will be treated and discharged from a hospital.

For a small number of people within this total, and despite safety systems and the best intentions of clinical staff, events happen that have the potential to harm or actually do harm patients. Most of these events involve known complications of treatment and are not preventable based on current knowledge. They include known side effects to medication, known risks from surgery and unpredictable events such as unknown allergic reactions.

In addition, a small number of events resulting in serious harm, death or requiring significant additional treatment are potentially preventable. These events are rarely the result of one unsafe act, but usually the consequence of a chain of events set off by small breakdowns in the process of caring for patients. Unfortunately the consequences can be tragic.

This report focuses on these potentially preventable serious and sentinel adverse events.

Clinical judgement has been used to further refine these categories so that they reflect the serious and sentinel adverse events that are considered preventable given current knowledge. For instance, a known complication of surgery is an adverse event, but if it is not preventable it will not appear in this report.

The purpose of recording and investigating preventable adverse events in hospitals is to understand why these events occur and take action to try to prevent similar events happening in the future. Finding the cause and contributing factors allows hospitals to improve systems and processes and ultimately to improve patient safety.

Standardised, consistent systems for classifying and recording adverse events are essential to this process. Hospitals in New Zealand and around the world vary in the way they classify, collate and report preventable adverse events, and are only now starting to standardise their approach in this area. The Quality Improvement Committee is leading this standardisation work in New Zealand.

Definitions

A **health care event** is an event or circumstance that could have led or did lead to unintended and/or unnecessary harm to a patient, and/or a complaint, loss or damage.

An **adverse event** is a health care event causing patient harm that is not related to the natural course of the patient's illness or underlying condition.

A **serious adverse event** has required significant additional treatment but is not life threatening and has not resulted in major loss of function.

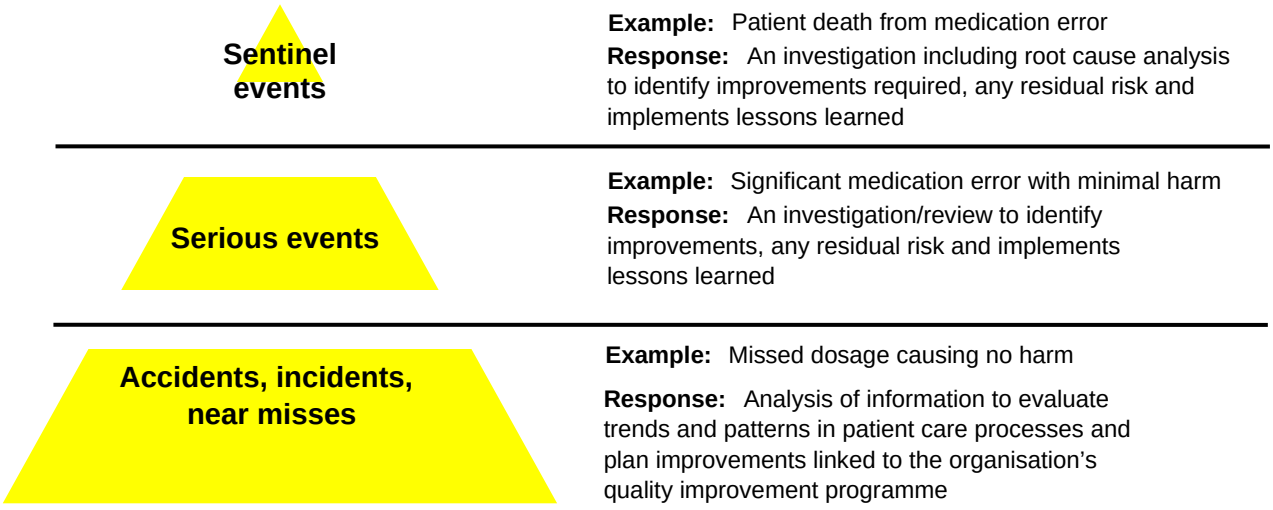
A **sentinel adverse event** is life threatening or has led to an unanticipated death or major loss of function.

Open disclosure is the open discussion of adverse events with the affected parties and the associated investigation and recommendations for improvement.

Preventable describes an event that could have been anticipated and prepared against, but that occurs because of an error or another system failure.

Root cause analysis is a method used to investigate and analyse a serious or sentinel event to identify cause and contributing factors and to recommend actions to prevent a similar occurrence.

Medication errors are a common category of adverse event. The following diagram is an example of how a medication error can be classified and recorded based on the circumstances and outcome.



New Zealand Reporting on Serious and Sentinel Events 2007/08

In the 2007/08 reporting year there were nearly 900,000 admissions to District Health Boards. During that period 258 potentially preventable serious or sentinel events were reported (about 0.03% or 3 in 10,000 admissions).

Key caveats

The following are some caveats that are crucial to understanding and interpreting the data on the following pages.

- The increase in reported events compared with last year means that the systems for capturing and reporting are improving. It does not mean the number of events is increasing.
- The increase in the number of reported events was expected and is likely to increase further as reporting systems improve. This increase is consistent with international experience and research.
- The international literature does not support the use of the number or rate of reported events as a way to judge a hospital's safety. There are considerable variations in the degree of reporting, not just in the rate of events.
- The number of events in some hospitals is very small – to the extent that even an increase by one event can result in a large statistical variation.
- The events documented in the DHB releases are voluntary reports. DHBs from which larger numbers of events are reported, in greater detail, are likely to have better local systems for reporting and investigating and probably a superior safety culture. A lower event rate for a DHB may well indicate a greater degree of under-reporting and under-investigating or, conversely, may be the result of a very active risk management programme.
- The National Quality Improvement Programme on incident management has within the national policy introduced a standard method for assessing the severity, the consequence and the likelihood of occurrence of an adverse event (see Appendix A). This tool will improve standardisation or decrease the variation of the classification of incidents.

As previous sections have outlined, the aim of investigating serious events in greater detail and sharing the results is to identify system weaknesses so that they can be remedied.

Comparison over time

Table 1 sets out data to compare the reporting of serious and sentinel events in the 2007/08 reporting year with that in the 2006/07 reporting year.

Table 1: Sentinel or serious events by District Health Boards, July 2006 to June 2007 and July 2007 to June 2008

DHB	Number of reported serious or sentinel events	
	2006/07	2007/08
Northland	6	5
Waitemata	22	11
Auckland	26	30
Counties Manukau	7*	23
Waikato	24	36
Bay of Plenty	1	5
Lakes	1	6
Tairawhiti	1	3
Taranaki	5	7
Whanganui	3	4
Hawkes Bay	12	7
MidCentral	4	2
Hutt Valley	2**	7
Wairarapa	1	2
Capital and Coast	14	16
Nelson Marlborough	7	5
West Coast	5	11
Canterbury	22	41
South Canterbury	3	12
Otago	3	7
Southland	13	18
Total	**182**	**258**

Note: * Four events in the 2007/08 reporting year were included in the figures for the 2006/07 reporting year. These events have been included in the totals for this later report period.
** One event in the 2007/08 reporting year was included in the figures for the 2006/07 reporting year. This event has been included in the totals for this later report period.

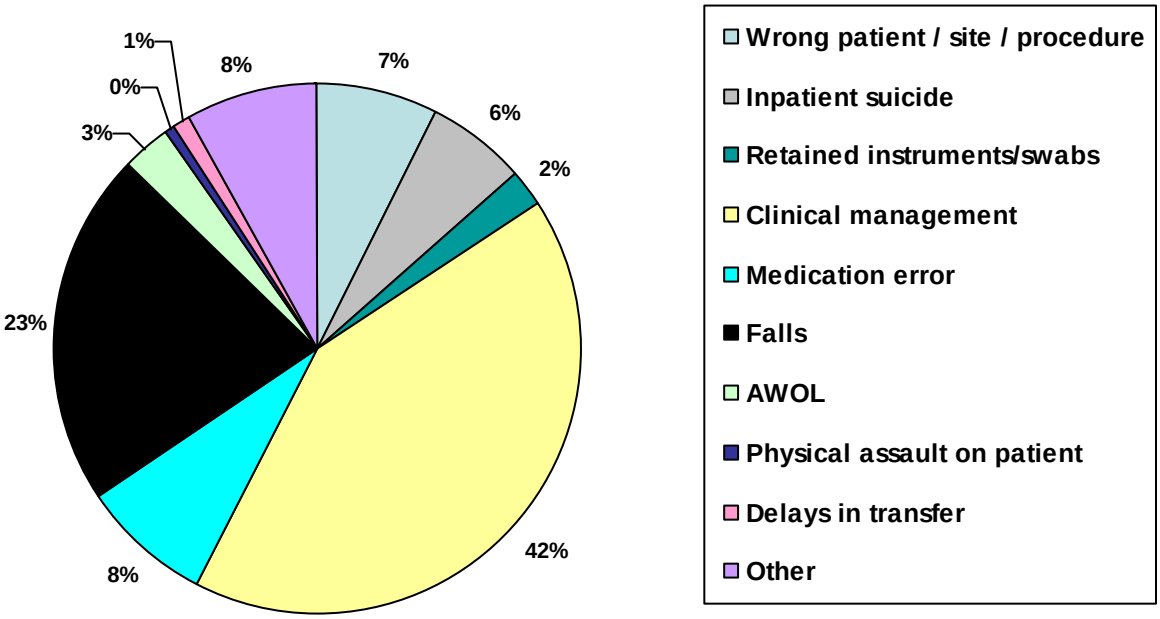
Types of events

Table 2 and Chart 1 summarise the nature and types of events recorded. Note that the DHBs are transitioning to recording information using a standardised national approach, so there is variability in the data collected. This data should therefore be regarded only as an estimate of the categories of events. It shows that the most common events are in the categories of clinical management, falls and medication error.

Table 2: Summary of event types from 21 District Health Boards

Category	Number of sentinel events	% of sentinel events	Number of serious events	% of serious events
Wrong patient, site, procedure	9	9	10	6
Suicide of an inpatient	14	14	2	1
Retained instruments or swabs	3	3	3	2
Clinical management problems, made up of:	**50**	**51**	**57**	**36**
4a – Diagnosis	9		10	
4b – Treatment	9		18	
4c – Monitoring	4		4	
4d – Procedure	14		10	
4e – Investigation	0		5	
4f – Discharge	1		1	
4g – Other	5		6	
Multiple categories within clinical management	8		3	
Medication error	7	7	14	9
Falls	1	1	55	35
AWOL patient	5	5	3	2
Delays in transfer	1	1	2	1
Physical assault on patient	1	1	0	0
Other	8	8	13	8
Total	**99**	**100**	**159**	**100**

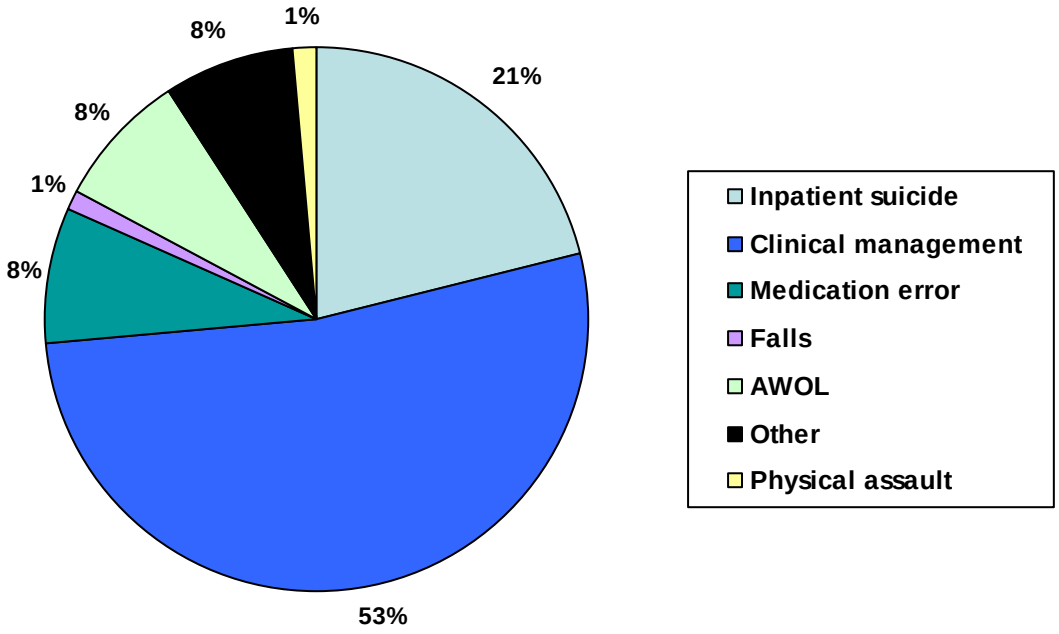
Chart 1: Percentage of events from 21 DHBs



Events associated with death of a patient

Chart 2 summarises the nature and types of events that were associated with a patient death. It shows that the cause of most of these deaths related to the categories of clinical management and inpatient suicide.

Chart 2: Nature and types of events associated with a patient death



Contributing Factors

It is generally acknowledged that adverse events happen in any industry. Significant work in the past 20 years has built up a body of knowledge that contributes to our understanding of what causes these events.

In health care we have learned from how other sectors have investigated and prevented accidents. However health care contains a degree of complexity that means many more variables affect outcomes compared with those of other sectors. While many safety nets are built into all health care, unrecognised and unpredicted opportunities for error still exist.

A key point of learning from an adverse event is understanding what caused it to happen. Some of its causes may be immediately evident. However it is important to understand the underlying causes as well. It is in achieving this deeper understanding that a root cause analysis is important. This type of analysis investigates what happened and identifies the factors that precipitated the events leading to the accident. Once we find the root causes of an event, it is possible to make changes to prevent similar events from occurring in the future.

The Quality Improvement Committee is sponsoring a national programme to improve management of health care events. Managing adverse events is a key strategy that health services are using to manage the risks of clinical care as well as corporate risks. When implemented, adverse event management is an effective mechanism for systematically identifying and managing problems and failures in the system and for informing the development of preventive strategies. It also guides the immediate response to events, for the purpose of reducing risk and minimising further harm, including emotional and psychological trauma for the patient, family and health practitioner.

A component of the national programme is investigating and managing serious events, for the purpose of identifying system improvements and reducing future patient risk. As a result of this programme, more people will have the skills to effectively identify the root causes of events.

As our knowledge of investigating events grows and our national reporting system matures, we will be more able to encourage accelerated learning from events and make further gains towards preventing the occurrence of similar events.

Clinical Management: Lessons Learned

Serious and sentinel events involve a serious deterioration in a patient's condition that is not due to the natural course of the illness, or that differs from the expected outcome of treatment. Clinical management events include specific phases in the care process such as:

- diagnosis
- treatment, including investigations ordered
- monitoring of the patient following treatment
- safe discharge
- any complications arising from treatment.

There were 107 events reported in the clinical management category. This figure represents the largest proportion (42%) of serious and sentinel events reported. Table 3 breaks down this category into more specific sub-categories used in both reporting years.

Table 3: Classification of events within the clinical management category, 2006/07 and 2007/08

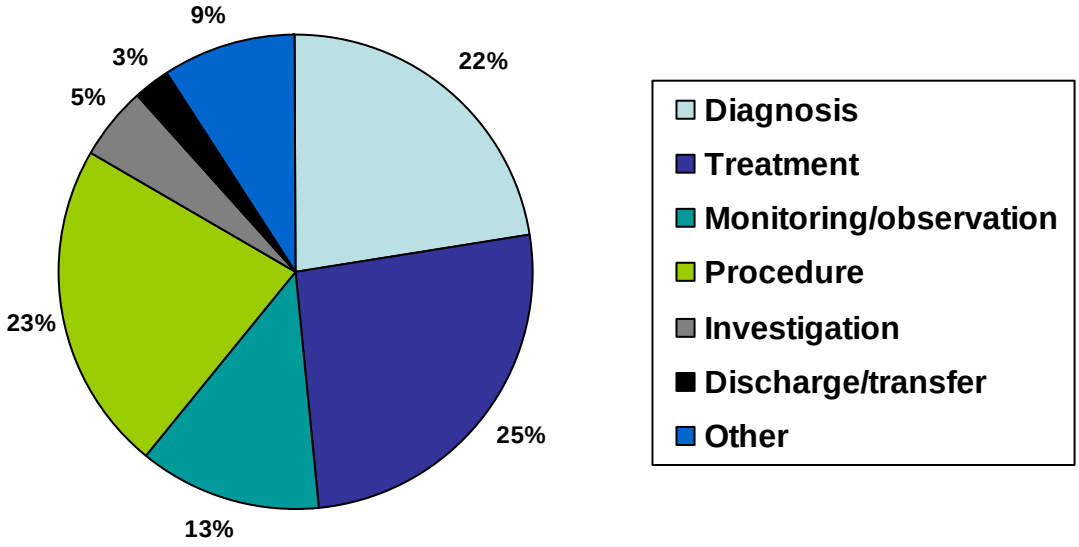
Classification	2006/07	2007/08
Diagnosis (including delayed and misdiagnosis)	6 (4%)	26 (21%)
Treatment (including delayed and inadequate treatment)	18 (12%)	34 (28%)
Monitoring/observations (not performed and/or actioned)	19 (13%)	17 (14%)
Procedure associated event or complication	60 (41%)	24 (20%)
Investigations (delayed, not ordered or actioned)	10 (7%)	6 (5%)
Discharge and transfer	23 (15%)	2 (2%)
Other	12 (8%)	12 (10%)
Total	**148 (100%)**	**121 (100%)**

Note: 11 events reported under the clinical management category fall into more than one subcategory.

As Table 3 shows, the two classifications with the most clinical management events were events or complications associated with procedures, and delayed or inadequate treatment. Examples of these types of events are:

- preventable complications following surgical procedure or medical procedure
- equipment failure that impacts on a patient's condition
- procedure carried out on the wrong patient
- delayed clinical staff response
- inadequate handovers.

Chart 3: Breakdown of clinical management events



Actions taken to improve clinical management

Typically actions taken to improve clinical management are concerned with systems and processes that could be improved to prevent the recurrence of such an event. As a starting point, a root cause analysis helps to identify the underlying causes that led to the event. The actions therefore directly relate to the causes identified. They might include, for example:

- changes to patient monitoring and care delivery processes
- improved patient care planning
- changes to the physical environment
- increased supervision of staff
- staff education
- development of new policies, protocols or guidelines – e.g. when to call the consultant
- audit of compliance with policies, protocols and guidelines
- purchase of new equipment
- education and implementation of an Early Warning Scoring (EWS) system
- improved staff handover procedures.

Medication Errors: Lessons Learned

District Health Boards reported 22 serious and sentinel events related to medication errors in the 2007/08 reporting year. They represent 8% of the total number of serious and sentinel events – the third largest category of events reported.

Over half of the medication errors were either overdoses or wrong doses. In many cases issues such as the similarity of packaging for different doses of the same medication contributed to the error. Other reasons were human error or unclear protocols.

In most cases the remedy for this situation was to adopt more rigorous checking processes. In some instances it was to use technology that may assist with reducing medication errors.

Case study

A nurse was concerned that a patient may have received too much narcotic medication. A check of the controlled drug book against the drugs in stock showed two extra 10 mg M-Eslon (long acting morphine) capsules in stock, but two fewer 100 mg M-Eslon capsules. It was therefore assumed that the patient had been administered 200 mg of M-Eslon instead of 20 mg. The patient was given an opiate antidote and regained consciousness.

This event led to a review that found that although M-Eslon comes in five different doses, ranging 10 mg to 200 mg capsules, all are presented in 'look alike' boxes.. It was also found that the different doses were all kept together in the controlled drug cupboard.

As a result of the review, new processes are in place. The 100 mg and 200 mg capsules have been removed from the wards and now must be requested for individual patients. They then come to the ward in individual snap-lock bags with the patient's name clearly visible. The clinical pharmacists remove these when the patient is discharged. The layout of the controlled drug cupboard has been reviewed and standardised. An automated dispensing machine has been introduced to prevent this kind of error from happening again. This machine allows access only to the patient's medication.

The issues regarding the packaging of M-Eslon have also been raised with the Director General of Health and the National Safety and Quality Use of Medicines Committee.

Initiatives to prevent medication errors

Given that medication is one of the most common therapeutic interventions used in the health care system, medication errors are a relatively common adverse event. Approximately 1.6% of people admitted to hospital may experience an adverse medication event. Of these events, the majority are preventable and occur inside hospitals.

Several strategies have been proven to be effective for reducing the rate of errors in medication management. They include:

- the use of standardised medication charts across the whole organisation or sector
- continually and effectively reconciling a patient's medication list; particularly when the patient is being transferred from one part of the health system to another part
- the introduction of some safety mechanisms around the use of high risk drugs
- verifying medications at the bedside, using bar-coded point of care systems
- using an electronic prescribing system.

In line with the above strategies, DHBs have taken the following initiatives to prevent the recurrence of such events:

- staff education in regard to dosage adjustments
- the introduction of PYXIS, an automated drug dispensing machine, to some DHBs
- staff education on antibiotics that should be avoided when allergies are present
- introduction of the SWITCH campaign, which involves switching patients from IV to oral antibiotics
- the placement of warning notices in the dispensary area.

Safe medication management, one of the five National Quality Improvement Programmes, is addressing the prevention of medication errors at national level.

Falls: Lessons Learned

District Health Boards reported 58 of the serious and sentinel events in the 2007/08 year were patient falls. This total represents 23% of the overall number of events reported. The reason for most of these falls related to the person's higher risk due to their physical or medical condition combined with the DHB's inability to provide one-to-one care for every patient at risk of a fall.

Common recommended remedies reported for falls were, first, to identify those patients most at risk of falls and, second, to increase supervision of these patients. Other recommendations included:

- improving the use of falls risk tools to assess the patient's risk of falling, as well as the use of care plans
- implementing hourly nursing rounds to anticipate toileting and other needs
- educating staff on falls prevention and management policy in this area
- monitoring the number of instances of falls
- maintaining equipment.

Case study

A patient required surgery to repair a fractured hip after the patient mobilised without calling for assistance.

This event, and several similar events, led to the implementation of hourly nursing rounds to address patients care needs. Further recommendations have seen a specialty bed replacement programme initiated for at risk patients, and staff education around fall preventions, environment and equipment risks and management policies.

A further result of the review has led to widespread use of the falls risk tool and care plan. These include a basic assessment of people admitted to determine their fall risk and a system to target activities to reduce risk. Actions to reduce risk include ensuring a clutter free environment, making sure that the call bell is accessible and reassuring the patient they should use it instead of trying to mobilise on their own, avoiding dangerous footwear such as bed socks on hospital floors, and a system so staff can see clearly if a patient has been assessed as a high risk.

Initiatives to prevent falls

There will always be a risk of falls in hospitals given the nature of the patients that are admitted and, where they occur, the injuries may be significant. There is, however, much that can be done to reduce the risk of falls and to minimise harm, while at the same time allowing patients the freedom and mobilisation they need during their stay in hospital.

It is not desirable to aim for zero falls in hospital, as this would prevent many patients from mobilising and strengthening as part of their recovery. Falls reduction therefore must find the best fit between the patient's clinical needs to recover from their illness, and the need to stay safe from the consequences of a fall.

Research shows that taking a multifaceted approach to reducing falls has the greatest effect. This approach involves making both clinical and environmental changes rather than focusing on one of these over the other.

Many of the initiatives that DHBs have recommended support a multifaceted approach. For example, targeted risk assessment tools are being implemented and used in conjunction with other methods. This kind of initiative is consistent with international research that shows that having a risk assessment tool does not in itself lead to an intervention.

There are many reasons why patients fall. For example, patients may undergo surgery that affects their mobility or memory, or they may need sedation, pain relief, anaesthetic or other medications that increase their risk of falling. Patients need to rapidly adapt to changes in their strength and mobility as they become ill and as they recover.

Preventing falls is one of the priority areas in the New Zealand Injury Prevention Strategy (NZIPS), which is a partnership of organisations such as the Accident Compensation Corporation (ACC), the Ministry of Health and District Health Boards. Many DHBs have implemented a falls harm reduction programme that involves:

- assessing the falls risk of all patients over 65 years on admission to the ward
- documenting and implementing a falls minimisation programme for the patient, encompassing measures such as:
  - orienting the patient to their new surroundings
  - asking them to use the call button to summon the nurse for assistance prior to getting out of bed
  - introducing non-slip flooring
  - introducing hand rails
  - using adequate night-time lighting
  - implementing regular toileting times
  - assessing all medications for their appropriateness
  - referring the patient to physiotherapy
  - increasing observation as needed (in extreme cases this measure will be one-to-one and may involve asking the patient's family to assist in this regard)
  - placing a falls risk sign above the patient's bed to alert staff and family to the patient's falls risk
  - educating family members on falls prevention
  - communicating about the patient's falls risk at every staff handover
  - ensuring that equipment is safe for use – for example, that brakes on the beds are working.

The reports from DHBs highlight that falls have complex and wide-ranging causes. The interventions to reduce falls need to reflect this complexity and diversity. We are already starting to see the development of good policies and practices in this area across the DHBs.

Suicides: Lessons Learned

Although New Zealand has a high rate of suicide by international standards, it has been trending downwards over the past few years. This report deals only with the number of suicides of District Health Board patients in a hospital setting or under intensive outpatient follow up.

Suicides are tragic events that sadly occur both in the community and in the health care system. In the 2007/08 reporting year 16 suicides of DHB inpatients were reported. Another 6 recorded suicides occurred in the community after a client had had recent contact with a DHB. These events are recorded in the clinical management category.

Remedies to address this issue included reviewing risk assessment and observation procedures, reviewing physical environment risks, reconfiguring doors to improve observation, improving communication between hospital teams, and improving communication with families.

Case study

A mental health inpatient committed suicide while on home leave from the inpatient unit. A review of this case highlighted the need for improved coordination and care of clients on home leave.

The role of Transition Liaison Nurse positions within the mental health inpatient unit were established – their role is to ensure appropriate processes and supports are in place for mental health inpatients on home leave. This includes ensuring all paperwork is completed such as risk assessments, leave recovery plans and Mental Health Act requirements. The Nurse is a key point of contact for the client and/or family members, ensuring that any concerns are quickly addressed. The nurse also arranging home visits and telephone support calls. This regular contact provides opportunity to continuously reassess the clients compliance with medication plans and may result in the client being re-admitted for inpatient care should concerns become elevated.

The mental service has also reviewed ways to improve the service offered to families post-suicide. The Family Advisor for mental heath services plays a key role in proactively contacting the family and managing the supports required. The Family Advisor also provides increased access to family education sessions

Initiatives to prevent suicide

The Ministry of Health has an action plan to prevent suicide, from which a number of initiatives are underway. A key initiative that has proved successful in DHBs is the Self-harm and Suicide Prevention Collaborative whakawhanaungatanga. Under this initiative, emergency departments, crisis mental health services and Maori health services from 10 DHBs worked together to improve the care of people who presented at a crisis service at risk of self-harm or suicide. The Collaborative focused on the consumer's experience and changed processes and care in accordance with a best practice guideline. The Collaborative is continuing under the guidance of the New Zealand Guidelines Group.

Looking to the Future

Why is the safety of care not improving more quickly? To make substantial improvements, it is important to continue to create an environment that encourages the reporting of adverse events. While substantial improvements to adverse event reporting are still required, as we continue to report on the serious and sentinel events we should see the development of a culture that encourages openness in admitting when things go wrong, addresses the root causes and prevents recurrence where possible. At the same time this culture needs to recognise that not all adverse events are preventable.

Over time we will see improved methods for recording and categorising events in District Health Boards, with a standardised approach nationally. This approach will in turn improve learning across DHBs and prevent the recurrence of serious and sentinel events. The overall result will be a safer health system.

It is through learning within DHBs, learning from other DHBs, increased public awareness of adverse events in health care and the establishment of national and regional programmes that a safer health system will emerge. The Quality Improvement Committee's National Quality Improvement Programme that is concerned with management of health care events has developed a draft national policy on adverse event management that will improve reporting systems and produce nationally agreed definitions of adverse events – including serious and sentinel events. In particular, its emphasis on open disclosure training will contribute to improved reporting of serious and sentinel events.

One of the most effective strategies to rapidly improve quality, which has been implemented in several countries, has been the use of national campaigns to prevent unnecessary deaths and reduce preventable harm. The use of a similar national campaign in New Zealand could well be considered as a future initiative to provide national and local measures of change and improvement to build a reliable national infrastructure for improvement actions and change.

Appendix: The Quality Improvement Committee

In February 2007 the Quality Improvement Committee was established. Its mandate was to provide independent advice to Parliament on making and implementing recommendations for national quality improvement.

After consulting widely the Quality Improvement Committee presented business cases on the five highest priority projects to the Minister of Health. The projects included arrangements for leading and co-ordinating the work for the District Health Boards and the Ministry of Health along with appropriate mechanisms for oversight.

Quality improvement is an integral part of health planning. The Quality Improvement Committee is leading the work to consolidate and build on the initiatives that many DHBs have already taken in this area.

The Quality Improvement Committee has a focused and co-ordinated national approach to quality improvement. In the first instance, this approach will address quality and safety problems within public hospitals because the greatest risks are in this part of the health care system.

As the serious and sentinel events reports highlight, in many instances there are more quality improvement opportunities than there are resources to address them. Therefore the following programmes have been prioritised to achieve value for money and higher quality services:

- optimising the patient's journey
- management of health care incidents
- infection prevention and control
- national mortality review systems
- safe medication management
- improving consumer participation
- education and training in quality improvement.

Each of these programmes is outlined below.

Management of health care incidents

The complexity of health care means that accumulated simple errors and risk factors can lead to major system failures and harm to patients. All human operators can make errors at times, but the system of care is not always designed to trap errors and prevent consequent patient harm.

A systematic approach to identifying and analysing common causes of system failure allows the redesign of patient care processes to eliminate repeated harm. Furthermore, a standardised approach to the management of major incidents can

ameliorate patient risk and harm by enabling the most effective response to be mounted swiftly.

All DHBs have systems for identifying and responding to such events. However, their approaches are inconsistent and DHBs have varied in the way they have implemented the national guidelines on managing reportable events.

Incident management is a key strategy that health services are using to manage the risks of clinical care as well as corporate risks. When implemented correctly, incident management is an effective mechanism for systematically identifying and managing problems and failures in the system and for informing the development of preventive strategies. It also guides the immediate response to incidents, for the purpose of ameliorating risk and minimising further harm, including emotional and psychological trauma for patient, families and health practitioners.

Incidents vary from simple errors, involving no patient harm, up to major reportable events associated with permanent harm or death of a patient. A uniform incident management system is needed to classify the magnitude or severity of incidents and define a hierarchy of responses.

System learning is made possible with aggregated data from large numbers of low-level events and the in-depth investigation (including root cause analysis) of cases of serious patient harm.

The national programme for managing health care incidents has three components.

1. Review and redevelop national policy and guidelines related to managing reportable events, including the principles and practices around the open disclosure of adverse events.
2. Provide a comprehensive education programme for health and disability providers on incident management. This programme will have a particular focus on investigating and managing serious and sentinel events, for the purpose of identifying system improvements; reducing future patient risk; open disclosure of the results to patients and families; and developing the confidence and communication techniques required for effective open disclosure.
3. Scope the business and technical requirements for a nationally co-ordinated incident information management system that meets the information requirements of all key stakeholders, including all health providers, DHBs, the Ministry of Health, ACC, the Office of the Health and Disability Commissioner and the Coroners.

Optimising the patient's journey

The national programme is based on a national collaborative approach to implementing effective processes in all DHBs for optimising the flow of patients and improving their journey through the health system. A key mechanism for improving the quality of patient care, particularly in hospitals, is to look at the

patient's journey through the system as a whole, both from the patient's perspective and from a whole system perspective, to optimise the flow of patients and allocation of resources at every step of the journey.

The entire project is anticipated to take three years. It will be conducted in two phases.

1. Phase 1 will focus on improving the patient's journey within the inpatient setting, from before the patient's entry (i.e., attendance at the emergency department or at outpatient medical and surgical services) until the patient is discharged from that episode of care.
2. Phase 2 will focus on the management of patients with chronic diseases who present at the hospital for treatment and on the flow of patients from the community/primary care setting through to the hospital setting.

Infection prevention and control

Infections that have been contracted in the health care system are a significant problem worldwide. Reducing these infections has been identified as a priority because of the disease burden and the economic burden that they create.

At any one time, over 1.4 million people worldwide are suffering from infections acquired in hospital. Up to 10% of patients admitted to modern hospitals in the developed world acquire one or more infections. The importance of this issue in New Zealand has been highlighted in the Controller and Auditor-General's Report in 2003. The Controller and Auditor-General reported on the management of hospital-acquired infections in public hospitals in New Zealand and described and assessed systems for managing these infections in public hospitals.

The key components of this national programme are as follows.

1. Adopt the World Health Organization (WHO) Guidelines on Hand Hygiene, participate in the WHO High 5s Action on Patient Safety Programme, and implement a national hand hygiene campaign.
2. Develop guidance on the prevention of catheter-related bloodstream infections; pilot the guidance; and finalise and publish it.
3. Review current systems for surveillance of procedural and surgical site infections and make recommendations for implementing a national surveillance system. Funding for this system is not included in this paper; if its implementation is agreed to, additional funding will be required.

The first two components will be the collective responsibility of DHBs, through a lead chief executive appointed by the DHB Chief Executive group. The third component will be the responsibility of the Ministry of Health, in collaboration with DHBs.

National mortality review systems

The importance of systematic analysis of mortality is well recognised both nationally and internationally. Many countries have long-established mortality review processes.

Mortality review helps to identify what is needed to make improvements in health care systems, which in the longer term can reduce the number of preventable deaths. It can also provide information about populations, which can then inform policy and service development, education and research.

The process of Child and Youth Mortality Review Groups (CYMRGs) is based on national data collection, and further data collection and review of deaths by the local CYMRG covering a particular DHB district. Currently there are only seven functioning groups. A further 14 groups are needed to cover the remaining 14 DHBs (among which are large DHBs that represent a high proportion of the deaths in New Zealand).

New Zealand lags behind comparable countries in that it has no national adult mortality review process. The current system provides only national quantitative data (with limited analysis) relating to adult mortality.

Perioperative deaths are reviewed in organisations across New Zealand but there is no national system. This fragmented approach creates difficulties for those involved in perioperative care in New Zealand, such as surgeons and anaesthetists, because they have no reliable data to compare with data from counterparts in Australia and other countries.

This national programme has two components.
1. Establish a national adult mortality review committee to look at perioperative deaths.
2. Increase the number of local Child and Youth Mortality Review Groups so that they cover all DHBs.

Safe medication management
Given that medication is one of the most common therapeutic interventions used in the health care system, medication errors are a relatively common adverse event.

Medication errors may occur either in hospitals or in the community. Approximately 1.6% of people admitted to hospital may experience a medication error. Of these events, the majority are preventable and occur inside hospitals. Many preventable adverse events related to medication errors have a significant impact on consumers.

Several strategies have been proven to be effective in reducing the rate of errors in medication management. They include:
- using a standardised medication chart across a whole organisation or sector
- reconciling a patient's medication list effectively and continually, particularly when the patient is transferring from one part of the health system to another
- introducing some safety mechanisms around the use of high risk drugs
- verifying medications at the bedside, using bar-coded point-of-care systems
- using an electronic prescribing system.

This national programme will use the following strategies, which have been proven to be effective in reducing the rate of errors in medication management.

1. **Medication chart**. This component will standardise medication prescribing in hospitals, and with its built in safety features it has the potential to decrease medication errors by up to 25%. It will form the basis of an electronic medication chart – an essential prerequisite for bedside verification.
2. **Medicine reconciliation**. This component involves the accurate collection and access of information on the medication history of a consumer.
3. **Appropriate ICT tools**. Introduce e-medication charts, or e-prescribing or a clinician point of entry system.
4. **Standardised hospital medicine information systems**. The main emphasis and effort will be channelled into implementing a consistent electronic prescribing system and ensuring that all information systems dealing with medicines are using a consistent dataset of medicines.
5. **Barcoded packaging**. Package pharmaceuticals at unit of dose with barcodes on wrappers or labels. In the short to medium term this component is likely to involve the purchase and operation of unit dose repackaging machines. In the medium to long term, by mandating through rule or regulation, the requirement will be for globally standardised barcodes to be printed on pharmaceutical packaging.
6. **Linking all information systems**. Link all information systems that are related to medicine management including patient management systems, electronic prescribing systems, barcode point-of-care systems, and pharmacy dispensing systems, using a common consistent dataset of medicines.
7. **Barcoded bedside verification**. Introduce bedside verification using barcode point-of-care (BPOC) systems to New Zealand public hospitals.
8. **Training**. Train and support DHB staff in the operation of these systems and process change management.

In the first year all the National Quality Improvement Programmes have been initiated and are progressing. Details of each programme's progress can be viewed on the QIC website www.qic.health.govt.nz

Committee members

Patrick Snedden, Chair – Chair of Auckland DHB

Prof Alan Merry – Professor of Anaesthesiology, University of Auckland and Chair of the Quality & Safety Committee of the World Fed of Societies of Anaesthesiologists

Barbara Crawford – Quality and Clinical Risk Manager of Waikato DHB

Barbara Greer – registered psychiatric nurse and member of the Health Advisory Group of the Maori Women's Welfare League

Catherine Rea – Quality and Risk Manager at Otago DHB and Chair of the National DHB Quality and Risk Managers Group

Prof Cynthia Farquhar – Postgraduate Professor of Obstetrics and Gynaecology, University of Auckland and Consultant at National Women's Auckland City Hospital, Chair of New Zealand Guidelines Group.

Dr Jean Hera – community health worker / manager of the Palmerston North Women's Health Collective and a public member of the Medical Council of NZ

Dr Jim Vause – a GP since 1979, former President of the Royal NZ College of General Practitioners and involved in GP quality initiatives nationally, workforce planning and evidence based guideline development with the New Zealand Guidelines Group

Judi Strid – Director of Advocacy at the office of the Health and Disability Commissioner (HDC) to ensure close links on quality initiatives between the Quality Improvement Committee and HDC

Dr Mary Seddon – Clinical Director, Quality Improvement Unit, Counties Manukau District Health Board and senior lecturer in quality improvement theory and techniques at the Auckland School of Population Health

Dr Nick Baker – Paediatrician, Nelson Marlborough DHB and Chair of the National Child and Youth Mortality Review Committee