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Learning from mistakes in New Zealand hospitals: what else do we need besides “no-fault”?  
F Soleimani

Many supporters of New Zealand’s no-fault system for medical injury compensation (i.e. ACC) contend that, because this system eliminates legal culpability, it facilitates a more open discussion of medical errors and allows doctors to learn from mistakes and improve quality. After three decades of experimenting with no-fault, however, the risk of experiencing preventable iatrogenic (caused by treatment) injuries in New Zealand remains comparable to that seen in countries dealing with tort (a civil wrong or injury). What else do we need besides no-fault to learn from errors and better our performance? This survey study revealed that there are other factors that influence error-reporting behaviour of New Zealand doctors. For example, they are less inclined to report small errors and they find the fear of losing patient’s trust and the threat of public outcry as strong disincentives. The policy implications of these findings are discussed.

The influence of PHARMAC’s National Hospital Pharmaceutical Strategy on Quality Use of Medicines activities in New Zealand hospitals  
J Tordoff, P Norris, J Kennedy, D Reith

In 2002, as part of a Strategy to manage pharmaceutical expenditure in New Zealand hospitals, New Zealand’s Pharmaceutical Management Agency (PHARMAC) planned to coordinate Quality Use of Medicines (QUM) activities in hospitals (i.e. measures to improve the use of medicines such as hospital formularies, bulletins, campaigns, and Drug Utilisation Reviews). To assess any influence from the Strategy on hospital QUM, researchers at the University of Otago examined QUM activities in the periods before and after the launch of the Strategy. They found that QUM activities were similar in both periods and these were not positively influenced by PHARMAC’s Strategy. In 2004, PHARMAC put their original plans to coordinate QUM on hold and chose to participate in the process of the Safe and Quality use of Medicines Group (SQM), a group formed by the District Health Boards of New Zealand in 2003. The researchers suggest that the SQM group may influence QUM in New Zealand hospitals in future.
Comprehension of discharge information for minor head injury: a randomised controlled trial in New Zealand
K Yates, A Pena

In this prospective randomised controlled trial, 200 patients (mean age 43 years) presenting to the Emergency Department at North Shore Hospital (Takapuna, Auckland) were studied to gauge their relative comprehension of two different discharge information advice sheets for minor head injury (e.g. concussion): one in simple English and one standard. Factors associated with better comprehension included: the simplified form, higher literacy level, more years of schooling, and younger age group. Recommendations for improving discharge information are discussed.

After hours healthcare for older patients in New Zealand—barriers to accessing care
A Eastwood, C Jaye

Interviews and a focus group were used to explore any difficulties older people might have in accessing after hours healthcare in a New Zealand suburban area: Hutt Valley, near Wellington. Transport problems, cost, and lack of information about after hours services were identified as barriers. Older people were also reluctant to “be a nuisance” and to be seen by an unfamiliar doctor.

Investigating the accuracy of ethnicity data in New Zealand hospital records: still room for improvement
J Swan, S Lillis, D Simmons

As part of the Barriers to Diabetes Care in the Waikato Study, this paper reports the ongoing mis-recording of ethnicity in hospital records when compared to self-identification. It highlights that ethnic mis-recording occurs in all ethnic groups, and is more pronounced as the ethnic group assessed becomes more specific. The value of this paper is in reminding those who use hospitalisation data to view the ethnic data with caution, and to agitate for improvements in the recording of accurate ethnic information.

Cholecystectomy following acute presentation to a major New Zealand metropolitan hospital: change to the timing of surgery is needed
A Lin, P Stiven, P Bagshaw, S Connor

When patients develop gallstones, the treatment of choice is surgical removal of the gallbladder (cholecystectomy). International data supports that this should be performed when patients first present to hospital with gallstone disease. Currently only 15% of patients at Christchurch Hospital suitable for such an approach are offered cholecystectomy. The majority are placed on elective operating lists and subsequently re-present to hospital with ongoing problems resulting in both an increased cost and burden to both patient and the public health system. A change in policy to emergency cholecystectomy is required.
Leadership in medicine

Ron Paterson

Today I do not want to be a doctor (by Glenn Colquhoun)

Today I do not want to be a doctor.
No one is getting any better.
Those who were well are sick again
And those who were sick are sicker.
The dying think that they will live.
And the healthy think they are dying.
Someone has taken too many pills.
Someone has not taken enough.
A woman is losing her husband.
A husband is losing his wife.
The lame want to walk.
The blind want to drive.
The deaf are making too much noise.
The depressed are not making enough.
The asthmatics are smoking.
The alcoholics are drinking.
The diabetics are eating chocolate.
The mad are beginning to make sense.
Everybody’s cholesterol is high.
Disease will not listen to me
Even when I shake my fist.

Today’s medical students face a career in medicine that may span 30 to 50 years. Some days you will feel mired in the mundane. You may wonder why you ever decided to study medicine. Like the doctor in Glenn Colquhoun’s poem, you may say, Today, I do not want to be a doctor.

My challenge to you as future leaders of medicine in New Zealand is first, to learn how to be a good doctor; and secondly, if you want to be a leader, learn how to be a servant leader, using your medical and leadership skills in the service of your patients and the community.
What does it take to be a good doctor?

The last five years have seen renewed emphasis, in New Zealand and overseas, on the concept of professionalism in medicine. Professionalism is not a patient-friendly term. It can very easily sound like what Ian Kennedy (in his Bristol Inquiry Report) called “club culture” or what Harvard physician David Blumenthal has described as “a refuge of scoundrels”.

In 2002, the European Federation of Internal Medicine and the American Board of Internal Medicine launched a new charter on medical professionalism, which has been endorsed by the New Zealand Medical Association. It is based on three principles—patients’ welfare, patients’ autonomy, and social justice. It is very clearly about putting patients first. In December 2005, the Royal College of Physicians issued a significant report on “Doctors in society: Medical professionalism in a changing world”. It describes medical professionalism in the following terms:

“Medicine is a vocation in which a doctor’s knowledge, clinical skills, and judgement are put in the service of protecting and restoring human well-being.”

The Royal College goes on to describe the good doctor in day-to-day practice as committed to:

- integrity
- compassion
- altruism
- continuing improvement
- excellence
- working in partnership with members of the wider healthcare team.

The first three aspects—integrity, compassion and altruism—are hallmarks of a good human being, not just a good doctor. But the stakes are different in medicine. Even in this age of the Internet and the informed patient, as a doctor your knowledge, skills, and understanding of the mysterious workings of the hospital and health systems (never mind the human body) place you in a position of power vis-à-vis your patients.

**Integrity** means being honest about yourself—admitting what you don’t know and the limits of your experience; sharing your own results (successes and failures) in treating the particular condition; being open to your patients (listening to them, engaging them in conversation, answering their questions); and openly disclosing your mistakes.

**Compassion** means bringing kindness and caring to your work—seeing your patient not as a case, but as a fellow human being experiencing fear, uncertainty and suffering. In *The Lost Art of Healing: Practicing Compassion in Medicine*, Boston cardiologist Bernard Lown dissects the heart of medicine. He describes medicine as having indulged in “a Faustian bargain. A three-thousand-year tradition, which bonded doctor and patient in a special affinity of trust, is being traded for a new relationship. Healing is replaced with treating, caring is supplanted by managing, and the art of listening is taken over by technological procedures…The distressed human being is frequently absent from the transaction.” Lown quotes the 12th century philosopher-physician Maimonides, who prayed, “May I never forget that the patient is a fellow creature in pain. May I never consider him merely a vessel of disease.”
**Altruism** is putting the needs of others—your patients—before your own. This does not mean that doctors are called to be saints. As the novelist Albert Camus wrote in *The Plague*, doctors are called to be “not saints but healers”. You will be required to work long hours. You will at times put your own health at risk. Society places heavy demands on doctors—which is one reason why it is so important that society supports doctors in their work.

The next values that the College lists as hallmarks of a good doctor are **continuing improvement** and **excellence**. You need to make a commitment to lifelong learning and maintenance of your skills. Troy Brennan, a US physician and lawyer who was part of the landmark study of adverse events in New York hospitals in 1988, has described doctors’ professional responsibility to improve the quality of care as follows:

Physicians are the stewards of quality, and they must aggressively develop an agenda for improvement...we are at a critical cusp of time in which we have a last chance to retain our professional role, and to do so we must become protectors of quality. Altruism must grow if we are to promote the professional/quality link at the level of patient care. This responsibility reaches to every physician.

Finally, **teamwork** is key. As noted in the Royal College report, “most discussions of contemporary medical practice are plagued by manufactured and often false conflicts: between doctors and managers, specialists and general practitioners, employers and employees”. At the heart of the Code of Patients’ Rights is the statement in right 4(5), *Every consumer has the right to co-operation among providers to ensure quality and continuity of services.*

To my knowledge, this provision is unique. Yet it goes to the heart of modern healthcare. To be a good health professional, whatever your work setting, you need to be an effective team player, making sure that your patient does not fall through the many cracks in a complex health system.

**What does it take to be a good leader?**

Leadership week was recently commemorated in New Zealand, and July 2006 marked the 10-year anniversary of the introduction of the *Code of Health and Disability Services Consumers’ Rights*. There has been a lot of earnest discussion and hopefully some useful reflections on what we mean by leadership.

There have been outstanding leaders in the history of New Zealand medicine. Dr Maui Pomare was the first Māori medical graduate (he graduated MD in 1900 from the American Missionary College in Chicago), the first Māori health officer, an influential figure in improving Māori health in the early 20th century, and later the first and only medically qualified Minister of Health (1923–26).

Although there continue to be fine leaders within medicine in New Zealand, leadership of the profession has become fragmented and has sometimes seemed more concerned with service of the profession than the community. The words of an English trainee doctor strike a chord:

*I feel that our profession has been sold up the road by our superiors over the years for a few pieces of silver, for their own selfish interests. That has*
eventually placed us, both present and future doctors, in very difficult positions, and undermined our morale, confidence, and standing in society. We lack leadership and foresight in our present-day peers and seniors.

This is not a recent phenomenon. On Christmas Eve 1912, the Daily News in London ran a cartoon showing the spoilt child (the British Medical Association) saying, “I want it all, and I want to carve it myself”—in response to Lloyd George’s Insurance Act reforms to provide free healthcare for workers, with guaranteed fees for doctors.

Lack of leadership and foresight was evident in New Zealand medicine 30 years ago. In a 1974 publication entitled The Future of New Zealand Medicine: A Progressive View, Dr Eric Geiringer (writing on ‘Medical Ethics’) bemoaned that the delivery of skilful advice and treatment “has been to all intents and purposes handed over to external regulation”—an extraordinary claim given the lack of medical regulation at that time, and the very limited recognition of patients’ rights and the need for proper ethical review of research. As events at National Women’s Hospital showed, and Judge Cartwright’s Cervical Cancer Inquiry Report highlighted in 1988, reliance on self-regulation and the internal morality of medicine was not in itself sufficient to protect patients.

We have heard a good deal from medical professional leadership in New Zealand in recent years about MECAs, new fees arrangements, the working hours of junior doctors, the impact of complaints on doctors, the need for the profession to appoint members of the Medical Council, the risks that the threatened influenza pandemic poses for doctors, the need for a more tolerant approach to doctors entering relationships with their patients, the unfairness of proposed 360-degree assessment of doctors’ performance.

Where is the advocacy for patients in all this? On some issues (notably the workforce and access to hospital-based services) professional voices have been eloquent and powerful. But on other issues the professional response has been impoverished. This is less than the community deserves—but also less than the vast majority of competent, committed and hardworking doctors deserve. If medical leadership is really about serving the interests of patients and the community, the first question whenever a health policy issue arises for public debate should be—how will this proposal affect the health and well-being of the community?

Saluting our leaders

There are plenty of opportunities for future leaders of medicine in New Zealand. We face major challenges to improve the gaps in health outcomes for Māori and Pacific Island people. I salute a leader like young Māori Dr Lance O’Sullivan, practising as a GP in the Far North with Te Hauora O Te Hiku O Te Ika, driving the dusty roads of Tai Tokerau to deliver marae-based healthcare, with a vision of providing his people with gold-standard medicine delivered in a way that embraces tikanga Māori.

I salute leaders like Dr George Downward, President of NZMA, who has challenged the profession to be brave and to tackle healthcare induced harm, and is leading by example at Christchurch Hospital ICU. We need a concerted effort to improve the safety and quality of health services in New Zealand—as noted recently by Alan Merry and Mary Seddon in their article Quality improvement in healthcare in New Zealand. Part 2: are our patients safe—and what are we doing about it?5
In July 2006, Liam Donaldson, Chief Medical Officer of the NHS in England, in a major report entitled “Good doctors, safer patients”, commented: “Most doctors know of another doctor whom, on balance, they would prefer not to treat their own family. Unsatisfactory practice compromises patient safety. The medical profession has a duty to identify such practice and to remedy it. The profession owes this not only to patients, but to itself.”

Looking further afield, there are major challenges in the Pacific, in Asia, and in Africa, where New Zealand doctors can serve people suffering a level of poverty, disease and starvation that is difficult to imagine. We need medical “missionaries” to be global health workers. If you want to be inspired about what being a medical leader means, read Catherine Hamlin’s biography *The Hospital by the River*, the story of her and her New Zealand-born husband Reg’s lifetime of work and service in surgical repair of fistula in Ethiopian women—truly “restoring human well-being” to society’s outcasts.

In closing, I remind you of the challenge—to be a good doctor, and to be a servant leader. Let me close with Glenn Colquhoun’s companion poem.

**Today I want to be a doctor**

*Today I am happy to be a doctor*

*Everyone seems to be getting better.*

*Those who were sick are not so sick*
*And those who were well are thriving.*

*The healthy are grateful to be alive.*
*And the dying are at peace with their dying.*

*No one has taken too many pills.*
*No one has taken too few.*

*A woman is returning to her husband.*
*A husband is returning to his wife.*

*The lame accept chairs.*
*The blind ask for dogs.*
*The deaf are listening to music.*
*The depressed are tapping their feet.*

*The asthmatics have stopped smoking.*
*The alcoholics have stopped drinking.*
*The diabetics are eating apples.*

*The mad are beginning to make sense.*

*Nobody’s cholesterol is high.*

*Disease has gone weak at the knees.*
*I expect him to make an appointment.*
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References and endnotes:


3. Royal College of Physicians, above n 1, para 3.18.

4. Royal College of Physicians, above n 1, para 3.13.


6. Good doctors, safer patients: Proposals to strengthen the system to assure and improve the performance of doctors and to protect the safety of patients (Report of the Chief Medical Officer, Department of Health, London, 2006), vii. URL: http://www.dh.gov.uk/assetRoot/04/13/72/76/04137276.pdf
Learning from mistakes in New Zealand hospitals: what else do we need besides “no-fault”?

Farzad Soleimani

Abstract

Aim to obtain a more in-depth understanding of some of the key factors influencing medical error reporting behaviours of doctors in New Zealand.

Methods A cross-sectional anonymous survey of 292 doctors in North Island was conducted over a period of 4 months.

Results 128 doctors completed the survey (45% response rate). The results of the study suggest that (overall) most doctors feel they should report the occurrence of medical errors to both the patient and the hospital when they are anticipating major adverse events (long term/serious complications or mortality). However, when they are anticipating minor complications, not every doctor feels that they should report the error(s). This study also shows that doctors feel more comfortable to report errors to the patient than to report to the hospital (79% vs 21%). Furthermore, doctors selected the fear of losing patient’s trust and the threat of public outcry most frequently as the most important reasons for their reluctance to report. Lastly, 86% of surveyed doctors felt that reporting the occurrence of errors to patients will decrease the likelihood of complaints being filed against them.

Conclusions The study suggests that to learn from most of the mistakes, we need to have a system that not only facilitates the reporting of major errors but also encourages the reporting of minor ones. To mitigate the effects of key factors that prevent error reporting, we may benefit from making changes to how doctors are trained and how media reacts to the occurrence of errors in New Zealand hospitals.

The issues of patient safety and quality of care have been scrutinised on the international level by healthcare providers and policymakers. We now know that our hospitals are not as safe as we once thought, and iatrogenic injuries occur with significant economic impacts on healthcare systems.

In a tort legal environment, patients may seek some sort of financial compensation for injuries if negligence is proven through litigation. In a “no-fault” system, by contrast, iatrogenic injuries can be compensated without the need to prove culpability. “No-fault” aims to reduce barriers to compensation and increase disclosure of errors that may result in preventable injuries. Error reporting would in turn guide providers as to how they can improve quality. Based on these principles, a “no-fault” system for medical injury compensation was established in New Zealand in 1972 and funded out of taxes and a mandatory payroll levy. This system, however, has not fully lived up to its potentials in terms of compensation and facility of quality improvement.
A retrospective review of 6579 medical records conducted by Davis and colleagues revealed that just over 2% of hospital admissions were associated with an adverse event (an unintended iatrogenic injury) that was potentially compensable under New Zealand’s “no fault” compensation scheme criteria. However, the ratio of successful claims to potentially compensable events was approximately 1:30, which is comparable to the low levels of claims making seen in tort systems.

The researchers concluded that this small number of claims in a system that is well targeted, cheap, and free of financial and legal barriers, might happen due to particular features of the system, including limited payoffs and a history of limited litigation for medical errors.

While the number of claims produced in New Zealand may be comparable to those seen in tort systems, one should remember that an advantage a “no-fault” system carries is in substantially lower “overhead” costs for benefits payments. For example, “overhead costs” in New Zealand account for less than 10% of total system expenditures, while in the US tort system, this figure approaches 50%. In other words, at the same average overall cost, the New Zealand system has the capacity to compensate more claims than the US system, even if it were to provide similar generous payoffs.

Another advantage of a “no-fault” system is that the time interval between making a claim and getting compensated is shorter relative to that observed in tort. For instance, in New Zealand, most straightforward claims can be processed in weeks, with a statutory mandate for decisions to be made within 9 months. Moreover, award decisions are based on a fixed schedule. So, similar injuries receive similar compensations and the variability produced by non-uniform court decision-making process is eliminated.

Davis and colleagues reported in 2003 that the risk of a patient experiencing a preventable adverse event in New Zealand is just under 1%, which is again close to the figures published for tort. Of course, one should acknowledge that differences in study methodologies, healthcare systems under review, and subjectivity of chart review; and retrospective judgments about the quality of care; make comparisons between different systems unreliable. At the same time, if eradication of the culture of blame alone was sufficient to encourage a more widespread reporting of potentially harmful errors, one might have reasonably anticipated a significantly lower incidence of preventable adverse events in New Zealand. After all, the studies conducted across other industries have shown that such a reporting system is the major cause of high levels of safety we see today in aviation, nuclear power technology, and other industries.

Then, the question is—why in New Zealand, after three decades of experimenting with “no-fault,” the risk of preventable iatrogenic injuries is not much lower in comparison to that seen in the tort environment. As we move the focus away from blaming the individuals participating in the system to the design of the system itself, we should ascertain that we have also identified and minimised the effects of factors other than legal culpability that may still discourage our doctors from reporting errors that may lead to preventable adverse events. This way, we can truly learn from all the mistakes and make a significant leap in making our hospitals safer.
Many experts argue that simply learning from mistakes is not enough to ensure and improve quality, and that accountability needs to be enforced as well when doctors fail to perform their duties with reasonable care and skill. To restore accountability, The Code of Consumers’ Rights, which defines providers’ duties and patients’ rights, was introduced in New Zealand in the late 1980s. Patients may choose to file complaints with the Health and Disability Commissioner whenever they suspect a breach of this Code.

The Commissioner does not offer financial awards. Yet, it makes sure that professional competence is scrutinised and serious breaches are assessed for disciplinary proceedings. Albeit the purpose of the complaints is resolution and not retribution, doctors feel under siege by this process; they refer to it as “death by a 1000 arrows” and seek to avoid it.

Paterson contends that complaints provide “a window of opportunity” to improve health services because investigations often unravel many invaluable lessons that are widely disseminated. At the same time, when set against the actual number of injuries, Bismark and colleagues have shown that there is surprisingly a significant under-utilisation of this process, with only one in 200 injured patients filing any sort of complaints. This finding means that the complaint process actually falls short of exposing all the errors, while skepticism of New Zealand doctors about the legitimacy of this process may interfere with their desire to freely report errors. This potential conflict highlights the fact that any feature we build into the system has the potential to interfere with error reporting and thus needs to be carefully evaluated before being implemented.

The current study was conducted to give us a more in-depth understanding of some of the key factors influencing medical error reporting behaviours of New Zealand doctors. Before we delve into the findings of this study and its implications, we should acknowledge that, even with an appropriate level of accountability, comprehensive medical error reporting is not sufficient to create an ultrasafe environment as experienced in other industries such as aviation.

In addition to inadequate error reporting, five systemic barriers currently prevent healthcare from becoming an ultrasafe environment—the need to:

- Limit the discretion of workers,
- Reduce worker autonomy,
- Make the transition from a craftsmanship mindset to that of equivalent actors, and
- System-level (senior leadership) arbitration to optimise safety strategies, and
- Simplification.

Furthermore, healthcare must overcome three unique problems: a wide range of risk among medical specialties; difficulty in defining medical error; and various structural constraints (such as public demand, teaching role, and chronic shortage of staff). Discussing each of these barriers is beyond the scope of this article, however. Interested readers are encouraged to consult Amalberti (2005) and Edmonson (1996).
Meanwhile, we hope that the current study provides some guidelines as to how we can create an environment in which learning from mistakes is carried out in a more open and efficient manner.

Methods

Stanford University Institutional Review Board approved the study. Overall, 292 doctors affiliated with different hospitals in North Island were invited to participate in an online survey study. Individual doctors were not identified or contacted at any point during the study. Instead, the web address of the online questionnaire was sent to the administrators (chiefs, chairs, or clinical directors) of individual departments, and they were asked to notify their doctors about the study and to report back how many doctors they contacted.

Table 1. Questionnaire

HYPOTHETICAL SCENARIO: A doctor prescribes an anticoagulant at a higher dose than should be given. If the dosage is not too high, the patient may suffer a minor internal bleeding, which requires monitoring and an additional day of hospitalization. If the dosage is too high, the patient may suffer a serious intracranial hemorrhage, survive, and have some long term/serious disability. In the worst case scenario, the patient may die from the hemorrhage. Now, assuming that you were in place of this doctor, and that the doctor is practicing in a setting similar to yours, please answer the following questions.

1. If the doctor anticipates minor/short term complication for the patient (i.e. one additional day of hospitalization) as a result of this error, should the doctor report the error to the patient, or if patient is incompetent, to a responsible family member? Should he/she report the error to the hospital?

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<tr>
<th>Yes</th>
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<td>Yes</td>
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2. If he/she anticipates long term/serious complication, should he/she report the error to the patient? Should he/she report the error to the hospital?

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<th>No</th>
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<tr>
<td>Yes</td>
<td>No</td>
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<td>Yes</td>
<td>No</td>
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3. If he/she anticipates mortality, should he report the error to the patient or his/her family? Should he/she report the error to the hospital?

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<th>Yes</th>
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<td>Yes</td>
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4. If you were in place of this doctor, to whom do you feel most comfortable to report this event? Please indicate only one.

   __Hospital __Patient

5. If you feel reluctant to report, what are the reasons? Indicate 1 (most probable) to 5 (least probable) cause.

   __Fear of patient’s anxiety __Fear of losing patient’s trust __Threat of public outcry __Professional consequences/discipline __Embarrassment in front of colleagues

6. If the patient learns from the doctor that a medical error has occurred, do you think that this will increase or decrease the chances of that patient filing a complaint against the doctor?

   Increase Decrease

7. Will you be comfortable to discuss errors amongst your colleagues, given complete confidentiality and protection against any type of disciplinary action?

   Yes No
Upon their own request, some department administrators received paper copies of the survey, distributed them amongst their doctors, and faxed back the completed questionnaires. In either format, completed surveys carried no identifying information. To improve the response rate, email reminders were sent to the administrators after 2 months. The study period lasted 4 months from July to November 2004. A copy of the questionnaire is shown in Table 1.

**Preventability** of an adverse event is defined as “an error in healthcare management due to failure to follow accepted practice at an individual or system level.” ² Not all medical errors will result in an adverse event. However, a preventable adverse event always results from a medical error. Studies have shown that medication errors, such as the one presented in the hypothetical scenario, are amongst the most common medical errors that cause preventable adverse events. ⁶ Hence, the above hypothetical scenario was chosen to put the concepts of medical error and resultant preventable adverse event in a clinical context that is unequivocal for doctors from different specialties.

The first part of this questionnaire (questions 1–3) attempts to capture variations in doctors’ willingness to report the occurrence of errors to the patient or to the hospital depending on the severity of anticipated adverse event. In questions 1–3, three different scenarios—minor/short term injury, long-term/serious complication, and mortality—are presented, respectively.

The second part of this survey (questions 4–7) gives us an idea of what factors influence error reporting behaviours of New Zealand doctors. Every question was designed to help us figure out what are some of the hindrances to reporting and what system modifications might facilitate disclosure of errors.

**Results**

By the end of the study period, a total of 128 practicing doctors had completed the questionnaire, thus giving a response rate of around 45%. Some of the findings of this study are summarised in Table 2.

**Table 2. Doctors’ responses to survey questions (N=128)**

<table>
<thead>
<tr>
<th>Scenario 1: Short term/minor complication</th>
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<tbody>
<tr>
<td>Percentage feeling they should report to the patient</td>
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<tr>
<td>Percentage feeling they should report to the hospital</td>
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<table>
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<tr>
<th>Scenario 2: Long term/serious complication</th>
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<td>Percentage feeling they should report to the patient</td>
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<td>Percentage feeling they should report to the hospital</td>
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<th>Scenario 3: Mortality</th>
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<tr>
<td>Percentage feeling they should report to the patient</td>
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<td>Percentage feeling they should report to the hospital</td>
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**Reporting preferences and behaviour**

| Percentage feeling most comfortable to report to patient | 79%* |
|---------------------------------------------------------|
| Percentage feeling most comfortable to report to hospital | 21% |
| Percentage feeling comfortable to discuss errors amongst colleagues, given complete confidentiality and protection against any type of disciplinary action | 100% |
Expected effect on possibility of disciplinary complaint
Percentage feeling that disclosure to patients will INCREASE chances of complaints filed against them: 14% *
Percentage Feeling that disclosure to patients will DECREASE chances of complaints filed against them: 86%

Composition of surveyed doctors by specialty

<table>
<thead>
<tr>
<th>Specialty</th>
<th># contacted</th>
<th># responded</th>
<th>response rate in a given specialty group</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>153 (52%)</td>
<td>42 (33%)</td>
<td>27%</td>
</tr>
<tr>
<td>Surgery</td>
<td>26 (9%)</td>
<td>24 (19%)</td>
<td>92%</td>
</tr>
<tr>
<td>OBGYN</td>
<td>17 (6%)</td>
<td>17 (13%)</td>
<td>100%</td>
</tr>
<tr>
<td>Cardiology</td>
<td>31 (11%)</td>
<td>9 (7%)</td>
<td>29%</td>
</tr>
<tr>
<td>Geriatrics</td>
<td>24 (8%)</td>
<td>8 (6%)</td>
<td>33%</td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>20 (7%)</td>
<td>7 (6%)</td>
<td>35%</td>
</tr>
<tr>
<td>Other specialties</td>
<td>21 (7%)</td>
<td>21 (16%)</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Difference between comparison groups were statistically significant (p<0.05)

This study suggests that overall most doctors feel they should report the occurrence of medical errors to both the patient and the hospital when they are anticipating major adverse events (long-term/serious complications or mortality). However, when they are anticipating minor complications, not every doctor feels that they should report the occurrence of contributory errors: 82% indicated willingness to tell the patient and 45% indicated willingness to tell the hospital in such situations.

Furthermore, this study shows that, in general, doctors feel more comfortable to report to the patient than to report to the hospital (79% vs 21%; Table 2). It is important to note that stratification of data across different specialty groups did not reveal cross-sectional variations. Moreover, while one can see that for example the response rate was lowest amongst the GP’s compared to other specialty groups, one cannot draw any tangible conclusion about the characteristics of respondents and non-respondents based on these limited demographic data. Indeed, response rate in a given specialty group may simply reflect the aggressiveness of respective department administrator(s) in getting doctors in their group to complete the survey.

For each doctor, the most important reason why they do not want to report the occurrence of medical errors is different, as shown in Table 3. The fear of losing patient’s trust and the threat of public outcry were selected most frequently as the most contributing factors to individual doctor’s reluctance to report (29% and 26%, respectively).

A lower yet similar percentage of doctors found professional consequences/discipline and the fear of patient’s anxiety as the most important reasons for their reluctance (18% and 17%, respectively), while only 10% of doctors identified embarrassment in front of colleagues as their number one reason not to report.
Table 3. Percentage of doctors selecting a particular factor as their number one reason not to report the occurrence of errors

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of losing patient’s trust</td>
<td>29%</td>
</tr>
<tr>
<td>Threat of public outcry</td>
<td>26%</td>
</tr>
<tr>
<td>Professional consequences/discipline</td>
<td>18%</td>
</tr>
<tr>
<td>Fear of patient’s anxiety</td>
<td>17%</td>
</tr>
<tr>
<td>Embarrassment in front of colleagues</td>
<td>10%</td>
</tr>
</tbody>
</table>

Discussion

The results of this study suggest that most doctors feel they should report errors that may result in major adverse events to both the patient and the hospital, but their attitude towards the reporting of smaller errors is clearly different (Table 1).

When anticipating minor adverse events, not every doctor feels that they should report (errors), especially to the hospital. It is possible that doctors do not see any added benefits from reporting small errors to the hospital and find the process complicated while they view reporting to the patient as straightforward and part of their fiduciary duty to the patient. Whatever the underlying reason might be, this reporting behaviour is problematic, as it does not allow us to keep track of minor errors on a system-wide basis.

As shown by Davis and colleagues, 85% of adverse events happening in New Zealand’s hospitals have minor patient impacts. This means that it is especially important to record errors that have minor impacts and yet happen very frequently. Furthermore, as Reason argues, relating aviation industry’s lessons to healthcare, system accidents are more like “slices of Swiss cheese, having many holes—although, unlike in the cheese, these holes are continually opening, shutting, and shifting their location. The presence of holes in any one ‘slice’ does not normally cause a bad outcome. Usually this can happen only when the holes in many layers momentarily line up to permit a trajectory of accident opportunity—bringing hazards into damaging contact with victims.” In healthcare, minor errors are analogous to small holes that can line up and lead to a devastating effect on the patient. By studying how they occur, we have an opportunity to reduce the frequency of these errors.

Based on the results of this study, it appears that in general doctors feel more comfortable to report to the patient than to report to the hospital (79% vs 21%; Table 2). As mentioned before, the level of claims making is very low in New Zealand. Therefore, even if the patient learns from the doctor that his/her minor medical injury was preventable and hence compensable, the chances that they would file a claim is slim. So, if reports of errors are made more frequently to patients as opposed to hospitals, we have no guaranteed means of generating a comprehensive database of all types of errors that occur in our hospitals everyday.

In contrast, if errors are consistently reported to hospitals and then relayed to a national database, we have a good chance of generating a reliable database of errors that we can study and learn from. Thus, it is very important for us to change this reporting behaviour and to encourage doctors to report to the hospital.
As discussed in the introduction, New Zealand doctors feel that the complaint process managed by the Health and Disability Commissioner is very hostile. For instance, Cunningham and colleagues found in 2001 that only 1 in 10 doctors find the complaints filed with the Commissioner as warranted and half of them disagree with the statement that most complaints are about errors and wrongdoings. Therefore, New Zealand doctors’ desire to avoid complaints may counteract their desire to report errors.

The current study yet suggests that the key to avoiding complaints may be in reporting itself. 86% of surveyed doctors feel that reporting the occurrence of errors to patients will decrease the likelihood of patients filing complaints against them (Table 2). In practice, studies have established that this approach indeed works in doctors’ favour and communicating errors to patients reduces the likelihood of any type of retaliation, whether it is in form of a malpractice lawsuit or a simple filing of a disciplinary complaint when lawsuit is not an option. Hence, medical error reporting may help doctors not only to learn from mistakes and improve quality, but also to avoid complaints.

The challenge is then to convince doctors to follow their instincts and to assure them that transparency actually helps make the complaint process work better as a quality assurance tool by filtering out those complaints that arise from patients’ misgiving about doctors’ openness.

This study also offers us a better understanding of the relative importance of some of the key factors contributing to doctors’ reluctance to report errors (Table 3). While we should contemplate how we can mitigate the negative effects of all the factors, the following discussion focuses on the two factors that were selected most frequently by doctors as contributing the most to their reluctance: the fear of losing patient’s trust and the threat of public outcry.

The principle of trust holds doctor-patient relationship together. In non-emergency situations, patients should be free to choose their own doctors. This freedom is, of course, limited by geographical access and peculiar constraints, often of economic origin, imposed on patients by the various systems of healthcare delivery. Regardless, to choose their doctors and continue their relationships, patients need to trust in the abilities of their doctors. Patients too often have unrealistic expectations of doctors and don’t recognise that doctors are also humans and ‘to err is human.’ This societal perspective is internalised by practicing doctors, especially when they go through a medical training that strives for perfection.

At the end of the day, as our data suggests, the fear of losing patient’s trust plays a powerful role in making doctors hesitant to unveil errors. Mitigating the negative influence of this fear on error reporting is imperative. We have an opportunity to tackle this issue during medical training by emphasising that reporting errors to patients and practicing medicine in a transparent manner are all steps towards becoming a perfect doctor. Furthermore, this approach is unlikely to undermine the established trust if it helps us deliver a higher quality of care.

The threat of public outcry was the second factor most frequently identified by participating doctors as contributing the most to their reluctance to report. In New Zealand, public outcry is often instigated by the media. Many doctors believe that the media promotes the culture of “doctor bashing” and “reporters do not appear on the
whole to have a good, intelligent grasp of the issues, and try and exploit the emotive angle.” So, if medical error reporting is to be carried out on a more extensive scale, we need to give doctors protection against the possibility of media unjustifiably inciting the public outcry against them.

As much as a patient’s private health information (PHI) is protected from the public and media, reporting of errors should also be protected. Otherwise, the rate of reporting would decline. The recent passing in Florida of a constitutional amendment that makes all quality assurance data available to the public has already led to a decrease in reporting of adverse events. We need to avoid making a similar mistake in New Zealand.

The limitations of the current study need to be acknowledged. Firstly, this study could have benefited from a greater number of participants. The pool of participants did not represent a randomised national sample, and it was not possible to capture variations amongst different specialty groups or figure out the characteristics of respondents and non-respondents from only 128 completed surveys.

Secondly, given the low response rate of this study, it is likely that those who participated in this study were actually the ones who had more interest in error reporting and quality improvement issues, and hence more likely to report errors in the first place.

Thirdly, the respondents’ attitudes towards error reporting might have been captured and interpreted differently had they been given an opportunity to reflect on each scenario by answering some open-ended questions in addition to pre-determined multiple choice answers offered in the survey.

Lastly, this study was concluded prior to July 2005 legislation, which replaced medical mishap and medical error with a new concept of treatment injury. This reform aims to broaden coverage and in theory should improve reporting rates for adverse events. It is quite possible that survey respondents who thought of the hypothetical scenario as a mishap as opposed to an error, given the new definition of treatment injury, would have answered the questions differently.

While there are many limitations, the results of this investigation offers us some guidelines as to how we can design a system in which medical error reporting is carried out more openly and effectively. While New Zealand’s “no-fault” system has eliminated some of the hindrances to error-reporting, much work still needs to be done to make our hospitals safer than they are today.

To encourage further research into how we can advance reporting, policy makers and healthcare providers need to make a strong commitment to respond to findings of these investigations.

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Email: Farzad@Stanford.edu

References:

The influence of PHARMAC’s National Hospital Pharmaceutical Strategy on Quality Use of Medicines activities in New Zealand hospitals

June Tordoff, Pauline Norris, Julia Kennedy, David Reith

Abstract

Aim To determine the influence of PHARMAC’s National Hospital Pharmaceutical Strategy (NHPS) on Quality Use of Medicine (QUM) activities in New Zealand hospitals.

Method In July 2002 and July 2004, a questionnaire-based cross-sectional survey on QUM activities was administered to chief pharmacists at all 30 New Zealand public hospitals employing a pharmacist (29 in July 2004), to examine pre and post-NHPS activity.

Results Both surveys achieved a 97% response rate. A range of QUM activities were undertaken in hospitals. Overall, Drug Utilisation Reviews (DURs) significantly decreased (67 vs 42) (p<0.05), although antimicrobial guidelines and intranet formularies significantly increased (p<0.05). PHARMAC’s QUM initiatives, still evolving, did not appear to positively influence QUM activity in 2002–4. In 2004, PHARMAC put their original plans to coordinate QUM activity on hold and chose to participate in the processes of the Safe and Quality use of Medicines Group (SQM). Formed in 2003 by the District Health Boards of New Zealand, SQM focused attention on anticoagulants and high-risk medicines.

Conclusion QUM activities, similar in both periods, were not positively influenced by PHARMAC’s Strategy.

The term Quality Use of Medicines (QUM) is used in Australia and New Zealand to describe the rational and appropriate use of medicines; it evolved from the World Health Organization’s statement on rational drug use.1

QUM is the fourth arm of Australia’s National Medicines policy—its QUM policy objectives are:

- The judicious selection of management options (using medicines only where appropriate);
- The appropriate choice of medicine and dosage regimens (such as choosing the most effective medicine, and considering benefit/ risk/cost);
- The safe use of medicines (minimising misuse, overuse, underuse, and medication-related problems such as adverse effects).2

Although New Zealand has no National Medicines and QUM policies, health professionals are concerned about the safe and effective use of medicines. Therefore they have undertaken activities that promote QUM.3–5
We undertook two surveys to determine QUM activities in New Zealand hospitals. This first survey, in July 2002, determined QUM activities immediately prior to the implementation of the National Hospital Pharmaceutical Strategy (NHPS) by the government agency PHARMAC. The second was undertaken in July 2004 to determine any influence from the Strategy and is reported in this paper.

PHARMAC began implementing the NHPS in the latter months of 2002. Quality use of Medicines (QUM) was one of three key areas of focus; others being the management of prices for pharmaceuticals and the assessment of new medicines.

PHARMAC intended to establish a national programme for QUM with some activities centrally coordinated by the agency itself. The initial plan was to establish a national QUM steering group with clinicians and specialist pharmacist members. The group would consider the role of drug utilisation review (DUR), education, compliance monitoring, reporting of adverse drug events, guidelines on the use of medicines, clinical pharmacy, and the hospital/primary sector interface. The group’s role would be to develop a project plan and programme of activities using a combination of appropriate initiatives.

If DUR was considered a useful tool then PHARMAC might assist by providing coordination of DUR initiatives and/information sharing. Discussions began in 2002 and a steering group was set up in 2003.

The present study compares the levels of activity for the promotion of Quality Use of Medicines in New Zealand hospitals in 2000–2 and 2002–4, and aims to determine any influence from the implementation of PHARMAC’s National Hospital Pharmaceutical Strategy.

**Methods**

In 2002, a questionnaire on activities undertaken to promote the quality use of medicines in New Zealand public hospitals was developed, piloted, and administered to chief pharmacists at all 30 hospitals employing a pharmacist. The questionnaire was administered in July 2002, to examine the period 1 July 2000–1 July 2002 (prior to the launch of the NHPS).

Details of the methodology were reported earlier. Since PHARMAC’s QUM initiatives were not yet defined or in place (apart from a proposal to facilitate and coordinate national DURs), the questionnaire was designed to examine a range of known QUM activities in hospitals. Topics for the questionnaire were derived from a focus group of hospital pharmacists.

The topics included in the questionnaire were:

- Guideline development;
- Drug utilisation reviews (DURs);
- Dissemination of drug expenditure data;
- Hospital formularies;
- Bulletins on medicine use;
- Campaigns to improve prescribing;
- Sources of economic information; and
- Staffing levels for drug utilisation and drug information activities.

An increase in DURs was considered to be the primary outcome measure, and changes in other QUM activities were considered secondary measures.

In July 2004, the same questionnaire, modified by the removal of two questions (asked in a different manner later in the questionnaire), was administered again to chief pharmacists at all New Zealand public hospitals employing a pharmacist; a total of 29 pharmacists. The number differed from the 2002 survey since one hospital pharmacy closed in 2003. The second survey examined activities in the period 2 July 2002 to 1 July 2004—i.e. subsequent to the launch of the NHPS.
For both surveys hospitals and chief pharmacists were identified from a list published by the New Zealand Healthcare Pharmacists Association. Questionnaires were followed up by telephone and email to improve the response rate.

In the questionnaire, Drug Utilisation Reviews (DURs) were defined as audits of medicine use undertaken in clinical areas, where data is collected on the use of particular medicines plus data on relevant patient factors. Decision-makers (DM) were defined as those given authority to decide whether/how particular medicines could be used in clinical areas—e.g. senior managers/clinical leaders/advisory committees.

Drug Utilisation activities were defined as assessment of new medicines, formulary and guideline development, bulletin writing, education campaigns, and DURs. Drug information activities were not specifically defined but are usually understood to be the provision of information on drugs in response to specific requests. Some aspects of QUM (such as systems for monitoring adverse drug events and clinical pharmacy interventions) were considered beyond the scope of this study.

Hospitals were defined as tertiary, secondary, or rural/special. Tertiary hospitals were those with all specialties on-site; secondary hospitals were most specialties on-site but with some visiting specialists; rural/special hospitals were small hospitals with only visiting specialists or hospitals for a special group of patients (e.g. psychiatric patients).

The New Zealand Ministry of Health (MOH) provided advice and validated the group allocations in 2002. From information on the survey, hospitals were further divided into independent hospitals (undertaking QUM activities independently) and hospitals under the auspices of a local tertiary hospital. Results are presented as total activity and activities undertaken by independent hospitals.

For both surveys, continuous data were analysed for differences between hospitals using the Kruskal-Wallis test for equality of medians. Comparisons between continuous data for 2002 and 2004 were made using the Wilcoxon rank sum test. Categorical data for each period were compared using the McNemar’s Chi-squared test. A level of p<0.05 was considered statistically significant. Results are presented as numbers, percentages, medians, and ranges for each year and type of hospital.

**Results**

The questionnaire was administered to 30 hospitals in 2002, and 29 in 2004. Twenty-nine hospitals responded in 2002, and 28 hospitals in 2004, a response rate of 97%. In both surveys, three hospitals undertook QUM activities under the auspices of a local tertiary hospital, and 26 and 25 hospitals respectively were considered independent.

Similar levels of QUM activities took place in both periods. There were no activities that were known to result from any initiatives of PHARMAC or their recently–formed QUM steering group, however some DURs were undertaken on drugs (anticoagulants) highlighted by another recently-formed group, the Safe and Quality use of Medicines group.

The 2004 survey indicated a significant decrease in DURs undertaken in the previous 2 years, compared with the 2002 survey (67 in 2002 vs 42 in 2004, p<0.05), particularly in secondary and rural/special hospitals (Table 1).

This change in primary outcome measure, as mentioned earlier, could not be related to any PHARMAC activity. Reviews were predominantly on antibiotics, but these decreased by 2004 (20 vs 11). Reviews increased on anticoagulants (two vs five) and omeprazole (two vs six). Respondents in both surveys indicated that they would target reviews to all medicines with safety/cost concerns, resources permitting.

Similar numbers of medicines information bulletins were produced in both periods in independent hospitals (106 vs 103), with an increase by 2004 in tertiary hospitals (37 vs 49). By 2004, the number of hospital-wide campaigns per 2 years decreased in independent hospitals (63 vs 43).
Table 1. Drug Utilisation Reviews (DURs), bulletins, campaigns: (a) July 2000-2; (b) July 2002-4

<table>
<thead>
<tr>
<th>Variable</th>
<th>All hospitals</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Rural/special</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a) (n=29)</td>
<td>(a) (n=6)</td>
<td>(a) (n=12)</td>
<td>(a) (n=11)</td>
</tr>
<tr>
<td></td>
<td>(b) (n=28)</td>
<td>(b) (n=6)</td>
<td>(b) (n=11)</td>
<td>(b) (n=11)</td>
</tr>
<tr>
<td>Drug Utilisation Reviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of DURs undertaken</td>
<td>67</td>
<td>42*</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>DURs undertaken by independent hospitals</td>
<td>64</td>
<td>42</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Median (range)</td>
<td>1 (0-12)</td>
<td>1 (0-10)</td>
<td>2.5 (0-12)</td>
<td>2.5 (0-10)</td>
</tr>
<tr>
<td>Total number of hospitals undertaking ≥1 DUR</td>
<td>19 (66%)</td>
<td>13 (46%)</td>
<td>5 (83%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Number of independent hospitals undertaking ≥1 DUR</td>
<td>17 (59%)</td>
<td>13 (46%)</td>
<td>5 (83%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Bulletins and Campaigns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of bulletins produced and sent out</td>
<td>125</td>
<td>106</td>
<td>37</td>
<td>49</td>
</tr>
<tr>
<td>Bulletins produced by independent hospitals</td>
<td>103</td>
<td>106</td>
<td>37</td>
<td>49</td>
</tr>
<tr>
<td>Median (range)</td>
<td>5 (0-24)</td>
<td>4 (0-20)</td>
<td>6 (0-12)</td>
<td>7.5 (2-20)</td>
</tr>
<tr>
<td>Number of independent hospitals producing and sending out own bulletins</td>
<td>13 (45%)</td>
<td>16 (57%)</td>
<td>5 (83%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Total number of hospital-wide (HW) campaigns</td>
<td>76</td>
<td>43</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>HW campaigns run by independent hospitals</td>
<td>63</td>
<td>43</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Median (range)</td>
<td>1 (0-20)</td>
<td>1 (0-10)</td>
<td>1.5 (0-7)</td>
<td>1 (1-3)</td>
</tr>
<tr>
<td>Number of independent hospitals running campaigns</td>
<td>15 (52%)</td>
<td>13 (46%)</td>
<td>4 (67%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Total number of ward/unit based (WB) campaigns</td>
<td>39</td>
<td>26</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>WB campaigns run by independent hospitals</td>
<td>37</td>
<td>26</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Median (range)</td>
<td>1 (0-10)</td>
<td>1 (0-8)</td>
<td>2 (1-3)</td>
<td>2 (0-3)</td>
</tr>
<tr>
<td>Number of independent hospitals running campaigns</td>
<td>12 (41%)</td>
<td>7 (25%)</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
</tr>
</tbody>
</table>

*p<0.05, Wilcoxon signed rank.
There were some increases in formulary development by 2004: one hospital newly reported developing a formulary; there was an increase in formularies having emergency resuscitation guidelines (four in 2002 vs seven in 2004), acute medical guidelines (eight vs ten), policies concerning medicine use (18 vs 21), and a significant increase in those having antimicrobial guidelines (19 vs 24, p<0.01) (Table 2).

Similar rates of formulary revision in the past three years were reported (22 vs 23 hospitals). By 2004, there was a significant increase in distribution of formularies to departments (10 vs 17, p<0.05); a decrease in distribution to individual staff; a significant increase in availability of intranet-only versions (one vs five, p<0.05); an increase in hospitals having both hard-copy and intranet versions (10 vs 16); and a significant decrease in hospitals with hard-copy only versions (14 vs four, p<0.01).

In both surveys, hospitals reported sending drug expenditure data to financial managers, nurse managers, consultants, nurses, and “others” (e.g. Medicines and Therapeutics committees (MTCs) or Chief Executive Officers). In 2002, but not in 2004, tertiary hospital financial managers appeared to provide more feedback comments than other managers (Table 3). There were no other significant differences in the responses between the surveys. In both surveys, respondents indicated they would predominantly source economic information from the drug literature, an independent source or the supplier (Table 4).

In 2004, decision-makers and clinicians in tertiary hospitals appeared to request DURs for medicines already in use more than decision-makers and clinicians in other hospitals, significantly so for decision-makers (p<0.05) (Table 5).

In both surveys clinicians in all hospitals indicated more interest in guideline development than in DURs. There were no statistically significant differences between responses to each question between surveys.

Similar opinions were reported on the possible centralised coordination of QUM activities. About two-thirds (2002 vs 2004) indicated they would use centrally-developed guidelines by PHARMAC (66% vs 64%) or an independent evaluation group (IEG) (69% vs 68%) if they agreed with the supporting evidence.

About a fifth required total agreement with own-hospital guidelines (24% vs 25% PHARMAC, 14% vs 21% IEG). Around two-thirds would use centrally-developed DURs if they agreed with the design and supporting evidence (69% vs 64% PHARMAC, 72% vs 68% IEG). About a fifth reported insufficient staff to participate (21% vs 25% PHARMAC, 17% vs 21% IEG). Around 4% would develop their own DURs; around 7% would unconditionally use centrally-developed DURs. There were no statistically significant differences in responses within or between surveys.

All hospitals in both surveys provided a drug information (DI) service and two-thirds a drug utilisation (DU) service; DI and DU staff were mainly employed in tertiary hospitals. More DI (10.7 FTE vs 15.6 FTE) but fewer DU staff (10.1 FTE vs 7.7 FTE) were employed in 2004. In both surveys around 80% of hospitals provided a clinical pharmacy service to over 50% of wards, and around 20% to less than 50% of wards. Three hospitals increased their level of service to over 50% of wards by 2004.
Table 2. Details of formularies: (a) July 2000–2; (b) July 2002–4

<table>
<thead>
<tr>
<th>Variable</th>
<th>All hospitals</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Rural/special</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a) (n=29)</td>
<td>(b) (n=28)</td>
<td>(a) (n=6)</td>
<td>(b) (n=6)</td>
</tr>
<tr>
<td>Hospitals responding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals using a formulary</td>
<td>25 (86%)</td>
<td>25 (89%)</td>
<td>6 (100%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Non-tertiary hospitals using a tertiary formulary</td>
<td>6 (20%)</td>
<td>6 (21%)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>No formulary</td>
<td>4 (14%)</td>
<td>3 (11%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(a) (n=25)</td>
<td>(b) (n=25)</td>
<td>(a) (n=6)</td>
<td>(b) (n=6)</td>
</tr>
<tr>
<td>Hospitals with formularies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revision</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergoing revision</td>
<td>4 (16%)</td>
<td>2 (8%)</td>
<td>2 (33%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Revised in past 3 years</td>
<td>18 (72%)</td>
<td>21 (84%)</td>
<td>4 (67%)</td>
<td>5 (83%)</td>
</tr>
<tr>
<td>Revised 3-5 years ago</td>
<td>2 (8%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Revised &gt;5 years ago</td>
<td>1 (4%)</td>
<td>2 (8%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Median number of revisions in past 10 years</td>
<td>3</td>
<td>2.5</td>
<td>5.5</td>
<td>5</td>
</tr>
<tr>
<td>Format</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard copy only</td>
<td>14 (56%)</td>
<td>4 (16%)*</td>
<td>2 (33%)</td>
<td>0</td>
</tr>
<tr>
<td>Hard copy and intranet</td>
<td>10 (40%)</td>
<td>16 (64%)</td>
<td>3 (50%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Intranet only</td>
<td>1 (4%)</td>
<td>5 (20%)*</td>
<td>1 (17%)</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred Medicines List</td>
<td>25 (100%)</td>
<td>25 (100%)</td>
<td>6 (100%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Antimicrobial guidelines</td>
<td>19 (76%)</td>
<td>24 (96%)*</td>
<td>6 (100%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Policies concerning medicine use</td>
<td>18 (72%)</td>
<td>21 (84%)*</td>
<td>6 (100%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Paediatric dosing guidance</td>
<td>9 (36%)</td>
<td>9 (36%)</td>
<td>4 (67%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Acute Medical Guidelines</td>
<td>8 (32%)</td>
<td>10 (40%)</td>
<td>2 (33%)</td>
<td>4 (67%)</td>
</tr>
<tr>
<td>Emergency Resuscitation Guidelines</td>
<td>4 (16%)</td>
<td>7 (28%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (12%)</td>
<td>4 (16%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
</tr>
</tbody>
</table>

*p<0.01, **p<0.05, McNemar’s Chi-squared test.
Table 3. Drug expenditure feedback/comments - (a) July 2000-2 (b) July 2002-4 (Median response on a scale from 1= “always” to 6= “never”)

<table>
<thead>
<tr>
<th>Variable</th>
<th>All hospitals (n=29)</th>
<th>Tertiary (n=6)</th>
<th>Secondary (n=12)</th>
<th>Rural/special (n=11)</th>
<th>Probability (n=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a)</td>
<td>(b)</td>
<td>(a)</td>
<td>(b)</td>
<td>(a)† (b)‡ compared</td>
</tr>
<tr>
<td>How often, on average, comments are received back from:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward nurses</td>
<td>4.5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Nurse managers/supervisors</td>
<td>4</td>
<td>4.5</td>
<td>4</td>
<td>4.5</td>
<td>3</td>
</tr>
<tr>
<td>Financial Managers</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Consultants</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Others*</td>
<td>2</td>
<td>2.5</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

*MTCs, CEOs, General Managers, Chief Finance Officers, Clinical Directors; †Kruskal-Wallis test. Comparison of responses from different types of hospitals within each period; ‡Wilcoxon signed rank test. Comparison of responses to individual questions between the two periods.

Table 4. Sources of economic information - all hospitals* (Number of respondents reporting use of sources/attempts to calculate)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per Quality Adjusted Life Year (QALY)</td>
<td>20 19</td>
<td>11 13</td>
<td>13 11</td>
<td>1 3</td>
<td>2 1</td>
<td>1 1</td>
</tr>
<tr>
<td>Cost per life year gained</td>
<td>19 17</td>
<td>13 12</td>
<td>12 7</td>
<td>3 4</td>
<td>2 1</td>
<td>1 1</td>
</tr>
<tr>
<td>Cost per event saved</td>
<td>17 18</td>
<td>12 13</td>
<td>9 8</td>
<td>7 8</td>
<td>1 0</td>
<td>0 1</td>
</tr>
<tr>
<td>Cost for shorter hospital stay Numbers Needed to Treat (NNT)</td>
<td>11 15</td>
<td>9 14</td>
<td>6 8</td>
<td>11 13</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>Median</td>
<td>18 18</td>
<td>9 10</td>
<td>8 9</td>
<td>9 6</td>
<td>2 2</td>
<td>1 1</td>
</tr>
</tbody>
</table>

* No significant differences between 2002 and 2004, McNemar’s Chi-squared test.
Table 5. Decision-makers, clinicians, and requests for guideline and DUR development: (a) July 2000–2; (b) July 2002–4

(Median response on a scale from 1= “always” to 6= “never”)

<table>
<thead>
<tr>
<th>Variable</th>
<th>All hospitals</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Rural/special</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a) (n=29)</td>
<td>(a) (n=6)</td>
<td>(a) (n=12)</td>
<td>(a) (n=11)</td>
<td>(a)† (n=29)</td>
</tr>
<tr>
<td>How often do decision-makers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request that clinicians develop guidelines/</td>
<td>4 4</td>
<td>5 4</td>
<td>4 4</td>
<td>3.5 5</td>
<td>0.92 0.27 0.45</td>
</tr>
<tr>
<td>criteria for use, for medicines already in use?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request guidelines/criteria for use when there are safety/cost concerns?</td>
<td>3 3</td>
<td>2 2</td>
<td>3 3</td>
<td>4 4.5</td>
<td>0.26 0.01 0.53</td>
</tr>
<tr>
<td>Request DURs to review the use of new medicines?</td>
<td>6 5</td>
<td>3 3</td>
<td>6 5.5</td>
<td>6 6</td>
<td>0.01 0.13 0.53</td>
</tr>
<tr>
<td>Request DURs to review the use of medicines already in use?</td>
<td>6 6</td>
<td>4 3.5</td>
<td>6 6</td>
<td>6 6</td>
<td>0.16 0.03 0.80</td>
</tr>
<tr>
<td>How often do clinicians:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request help from pharmacists with guideline development for medicines</td>
<td>3 3</td>
<td>4 2.5</td>
<td>3 3</td>
<td>3 4</td>
<td>0.57 0.15 0.27</td>
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<tr>
<td>already in use?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request DURs to review the use of medicines already in use?</td>
<td>5 5</td>
<td>5 3</td>
<td>5 6</td>
<td>5.5 5.5</td>
<td>0.54 0.02 0.24</td>
</tr>
<tr>
<td>Request DURs to review the use of new medicines?</td>
<td>6 5</td>
<td>5 4</td>
<td>5.5 6</td>
<td>6 6</td>
<td>0.50 0.05 0.86</td>
</tr>
</tbody>
</table>

† Kruskal-Wallis test. Comparison of responses from different types of hospitals within each period; ‡ Wilcoxon signed rank test. Comparison of responses to individual questions between the two periods.
There were significant increases in pharmacists (169 vs 206.2) and technicians (94.5 vs 102.6) employed by 2004 (p<0.01). For pharmacists, this was greater for tertiary (31%) than secondary (14%) than rural/special hospitals (8%).

Regression analysis of independent hospitals indicated an association between increased DURs and increased clinical pharmacist staff-time (FTEs/100 beds) for both surveys (p<0.01); increased DURs and increased DU+DI pharmacists—2002 survey (p<0.01); and increased hospital-wide campaigns and clinical pharmacy staff-time—2002 survey (p<0.05) (Table 6). No other associations were found.

Table 6. Regression analysis—独立的医院
Increasing staff time (FTE/100 hospital beds) and association with:

<table>
<thead>
<tr>
<th>Variable</th>
<th>2000–2</th>
<th></th>
<th>2002–4</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>P</td>
<td>Adjusted-R squared</td>
<td>P</td>
<td>Adjusted-R squared</td>
</tr>
<tr>
<td>Increased DURs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All clinical pharmacists</td>
<td>0.01</td>
<td>0.24</td>
<td>0.002</td>
<td>0.32</td>
</tr>
<tr>
<td>DU+DI pharmacists</td>
<td>0.01</td>
<td>0.20</td>
<td>0.28</td>
<td>0.01</td>
</tr>
<tr>
<td>Increased Bulletins</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All clinical pharmacists</td>
<td>0.25</td>
<td>0.02</td>
<td>0.29</td>
<td>0.01</td>
</tr>
<tr>
<td>DU+DI pharmacists</td>
<td>0.09</td>
<td>0.11</td>
<td>0.79</td>
<td>0.06</td>
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<tr>
<td>Increased hospital-wide Campaigns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All clinical pharmacists</td>
<td>0.02</td>
<td>0.21</td>
<td>0.16</td>
<td>0.05</td>
</tr>
<tr>
<td>DU+DI pharmacists</td>
<td>0.85</td>
<td>-0.04</td>
<td>0.56</td>
<td>-0.03</td>
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</table>

Discussion

Our surveys indicated a range of activities were used to promote QUM in New Zealand hospitals in 2000–2 and 2002–4. Activity levels were similar in both periods with some changes noted by 2002–4. PHARMAC’s initiatives were still evolving in the latter period and did not appear to influence QUM. However other developments in QUM took place in 2002-4 that may have influenced QUM.

PHARMAC published their intention to coordinate QUM activities in New Zealand Hospitals in their National Hospital Pharmaceutical Strategy. In 2002, PHARMAC began discussing a QUM Strategy with the Hospital Pharmacists Advisory Committee (HPAC). In 2003, PHARMAC published a Quality Use of Medicines Strategy and set up a national steering group (the National QUM Assessment Committee, NQAC) to develop a national agenda for hospital QUM activities.

Around this time, a Safe Use of Medicines group was set up by New Zealand District Health Boards (DHBs), meeting initially in April 2003. The group published a list of six high-risk medicines as targets for urgent action: warfarin, heparin, potassium, diltiazem, insulin, and morphine.

Other areas highlighted were: information technology (IT), primary/secondary care interface, drug information, pharmacy services, reporting and monitoring medication incidents, and a national QUM policy. In 2004, a working party of representatives from the DHBs, the MOH, and PHARMAC decided to pursue QUM coordination
under the Safe Use of Medicines banner—i.e. a Safe and Quality use of Medicines (SQM) group.

PHARMAC put their original plans to coordinate QUM on hold, and chose to participate in the SQM process. PHARMAC and the MOH are represented in the larger SQM group plus health professionals from eight DHBs (pharmacy, nursing, management, public health, internal medicine, general practice, and pharmacology).

Our 2004 survey reported an increase in DURs for some drugs that may have been influenced by the activities of the SQM group. In April 2003, the group named warfarin and heparin as two of six target medicines recommended for safe use of medicines initiatives. Our study indicated an increase in DURs on anticoagulants by 2004. Further research could be undertaken to examine this possible influence.

Although overall activity was similar in both periods, our 2004 survey indicated a significant increase in: hospital intranet formularies; hospitals with antimicrobial guidelines; interest in DURs amongst tertiary hospital decision-makers and clinicians; numbers of pharmacists employed; and there was a significant association between increased DURs and increased numbers of clinical pharmacists. There were increases in formulary development (full and sections) and bulletin production (tertiary hospitals, numbers of hospitals).

Numbers of hospitals providing a clinical pharmacy service increased slightly but there were still 20% of hospitals providing only a limited service to wards. This is a major concern that needs to be addressed since limited clinical pharmacy services may put patients at increased risk of harm from prescribing errors. Furthermore, the Health and Disability Commissioner commented after a recent fatality resulting from a prescribing error in a New Zealand hospital “I consider it likely that had a pharmacist been called to see Mrs B and review the drug chart, the error would have been identified.”

In contrast, numbers of DURs and campaigns decreased. Decreased DURs may have been due to decreased DU staff, increased clinical pharmacy activities, or increased complexity in the DURs undertaken. Indeed, several complex DURs, some involving patients in both primary care and hospital settings, have been reported. Our surveys did not examine the outcomes of individual reviews so this may be a topic for further research. Other studies however indicate that DURs and feedback have improved the quality of medicine use.

Overall, QUM activities in New Zealand hospitals appear similar to those in other countries (DURs and campaigns undertaken; bulletins, formularies, and guidelines developed; and drug expenditure information distributed).

Our 2004 survey indicated an increased use of medicines information bulletins by tertiary hospitals, and three additional hospitals now producing bulletins. Research indicates that educational outreach and local opinion leaders are more effective than bulletins alone in promoting change. The present study did not examine whether bulletins were isolated QUM measures or part of wider educational campaigns. Further research could be undertaken to determine this.

Our study was limited by the retrospective nature of the surveys. Because the accuracy of responses relied on good record-keeping or memory, recall bias or bias from attempts to make a socially-desirable response may have occurred. Where
details were sought (e.g. types of DURs), estimates would have been more accurate. A large number of hypothesis tests were performed (most of which were negative) and this should be considered in the interpretation of the results. A survey of clinical directors may have identified more QUM activities in clinical areas, but chief pharmacists were surveyed for two reasons: firstly they have a hospital-wide view of QUM activities, and secondly to avoid double counting of activities. The small number of hospitals, particularly numbers within sub-groups, limited the scope for statistical analysis.

**Conclusion**

Our surveys indicated a wide range of activities to promote QUM in New Zealand hospitals, with some changes in activities by 2002–4. Changes in activities do not appear to have been directly influenced by PHARMAC’s National Hospital Pharmaceutical Strategy, but may be influenced by the SQM group’s activities in future.

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**Acknowledgements:** We are grateful to the chief pharmacists for responding to the survey; the Ministry of Health for assistance with classifying hospitals, and the pharmacists for taking part in the focus group and pilot-testing of the questionnaire.

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**References:**


Comprehension of discharge information for minor head injury: a randomised controlled trial in New Zealand

Kim Yates, Andres Pena

Abstract

Aims To investigate health literacy (i.e. understanding medical information) in North Shore Hospital’s Emergency Medicine Department patients and to assess differences in comprehension between standard and simplified head injury advice sheets.

Methods Prospective randomised controlled trial in a convenience sample of adult Emergency Medicine patients presenting to an urban emergency department (ED) in New Zealand. Consented patients were randomised to receive either the standard head injury advice sheet or a shorter, simplified sheet. Participants were asked 10 questions (to test comprehension of advice sheets), demographic data collected, and a Rapid Estimation of Adult Literacy in Medicine test administered. Data analysis included descriptive statistics with 95% confidence intervals, Mann Whitney U test, and regression model analysis.

Results 200 participants. Mean age 43.4 years, 77.5% with 12 or more years of schooling, 84.5% with reading level of high school age or above. No significant differences in demographics, schooling, and reading levels were observed between study groups. The simplified form study group showed significantly higher comprehension scores (p<0.0001). In the regression analysis, factors associated with higher comprehension scores included: the simplified form, higher literacy level, more years of schooling, and younger age group.

Conclusions Previous studies have highlighted poor literacy levels in ED populations, a factor thought to affect understanding of discharge information. In this study population, where most read at high school level or above, the simplified advice sheet was still better understood. Recommendations for improving discharge information are discussed.

Effective communication is an essential component of good medical care. Clear discharge information has been shown to improve compliance, improve patient satisfaction, and decrease unplanned representations to emergency departments (EDs).1–3

Past studies in American EDs have highlighted a disparity between the readability of written discharge instructions and patient literacy levels.4–6 For example, in one study, discharge instructions required reading levels of 8th to 14th grade, while 45% of patients had measured reading levels of 9th grade or below.6 Indeed, simplification or standardisation of discharge instructions has been shown to improve comprehension.1,7
Figure 1. ACC head injury advice sheet

What to do after an Injury to the Head

Risk of Injury to the Brain
You have a head injury. The doctor has examined you and finds your injury seems not to be serious. You may now go home. Even so, a risk remains that your brain may have been shaken or harmed. For this reason you need another person to watch over you closely for the next 24 hours after your injury.

The doctor is asking another adult you know to watch you over the next 24 hours and get you to hospital if you are not well.

Read this fact sheet carefully and keep it handy for the next month. It outlines what signs to look out for after a head injury, and what you need to do if you have problems.

In the next 24-48 hours
- Signs to Watch
  Problems could arise over the next 24 hours. You must go to hospital at once if you:
  - Have a headache that gets worse
  - Are very drowsy or can’t wake up
  - Can’t recognise people or places
  - Pass out or have a blackout
  - Vomit more than three times
  - Behave unusually or seem confused
  - Are very irritable
  - Have seizures (fits and legs jerk uncontrollably)
  - Have weak arms or legs, are unsteady on feet
  - Slurred speech

The person looking after you needs to get you straight to hospital or phone for an ambulance (111) if they notice any of the above signs.

- Sleeping
  For the first night after the head injury, someone should wake you every two hours and check on you.

- Drinking
  Do not drink alcohol or take sleeping pills for at least 48 hours. Alcohol can make it hard for other people to tell whether or not the injury is affecting your behaviour.

For the same reason, anyone who takes non-prescribed mood-changing drugs needs to stop during this period

- Driving
  Do not drive for at least 24 hours. You can drive again when you stop feeling giddy and you feel well enough. Talk to your doctor.

- Pain Relief
  It is safe to take Paracetamol such as Panadol for the headache. Don’t take tablets containing aspirin or ibuprofen for the next four days. These types of medicines can make you bleed more from cuts or bruises (internal and external).

In the next 3-4 weeks
- Protect Head for 3 Weeks
  It is dangerous for the brain to be injured again if it has not recovered from the first injury. For the next three weeks you must not take part in activities where you can knock your head. This includes activities such as rugby, cycling, and racquet sports. Contact sports such as rugby union and league have stand-down periods.

- Common Effects
  You are likely to have some effects from the head injury. You may find that you:
  - Feel tired or dizzy
  - Can’t remember things
  - Can’t concentrate for long
  - Are short tempered or irritable
  - Have mood swings

These are common effects and are likely to go away in the next three to four weeks.

- Rest
  Your brain needs time to recover. It is important to rest and to have regular sleeping times. Avoid loud noises and too much activity until you start to feel better.

- Work
  You may need to take time off work until you can concentrate better. How much time you need off will depend on the type of work you do. Most people need a day or two off work but are back full-time by 10 days. Talk to your doctor about returning to work.

- Recovery
  You can expect to start feeling better in the next three to four days. You should feel 100% again within three to four weeks. Talk to your doctor if you have any problems at work or home because of your injury.

After 4 weeks
If you are still having problems after four weeks, see your doctor. Talk to your doctor about seeing a brain injury clinic or specialist.

For Urgent Help
If you need urgent help or want more advice please call
- The hospital emergency department nearest you
- The ambulance (111)
- Your doctor

www.acc.co.nz

ACC's Help
ACC helps pay for treatment you need after an accidental head injury. (You may have to pay part of the cost.) If you have not already filled out an ACC claim form for your injury, ask your doctor to help you. If you need more help from ACC please call 0800 701 996.

If you need time off work you can apply for weekly compensation to cover your pay.
Figure 2. North Shore Hospital head injury advice sheet

MINOR HEAD INJURY

Discharge advice to patients and their families & friends

- You have had a head injury (sometimes called concussion).
- The doctors have seen you, and have found no serious injury. We now think it is safe for you to go home.
- In the next 24 hours most people get better, but problems can occur.
- Although serious problems are rare, someone should stay with you in the next 24 hours to watch and help you.
- It is safe to go to sleep. Friends or family could wake you once the first night to check you.

SERIOUS PROBLEMS

Return to hospital or call an ambulance (111) if you or your friends & family notice:

- Seem very sleepy or difficult to wake.
- Confusion (don’t know where you are or get things mixed up).
- Fits (falling down and shaking).
- Bad headache not helped by paracetamol (Panadol).
- Vomiting (being sick).
- Can not see as well as usual.

MILD PROBLEMS

- Mild headache can occur, but paracetamol (Panadol) usually helps.
- Feeling dizzy, can not remember things, or can not concentrate for long.
- Feeling tired, feeling easily annoyed or poor sleep.

These problems usually get better without any treatment.
If you get worse or you are worried, see a GP (family doctor) for a check.
If the milder problems do not get better after two weeks, see your family doctor.

WHAT YOU CAN DO TO HELP YOURSELF

- Medication & drugs
  - DO take paracetamol (Panadol) for headache.
  - DO take your usual pills.
  - DO NOT take sleeping pills unless your doctor says you can.
  - DO NOT drink any alcohol until you are better.

- Sport
  - DO start mild exercise when you feel better.
  - DO NOT play any sport where you could injure your head for at least three weeks. Check with your doctor or coach before playing again. If this is your second head injury this season, your doctor may tell you to stop sport for the rest of the season.

- Work & school
  - DO take a few days off work or school if you have some of the milder problems. See your family doctor for a check if you need further time off.

- Driving
  - DO NOT drive for at least 24 hours.

- Rest
  - DO have plenty of rest. Eat and drink as usual.
In New Zealand, the Accident Compensation Corporation (ACC), the nation’s no-fault accident insurance scheme, had developed a head injury advice sheet, which was commonly given out to patients discharged from EDs with a head injury (Figure 1).

Although the ACC form scored at 4th grade using the Flesch Reading Grade level (Microsoft Word), it was felt to be difficult to read by staff, and thus a simplified head injury advice sheet was developed (Figure 2).

The goals of this study were to investigate the health literacy of emergency medicine patients in our population, to compare the comprehension of the ACC head injury advice sheet with the simplified sheet, and to investigate factors affecting comprehension.

**Patients and Methods**

The study was a prospective randomised controlled trial, reviewed, and approved by Auckland Ethics Committee Y. A convenience sample of adult patients meeting inclusion and exclusion criteria that consented to participate were randomised, using an opaque envelope method, either to the group given ACC head injury advice sheet to read, or to the group given the simplified sheet developed by the Department of Emergency Medicine. Comprehension of the head injury advice was then assessed, an estimation of health literacy made, and demographic data collected.

The study was conducted at North Shore Hospital, an urban district hospital serving a population of around 470,000 in 2003. The annual Emergency Department census is approximately 42,000, with 27,000 self-referral patients presenting to Emergency Medicine and the rest, referrals by general practitioners to inpatient services.

From August to December 2003, Emergency Medicine patients aged 15 years or more, presenting on study shifts, were invited to participate. Study shifts were a mixture of days, afternoons, and weekends. Patients were excluded if they were unable to comprehend spoken or written English, if they had severe illness or pain, if they were triaged as needing to be seen immediately, if they had a significant eye condition or complaint, or if their corrected visual acuity was less than font size 10. During the consent process, words such as “literacy” and “test” were specifically avoided.

Following randomisation, participants were given 5–10 minutes to read their allocated head injury advice sheet, either the ACC form (Figure 1) or the simplified form (Figure 2). Readability scores (Readability Calculations, Micro Power & Light Co, Texas, USA) for both forms were similar (Flesch-Kincaid & Powers 4th grade, Dale-Chall 6th, FOG 7th, SMOG 8th)—but the ACC form had 750 words and the simplified form had 371 words.

Following the reading time, the participant was interviewed by a researcher, using a data collection sheet that included a script to standardise the interviews. Participants were asked 10 questions to assess comprehension of the advice sheet (Figure 3), and were able to refer to their sheet at any time.

Health literacy was estimated using the Rapid Estimate of Adult Literacy in Medicine (REALM), a validated word recognition test that takes 3–5 minutes to administer, which classified participants into 4 groups according to reading levels: 3rd grade or less, 4th–6th grade, 7th–8th grade, high school (9th grade) or above. Data was then collected on gender, age, years of schooling, and ethnicity—and finally, participants were shown the advice sheet they had not received and asked which advice sheet they preferred.
Figure 3. Comprehension assessment: questions with script and scoring guide

<table>
<thead>
<tr>
<th>Question</th>
<th>Simplified form</th>
<th>Standard ACC+ form</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it OK to go home alone after a head injury? Score 1 for No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How long should a person with a head injury usually be watched for serious problems or complications? Score 1 for 24 hours (or 24-48 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you have just had a head injury is it OK to drive yourself home in a car? Score 1 for No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What should you do if the person with a head injury is vomiting? Score 1 for return to hospital or call an ambulance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you were looking after a person with a head injury, when (else) would you call an ambulance or take them to hospital? Score 1 if get at least 3 others. Prompt = “Anything else?”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Should you let a person who has had a head injury sleep? Score 1 for yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you have a head injury there can be some after-effects. Can you name three of the common milder things might you have problems with?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What should you do if you can not remember things well four weeks after a head injury? Score 1 for see your GP or doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What pain relief should you take for headaches? Score 1 for paracetamol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When can a person with a head injury go back to playing sports? Score 1 for 3 weeks or check with your doctor or coach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL out of 10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The main outcome of interest was the comprehension score for the advice sheet. Secondary outcomes included health literacy level, demographic factors, and form preference. A power calculation indicated 200 participants would be required to show a significant difference in comprehension scores.

Microsoft Excel and the Analyse-It general statistics module (Analyse-it Software Ltd, Leeds, England) were used for descriptive statistics with 95% confidence intervals, and for a Mann-Whitney U test of differences in comprehension scores between comparison groups. Logistic regression looking at factors affecting the comprehension score was performed by our statistician.

Results

260 patients meeting inclusion and exclusion criteria were invited to participate; 60 declined giving reasons which included “too tired”, “not feeling well”, “have to go”, “headache”, “(family member) did not want me to” and “too dizzy”—thus leaving 200 study participants.

Table 1 summarises study group characteristics. Groups were well-matched for age, education, and literacy levels, and while less matched for gender and ethnicity, these differences were not significant.

Table 1. Study group characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Simplified form n=100 [95% CI]</th>
<th>Standard ACC+ form n=100 [95% CI]</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>45 years [41–48]</td>
<td>42 years [38–46]</td>
<td>0.30</td>
</tr>
<tr>
<td>Female gender</td>
<td>48% [38–58]</td>
<td>58% [48–68]</td>
<td>0.20</td>
</tr>
<tr>
<td>Education: &gt;12 years</td>
<td>59% [49–69]</td>
<td>66% [56–75]</td>
<td>0.38</td>
</tr>
<tr>
<td>Ethnicity: NZ European</td>
<td>79% [69–86]</td>
<td>67% [57–76]</td>
<td>0.19</td>
</tr>
<tr>
<td>REALM* literacy level: high school or above</td>
<td>86% [77–92]</td>
<td>83% [74–90]</td>
<td>0.65</td>
</tr>
</tbody>
</table>

*Rapid Estimate of Adult Literacy in Medicine (test). †ACC=Accident Compensation Corporation.
Figure 4 shows the range of comprehension scores (questions correct out of 10) for the study groups. Median comprehension score for the ACC form was 9, and for the simplified form 10. The Mann-Whitney U test showed the simplified form group had significantly higher comprehension scores (p<0.0001).

Figure 4. Comprehension scores: number of participants with each score in the two study groups

![Figure 4](image)

Figure 5 shows REALM test results for the study groups. For the logistic regression analysis to investigate factors affecting comprehension, comprehension scores were condensed into 3 groups: 10 correct, 9 correct, <9 correct. Two factors had no effect on comprehension score: gender (p=0.6) and ethnicity (p=0.3).

Table 2 shows factors that had an effect on comprehension score. Logistic regression was also used to investigate the interaction of literacy levels and the form used, and there was no evidence of an effect of the form on comprehension scores for the different REALM groups (p=0.5), that is, whatever the REALM group, the simplified form improved comprehension scores. The simplified sheet was preferred by both study groups: 94% of those in ACC advice sheet group, and 95% of those in simplified group.
Figure 5. Rapid Estimate of Adult Literacy in Medicine (REALM) test classification for the two study group

![Diagram showing REALM literacy group classification](image_url)

Table 2. Results of logistic regression: factors affecting comprehension scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds ratio [95% CI]</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard ACC form</td>
<td>1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Simplified form</td>
<td>4.14 [2.19–7.81]</td>
<td></td>
</tr>
<tr>
<td>Schooling: 12 years or less</td>
<td>1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Schooling: &gt; 12 years</td>
<td>3.81 [2.06–7.06]</td>
<td></td>
</tr>
<tr>
<td>Age: 65 years or above</td>
<td>1</td>
<td>0.04</td>
</tr>
<tr>
<td>Age: 40–64 years</td>
<td>1.55 [0.65–3.65]</td>
<td></td>
</tr>
<tr>
<td>Age: 25–39 years</td>
<td>2.03 [0.8–5.18]</td>
<td></td>
</tr>
<tr>
<td>Age: 15–24 years</td>
<td>4.31 [1.53–12.11]</td>
<td></td>
</tr>
<tr>
<td>REALM: less than high school</td>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>REALM: high school or above</td>
<td>2.91 [1.16–7.25]</td>
<td></td>
</tr>
</tbody>
</table>

As for study limitations, there was poor representation of lower literacy groups in this study, particularly the lowest literacy group, so results may not apply to this group. With more than 20% of patients approached declining to participate for various reasons, selection bias is likely, and it is possible that patients with lower literacy levels may have been in this group. Population differences such as the high level of literacy in our population may mean that our results are less applicable to other ED populations.
Discussion

Previous studies have reported discharge instructions with readability scores of 6th to 14th grade and have highlighted concerns that patients with lower literacy levels would be unable to understand the material.4–6,9 Although both head injury advice sheets in this study had similar readability scores, between 4th and 8th grade depending on the formula used, comprehension of the simplified sheet was significantly better whatever the participant’s literacy level. This suggests that when revising written discharge information to improve comprehension it would be unwise to rely solely on the readability score of the document.

The National Work Group on Literacy and Health highlight that, in the United States, health providers could be held liable if information is not presented in a way that is understandable to the patient, and that some national accrediting agencies require healthcare providers to ensure that patients understand the information they are given.10

The Work Group also point out that people of all literacy levels prefer (and have a better understanding of) simple written materials compared to complex material, and our study certainly supports this in the ED setting. Their recommendations for written material are that it should be at 5th grade level or lower, that common words should be used or difficult words explained, that short sentences and large font be used, and that the layout should have large blank spaces to make the text look easy to read.

These recommendations were followed when the advice sheet was revised at North Shore Hospital. The other goal when revising the advice sheet to a simple one-page document was to make it “internet friendly” so that the document could be stored on the ED intranet website and printed off anywhere in the department when required, to alleviate the problem of not being able to find advice sheets in a busy ED.

Factors associated with better comprehension (of medical information) in our study included:

- More than 12 years at school,
- High school or above literacy,
- Younger age group, and
- Being given the simplified form.

Spandorfer and colleagues5 interviewed 217 patients discharged from the ED asking about their diagnosis, medications, and discharge instruction and found, as we did, that literacy level had a significant effect on comprehension, however age and education had no effect in their study.

Jolly and colleagues,7 who found improved comprehension when comparing scores for standard and simplified discharge instructions, also found that the higher education group (>12th grade) showed a greater improvement in average scores with the simplified instructions than the lower education group, although they did not use a regression model to study this improvement.

With 84.5% of our ED study population having a health literacy level of 9th grade or above, literacy levels appear higher than in other published studies, with Williams and colleagues finding that 45% of patients reading at or below 9th grade,6 and Spandorfer and colleagues finding a mean reading level of 6th grade, with 40% reading at 4th...
of grade or below. According to the International Adult Literacy Survey literacy levels in the United States and New Zealand do not appear significantly different, so these differences are more likely to be due to study population differences, differences in testing and/or selection bias.

In summary, it appears that simplifying written discharge advice sheets can improve comprehension even when readability scores between the sheets are similar, and that even in a population with higher literacy levels the simplified advice sheet was preferred and better understood whatever the literacy level.

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**Acknowledgements:** We thank Elizabeth Robinson (University of Auckland) for statistical advice and analyses; Terry Davis (Louisiana State University) for information on the REALM test; and Christine Woods and Peter Hughes (Auckland College of Education) for information on assessing readability.

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**References:**

After hours healthcare for older patients in New Zealand—barriers to accessing care

Anne Eastwood, Chrystal Jaye

Abstract

Aim To explore older people’s attitudes and their perceptions of barriers when seeking medical care after hours.

Method In-depth interviews and a focus group of older people were conducted and key informants were interviewed. The data was analysed using qualitative techniques.

Results Reluctance to be a nuisance, transport problems, cost, lack of information, and reluctance to see an unfamiliar doctor are among the barriers described by older people.

Conclusions There were transport, cost, and social barriers to older people obtaining after hours medical care.

Most research and policy documents on the health of older people focus on chronic and degenerative conditions. Older people also suffer from acute health problems. Campbell¹ refers to the “threshold effect” in which many older people are close to a point where further small losses of function will seriously affect their independence. Appropriate acute care is therefore important in this age group, which forms an increasing proportion of the New Zealand population.

Foster, Dale, and Jessopp² found barriers to after hours healthcare use in the UK, including difficulties with transport, reluctance to go out at night, distrust of telephone advice, and a preference for a familiar doctor.

Overseas research cannot necessarily be applied to New Zealand, however. Quantitative research by one of the authors³ found that older people in the Hutt Valley in 2002, especially the “young-old” (aged 65 to 74 years) used after hours health centres at a lower rate than younger adults. Furthermore, older people attended the emergency department (ED) at a higher rate than younger adults (except for the “young-old” who attended at a similar rate), although at a lower rate than during the day, and the difference was greater than for younger adults.

The quantitative component of this research³ generated several questions around after hours medical care for older people, which the present study investigated: specifically, are older people more reluctant to use after hours services than younger people and what barriers do older people identify in accessing healthcare after hours?

Method

Subjects—This research was conducted in the Hutt Valley near Wellington in New Zealand. ‘Sixty-five years old and over’ was chosen to define “older people”, which reflects the definition used in New Zealand government publications. In addition, New Zealanders are eligible for National Superannuation at age 65. Many research papers also choose 65 and over to define the elderly.
Sampling and data collection—Data were collected using in-depth semi-structured interviews, a focus group and key informant interviews conducted in mid-2003. Approval was obtained from the Wellington Regional Ethics Committee and the Te Awakairangi Regional Board.

Participants were recruited from several sources (Figure 1) and were purposively selected using a maximum variation sampling framework to obtain a broad range of opinion and perspectives. In this instance, participants (from both genders) were recruited to represent a range of ages (within the 65 and over group), suburbs and presenting complaints. All participants could describe an incident when they had become unwell after hours, since they had turned 65.

Figure 1. Recruitment of participants

<table>
<thead>
<tr>
<th>Source</th>
<th>Number approached</th>
<th>Method of approach</th>
<th>Number interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hutt Hospital ED</td>
<td>16</td>
<td>Letter</td>
<td>6</td>
</tr>
<tr>
<td>Wellington Age Concern</td>
<td>56</td>
<td>Letter</td>
<td>10</td>
</tr>
<tr>
<td>Hutt Valley and Wainuiomata Grey Power</td>
<td>60</td>
<td>Request at meeting</td>
<td>8</td>
</tr>
<tr>
<td>Maori Health Unit</td>
<td>12</td>
<td>Personal approach by Maori Health Unit staff and letter</td>
<td>2</td>
</tr>
<tr>
<td>Hutt Hospital</td>
<td>12</td>
<td>Personal approach by focus group facilitator</td>
<td>4 (Focus group)</td>
</tr>
<tr>
<td>Samoa Community</td>
<td>6</td>
<td>Personal approach by focus group facilitator</td>
<td>4 (Focus group)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not all responders were interviewed where this would have resulted in over-representation of a demographic group.

The ED sample of after hours attenders was obtained from the data used in the quantitative study.³ People who had attended the ED three or more times in the year were excluded, as were those who were unlikely to have participated in the decision to seek care because they were (for example) unconscious or fitting; considered by their GP to be unsuitable (extremely frail or terminally ill); poor English speakers; patients suffering from moderate or severe impairments of hearing or speech; suffering from moderate or severe dementia; or otherwise not able to give consent.

Participants chose the interview venue, which in most cases was their home and knew that the researcher was a GP, doing research for a Masters degree. The interview guide included general and more specific questions about the use of after hours facilities and two clinical vignettes. The interviews, which lasted between 45 and 90 minutes were audiotaped and later transcribed. The Interview Guide is shown in Figure 2.

Key informants included staff and office holders of Age Concern and Grey Power, Maori and Pacific health-workers concerned with care of the aged, and a Wellington Free Ambulance senior officer. Interviews were conducted in person or by telephone, and data was collected by note taking instead of telephone recording. Key informant interviews helped shape the interview guide used with elderly participants and provided a reference point for the subsequent analysis.
Analysis—During each interview, attempts were made to clarify, confirm, or discount concepts which had arisen in previous interviews. The data was entered into the qualitative analysis software package (Atlas.ti, version 4.1) for coding (data reduction and organisation) and interpretation. The transcript of each interview, the transcript of the focus group and notes made during key informant interviews were each entered as a primary document. The memo capacity within Atlas.ti was used to identify themes using a process of “immersion crystallisation”. This is an analytical technique widely used in anthropology and other social sciences to gain in depth engagement with qualitative data. Specifically, the researcher repeatedly reads over the data searching for patterns, insights, and explanations while maintaining a reflective stance. Emerging insights and interpretations are confirmed by continually checking against the data.

In the present study, the data was read several times and coded. These codes were then grouped into categories and possible relationships between categories, explanations, and outliers developed and referred back to the primary data for confirmation. After a period of reflection, the process of immersion crystallisation was again applied to the data, and recurrent themes that were grounded in respondents’ perspectives and experiences identified. Themes were named from participants’ descriptions or with reference to existing concepts in the literature.
Results

Older people had mixed views about whether they face particular problems in accessing healthcare after hours. Some respondents attributed access problems to income or “nature” (personality). Pseudonyms have been attributed to the following interview excerpts.

Reluctance to be a nuisance—The theme “not wanting to be a nuisance” emerged very strongly.

Well older people have got experience of life and I think they would put up with more than young people today. There is a reluctance to disturb people, a reluctance to be a nuisance and a feeling that we know how to assess our difficulties. (Katherine)

There was also a tendency to see other peoples’ needs as more important than their own. Although most respondents would hesitate to call a neighbour or relative in the middle of the night, they would have been very happy to help a friend who called them for help.

At 3 am I rang the After Hours and said I would get a taxi and come in. They advised me not to come alone, but to come with a family member. I didn’t want to wake my son, so I waited until 8am and then rang him. (Beatrice)

They’ve got families too, doctors, the same as other people. You know, wives or husbands or children to attend to or sports things to go to with their kids. I think you have to be careful we don’t demand too much from them. (Charlotte)

Some interviewees were reluctant to call the ambulance. A Wellington Free Ambulance shift leader remarked that they often get calls from older people, who haven’t wanted to bother anyone at night, when daylight breaks. He also noted that more often than not, someone telephones on behalf of the older patient.

Lay referrers and sanctioning—This group almost never used lay referrers. Family and friends were usually consulted only if they were a doctor, nurse, or paramedic. Reluctance to talk to others about their symptoms was attributed by interviewees and key informants to pride—a fear that disclosure may lead to loss of independence and a belief that it was inappropriate to discuss symptoms with non-professionals. The respondents lacked confidence in the advice of non-professionals.

If I rang somebody I knew, they probably wouldn’t know any more than I would, so I would ring a professional that I would trust. I don’t think I have ever rung any of my nursing daughters or anything like that for advice. Sometimes I think I know nearly as much as they do because of my age, whether things need medical attention or not. (Charlotte)

Many respondents were aware of publicity about the extent of “inappropriate” use of the ED—and if they were unwell, would not go to ED without medical sanction. ED was seen as the appropriate place to go for accidents, even in normal hours because of access to X-rays and other technology.

Transport—Lack of transport was frequently cited as a barrier to getting healthcare after hours: older people may not drive; they may be too unwell to drive safely or to use public transport; and little public transport is available after hours in the Hutt.
Valley. In addition, the cost of taxis is prohibitive for many older people and there was concern about the appropriateness of taxis for transporting sick people.

Cost—Many key informants cited cost as a barrier to attending after hours clinics and it was an issue for some interviewees. Generally it was the combined cost of consultation, prescription, and transport, which was seen as a significant problem.

With a Community [Services] Card you probably pay about $40 up there which is quite a lot for older people. It’s a shock because we remember when we got everything for free. I think the thought of paying all that money at the After Hours would put me off a bit. Because I was bought up in an age that you watched every penny, you even saved string. And for a whole lot of people, paying the chemist there would be a problem (Patricia).

No I don’t think I would go to the After Hours more if it was less expensive. You don’t often need to go to After Hours. Really it’s an emergency if you do. (Wilma)

Reluctance to see an unfamiliar doctor—This was extremely common among the respondents. There was also concern that lack of access to the patient’s notes poses a potential clinical safety issue.

The odd times I have been really uncomfortable in the middle of the night and I have been worried that I wouldn’t see morning. I have thought ‘well what’s the point in trying to go over the hill, they don’t know me, they don’t know my case, they don’t know my history’. (Gwendoline)

Knowledge familiarity and trust—There were gaps in participants’ knowledge about the existence, location, hours, and roles of after hours surgeries.

I didn’t know it existed to begin with, and now that I know it does I would be inclined to use that. (Patricia…referring to the after hours clinic)

The ED is also where older people have gone for after hours treatment in the past.

They didn’t have a 24-hour emergency doctor like they’ve got now. Hutt Hospital was just up the road…you would get taken and that would be that. (Brenda)

Many of the respondents trusted the ED more than after hours clinics, especially when they had previously been admitted or attended the hospital as outpatients.

I’ve only been there [After Hours] once and it wasn’t a good experience. The doctor didn’t speak very good English and I didn’t feel very sort of confident with him. I had to wait a long time and I didn’t know him and he didn’t know me and my background. (Patricia…referring to the after hours clinic)

Overcoming barriers—The Wellington Free Ambulance provides a free service, which is unique in New Zealand. Some respondents would ring the ambulance to avoid disturbing a doctor, even when they knew about after hours clinics and the ED. They also see the ambulance providing skilled personnel, manpower, and transport.

The ambulance can say how bad your problem is, whether you can stay home or they are going to take you to the hospital. They can start attending to you before you leave here. And for free. (Rawiri)
I think if I was really in a panic I would dial 111 because it’s easy to remember. I’ve never really thought about ringing the doctor in the middle of the night. (Winifred)

There was mixed opinion about the value of telephone advice generally, and a triage telephone service in particular.

Those who had written guidelines (e.g. for asthma and chest pain) found them very helpful in reducing the stress of decision making for example

The hospital gave me these instructions. You know, use the puffer, wait 10 minutes, use the puffer again, if it’s still no better, ring coronary care. That helps a lot. (Hubert)

There was a perception that home visits were either not available or done with great reluctance. Easier access to home visits was seen as a solution to the transport problem.

If house calls were available it would be a massive advantage. (Gwendoline)

Discussion

The participants as a group, including the hospital sample, were probably not typical of the elderly population. They were well-read and verbally confident, involved in community activities, and probably financially better off than most. While this group may not be representative of over 65 year olds in the Hutt Valley, it could be argued that they were more likely (than most) to have the knowledge and skills needed to deal with being unwell after hours.

Any difficulties which they encountered, would seem to be significant. There were also difficulties relating to the accuracy of memories and responses to hypothetical situations. It is unfortunate that the researcher was not able to interview any older Asian people, as the quantitative part of this study suggests that their pattern of ED-use is different from that of older people of other ethnicities. The transferability of the current study’s findings to communities outside the Hutt Valley is uncertain.

While the Hutt Valley elderly population is statistically reasonably representative of the New Zealand elderly, small differences, could be reflected in the study’s results. The free service provided by the Wellington Free Ambulance may have had a significant effect on the use of after hours services by the Hutt Valley elderly.

The number of participants who did not know where their local after hours clinic was, when it was open, or what services it could provide, is consistent with British studies of adult populations. For some respondents, the consultation cost was a factor in their decision making. A Ministry of Health Review noted that the proportion of the cost of a consultation met by the patient in New Zealand was high compared with other OECD countries and many of the interviewees remember when this was not the case. Dwyer et al’s NZ older focus group participants cited the cost of medical care as an increasing problem.

Recent changes to the funding of primary care may impact on the cost barrier. The combined cost of consultation, prescription, and transport may be barrier for many
elderly people and health planners need to consider the total cost of accessing consultations when considering subsidies.

After hours transport was a major problem for older respondents who lived alone and either did not drive or felt too unwell to drive. Several respondents described incidents when they delayed seeking care because they felt too ill to travel. Shipman et al also reported this in their United Kingdom research. As after hours primary care is increasingly centralised for economic reasons, the resulting loss of access for the most vulnerable groups (including the elderly) needs to be considered by policymakers. Increased access to home visits and subsidised transport are possible options.

A surprising finding was the extent of resistance to the use of “lay referrers” by the interviewees. Lay referrers are friends or family, whom a patient consults before seeking professional advice. Most of the research on the lay referral network studied working age people in the 1960s and 1970s, based on Friedson’s American work. This is the cohort to which the participants belong, which raises the possibilities of an ageing effect or a peculiarly New Zealand phenomenon. It may also reflect a sample biased toward the better educated or have been influenced by the participant’s knowledge that the researcher was a GP. The participants put a high value on independence, medical knowledge, the wisdom of age and there was also a sense of moral sanction against “complaining”.

Stoicism was a theme which emerged strongly in Foster et al’s British research on older people’s use of after hours services. Some of the patterns of use of after hours services may relate to characteristics of the elderly cohort, rather than the provision of services. The effects of the stereotyping of older people also emerged as a theme in the present research.

As Campbell observed, the denigration of old age may mean that the elderly person avoids disturbing the “busy doctor”, younger family members, and neighbours (who were seen to have a more productive and valuable role in society). There was resistance to the idea that the elderly might have particular problems, consistent with the New Zealand findings of the Prime Ministerial Task Force on Positive Ageing. Difficulty accepting the stereotype of old age as physically and mentally infirm and helpless may have contributed to the reluctance of the newly retired to seek healthcare after hours. The increasing attendance by older people at after hours care as they age may reflect a gradual adjustment to this stereotype as well as increasing morbidity.

The theme “not wanting to see an unfamiliar doctor” emerged strongly in the current study and was a prominent finding in Foster et al’s study. There was concern about the lack of information available to another doctor and strong emphasis on the importance of having a doctor with whom one could develop a relationship and mutual trust. Participants who had medication cards from the hospital found them helpful but commented on difficulties with keeping them up to date.

Most general practices in New Zealand are computerised and it should be possible to have software designed to print off relevant information at each visit. Eventually there may be networking of some data between practices and after hours clinics. Health professionals need to give older people specific advice (preferably written) about what to do if symptoms deteriorate as well as information about the location,
availability, and appropriate use of after hours healthcare. The participants’ ambivalence about a telephone triage service is similar to the findings of Foster et al.² The importance of timely acute care in preventing longer term care needs was highlighted by Dwyer et al⁸ and Campbell.¹ While services for the chronically ill and most disabled elderly are important, lack of attention to the particular acute care needs of older people may not be in the best interests of older people or the health budget.

Conclusions

Transport difficulties, the total cost of accessing after hours care, lack of information, and reluctance to see a new doctor who is unfamiliar with their medical history are barriers to older people seeking after hours medical care. The Wellington Free Ambulance helps to overcome some of these barriers in the Wellington Region, however. A patient-held medical record for older patients should be considered, along with improved information about how and when to access after hours medical care.

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References:


Investigating the accuracy of ethnicity data in New Zealand hospital records: still room for improvement

Judith Swan, Steven Lillis, David Simmons

Abstract

**Background** The accuracy of ethnicity information in the New Zealand hospital data was reported on in 1994. Data collected in the Barriers to Diabetes Care in the Waikato Study enables further evaluation of the accuracy of ethnicity information in hospital records.

**Aims** One aim of public health policy is addressing health disparities between ethnic groups. Monitoring disparities depends on accurate outcome data, such as that from hospitals. It would be expected that this data would improve over time. This paper reports on the contemporary accuracy of ethnicity data in hospital records in the Waikato district.

**Methods** Self-identified ethnicity data were gathered as part of the Barriers to Diabetes Care in the Waikato mail survey. Hospital record data were collected for those participants who had consented for access to their hospital records.

**Results** Complete data was available for 3500 people with diabetes. Ethnicity in the hospital record was correct for one of the sometimes multiple, self-identified ethnicities for 97.7 (95CI 96.8–98.3)% of respondents. Ethnicity data were concordant for 71 (67–75)% of Māori and 99 (99–100)% of non-Māori. The non-Māori ethnic group was disaggregated into component groups: the hospital record agreed with self-identified ethnicity for 89 (87–91)% of Europeans, 67 (55–78)% of Pacific groups, 70 (57–81)% of South Asian groups, 64 (48–77)% of Asian groups, and 41 (27–57)% of ‘Other’ ethnic groups.

**Conclusions** Hospital records continue to mis-record ethnicity when compared to a self-identified ethnicity. Mis-recording occurs for all ethnic groups, and is more pronounced at more specific levels of ethnic group. Researchers, clinicians, and policy makers must be cognisant of these continuing discrepancies when using hospital record data to describe ethnic variations in health status, service utilisation, or for policy planning activities.

The accuracy of ethnicity information in New Zealand hospital records has been investigated several times over the last 24 years. Each of these investigations has demonstrated inadequacies in the accuracy of ethnicity information contained in hospital records, particularly in relation to Māori. Such miscoding can lead to under- or over-estimates of differences in health outcomes or health resource utilisation in differing ethnic groups in New Zealand. The accuracy of hospital records is particularly important, as data from the hospital records constitute one of the few data sets available to describe morbidity in the New Zealand context.

The Barriers to Diabetes Care in the Waikato Study (Barriers) commenced in 2003. This study was established to identify perceived obstacles to the provision and receipt
of quality diabetes care in the Waikato region. This study is unique in New Zealand diabetes research in asking the same questions of both providers and consumers of diabetes care. The structure of the Barriers Study enables the comparison of perceived obstacles, and possible solutions, between providers and consumers, between primary and secondary providers, and between differing geographic and demographic groups.

Once obstacles to care have been identified, strategies can be planned to improve the delivery of diabetes care in an environment characterised by rapidly escalating disease burden. This paper reports on one demographic variable—ethnicity, and extends the knowledge of the accuracy or otherwise of this information in the hospital records.

**Methods**

The Waikato District Health Board (WDHB) catchment area comprises approximately 8.3% of New Zealand’s land area in the central North Island. The population count of the WDHB in the 2001 census was 317,751 people, 8.5% of the national population. Two urban areas: Hamilton, a main urban area, and Tokoroa, a secondary urban area; accommodate 56.8% of the district’s population. Ethnically, the WDHB population has more people who identify as Māori than the national population (20.2% and 14.1% respectively), fewer self-identified Pacific people (2.1%, 5.4%), fewer self-identified Asian people (3.3%, 6.1%), and the same European / 'Other' people (74.4%). This source combines European and 'Other' ethnic groups together, while this paper reports on these groups separately.

The exact numbers of people with diabetes in the WDHB region are unknown. The WDHB estimated in 2003 that there were 12,487 people who live with diabetes in the region. Of these, 5734 (45.9) were Māori, 6253 (50.1%) were European, and 500 (4.0%) were Pacific people. Other similar estimates have been published.

A validated four-item open questionnaire was posted to people who have diabetes; all general practitioners and practice nurses; all diabetes staff; and all relevant hospital-based medical, senior nursing, and allied health staff. The questionnaire asked the participant to identify what prevents diabetes care, how to improve diabetes care, what worries them about diabetes care, and to make any other comments. Additional closed questions elicited demographic and health history information.

Planned follow-up of non-participants was based on methods described by Dillman. The follow-up consisted of posting a second questionnaire, ‘in person’ follow-up to selected groups, and phone follow-up for all others. Consent was requested to access hospital records.

As part of the structured questionnaire, a single question asked “Which ethnic group(s) are you?” Participants could select, from six options (European, Māori, Pacific Island, South Asian, Asian and ‘Other’), and could list up to three ethnic groups. The order of ethnicities indicated was not analysed separately.

The hospital record data was drawn from the Regional Diabetes Database, a standalone National Health Index-based database developed and managed by the Regional Diabetes Service. This database permits recording of a single, patient-selected ethnicity.

Ethnicity data from completed questionnaires was compared with ethnicity information in the hospital-based medical record, for those who had consented. The self-identified ethnicity, from the Barriers Study, was taken as the standard, against which the hospital record was compared.

This paper reports on Māori–non-Māori differences as well as disaggregating the non-Māori group. In the Māori–non-Māori comparisons, if Māori was one of the reported ethnic identities, for those who reported multiple ethnicities, these participants were counted as Māori. All the other ethnic identities were grouped together and counted as non-Māori. In the analysis across all ethnic groups no prioritisation was applied.

Using percentage and 95% confidence intervals, the results were analysed using self-identified ethnicity and hospital record ethnicity as the denominator. The accuracy of the hospital record was assessed using the first analysis, while the latter provides a prediction of an individual’s ethnicity based on the hospital record material. The study was approved by the Waikato Ethics Committee.
Results

The Barriers questionnaire was sent to 6881 people who live with diabetes. Of these, 4499 (65.4%) have been received back and 3500 provided consent to accessing of their hospital record. Ethnicity data from both the hospital record and the Barriers Study were available for all of these 3500 individual records. Data from these two sources are shown in Table 1.

Table 1. Variation in ethnic identity between self-identification (Barriers) and hospital records; Māori and non-Māori (n=3500)

<table>
<thead>
<tr>
<th>Self-identity (Barriers)</th>
<th>Māori</th>
<th>Non-Māori</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori</td>
<td>369</td>
<td>20</td>
<td>389</td>
</tr>
<tr>
<td>Non-Māori</td>
<td>149</td>
<td>2962</td>
<td>3111</td>
</tr>
<tr>
<td>Total</td>
<td>518</td>
<td>2982</td>
<td>3500</td>
</tr>
</tbody>
</table>

These data show that 71.2 (95% CI: 67.2–75.0)% of persons who self-identify as Māori were correctly recorded as such in their hospital record. For those who self-identify in a non-Māori ethnic group, 99.3 (98.8–99.7)% were correctly recorded in their hospital record.

Considering the predictive value of a hospital record of ethnicity, the Barriers data showed that 94.9 (92.2–96.7)% of persons described in their hospital record as Māori identified themselves as Māori. Similarly, 95.2 (94.4–95.9)% of those described in their hospital records as non-Māori identified themselves as belonging to a non-Māori ethnic group.

Nearly one in three participants who self-identified as Māori were recorded as non-Māori in their hospital record. However, examining these 149 participants in more detail reveals a situation that is more complex than just incorrectly recorded ethnicity. Table 2 describes the diversity of these participants.

Table 2. Detail of those who self-identify as Māori and whose hospital record shows non-Māori (n=149)

<table>
<thead>
<tr>
<th>Self-identify as Māori, hospital record shows a non-Māori ethnic group</th>
<th>149</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-identify as Māori PLUS another ethnic group</td>
<td>99</td>
</tr>
<tr>
<td>Hospital record correct for other ethnic group</td>
<td>88</td>
</tr>
<tr>
<td>Hospital record shows ‘Other’ ethnic group</td>
<td>11</td>
</tr>
<tr>
<td>Self-identify Māori as SINGLE ethnic group</td>
<td>50</td>
</tr>
<tr>
<td>Hospital record shows European ethnic group</td>
<td>28</td>
</tr>
<tr>
<td>Hospital record shows ‘Other’ ethnic group</td>
<td>22</td>
</tr>
</tbody>
</table>

These data show that two-thirds of this group self-identify with multiple ethnic groups (11 participants identified with three ethnic groups). Of those who identified with
multiple ethnic groups the majority (88%) were correctly recorded in the hospital record for one of their ethnic identities.

When combined with the data from Table 1, this shows that 88.2 (85.2–90.8)% of participants who self-identify Māori as one of their ethnic groups had their ethnicity correctly recorded for one of their ethnic identities. However, this leaves 11.8 (9.3–14.9)% of participants who self-identify as Māori with their ethnicity incorrectly recorded in their hospital record. Most of these are participants who self-identified solely as Māori.

Closer examination of the much smaller group of participants who self-identify in a non-Māori ethnic group but are recorded as Māori in their hospital record shows 17 of the 20 self-identify as solely European. Two participants self-identified as solely Pacific Islander. The one remaining participant identified in two ethnic groups, these being European and Pacific Islander.

Combining the data from Tables 1 and 2 allows consideration of ethnic identity across all participants and all of their (sometimes multiple) ethnic identities. At this level, the data show 97.7 (96.8–98.3)% of participants had an identical ethnic group recorded for one of the ethnic identities.

Table 3 shows the data across all the ethnic groups in the Barriers dataset. While in all groups (except the ‘Other’ group) the majority of respondents (64.1–89.1%) had the same ethnicity data self-identified and recorded in the hospital notes, several variations emerged.

The self-identified ethnic group was correctly recorded in the hospital record for 89.1 (87.3–90.6)% of Europeans; 67.2 (54.7–77.8)% of Pacific Island ethnic groups; 70.2 (57.3–80.6)% of South Asian ethnic groups; and 64.1 (48.4–77.4)% of Asian ethnic groups—but only 41.0 (27.1–56.7)% of ‘Other’ ethnic groups. Most participants who had their ethnicity recorded differently to their self-identified status in the ‘Other’ group had European as their ethnic group in the hospital record.

Table 3. Variation in ethnic identity between self-identification (Barriers) and hospital records; all ethnic groups (n=3500)

<table>
<thead>
<tr>
<th>Self-identity (Barriers)</th>
<th>European</th>
<th>Māori</th>
<th>Pacific Island</th>
<th>South Asian</th>
<th>Asian</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>2482</td>
<td>114</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>18</td>
<td>2626</td>
</tr>
<tr>
<td>Māori</td>
<td>18</td>
<td>369</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>390</td>
</tr>
<tr>
<td>Hospital record</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Island</td>
<td>2</td>
<td>0</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>South Asian</td>
<td>2</td>
<td>0</td>
<td>9</td>
<td>40</td>
<td>0</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>25</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>Other</td>
<td>282</td>
<td>34</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>16</td>
<td>358</td>
</tr>
<tr>
<td>Total</td>
<td>2787</td>
<td>518</td>
<td>61</td>
<td>57</td>
<td>39</td>
<td>39</td>
<td>3500</td>
</tr>
</tbody>
</table>

The hospital record predicted the self-identified ethnic group for 94.5 (93.1–95.6)% of Europeans; 94.6 of Māori; and 93.2 (81.2–98.4)% of Pacific Island ethnic groups. However, for Asian ethnic group participants, the predictive value of the hospital record fell to 86.2 (68.9–95.2); and to 74.1 (61.0–84.1)% for South Asian ethnic
group participants. The hospital record predicted only 4.5 (2.7–7.2)% of those who identified in the ‘Other’ ethnic group. Most [78.8 (74.2–82.7)%] respondents recorded in the ‘Other’ ethnic group self-identified as European.

Discussion

These findings have significant policy implications. With such major discrepancies in ethnicity reporting among non-European groups in the major national outcome dataset (besides death certificates), it is difficult for the impact of policies focussing on inter-ethnic health disparities to be interpreted.

The accuracy of self-identified ethnic group hospital records has been reported on several times by different researchers. Table 4 shows how self-identity has compared with hospital records for Māori and non-Māori over the last 24 years. Our data are consistent with the two earlier studies, but not Priest and Jackson. Indeed, one of the earlier reports was from the Waikato. Whether our results reflect national coding validity is unknown, but the Waikato itself is a significant proportion of the national population.

### Table 4. Self-identity and correctly recorded ethnic group in hospital data 1980–2004 in New Zealand; various researchers

<table>
<thead>
<tr>
<th>Studies</th>
<th>Participants (n)</th>
<th>Self identity (n)</th>
<th>Ethnicity correctly recorded [n (% of self identity)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980: Pasupati et al (in Kilgour &amp; Keefe)</td>
<td>235</td>
<td>26</td>
<td>20 (76.9)</td>
</tr>
<tr>
<td>1988: Sceats</td>
<td>605</td>
<td>117</td>
<td>84 (71.8)</td>
</tr>
<tr>
<td>1994: Priest and Jackson</td>
<td>5729</td>
<td>353</td>
<td>328 (92.9)</td>
</tr>
<tr>
<td>2004: Swan et al, present paper (Barriers)</td>
<td>3500</td>
<td>518</td>
<td>369 (71.2)</td>
</tr>
</tbody>
</table>

Limited information appears to have been published specifically addressing the accuracy of hospital data for ethnicity variables elsewhere. Boehmer et al reported on a review of a US dental department’s outpatient clinic files compared with self-reported race/ethnicity. These authors show that 77.1% of clinic files were correct for those who self-reported as white. The accuracy fell to 4.6% for those who identified as American Indian— with accuracy at 68.9% for Black or African American; 61.0% for Spanish, Hispanic, or Latino; and 54.0% for Asian people. The accuracy of the clinic records was lower in all ethnic groups when respondents identified with multiple ethnicities.

Western Australian data from an interview study showed 85.8% of indigenous people were correctly recorded in hospital records. Non-indigenous people had the correct ethnicity recorded in 99.5% of hospital records.

When comparing these studies it must be noted that each used a slightly different method for data collection, which may explain some of the variation in the results shown in Table 4. It is known that ethnic responses may alter depending on a range of factors, including broad social structures, perceived fiscal or political benefit, psychological, and familial. Technical issues such as question design, collection methods, timing and coding can also have an impact.
Notwithstanding these methodological differences, it appears that ethnic identity has been recorded in hospital records less accurately for those who self-identify as Māori than for those self-identify in a non-Māori ethnic group. Moreover, this situation seems to be a long-standing tradition which does not seem ready to change. While the high and rising levels of accuracy in the non-Māori ethnic group appears reassuring, this may be misleading. The Barriers Study data (Table 3) clearly shows that when the non-Māori ethnic group is disaggregated into its component parts, all ethnic groups experience mis-recording in their hospital records.

The mis-recording of ethnic identity is particularly problematic in the ‘Other’ ethnic group, where the predictive value of the hospital record is also highly suspect. The ‘Other’ group may require specific attention from data entry personnel to increase the accuracy of ethnic self identity when people present for hospitalisation.

At more defined levels of ethnic identity there may be further concerns, not able to be reported on with the Barriers Study data. This study requested participant information at aggregated levels, thus the study cannot report on the accuracy of hospital records, for those who identify, for example, as Tongan or Sri Lankan.

More positively, it is important to note that nearly 98% of all participants had an ethnic group correctly recorded in the hospital record for one of their ethnic groups. While multiple ethnic identities do increase the complexity of demographic analysis, in any field, it is important that effort is expended to reflect the everyday realities of participants.

Lastly the predictive value of ethnicity information in hospital records show high levels of accuracy for Māori, Non-Māori, and Pacific Island ethnic groups (the latter two at aggregated levels). However there is room for improvement in the Asian and South Asian ethnic groups. The accuracy of the hospital record must be questioned when it states an individual belong to the ‘Other’ ethnic group.

As has been shown by past researchers, hospital records continue to mis-record ethnicity when compared to self-identified ethnic group. This occurs for all ethnic groups. The hospital record can predict ethnicity accurately but only at higher levels of aggregation: more detailed levels of ethnic group extracted from the hospital record must be treated with caution.

The discrepancies between the self-identified ethnicity and the ethnic group recorded in hospital record demonstrate several concerns which researchers, clinicians, and policy makers must be cognisant of. This continuing limitation of data in the contemporary New Zealand health environment must act as an impetus to improve the collection and accuracy of all datasets, but especially hospital records. Hospital data comparing ethnic groups needs to be viewed cautiously and the implications of misclassification should be reported quantitatively.

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References:


Cholecystectomy following acute presentation to a major New Zealand metropolitan hospital: change to the timing of surgery is needed

Anthony Lin, Peter Stiven, Philip Bagshaw, Saxon Connor

Abstract

Aims To review the management and outcome of patients presenting with acute biliary pain/cholecystitis, mild acute pancreatitis, or cholangitis to a major New Zealand (NZ) metropolitan hospital.

Methods A retrospective case note review was performed for all patients admitted acutely to Christchurch Public Hospital between 1 February 2005 and 31 September 2005, with the diagnosis of acute biliary pain/acute cholecystitis, acute pancreatitis, or cholangitis. Basic demographics, inpatient management, and subsequent outcome were recorded.

Results Sixty-eight (65%) patients were admitted with acute biliary pain/cholecystitis, 23 (22%) with mild acute pancreatitis, and 13 (13%) with cholangitis. Twelve of 81 (15%) patients (who were suitable for index cholecystectomy) underwent surgery, including only 3 of the 18 patients with mild acute pancreatitis. In the remaining 69 (85%) patients, who were eligible but did not undergo cholecystectomy at the index admission, 29 (42%) subsequently represented to the emergency department. Forty-eight (70%) patients required further inpatient admission related to gallstone-related pathology within the study period. Subsequently, 42 (61%) of the 69 patients treated conservatively underwent cholecystectomy at a median (range) of 70 (1–195) days from index admission, including 6 emergency cholecystectomies due to re-presentation.

Conclusions The management of acute gallstone-related disease at a major NZ metropolitan hospital fails to meet with current international standards. Few patients undergo index cholecystectomy, and a large proportion of those treated conservatively return to the health sector with ongoing problems.

The treatment of choice for symptomatic cholelithiasis is cholecystectomy. Failure to do so results in re-presentation to primary or secondary health providers at substantial social and financial expense to both the patient and healthcare providers.

The incidence of acute pathology within a population has been shown to be inversely proportional to the rate of elective gallbladder surgery within that population, such that a reduction in elective services will increase the burden on acute services. Acute presentation of gallstone disease ranges from simple pain secondary to cystic duct obstruction through to life-threatening sepsis (cholecystitis or cholangitis) or pancreatitis.

Traditionally, the management of acute biliary pain or cholecystitis has been conservative, focusing on antibiotics and analgesics with or without delayed elective cholecystectomy. In an acute setting, inflammation, oedema, and adhesions have...
often been cited as factors that may increase the rate of complications following an acute cholecystectomy.\textsuperscript{1,6–9} However, even in the era of open cholecystectomy, this approach was disputed and equivalent outcomes were achieved with early cholecystectomy.\textsuperscript{1,6}

When laparoscopic cholecystectomy was first introduced, acute cholecystitis was a relative contraindication for this operation, as it was believed that it would increase the rate of conversion to open surgery.\textsuperscript{10} With increasing laparoscopic experience, however, this issue has been addressed in two meta-analyses.\textsuperscript{11,12} Both studies concluded that not only was early laparoscopic cholecystectomy associated with an equivalent outcome in terms of complications or conversion to open surgery compared to delayed cholecystectomy, but also it resulted in a reduction in hospital stay.

Following an episode of mild acute pancreatitis, the recommended treatment is cholecystectomy prior to, or within, 2 weeks of discharge.\textsuperscript{13} Early laparoscopic cholecystectomy has been shown to be safe and reduces hospital stay,\textsuperscript{14} while leaving the gallbladder \textit{in situ} is associated with a recurrence rate of up to 61%.\textsuperscript{15}

Cholangitis secondary to choledocholithiasis requires urgent drainage of the biliary tree by endoscopic retrograde cholangiopancreatography (ERCP),\textsuperscript{16,17} and subsequent cholecystectomy in those who are medically fit enough should be part of the standard care.\textsuperscript{18}

At a time where health resources are limited and hospital occupancy rates are high it is important that the most efficient (in terms of patient outcome and cost effectiveness) treatment pathways are instituted.

Hence the aim of this study was to review the management of patients who presented with acute gallstone-related disease at a large New Zealand metropolitan hospital over an 8-month period, with a particular focus on the timing of cholecystectomy.

**Methods**

A retrospective case note review was performed for patients presenting with acute biliary pain or cholecystitis, gallstone pancreatitis, and cholangitis between 1 February 2005 and 31 September 2005 in Christchurch Public Hospital. Patients with the above conditions as their primary diagnosis on discharge were identified through the International Classification of Diseases, 10\textsuperscript{th} revision (ICD-10) from the Christchurch Public Hospital Patient Management System.\textsuperscript{19} The discharge notice, blood results, and imaging reports were also checked for each patient to confirm the ICD-10 diagnosis. Follow-up data were collected up to December 2005.

Acute biliary pain or cholecystitis was defined as right upper quadrant pain with evidence of cholelithiasis on ultrasound scan. Acute biliary pancreatitis was defined by the presence of upper abdominal pain with an elevated amylase level (three times the normal range) with ultrasound evidence of cholelithiasis. Acute cholangitis was defined as jaundice, temperature \(>37.5\)°C, neutrophilia, and the presence of choledocholithiasis. When two diagnoses were present, cholangitis or gallstone pancreatitis took precedence over acute biliary pain/cholecystitis.

Patients were excluded from this study for the following reasons: absence of cholelithiasis or choledocholithiasis; known biliary tract malignancy; previous cholecystectomy; or patients with actual or predicted severe acute pancreatitis.\textsuperscript{13}

Basic demographic data as well as all the past and current gallstone-related admissions, emergency department (ED) visits, outpatient visits, and interventions were recorded. The first presentation within the audit period was defined as the index presentation. Admissions, ED visits, and outpatient visits, prior to the index presentation were classified as previous events. Cholecystectomy performed during the index admission was classified as index cholecystectomy. Events after the index presentation were
classified as subsequent events. Inpatient events included: admissions for gallstone related conditions, elective cholecystectomy, and ERCP. Complications were recorded based on the discharge letters and clinical notes.

Nominal data is presented as actual numbers with % where the denominator is >50. Continuous data are presented as medians (range).

Results

104 of 125 patients (83%) that were identified by the study search criteria were included for further analysis, including two patients in whom incomplete notes were available. Twenty-one patients were excluded for the following reasons: eight due to previous cholecystectomy, five had no evidence of cholelithiasis or choledocholithiasis on imaging, four had a biliary or pancreatic malignancy, three had severe pancreatitis, and one due to the patient self-discharging prior to investigations being completed.

The median age was 55.5 years (range 18–94 years) and 65 (63%) were female. Sixty-eight (65%) patients presented with acute biliary pain/cholecystitis, 23 (22%) with mild gallstone pancreatitis, and 13 (13%) with cholangitis. The median hospital stay was 6 (0–29) days.

The subsequent management and outcome of these patients is shown in Figure 1. Eleven (11%) patients were thought to be unfit for surgery, nine (9%) opted for private treatment, and three (3%) declined surgery. One (1%) of the patient who declined surgery subsequently died secondary to pneumonia. Of the 81 (77%) remaining patients, 12 (15%) patients underwent index cholecystectomy with a median waiting time of 5.5 (0–11) days.

Of the 69 (85%) patients managed conservatively, 34 (49%) were placed on the waiting list for cholecystectomy during the index admission, while a further 17 (25%) patients were waitlisted after subsequent outpatient review. Of the patients managed conservatively, 29 (42%) subsequently returned to the Emergency Department (ED) with a median of 1 (1–4) visit, and 48 (70%) returned for further inpatient management with a median of 1 (1–6) visit. A total of 41 (60%) patients received cholecystectomy on a subsequent admission at a median (range) of 69 days (1–195), including 25 on the waiting list from index admission (median [range] 63 days [1–185]) three of which were performed acutely during unplanned readmissions.

Management and outcome by presentation is presented in Table 1. Of the 12 patients who underwent index cholecystectomy, 7 were for acute biliary pain or cholecystitis (1 open cholecystectomy, 1 laparoscopic cholecystectomy, and 5 converted from laparoscopic to open cholecystectomy). Of these 7 patients, 4 experienced postoperative complications, including 2 patients with wound-related complications, 1 patient required a blood transfusion, and 1 patient developed a bile leak.

Three patients underwent index cholecystectomy following recovery from mild acute pancreatitis, all were completed laparoscopically without any documented complications. Two patients underwent index cholecystectomy following presentation with cholangitis: one patient open cholecystectomy and common bile duct exploration after failed ERCP (this was complicated by pancreatitis), while a second patient underwent an open cholecystectomy. Thirty-seven patients underwent ERCP, including 10 patients who were deemed unfit for surgery.
Figure 1. Management and outcome of patients presenting with acute gallstone-related disease to Christchurch Hospital between 1/2/2005 and 31/9/2005

*Patients who were not fit for surgery, declined surgery or transferred to the private sector; ERCP=endoscopic retrograde cholangio-pancreatography, OPD=outpatient department, ED=emergency department. WL=waiting list.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Acute biliary pain/cholecystitis (n=68)</th>
<th>Gallstone pancreatitis (n=23)</th>
<th>Cholangitis (n=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of patients on waiting list at index admission</td>
<td>4 (6)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Number (%) of patients seen in OPD prior to index admission</td>
<td>6 (8)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Number (%) of patients having previously attended ED for gallstone related symptoms</td>
<td>19 (27)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Median (range) number of ED attendances prior to index admission for gallstone related symptoms</td>
<td>1 (1–4)</td>
<td>2 (1–3)</td>
<td>2 (2–2)</td>
</tr>
<tr>
<td>Number (%) of patients having previously been admitted prior to index admission for gallstone related symptoms</td>
<td>8 (11)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Median (range) number of inpatient admissions prior to index admission for gallstone related symptoms</td>
<td>1.5 (1–5)</td>
<td>1 (1–1)</td>
<td>2 (2–2)</td>
</tr>
<tr>
<td>Median (range) hospital stay (days)</td>
<td>4 (0–24)</td>
<td>8 (0–22)</td>
<td>8 (5–29)</td>
</tr>
<tr>
<td>Patients not for surgery * (%)</td>
<td>14 (21)</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Cholecystectomy on index admission</td>
<td>7/54 (13)</td>
<td>3/18</td>
<td>2/9</td>
</tr>
<tr>
<td>Median (range) time to surgery on index admission (days)</td>
<td>5 (0–11)</td>
<td>4 (3–8)</td>
<td>9 (7–11)</td>
</tr>
<tr>
<td>Total number (%) of patients in whom ERCP was performed</td>
<td>14 (21)</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Number (%) of patients eligible for surgery in whom ERCP was performed</td>
<td>12</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Number (%) of patients eligible for delayed cholecystectomy</td>
<td>47 (69)</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Number of patients discharged on waiting list</td>
<td>22</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Total number of patients who have subsequently undergone cholecystectomy (number from waiting list at index admission)</td>
<td>26 (15)</td>
<td>10 (6)</td>
<td>5 (4)</td>
</tr>
<tr>
<td>Median (range) time for those discharged on waiting list until delayed cholecystectomy (days)</td>
<td>63 (17–185)</td>
<td>90 (41–147)</td>
<td>45 (23–71)</td>
</tr>
<tr>
<td>Number (median number of attendances per patient, range) of patients who subsequently returned to ED following discharge with gallbladder in situ</td>
<td>22 (1, 1–4)</td>
<td>7 (1, 1–4)</td>
<td>0</td>
</tr>
<tr>
<td>Number (median number of admissions per patient, range) of patients who subsequently required further inpatient admissions following discharge with gallbladder in situ</td>
<td>32 (1.5, 1–5)</td>
<td>10 (1.5, 1–6)</td>
<td>6 (1, 1–2)</td>
</tr>
</tbody>
</table>

*Patients who were not fit for surgery, declined surgery or transferred to the private sector; ERCP=endoscopic retrograde cholangio-pancreatography; OPD=outpatient department, ED=emergency department.

**Discussion**

There is now the highest quality evidence to support early cholecystectomy in patients presenting with acute gallstone related pathology. Recent meta-analyses concluded that delayed cholecystectomy has no significant advantage over early operation in terms of perioperative mortality and morbidity rate. Papi et al also
confirmed that the mean hospital stay was significantly shorter in the group receiving early treatment (9.6±2.5 days in the early group vs 17.8±5.8 days in the delayed group; p<0.0001). Furthermore, 115 of 503 (22.9%), randomised to delayed surgery group, failed to respond to conservative management or suffered recurrent cholecystitis.

Overall, 65 (56.5%) of these 115 patients required unplanned urgent surgery. Yet, within the current study only 15% of the 81 eligible patients underwent index cholecystectomy. Reasons for this low rate of index cholecystectomy cannot be elucidated from this study but previous studies have has previously identified multiple factors—including surgeon reluctance (up to 276 of 308 [90%] of general surgeons surveyed), lack of either acute facilities (radiological and operative) or a dedicated gastrointestinal (GI) acute service.

Of particular concern in the current study is the low rate of index cholecystectomy performed following admission with mild acute pancreatitis. Of the 18 eligible patients, only 3 received cholecystectomy on the index admission. Evidence-based international guidelines recommend that cholecystectomy should be performed during the same hospital admission or no longer than 2 weeks after initial discharge from the hospital.

The median waiting time for cholecystectomy following mild acute pancreatitis during the study period was more than 10 weeks—in fact no patient discharged underwent elective cholecystectomy within the recommended 2 weeks. The number of subsequent ED visits (median of 1 per patient) in those not treated with index cholecystectomy further emphasises the need for early cholecystectomy in this group of patients.

A total of 27 (33%) ERCPs were performed in 81 patients eligible for cholecystectomy including 8 in 18 patients following mild acute pancreatitis. While this may simply reflect the complex case mix of this group of patients, unfortunately the current study cannot elucidate the proportion, which was therapeutic.

Of the eligible patients who were managed conservatively, 29 (42%) returned to ED within the audit period and 48 (70%) were readmitted for further gallstone related conditions/investigations/procedures.

There is a risk of emergency admission while awaiting elective cholecystectomy, and the rate of admission increases depending on the length of time on the waiting list. This places a significant burden on the health sector (let alone unnecessary patient suffering), as shown by a recent Australian study which reported a total cost of AU$6129 for unplanned admissions from the waiting list, while an uncomplicated elective laparoscopic cholecystectomy cost AU$3725. Furthermore, Chandler et al reported reduced hospital costs for those undergoing early cholecystectomy vs delayed cholecystectomy. Thus, overall, it would seem more cost effective to perform early surgery.

A change in management of these patients is suggested. Potential solutions include the development of a management algorithm for acute gallstone related pathology, and provision of a dedicated “acute biliary team” with appropriate access to radiological and operative services. Although surgeons need to drive this change
without the “purse holders” understanding the false economy of delaying these patients’ treatment, change will be difficult.

In conclusion, the management for acute gallstone-related disease at a major NZ metropolitan hospital does not meet with current international standards. Few patients undergo cholecystectomy at their index admission and large numbers of patients return to the health sector with ongoing problems.

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Deadly meatballs—a near fatal case of methaemoglobinaemia

Ali Khan, Adrienne Adams, Greg Simmons, Timothy Sutton

A 47-year-old Māori male was found unresponsive and ‘blue’ by family members when they returned home at night. When last seen he had been playing cards with friends. He was brought in by ambulance.

At presentation, he was severely hypoxic and centrally cyanosed with SpO₂ of 64% despite 100% oxygen. Temperature was 35.7°C, heart rate (HR) 126/minute, blood pressure (BP) 111/59 mmHg and Glasgow Coma Score (GCS) of 5/15 with urinary incontinence and tonic seizure-type movements.

Venesection yielded chocolate-brown coloured blood. Arterial blood gas analysis showed pH of 7.29, PO₂ of 10.2 kPa, PCO₂ of 4.7 kPa, HCO₃ of 16 mmol/L, lactate of 9.2 mmol/L, and base excess of –9 mmol/L. Haematological and biochemical indices were normal.

A diagnosis of methaemoglobinaemia of uncertain trigger was made on clinical grounds. Treatment was then commenced with methylene blue (MB). His colour promptly returned to normal and cyanosis corrected. Arterial blood gas (ABG) analysis 2 hours after MB infusion (when he was feeling well), revealed a methaemoglobin (Met-Hb) level ~2.6%, still higher than normal (Due to a problem with the blood gas analyser, the Met-Hb level could not be measured earlier in the acute stage.) His rapid response to the MB infusion confirmed methaemoglobinaemia as the cause of the hypoxia. He made a full recovery and was discharged after 3 days.

Earlier on the evening of admission the patient had eaten microwave-heated meatballs. About an hour later he vomited then lost consciousness. The day after admission, the left-over meatballs were recovered by his daughter from the fridge and analysis in Environmental Science and Research (ESR) revealed the sodium nitrite level at 4.3% w/w (43000mg/kg), which exceeded the recommended nitrite level as meat preservative by 344-fold. The Auckland Regional Public Health Service was notified and an immediate inspection and product recall was initiated.

Seven trays totalling 56 meatballs were made at a local butchery 2 days before. The preparation involved mixing flavouring powder to minced meat. A bag of nitrite powder labelled ‘poison’ was kept alongside the bag of flavouring powder. A worker who knew very little English made the meatballs for the first time on that occasion, with verbal instruction from co-worker. He added 500 grams of nitrite to the minced meat instead of flavouring, not knowing the meaning of the word ‘poison’ written on the bag.

The patient had purchased one tray and two were purchased by another woman, who reported no ill effect from consumption; 32 meatballs remained unaccounted for. The majority of the customers were Pacific Islanders. Product recall notices were placed in local newspapers and aired over a local radio, but none were ever returned.
Meatballs are considered ‘cured meat’—and under the joint Australia New Zealand Food Standards Code, nitrite (as a meat preservative not exceeding 125 mg/kg) is permitted. Methemoglobinemia from consumption of cured meats is well recognised, but rarely are levels measured. One outbreak involving three cases implicated meat containing nitrite at 10,000–15,000 mg/kg, only one-third of the level in our case.

Methaemoglobinaemia is a potentially fatal condition. Ferrous iron in haemoglobin is oxidised to ferric form and resulting methaemoglobin is incapable of binding oxygen. This reduces the oxygen carrying capacity of blood and profound cyanosis ensues. Methemoglobinaemia can result from congenital deficiency, or acquired from excessive exposure to substances that oxidise haemoglobin including nitrite/nitrates, aniline derivatives, local anaesthetics, sulphonamides, dapsone, and quinones.

Nitrites/nitrate exposure is the commonest acquired cause which can result from inhalation of room odorisers, ingestion of contaminated water, or meat products where nitrite is used as preservative for its property of inhibiting growth of *Clostridium botulinum*.

Two enzyme systems in red blood cells (RBCs) reduce methaemoglobin (Met-Hb) to haemoglobin (Hb)—NADH cytochrome beta-5 reductase and reduced NADPH methaemoglobin reductase (for which methylene blue is a co-factor). Reduced methylene blue in turn reduces Met-Hb back to Hb, which is the basis of methylene blue therapy.

This case highlights the need for care in the use of chemical food preservatives, and it emphasises the importance of staff training where potentially toxic food additives are used.

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Public and institutional responses to the ‘missed’ diagnosis in New Zealand

Hamish Wilson

There are regular public outcries in New Zealand when a patient dies from a ‘missed’ diagnosis. The usual scenario involves the patient presenting to a general practitioner or emergency department, being assessed as having a self-limiting condition, but who later unexpectedly dies at home. The underlying culprits are often meningococcal disease, myocardial infarction, or abdominal aortic aneurysm (AAA). There are usually a number of institutional and medicolegal reviews after each ‘missed’ diagnosis.

This article reviews some of the problems in public discussion of clinical error or missed diagnosis. These problems are illustrated by a 2006 press report about a recent case of a ‘missed’ diagnosis of abdominal aneurysm. Institutional review of the incident is then compared with Reason’s typology of responses to error (the ‘person’ versus the ‘system’ approach).

Finally, the approach to individual lapses in medicine is compared to that in the aviation industry, where the problem of human fallibility is managed in a different way. Rather than suggesting that more clinical education of doctors will eliminate the problem of ‘missed’ diagnosis, some ideas on teamwork as a method of moderating the variability of individual clinical competence will be presented.

The case: abdominal aortic aneurysm

The Health and Disabilities Commissioner (HDC) recently found against both the attending registrar and the local District Health Board in relation to a patient who presented to the Emergency Department (ED) with abdominal pain and who died later at home of a ruptured abdominal aortic aneurysm (AAA).

Briefly, a 59-year-old male called for medical help when he developed sudden severe pain around midnight. He was taken to the Dunedin ED, concerns being raised about a possible aneurysm diagnosis by the ambulance officer because of the nature of the pain and the observed hypotension. The registrar eventually assessed the patient as having renal colic. Treatment with fluids and pain relief restored vital signs; the patient was discharged at 5am only to die suddenly at home, the diagnosis being made at postmortem. The case and the outcome triggered an internal review by the District Health Board (Otago District Health Board’s Clinical Review Panel Report, 2004).

Two medicolegal bodies then became involved; The Accident Compensation Corporation (ACC) with respect to medical misadventure, while the HDC took a wider view in terms of possible breaches of the Code of Health and Disability Services Consumers’ Rights.

For ACC, two expert advisors reviewed the notes. Although one noted that expected survival was only 50% even with a correct diagnosis made earlier, both considered the registrar should have diagnosed AAA. The registrar contested the ACC findings,
calling in his own expert advisor who felt the decision of ACC to attribute the cause of death to medical error was unreasonable, given the patients’ comorbidity and the conditions of work at the time. Despite this dissenting voice, the ACC upheld the conclusion of ‘medical error’ causing death.

On receipt of two complaints from the patient's family, the Commissioner reviewed these findings and asked the opinion of a further clinical advisor. After an extensive and thorough investigation into standards of care, the Commissioner considered the doctor was in breach of Code 4.1: “Every consumer has the right to services provided with reasonable care and skill.” For a number of reasons, he also found the District Health Board (DHB) was ‘vicariously liable’ for the registrar's breach of the Code.

The Commissioner commended the DHB for increasing staff levels after the incident (and prior to the Commissioner’s investigation), but he also noted that “the Otago DHB attempted to “pass the buck” onto a junior member of staff…the Board was responsible for the system in which [the doctor] worked and the system was substandard”.

**Problems in public discussion**

Apart from the reports listed above, a newspaper article on the AAA tragedy appeared to be based on a number of uncontested assumptions, such as the idea that life-threatening diagnoses (for example, abdominal aneurysm, meningococcal disease, or myocardial infarction) are easy to identify. Public debate appears to avoid any acknowledgement that while classical presentations of these illnesses can be readily diagnosed, most patients present with an incomplete picture. (*Misunderstanding 1: Life-threatening diagnoses are always obvious.*)

In the case above, the patient had only two of the three ‘classical triad’ symptoms of AAA (pain in flank, hypotension, palpable mass). The HDC report included information about the diagnostic pitfalls with AAA; apparently even experienced physicians miss the diagnosis 60% of the time—misdiagnosis being more common when the classical triad is absent. These observations on diagnostic difficulty have not been aired in public. A further related misunderstanding is that medicine is an ‘exact’ science, with no inherent uncertainty in clinical practice.

Secondly, a patient's death does not imply medical error even if there was a delay in making the eventual diagnosis. (*Misunderstanding 2: Unexpected death equals clinical error.*) In general, aneurysm surgery carries at least a 50% mortality, and in this particular case (ex-myocardial infarction, hypertension, significant obesity, current smoking) the expected survival would be much lower.

By definition, an adverse event is an unintended injury caused by healthcare management, rather than being due to an underlying disease process. In this case, it seems the patient was unlikely to survive regardless of the diagnostic process; he died, not from a ‘missed’ diagnosis, but from the severe morbidity associated with advanced disease. A further related issue is the complex nature of grief, which after such unexpected tragedies can sometimes lead to grievance.

Another related and important issue in retrospective analysis is *hindsight bias*. This is where the reviewer of the case knows the final outcome during their review, the problem being that (in hindsight) the diagnosis is considerably easier. None of the four reviewers of this case had been blinded to the final outcome when they reviewed
the doctor’s diagnostic process. While such blinding would be quite difficult to achieve, it would more closely match the conditions facing any doctor when a patient presents with abdominal pain and there are no results from tests (or a postmortem) available.

In this case, once the initial condition (presumably, a dissecting aneurysm prior to rupture) was widely circulated, it became more difficult for any institution, clinical advisor, relative, or member of the public to dispassionately and objectively evaluate the doctor's actions. Hindsight bias is usually not acknowledged in official reports or by the public, yet it pervasively influences every discussion about such incidents.10

(Misunderstanding 3: Hindsight is the same as foresight.)

These issues listed above (atypical presentations, clinical uncertainty, attribution of death to error, complexity of grief, hindsight bias) contribute to the public outrages that follow yet another ‘missed’ diagnosis. Education of the public about the limitations of medical science and problems in the analysis of error are sorely needed, while reviewing bodies such as DHBs need to accommodate these factors in their assessment of clinical cases.

Responding to clinical error: the ‘person’ and the ‘system’ approach

John Reason’s call in 2000 for a systems approach in response to adverse outcomes or medical error was met with widespread acclaim. He identified two institutional approaches to the problem of human fallibility:

• *The person approach*, which focuses on errors of the individual (and which blames them for ‘forgetfulness, inattention, or moral weakness’); and

• *The system approach*, which concentrates on the conditions in which individuals work, attempting to build defences to avert potential errors or at least, mitigate their effects.

His thesis was based on the assumption that as it is impossible for human beings to ‘get it right’ all the time, organisations dealing with high-risk situations need to develop extensive safeguards or systems of back-up.

Medicine is one of these high-risk situations. It is similar in some ways to the airline industry, where lives are also at stake, where human judgement and decision making processes have a strong bearing on outcome, and where historically there has been an expectation of zero human fallibility.

Reason identified three ‘high reliability’ organisations (aircraft carriers, nuclear power plants, and air traffic control centres) which have a reduced rate of accidents while still being dependent on individual human decisions: ‘The pursuit of safety is not so much about preventing isolated failures, either human or technical, as about making the system as robust as is practicable in the face of its human and operational hazards. High reliability organisations…have learnt the knack of converting these occasional setbacks into enhanced resilience of the system’.1

In a later article, Reason et al coined the term, ‘vulnerable system syndrome’. This phrase describes an organisation characterised by blaming front line individuals, denying the existence of systemic error-provoking weaknesses, and the blinkered pursuit of certain productive and/or financial indicators.11
In my view, prevention of future adverse outcomes is more likely to be achieved by improving the work environment for medical and nursing staff than by focusing on perceived individual error. Note that these comments are not intended to negate the importance of individual responsibility for clinical competence.

**Comparing medicine with aviation**

While there are some limitations in the comparison between medicine and aviation, medical organisations could arguably learn much from the aviation industry where there has been extensive research in the last 50 years with respect to risk management and team interventions to reduce the effect of individual mistakes. Cockpit crew are trained, for example, to acknowledge the effects of stress and fatigue on their performance and to use open error-reporting systems without fear of retribution. They also prefer ‘flat’ hierarchies, where it is possible to question more senior staff.

In contrast, some medical institutions have traditions such as not admitting to fatigue, attending work even when unwell, and interpersonal competitiveness. Other medical traditions include ‘steep’ hierarchies (where it is not acceptable to question more senior staff), unwillingness to call for help for fear of being shamed, and disregard of opinions of other health professionals. Despite these issues, most institutions in New Zealand practice medicine to a high standard, with staff using many informal teamwork systems in moments of stress and high workload.

To illustrate these comments about medical culture in the AAA case, the Commissioner observed that while extra on-call staff were available on the busy ED night in question, they were not actually called in to help. In my view, however, decisions not to call others, even when tired and being on one’s own, arise from the traditions within medicine listed above.

In terms of learning from ‘near-miss’ or actual clinical error, most hospitals have error-reporting systems, but these seem to be used more by nurses than doctors. Perhaps the latter group perceives there will be either no changes made as a result of reporting, or are fearful of personal consequences (as illustrated in the Bristol Royal Infirmary Inquiry).

It seems that while the aviation industry has worked hard to develop a culture of safety through supportive teamwork, personal awareness, acknowledgement of fatigue and stress, and incident reporting as a method of improving safety, the milieu of medical practice has lagged someway behind. It could be argued that certain traditions in medical practice can act as inherent weaknesses for error, as an individual clinical slip is allowed to escalate into an adverse outcome, and there is no institutional learning later. In other words, the interpersonal and teamwork safeguards in the aviation industry are not being replicated in medicine.

**Summary**

The standard of medical practice is high in New Zealand and the ‘missed’ diagnosis is quite uncommon. However, public discussion in New Zealand in response to a patient’s death remains rather simplistic, usually focusing solely on the doctor, nurse, or midwife in contact with the patient.
Given that:

- Medicine depends on one-to-one interactions between doctor and patient;
- The inevitable problem of human fallibility; and
- The unavoidable limitations of medical science; then

the occasional ‘missed diagnosis’—though tragic for the patient, their family, and the medical staff involved—is probably inevitable.

Internal institutional reviews are now starting to look at system issues that either generate error or allow an individual clinical decision to escalate into an adverse outcome, but the ‘person’ centred approach to evaluate a patient’s death was a feature of the Otago DHB review. Rather than exploring how existing safeguards and team culture were temporarily ineffective, the name-and-blame approach identified individual ‘wrong-doing’.

The airline industry has notably moved to reduce air accidents by focusing on teamwork, flat hierarchies, increased risk-awareness, and open error-reporting systems without retribution, but medical institutions have not yet incorporated this approach as a first defence against medical error.\(^{15}\)

Adverse outcomes should be viewed as a failure of effective teamwork, in that the local community of practice in that instance did not provide their usual checks and balances. Given that there are adequate educational systems in place for doctors to constantly improve their technical and clinical skills, the public is best served by institutions focusing more on preventive teamwork than on individual clinical error.

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Quality improvement in New Zealand healthcare. Part 3: achieving effective care through clinical audit

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Abstract

In this third article in the Series on quality improvement, we examine the ‘effectiveness’ dimension of healthcare quality. To satisfy this dimension, two equally important facets must be attended to. First the best available evidence must be sought through research, and second that evidence must be applied—this second function is the domain of quality improvement activities generally and clinical audit in particular.

Clinical audit is one of the main tools to establish whether the best evidence is being used in practice, as it compares actual practice to a standard of practice. Clinical audit identifies any gaps between what is done and what should be done, and rectifies any deficiencies in the actual processes of care. In this article, the steps involved in a clinical audit, how it is different to research, and the question of whether clinical audit requires ethical approval are explored.

The “effectiveness” dimension of quality has been defined by the Ministry of Health as “the extent to which a service achieves an expected and measurable benefit.” It is a fundamental dimension of quality in the patient-clinician partnership and it involves making appropriate decisions based on the best available evidence.

To provide effective care requires attention to its two facets. The first involves using research to determine:

- The best evidence for therapeutic decisions,
- Which drug regimen is superior, and
- Which test will provide the closest approximation of the truth with the fewest false positives.

Some call this facet finding the evidence to ‘do the right thing.’ Advances in the methodology of clinical research and in the critical appraisal and collation of research evidence have extended the boundaries of contemporary knowledge and our ability to determine ‘the right thing’ in a given clinical situation.

The other facet of effective care is ensuring that the best evidence as determined by research, is applied to every day practice. This side of effective care—‘doing it right’ is the domain of many quality improvement projects. Quality improvement has received less attention and certainly less resources than biomedical research, but it is at least as important in ensuring effective care is delivered to patients.
In this article we will examine the evidence of problems with the effectiveness dimension of healthcare quality and look at how we might measure and improve this through clinical audit.

How well we deliver care was first challenged by Jack Wennberg when he and others at Dartmouth University uncovered unexplained variation in the frequency of common operations in neighbouring regions of the United States. Some operations—such as tonsillectomy in children—varied 10-fold between ‘markets’ in the same state. The researchers could not explain the variation on differences in patient need, and concluded that most of the variation related to the doctors—where they trained, how long since they graduated, and historical practice patterns (‘how we have always done it’).

The degree of variation was a revelation to the medical community and directly challenged the effectiveness of care; although Wennberg and his colleagues could not determine which rate was right, it was clear that the extremes of variation could not both be right. Wennberg has gone on to develop maps of the United States for several surgical operations (e.g. radical prostatectomy, hysterectomy) available on their website (http://www.dartmouthatlas.org/), which continue to show variation in care and confirm that at least some people are getting ineffective care.

This notion was taken up by Mark Chassin in his taxonomy of ‘overuse,’ and ‘underuse’ of health services. ‘Overuse’ refers to patients receiving ineffective care, or care where the risks outweigh the benefits. ‘Overuse’ is particularly common in chronic care conditions but almost any medical condition is prone to overuse especially in a developed country. New Zealand examples of ‘overuse’ include antibiotics being prescribed for the common cold, and the medicalisation of common problems.

Such medicalisation has been labelled ‘disease mongering’ by some, who give examples of turning ordinary ailments into diseases (e.g. drugs to treat baldness), treating personal problems as medical problems (e.g. drug companies promoting antidepressants to treat ‘social phobia’—otherwise known as shyness), and labelling risk factors as diseases (e.g. high cholesterol).

‘Overuse’ also has important implications for patient safety, not only because of the inherent and inevitable risks of any treatment, but also because of the risks of error in a procedure that was not needed.

‘Underuse’ is defined as patients not receiving known effective care—that is care where the benefits far outweigh the risks such that all patients should be offered such care. Examples of ‘underuse’ also abound in New Zealand. For example in cardiology (a specialty rich in evidence about effective treatments): underuse is evident with the delays and barriers to cardiac intervention for people living in rural areas; underuse of warfarin in patients with atrial fibrillation; and the poor referral rates to cardiac rehabilitation for patients surviving an acute myocardial infarction.

The extent of ‘overuse’ and ‘underuse’ has been systematically studied in the United States and published in Beth McGlynn’s seminal work “The First National Report Card on Quality of Health Care in America”: In this study of 12 metropolitan areas in the United States it was found that only half of adult Americans received...
recommended care—i.e. there is widespread underuse of effective care and overuse of ineffective care.

For example, only 45% of patients with acute myocardial infarctions received beta-blockers and only 61% got aspirin—therapies that research has told us could decrease such patients’ risk of death by 20%. It also showed that such underuse was endemic and not confined to any one sociodemographic group or condition.

**Clinical audit**

Clinical audit and clinical indicators are the basic quality improvement methods for assessing and improving effectiveness in practice. In this article, we explore clinical audit, what it is, what it is not, and what steps are involved. Clinical indicators will be the subject of the next article in this series.

The essence of audit is that it “compares actual practice to a standard of practice” and “as a result of this comparison, any deficiencies in actual practice may be identified and rectified.”

The word ‘audit’ is thrown around with abandon in the health service but clinical audit has a very specific meaning as described above, whereas most calls to ‘audit’ something in healthcare mean nothing more than to have a look at it, or perhaps do a survey. However, clinical audit is more than a critical review or a survey (which can define problems but cannot in themselves solve them).

In embarking on a clinical audit, it is explicit that processes or outcomes of care will be measured and compared with pre-set standards. If deficiencies in process are identified then changes will be made and followed by further measurement to ensure that the change has lead to improvement. Surveys, on the other hand, do not have this commitment to improving practice—and much time, energy, and resources can be wasted by investing in surveying everything while not improving anything.

Clinical audit attempts to answer the 3 questions that are central to any quality improvement work:

- What are we trying to accomplish?
- What changes can we make to produce an improvement?
- How will we know that such changes have produced such improvement?

A further feature of modern clinical audit is the interdisciplinary nature of the activity, and the *Introduction to Clinical Audit* (by the Ministry of Health) has this to say:

> Clinical audit allows for the systematic, critical review of the quality of clinical practice by a multidisciplinary team. It includes the procedures used for diagnosis, treatment and care of patients, the associated use of resources and the effect of care on the outcome and quality of life for the patient.

**The steps of clinical audit**

There are many different diagrams and descriptions of the “audit cycle” or “quality cycle” but the essential tasks in the process of clinical audit are generic—see Figure 1 below for elements of the basic clinical audit cycle.
Step 1—Identify the area that may need improvement. The decision of what to audit is usually based on clinical experience, literature review, or data collection and should preferably be an area that is important. This may, for example, be an area that has high clinical importance, an area that is known to impact on patient safety or because poor management in this area may have high financial costs.

Step 2—Develop the standards that are to be achieved in the area (based on guidelines, literature review, and consensus). This will then define the agreed target for excellent performance. A useful acronym in developing standards for clinical audit is SMART. This is a reminder of the essential attributes of standards which should be specific (use precise language), measurable (identify a target standard to measure practice against), achievable (use performance levels that can actually be used in practice), related (to the aims and objectives of the project), and theoretically sound (based on best practice) and time-bound. “Measurable” is the key attribute of any standard.
Step 3—Confirm the presence of an opportunity to improve by collecting data and comparing the results against the standards. If there is no gap between the measurement of performance and the standard then the audit may be terminated. If there is, however, a gap then the audit proceeds.

Step 4—Develop an action plan. This phase may require discussions with all of the staff about the issue uncovered as the team looks for possible solutions. Occasionally the answer is obvious but most solutions will have an impact on delivery of care and will need acceptance from all those involved in the changes. This step also includes documenting plans to bring current practice into line with the standards.

Step 5—Implement the plan. This phase is often the hardest to do. Having involved all of the players in the preceding decisions, one now has to involve them in the solution and to be cognisant of the need to handle the human side of the change.

Step 6—Monitor and evaluate the new process. Follow the implementation of change with a re-survey to measure the impact of changes and compare the results with the standards set in Step 2. Measurement and recording of the results of clinical indicators over time as part of the monitoring process may give early confirmation that the changes made have resulted in improvement. The problem can then be further refined with monitoring of the gains made or the audit cycle re-entered if there is need for further improvement. It is important to also watch out for unexpected consequences of change (which may be positive or negative) and to be flexible enough to manage these as well.

Clinical audit versus clinical research

There is often some confusion between “clinical audit” and “clinical research” because the broad aim of both activities is to improve the quality of healthcare and there are methodological similarities. Clinical research is, however, directed at filling the gap between what is known and what needs to be known to provide high quality healthcare (i.e. extending the frontiers of “current professional knowledge”) while audit measures the gap between contemporary best practice for a particular clinical management and what actually happens in a particular service.

The “randomised clinical trial” (RCT) which is the gold standard for research studies concerning clinical effectiveness has no place in clinical audit. A clinical study of any sort in which interventions in groups of patients are compared is, by definition, research, and not audit.

It is important to stress that audit, when well conducted, is no less rigorous than research. Audit methods must, however, accommodate the real life situations of small numbers of cases and the possibility of confounding.

Likewise, there is some confusion as to whether clinical audit requires ethical approval. The National Ethics Committee wrote a discussion document on this question in 2004 where it is stated that “in broad terms most observational research requires ethics committee review whereas most audit and audit related activity does not.”
The document went on to say that ethical review was not required for clinical audit where the activity met the following criteria:

- It is to be conducted either internally or externally by persons who are under a professional obligation to preserve confidentiality
- It does not include the collection of new or additional information from patients/consumers
- It does not include anything being done to (or withheld from) patients beyond their normal clinical management.

The fly in the ointment is that if those conducting an audit wish to publish their findings, most journal editors will require prior ethical review or at least discussion with the chair of the local ethics committee.

**Summary**

Effectiveness is all about appropriate decision-making based on the best available evidence, avoiding ‘overuse’ (providing care of no benefit or in situations where the benefits are outweighed by the risks) and ‘underuse’ (failing to provide care of proven benefit).

Clinical audit is the chief method for measuring effectiveness and ensuring that best practice is indeed being practised, in a particular service. Clinicians who understand the clinical processes in place on the “shop-floor” are indispensable for the interpretation of the results of clinical audit and the formulation of action plans.

The central premise of this series of articles is that the involvement of clinicians in the measurement and management of quality is vital to address the gap between best practice and current practice, and it is essential that clinicians take a lead in quality improvement.

**Conflict of interest:** No conflict.

**Author information.** Mary Seddon, John Buchanan, on behalf of EPIQ.

EPIQ is a School of Population Health Group (at Auckland University) with an interest in improving quality in healthcare in New Zealand.

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References:


Cancer of the stomach

This excerpt is from a paper by Dr Fauler and published in the New Zealand Medical Journal 1906, Volume 5 (20), p41.

Cancer of the stomach is rare in the Tropics, and is said to be unknown in Egypt, although Gastritis is common. On the other hand, cancer of the stomach is common in temperate climates, and for several decades past it has been alarmingly on the increase in England, the United States of America and many other countries. The increase has been marked in Switzerland, where the mortality is now two per cent of the total deaths. This appears to be considered the heaviest record up to the present.

In New Zealand in 1904, the last year for which statistics are available, there were 162 deaths from cancer of the stomach—107 males and 55 females. In that year there were 34 deaths from cancer, in which the part affected was not specified. As the deaths from all causes in New Zealand the same year were 8087, it follows that the death rate for cancer of the stomach about equalled that of Switzerland, which had hitherto been supposed to be the highest rate in the world.

Even then, the fact has to be taken into consideration that the average age of the living in New Zealand is in all probability much lower than that of Switzerland; and if this surmise is correct, cancer of the stomach, being a disease of later life, would give, this Colony an undue advantage in the percentage comparison.

Then again, primary carcinoma of the stomach would be sure to claim a considerable proportion of cases that were not specified in the New Zealand returns, and when all allowances are made it seems to me highly probable that in the death rate from cancer of the stomach New Zealand leads the world.

I may here state that the average age of the living in New Zealand has never yet been worked out, but the Registrar-General has kindly promised that he will get this done after the census next month, and he will also work out the average age for the census of twenty years ago. However, to study the prevalence of cancer fairly, we ought also to have a return showing the numbers living at each decade.

Investigators generally in Europe and America have declared there is little or no difference between the sexes in the prevalence of cancer of the stomach, but Haberlin found about 50 males to 33 females, and Osler found 126 males to 24 females. If we take the New Zealand figures for the last five years—the only ones in existence—we find there were 492 deaths of males and 238 of females from cancer of the stomach, showing the disease to be more than twice as prevalent in males as in females.

I wish to further point out that cancer of the stomach causes about thirty per cent of the total cancer death rate of New Zealand.

Another important fact is that the total cancer death rate for this Colony has in the last twenty-two years nearly trebled.
Blistering rash in a neonate—not always herpes

Rajiv Sinha, John Criddle, Elisabeth Wain, Aman Bhandari

A 15-day-old girl was urgently referred for a fast-spreading blistering rash. Examination revealed an alert and well baby with extensive crops of vesicles in a linear and whorled distribution with facial sparing (Figure 1).

Figure 1. Blistering rash on the left arm of a 15-day-old girl

**Question**—What is the diagnosis?
Answer
The diagnosis was incontinentia pigmenti (IP) as confirmed by skin biopsy (Figure 2).

Figure 2. Biopsy of a skin vesicle [Haemotoxylin and Eosin (H&E) stain; magnification ×400]

IP is a rare (incidence 1:40,000) X-linked dominant multi-system (neurology, ophthalmology, dental) genodermatosis resulting from damage to the recently identified NEMO (NF-kappa β essential modulator) gene.1,3

The dermatological signs of IP classically evolve through four stages (vesicular, verrucous, hyperpigmented, and finally hypopigmented/atrophic). The neonatal vesicular stage usually manifests within 2 weeks and has a long list of differentials, including herpes simplex, herpes zoster, congenital candidiasis, transient neonatal pustular melanosis, blistering drug eruption.4

Despite the long list of differential diagnoses, herpes simplex should be actively ruled out as a priority because of potential harmful consequences of delayed treatment.

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Fluoxetine (Prozac) treatment for anorexia nervosa

Anorexia nervosa is a severe, treatment-resistant illness primarily affecting women. It has one of the highest all-cause mortalities, and the highest suicide rate of any psychiatric illness. So an effective treatment would be most welcome.

Nutritional rehabilitation with weight restoration is the cornerstone of treatment, and this intervention often requires hospitalization. Psychotherapy is also a regular part of treatment. Not unexpectedly, many medications, in particular antidepressants, have been tried—mostly without benefit. So what about fluoxetine (Prozac or Fluox—as we know it)?

A Canadian group have performed a randomized, double-blind, placebo-controlled trial to determine whether fluoxetine can promote recovery and prolong time-to-relapse among patients with anorexia nervosa following weight restoration. The dosage goal of fluoxetine was 60 mg/day.

The study failed to demonstrate any benefit from fluoxetine in the treatment of patients with anorexia nervosa following weight restoration.

JAMA 2006;295:2605–12 & 2659–60

Aspirin plus dipyridamole versus aspirin alone for secondary stroke prevention

Low-dose aspirin (75–100 mg per day) is widely used in secondary prevention of stroke as it has well-documented effect, small risk of serious side-effects, and minimum costs. When it fails, or if the patient is intolerant of aspirin, we usually supplement it with dipyridamole. The efficacy of this combination has been debated so a recent trial result is interesting.

An international group, principally European, have compared dipyridamole (extended release, 200 mg twice daily) and aspirin (dose between 30 and 325 mg/day) with aspirin alone in an at-risk-of-stroke population. And the results—dual therapy is substantially more effective than aspirin alone for the primary composite endpoint of death from all vascular causes, non-fatal myocardial infarction, or major bleeding complication.

Postscript—In New Zealand, aspirin 100 mg daily costs $1.02 per month. And dipyridamole 150 mg twice daily costs $11.52 per month (courtesy of PHARMAC).

Lancet 2006;367:1665–73 & 1638–9
Obstructive sleep apnea (OSA) in young children

Adenotonsillectomy, perhaps better known to us as ‘T and As’ is no longer routinely (and ritually) performed in New Zealand. But adenotonsillectomy has become the first-line treatment for OSA in children. Several studies have shown that adenotonsillectomy reverses the symptoms associated with childhood OSA.

This paper addresses the problem of whether these children should be admitted to hospital postoperatively. They found that, of 2315 patients younger than 6 years undergoing an adenotonsillectomy for treatment of OSA, 149 (6.4%) developed a postoperative respiratory complication. And it was twice as common in the under 3 year olds. Therefore they recommended hospital admission for all patients younger than 3 years undergoing adenotonsillectomy for treatment of OSA.


A new treatment for postural hypotension?

Postural hypotension is common in the elderly, particularly in those taking ACE-inhibitors, calcium channel blockers, beta blockers, and α adrenergics. The remedy—cease or lower the dose of the drug. If this does not work—patient education about the risk and elastic stockings are advised. After that, there is pharmacological manipulation with fludrocortisone or midodrine. These both work but may worsen supine hypertension.

In a recent placebo-controlled trial it has been shown that a single 60-mg dose of pyridostigmine bromide improves standing BP in patients with postural hypotension without worsening supine hypertension. The greatest effect is on diastolic BP, suggesting that the improvement is due to increased total peripheral resistance.

Arch Neurol 2006;63:513–8

MRI (magnetic resonance imaging) and the diagnosis of MS (multiple sclerosis)

The diagnosis of MS, particularly early in its course, has always been fraught with difficulty. Generally accepted criteria state that a diagnosis of multiple sclerosis should be based on two attacks of neurological dysfunction occurring at different times and affecting different parts of the central nervous system. Preferably, supported by an appropriate investigation. Visually evoked responses and oligoclonal banding in cerebrospinal fluid may help, but may not be noted early in the disease.

Enter MRI. All patients suspected of having MS will be tested by MRI. How good is it? According to a recent review of 29 studies, not very good. The authors conclude that many evaluations of the accuracy of MRI for the early detection of multiple sclerosis have produced inflated estimates of test performance owing to methodological weakness resulting in over-diagnosis and treatment.

BMJ 2006;332:875–8
Managing treatment injury

The article by Merry and Seddon in the 21 July issue of the NZMJ is a useful review of the issues associated with treatment injury. But it regrettably presents a seriously negative view of the many achievements of recent years.

These impressions have typically been picked up by the media, for example an article headlined Medical mishaps harm hundreds in The Press (Christchurch) of 21 July could have done much to undermine public confidence in our health system.

The authors acknowledge some developments at national level but state “Unfortunately we still have a long way to go in translating these high-level initiatives into practical gains at the organisational or facility level of the system.” Is this just opinion or is it based on the evidence-based approach, which the authors commend? The authors might wish to consider the evidence from a national study in 2001/2002 of DHBs and PCOs sponsored by the MOH through the Clinical Leaders Association of New Zealand which documented many activities and achievements at the organisational level in both DHBs and PHOs. A summary was published in the NZMJ 2 years ago.

The studies showed that a critical driving factor was clinical leadership. Clinical audit, credentialling, clinical guidelines, quality innovation awards, quality councils, reporting, and disclosure of injury are just some of the activities found. In PHOs, the many quality activities initiated by GP leadership have led to newly established performance management programme. It seemed clear that a thriving quality culture was emerging and has been favourably commented on by overseas experts.

A follow-up study of all DHBs on disclosure and management of treatment injury was undertaken 2 years ago. A questionnaire to clinical leaders and quality managers (with a 90% response rate) was based on the US studies of Lamb, Berwick, et al. This was followed up with detailed interviews. The study showed that DHBs were well ahead of the US in disclosure policy and practice as well as appropriate follow-up action. All DHBs indicated that disclosure was now felt to be much safer than non-disclosure.

Disclosure of injury is a key factor in fairer access to compensation for treatment injury. As a consequence of ACC’s abolition of medical error and mishap, New Zealand patients who suffer such injury are now uniquely advantaged internationally.

It is disappointing that so much achieved in recent years remains unrecognised by the authors in their otherwise useful paper.

Laurence Malcolm
Professor Emeritus and CDHBoard Member
Christchurch
Response

Professor Malcolm suggests that our view of recent achievements is “seriously negative” and cites three publications of which he is an author to support his contention. It was certainly not our intention to present a one-sided view, and we think he has been unduly dismissive of the positive points made in our paper.

In particular, we acknowledged that high-level legislation addresses the issue of patient safety—that the office of the Health and Disability Commissioner (HDC) has promoted “a world-leading focus on addressing aspects of the system, which contribute to patient harm rather than only seeking to identify individual scapegoats when things go wrong,” and the positive changes in relation to the ACC.

These points were made by way of example rather than in any attempt to provide a comprehensive list or to suggest that nothing else positive is worthy of note. We were also careful to emphasise caveats in relation to interpreting the data on iatrogenic harm, and to place these data into context in the interests of balance.

We agree with Professor Malcolm that it has been unfortunate that certain reports in the media placed undue emphasis on the negative aspects of our article. *The Press* (Christchurch) did not discuss the issues with us, but where we were interviewed (Radio New Zealand) we were able to move the discussion into a more positive direction highlighting some of the regional initiatives in patient safety.

He suggests that we might wish to review a paper he authored in 2002 which he states documented many achievements and examples of clinical leadership in quality.1 With the benefit of hindsight, this paper might be viewed as overly optimistic. One group cited in the article—the Clinical Leaders Association of New Zealand (CLANZ)—had its funding pulled by the Ministry of Health and has not functioned for several years.

While there has been an increase in the number of clinical managers, many of our hospital’s managers are still generic, and are under huge pressure to meet budgets. There is still plenty of evidence of disease in relation to the wider issues of

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governance of our hospitals—the standoff between junior doctors and management one example. Furthermore, leaders can only try to ‘enable’ efforts to improve patient safety—the actual improvement will come from involving and empowering the clinicians at the work-front to become involved. The ‘top-down’ approach that Professor Malcolm advocates can only have limited impact.

Professor Malcolm goes on to cite Counties Manukau DHB “in the forefront of promoting a quality culture.” One of us (MS) works as the Head of Quality Improvement (Medicine and Acute Care) at CMDHB and, while it may be at the forefront, there is still much to do. In a survey of nurses who were asked what response they would expect if they made and reported a medication error (even if no harm came to the patient), 80% said that they would be criticised, 66 % would be disciplined, and 27% would be fired.

If the patient was harmed by this very simple slip error (two sound alike/look alike medications transposed), the responses increased to 93%, 92%, and 70% respectively. If these perceptions indeed reflect the culture in one of the DHB at the ‘forefront’ then it does not bode well for the overall state of the country’s hospitals.

Professor Malcolm also cites work by Rae Lamb and others on open disclosure, and we agree that this work is important (and we also applaud the recent appointment to the position of Deputy HDC of someone such as Lamb, with established credentials in patient safety). Nevertheless (although top-level management may ‘talk the talk’) if those at the sharp end of the workforce have the levels of fear demonstrated in the survey above, then it is very unlikely that these people will ‘walk the talk.’

Standards for disclosure set by the U.S. Joint Commission on Accreditation of Healthcare Organizations and the official disclosure policies adopted by some leading hospitals (notably the Harvard Hospitals) are concrete examples of a commitment to open disclosure by at least some institutions in the U.S. Other than Waitemata, we are not sure how many DHBs have made a serious commitment of this type and as Professor Malcolm will know the CEO of that organisation has just resigned citing stifling compliance issues as interfering with his ability to introduce patient safety initiatives. ‘He urged the sector to refocus on concrete improvements to patient care, like better drug dispensing and infection control.’

Professor Malcolm may well be right that the situation in primary care is better, but much of what he mentions—“quality initiatives initiated by GPs”—do not deal primarily with Patient Safety, the focus of our article. Future articles in this series will deal with these other dimensions of quality.

It is not our position that nothing good has happened, or that New Zealand is behind other countries on all measures of patient safety. Indeed, we think progress has been made, and that many good initiatives in this area can be identified (in fact, we are personally involved in some of these). Our position is simply that there is still a great deal to be done to make our healthcare safer, and that patient safety needs to be given higher priority than it is at present.

We stand by the international and national research that shows that the extent of patient harm from healthcare is still unacceptably high.
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Death caused by choking on a peanut

Virendra Kumar, Ding Ai Lee

Choking—the term refers to the blockage of internal airways, usually between the pharynx and the bifurcation of the trachea.\(^1\) Death can be the result.

A 7-year-old mentally retarded Chinese girl suddenly started choking while she was being fed by her family's maid. She became cyanosed and was pronounced dead upon arrival at the hospital.

At the autopsy examination, her right lower eyelid and right cheek were swollen (Figure 1), and a whole peanut was found in the carina and partly lodged in the right bronchus (Figure 2). The lumen of the trachea was filled with mucus. The stomach contained undigested rice and peanuts.

Choking is defined as a blockage of the upper airway by foreign bodies or food. Death due to choking usually occurs suddenly before any hypoxic manifestations have time to take effect. The classical signs of asphyxia may occur if the victim struggles to breath for an appreciable time. The victim in the above case did not have signs of asphyxia. She started choking and then collapsed and was dead soon after.

The child was unable to feed herself, even though she was 7 years old. In normal children, food asphyxiation and foreign body asphyxiation usually only occurs within the first 4 years of life.\(^2,3\) It is obvious that some foods often have a rounded contour and are not easily friable—such as peanut, prune, and candy.\(^3-5\)
On the day of the incident, she was fed peanuts and rice. The peanut was lodged in the right bronchus because the anatomy of the right bronchus is wider and a more direct continuation of trachea than the left bronchus.

The size of the peanut is quite sufficient to block the airway mechanically. Moreover, the peanut gets swollen after being in contact with water or fluid which further can enhance the choking. According to the small part test fixture (SPTF), objects which are less then 4.44 cm in diameter and 7.62 cm in length tend to cause choking.\(^3\) The size of a peanut is usually less than the SPTF size, hence the potential danger.

The size of the choking agent is immaterial in some cases of choking however, as even a rice grain can cause choking by spasm of the airway. But in the aforementioned case, the size of the peanut was enough to cause choking and death.

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Insulin resistance and nitric oxide and associated renal injury: innocent bystanders or accessories to the crime?

The clustering of insulin resistance, dysglycaemia, dyslipidaemia, hypertension, and central obesity represent the major features of metabolic syndrome. These clusters of factors may share common aetiology and each of which is a risk factor for cardiovascular disease. The metabolic syndrome appears to affect between 10 and 25% of adult populations worldwide.

Several studies have described the association between metabolic syndrome and diabetes and cardiovascular disease. Although obesity is often associated with diabetes and hypertension, which are two of the most common risk factors for the development of end-stage renal disease (ESRD), it has been suggested that obesity per se is an independent risk factor.

Prospective data also suggest that the presence of the metabolic syndrome is independently related to a greater risk of developing chronic kidney disease. Furthermore, different analyses of subgroups of the third National Health and Nutrition Examination Survey (NHANES III) population, elevated insulin resistance and insulin levels, as well as the presence of the metabolic syndrome, were independently associated with the prevalence of chronic kidney disease.

Recently, the increase in body mass index was regarded as independent predictor for ESRD after adjustment for blood pressure and absence or presence of diabetes. The relation between the metabolic syndrome and the risk for kidney disease can be greatly explained by the fact that most of the basic components of the metabolic syndrome—namely type 2 diabetes, hypertension, obesity, and low high-density lipoprotein cholesterol levels, apart from predisposing to cardiovascular disease—are also risk factors for chronic kidney disease.

A number of potential mechanisms were hypothesised to be involved in insulin resistance induced renal injury. Among them, increased oxidative stress, increased expression of growth factors (IGF-1, TGF-β), and activation of rennin angiotensin system. Importantly, insulin resistance is associated with significant alteration in the production of renal nitric oxide (NO).

Mediators involved in metabolic syndrome-induced renal injury are poorly understood and most of the available information comes from fatty Zucker rat studies, an animal model of genetic obesity that results from inactivating mutation in leptin receptor gene. Homozygous Zucker rats (fa/fa) exhibit most of the metabolic picture seen in human obesity, including hypercholesterolemia, hypertriglyceridemia, hyperinsulinemia, and proteinuria.

These animals also develop glomerular hypertension, hypertrophy, and sclerosis and often die due to ESRD. The mechanism by which renal disease is produced in obese Zucker rats is largely unknown, but it has been shown that nephropathy associated with obesity in the obese Zucker rat model could be due to low renal NO production.
Furthermore, *in vivo* and *in vitro* studies have clearly shown that insulin causes endothelium-dependent vasodilation through NO release in a dose-dependent manner. In contrast in obesity, type 2 diabetes mellitus, and hypertension are not only associated with impaired insulin-mediated endothelium-dependent vasodilatation, but also there was significant reduction in renal NO production.\(^8,9\) It’s not yet clear how insulin resistance modulate renal NO production. It appears that the presence of insulin resistance or diabetes can trigger mechanisms that can either increase or decrease renal NO bioavailability and the net effect on NO production depends on mechanisms that dominant during different course of the disease.

Based on current data, however, it seems that in metabolic syndrome or early diabetic nephropathy is associated with an increase in the intrarenal NO production which contributes to the hyperfiltration that characterises this state. In contrast, advanced nephropathy associated with low renal NO that associated with hypertension, proteinuria, and renal function decline.\(^9,10\) Therefore it can be hypothesised that administration of NO inhibitors at an early stage of diabetic nephropathy, as well as NO donors at late stage of diabetic nephropathy, may provide potential therapeutic strategy in these growing number of patients.

Indeed, further studies are needed to address the link between NO and insulin resistance and renal injury. Overall, a pathway linking insulin resistance and hyperinsulinemia with renal injury through an increase or decrease in NO at this stage can only be speculated, and many aspects of this association need to be further elucidated.

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PHARMAC seeks clinical feedback on its cost-utility analysis methodology

Most will be familiar with the term ‘cost-effectiveness’. It is a term that is frequently seen in national and international medical journals, health reports, health technology assessments, and media releases from health funding agencies. In fact, a number of recent articles in the Journal have discussed PHARMAC’s processes, including how PHARMAC assesses whether a treatment is ‘cost-effective’.

PHARMAC uses cost-utility analysis (CUA) to assess whether a treatment is likely to be cost-effective compared with the next best alternative. CUA is a form of cost-effectiveness analysis that considers the impact of treatment on patients’ quality of life as well as length of life. This type of analysis is important, as cost-effectiveness is one of nine decision criteria used by the PHARMAC Board when making funding decisions.

PHARMAC has undertaken CUA since 1996. The methods PHARMAC uses when doing this analysis are outlined in PHARMAC’s Prescription for Pharmacoeconomic Analysis (PFPA), which was published in 1999.

In October 2004 PHARMAC staff initiated a review of this document. This review has resulted in several proposed changes to PHARMAC’s CUA methodology. The PFPA has also been completely restructured, with more information included on clinical evidence and other CUA inputs. This revised document has been reviewed by four prominent national and international economists, the Pharmacology and Therapeutic Advisory Committee (PTAC), and Consumer Advisory Committee (CAC).

PHARMAC is now consulting on this document, and specifically the methods it uses when doing cost-utility analysis. This document is available to download from the PHARMAC website: http://www.pharmac.govt.nz/pharmo_economic.asp

In view of the recent debate in the Journal, this may be a good opportunity for clinicians to provide feedback to PHARMAC on the methods we are proposing to use when doing cost-utility analysis. We are seeking feedback from all interested individuals and organisations, including clinicians and medical groups.

Consultation responses are requested by **Monday 18 September 2006**.

**Key proposed amendments to cost-utility analysis methodology**

Key proposed methodological amendments to the PFPA include the discount rate used when undertaking CUA and the range of costs included in CUAs:

**Discount rate**

PHARMAC’s use of the 8–10% discount rate in CUAs has been the source of considerable debate amongst the health sector. As a result of the review of the PFPA, it is proposed that the discount rates used in CUA be based on the 5-year average real risk-free long term government bond rate (3.5%).
Using a lower discount rate is likely to affect the cost-effectiveness ranking of pharmaceutical treatments and impose less of a disadvantage on treatments that confer long-term benefits (i.e. pharmaceuticals that have high up-front costs and long-term benefits are likely to appear more cost-effective). Note, however, that it is only the ranking of treatment that is changed (i.e. a ‘re-shuffling’ of the priority list).

**Direct patient healthcare costs**

PHARMAC staff have considered in detail whether direct patient healthcare costs (e.g. cost to the patient of a General Practitioner visit, prescription co-payments, cost of home and continuing care) should be included in CUAs, and also obtained expert advice on this issue. It is proposed that direct patient healthcare costs be included in CUAs.

While the exact impact on funding decisions of including direct patient healthcare costs in CUAs is not known, it is likely that pharmaceuticals that reduce the number of GP visits required or reduce the need for home care would rank higher (in terms of cost-effectiveness) on the priority list than in the past.

Note that all amendments to PFPA will be subject to the outcome of consultation and PHARMAC Board approval.

If you would like to comment on these proposed amendments, or any of the information in the PFPA, please send a response by Monday 18 September 2006 to Rachel Grocott by email to rachel.grocott@pharmac.govt.nz, fax to (04) 460 4995, or post to PHARMAC c/o Rachel Grocott, PO Box 10-254, Wellington 6143.

All consultation responses will be considered and discussed by PHARMAC staff, necessary amendments made, and a final version will be drafted for consideration by the PHARMAC Board in late 2006. We look forward to hearing your views.

Rachel Grocott
Senior Analyst, Hospital Pharmaceuticals Assessment
PHARMAC

Peter Moodie
Medical Director
PHARMAC

**References:**


More from PHARMAC on clopidogrel: feedback needed

Further to PHARMAC’s response in the Journal to the Special Series article on clopidogrel (http://www.nzma.org.nz/journal/119-1229/1872), PHARMAC and Sanofi-Aventis have reached a provisional agreement for the funding of clopidogrel (Plavix). PHARMAC is now seeking consultation feedback from the sector and interested parties.

The agreement, which is subject to a 2-week consultation period and approval by the PHARMAC Board, would see clopidogrel funded on the Pharmaceutical Schedule from October 2006 for a number of indications—including following myocardial infarction, stroke, transient ischaemic attack, or suffering acute angina. Funded access post-stenting would also continue. The diagram at the end of this letter summarises the proposed eligibility criteria.

PHARMAC is inviting feedback from the sector on the proposal—as it does with all significant investment decisions (http://www.pharmac.govt.nz/pdf/opps.pdf). The Board considers all feedback when making its decision whether to accept a proposal.

The full consultation document on the PHARMAC website at http://www.pharmac.govt.nz/pdf/040806.pdf details the proposal, including the new eligibility criteria, and how to submit responses. As stated there, the deadline for responses is **5:00 pm Thursday 17 August 2006.**

Stephen Woodruffe  
Therapeutic Group Manager Intern

Steffan Crausaz  
Manager, Funding and Procurement  

PHARMAC, Wellington
Proposed clopidogrel Special Authority criteria

Clopidogrel

INITIAL APPLICATION - aspirin allergic patients
Applications only from a relevant specialist or general practitioner. Approvals valid without further renewal unless notified.

Prerequisites (tick boxes where appropriate)

☐ The patient is allergic to aspirin (see definition below)
and

☐ The patient has:
  ☐ suffered from a stroke, or transient ischaemic attack
  or
  ☐ experienced an acute myocardial infarction
  or
  ☐ experienced an episode of pain at rest of greater than 20 minutes duration due to coronary disease that required admission to hospital for at least 24 hours
  or
  ☐ had a troponin T or troponin I test result greater than the upper limit of the reference range

Note:
Aspirin allergy is defined as a history of anaphylaxis, urticaria or asthma within 4 hours of ingestion of aspirin, other salicylates or NSAIDs.

INITIAL APPLICATION - aspirin tolerant patients
Applications only from a relevant specialist or general practitioner. Approvals valid for 3 months.

Prerequisites (tick boxes where appropriate)

While on treatment with aspirin, the patient has:
  ☐ experienced an acute myocardial infarction
  or
  ☐ had an episode of pain at rest of greater than 20 minutes duration due to coronary disease that required admission to hospital for at least 24 hours
  or
  ☐ had a troponin T or troponin I test result greater than the upper limit of the reference range
  or
  ☐ had a revascularisation procedure

INITIAL APPLICATION - patients awaiting surgery
Applications only from a relevant specialist or general practitioner. Approvals valid for 6 months.

Prerequisites (tick box where appropriate)

☐ The patient is awaiting stenting, coronary artery bypass grafting, or percutaneous coronary angioplasty following acute coronary syndrome

INITIAL APPLICATION - post stenting (no renewals)
Applications only from a relevant specialist or general practitioner. Approvals valid for 6 months.

Prerequisites (tick box where appropriate)

☐ The patient has had a stent inserted
### INITIAL APPLICATION - documented stent thrombosis

Applications only from a relevant specialist or general practitioner. Approvals valid without further renewal unless notified.  

**Prerequisites** (tick box where appropriate)  

- The patient has, while on treatment with aspirin, experienced documented stent thrombosis after stopping clopidogrel.

### RENEWAL - aspirin tolerant patients

Current approval Number: ......................................................  

Applications only from a relevant specialist or general practitioner. Approvals valid without further renewal unless notified.  

**Prerequisites** (tick box where appropriate)  

- The patient has experienced an additional vascular event following the recent cessation of clopidogrel.

### RENEWAL - patients awaiting surgery

Current approval Number: ......................................................  

Applications only from a relevant specialist or general practitioner. Approvals valid for 6 months.  

**Prerequisites** (tick box where appropriate)  

- The patient is awaiting stenting, coronary artery bypass grafting or percutaneous coronary angioplasty following acute coronary syndrome.
Charles Maxwell Collins

Charles Maxwell Collins died on 17 May 2006 after a long illness. Born in 1920, he was raised in Wellington where he attended Roseneath School, Wellington College, and Victoria University. In 1941 he moved to Knox College in Dunedin where he stayed for the duration of his undergraduate medical education.

Dunedin and medicine had particular significance for Maxwell. His great grandfather, Dr William Purdie, an Edinburgh graduate, was an early and distinguished medical pioneer in Dunedin. He was also a founding father of the Hanover Street Baptist Church and actively involved in the early public life of the settlement. In Dunedin, in keeping with his family traditions, Maxwell completed his early professional education and made what would become a lifelong group of medical friends with whom he enjoyed many reunions.

After working as a house officer at Wellington Hospital, marrying, having three children, and working for some years in the UK, Maxwell returned to New Zealand in 1956 to enter general practice in Carterton. The Carterton years (1956–1968) were busy, with Maxwell playing a full and active part in the life of the local council, Rotary, and his church, as well as building a thriving general practice.

Sadly this came to an end when a period of ill health and other setbacks prompted a radical change of direction. In 1968, Maxwell joined the Department of Health as a Deputy Medical Officer of Health in Christchurch and successfully completed a Diploma of Public Health (DPH) in Dunedin. He then went on to serve as Medical Officer of Health in Wanganui and Wellington before joining the Head Office of the Department of Health in Wellington in 1971. Also in 1971, Maxwell married Barbara Wood who was to become a much loved wife and companion and stepmother to Maxwell’s children, and step-grandmother to his six grandchildren.

In 1976, Maxwell was promoted to the position of Director of Public Health in the Department of Health, a position he held with distinction until he retired in 1985. During this time, he provided leadership on a number of high profile public health issues. Most notable was the role he played as the Department’s principal negotiator with the tobacco industry in relation to the advertising, labelling, and control of tobacco products.

Maxwell played a leading role in founding the New Zealand College of Community Medicine—the vocational body responsible for the postgraduate education and continuing professional support of specialists practising public health medicine in New Zealand (now the Australasian Faculty of Public Health Medicine of the Royal Australasian College of Physicians). Maxwell’s support was instrumental in getting what is now a thriving professional body off the ground. He was a member of the...
founding committee, became the Vice President, and was President from 1985 to 1989.

From his earliest years, Maxwell Collins’ life was grounded in Christian tradition and in the Baptist Church. Over the years he was involved in youth work, social services, missionary society work, and religious education, as well as in church music and in the administrative affairs of the church to the highest level. After years of service in many roles and in many places he was elected President of the Baptist Union in New Zealand in 1986.

His Christian faith and values were the cornerstones of Maxwell’s life and work. In his working life, associates, colleagues and friends always knew where he stood on substantive issues and what he stood for. He was principled, steadfast, loyal, and totally dependable.

The final months of Maxwell’s life were difficult. Nevertheless he maintained his unique sense of humour, his loving concern for his extended family, and a keen interest in wider events. In that time he was also able say goodbye to his family and many friends. His dignified and well-attended send off at the Central Baptist Church in Wellington would have pleased him.

We are grateful to Maxwell’s family and to George Salmond for this obituary.
Lindsay (Jiggs) William Poole

5 July 1924–11 June 2006

Lindsay Poole died after a battle with cancer. He is survived by his wife Jos; daughter Fiona; sons Simon, Giles, Hamish, and Duncan; and four grandchildren.

Lindsay was born in Gisborne and educated at King’s College in Auckland. It was here that he gathered the nickname “Jiggs” due to an imagined likeness to a cartoon character from “Bringing up Father”.

Thence to Otago and Medical School, Jiggs was a good student and just as well for his handwriting was dreadful. It is recorded that on one occasion he was summoned to Professor D’Ath’s office to read his paper to the examiners.

After gaining Otago and NZ Blues in Hockey, Jiggs did 2 years as a house surgeon before proceeding to London to train as an ophthalmic surgeon at Moorfields Eye Hospital.

Whilst in London he played for the Blackheath Hockey Club and an associated Exiles Club.

There was convivial canoeing on the Thames in a craft he had made himself. Jiggs was always fun to be with. In London he also met and married Jos Mahon.

Returning to Auckland he joined Drs Cecil Pittar and James Kriechbaum in private practice. In 1963, he joined the consultant staff of Auckland hospital and gave sterling service until his retirement 21 years later.

Lindsay had acquired expertise in the fitting of hard contact lens—now obsolete. This was a difficult skill, which not everyone chose to learn.

Lindsay and Jos bought a property of 200 acres at East Tamaki, and later, a 2500 acre farm at Port Waikato. His latest home at East Tamaki includes a huge art gallery.

During his property developing activities, Jiggs met and befriended the painter Garth Tapper. This opened up a passion for contemporary NZ art. He accumulated many works by Tapper and others, and housed these in the gallery at East Tamaki. It was in this gallery that his funeral service was held. Inside the funeral programme was a painting by Tapper of Lindsay entitled The Queen Street Farmer.

In 1982, tragedy struck the Poole family when Giles was the innocent victim of a road accident, which nearly cost him his life but unfortunately cost him his quality of life. Jigg’s and Jos’ ongoing care for Giles has been inspirational.

Jiggs set goals and achieved them. He took risks and they came off. He was fun to be with and was larger than life.

Roy Holmes edited this obituary from material provided by John Giliman and Bruce Hadden.
The Elegant Universe of Albert Einstein


UNESCO declared 2005 the International Year of Physics—who? The reason was that it was the centenary of a very fruitful year in the life of Albert Einstein. In that year he published three important papers, one of which led to the development of his famous equation \( E = mc^2 \). To honour this, the Royal Society of New Zealand commissioned a series of seven lectures to be broadcast on National Radio by eminent New Zealanders. These were subsequently collected together in essay form in this book.

Those interested in Einstein, quantum mechanics, or for that matter any branch of science will find considerable interest in this book. They will even find out what \( E = mc^2 \) really means.

Unsurprisingly there is some variation in this collection of essays. I was a little surprised to find that one had no mention of Einstein or anything related to his discoveries, and another of them mentioned him only in passing. It is not a book to read through cover to cover. I would suggest a diet of one essay per day. I found it interesting reading.

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Emergency Ultrasound Made Easy


This 180-page, soft-covered pocketbook has been produced by a variety of authors ranging from Emergency Medicine Specialists to Radiologists to Obstetric Specialists. The book is aimed at front-door emergency department practitioners, where the role of focused ultrasound has become well established.

The authors have used each chapter to illustrate and describe the use of ultrasound in a particular clinical scenario that is pertinent to emergency medicine. The quality of the images is surprisingly good and they are clearly labelled. The chapters are well set out and the salient points clearly made. The main strength of the book, however, is in defining what the role of ultrasound in the emergency department setting is, and focusing the reader on to those topics, while simultaneously assisting them in understanding the responsibilities of becoming adequately trained, credentialled, and updated.

Due to emergency ultrasound being a relatively new development, the structure in which it is taught and practised is not well defined and the authors do a good job in setting out a model for emergency medicine practitioners to follow in order to obtain sufficient expertise and ongoing audit.

In conclusion, this is a very succinct, well-illustrated book, which is sharply clinically focused, and would be of considerable use to those who work in the emergency department and have an interest in adding diagnostic ultrasound to their clinical skills.

Tim Buckenham
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