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This Issue in the Journal

Injuries to New Zealanders participating in adventure tourism and adventure sports: an analysis of Accident Compensation Corporation (ACC) claims

T Bentley, K Macky, J Edwards

The study examined national accident compensation data to determine the involvement of adventure tourism and adventure sports activity in injury claims. 18,697 adventure-related cases were identified, representing 28 activity sectors. Injuries were most frequently incurred by claimants in the 20–50 years age range, with approximately 60% of claims involving just four activities: horse riding, mountain biking, tramping, and surfing. Horse riding was associated with a significantly higher claims incidence rate than other activities where rates could be estimated. Slips, trips, and falls were the most common injury initiating event and injuries were most frequently located at the back/spine, shoulder, and knee. Findings suggest the need to investigate the requirement for regulatory intervention in the form of codes of practice for high injury count activities such as horse riding and mountain biking, and improved risk management practices across the commercial adventure sector.

Work-related bystander deaths in New Zealand: a significant hidden problem

J Langley, B McNoe, A-M Feyer

Studies of work-related fatal injuries typically exclude injuries to bystanders, that is people who are not working at the time but are injured by work processes. An example would be a member of the public killed by scaffolding falling from a building site. This study shows that bystander deaths represent a substantial portion of the work-related death problem and that the majority of the events involve road traffic crashes. The opportunities for reducing these deaths needs to be more vigorously pursued than has been the case in the past.

Characteristics of general practitioner consultations prior to suicide: a nested case-control study in New Zealand

R Didham, S Dovey, D Reith

A study of the characteristics of patients who later commit suicide was performed using information from the RNZCGP Research Unit Database, the National Mortality Database, and the Hospital Separation Diagnosis Database for the years 1996 to 2001. 221 cases of suicide were identified; 60% had a general practice consultation in the 6 months prior to death. The study found that any previous hospital admission for a psychiatric condition; a record of depression, suicidal ideation, or self-harm in the general practice notes; previous hospital admission with self-harm; and prescription of sedatives, were indicators of higher risk of suicide. The researchers concluded that, in general, general practice patients who commit suicide have higher rates of depression, suicidal ideation, previous self harm, and sedative prescription than average.
General practitioners’ attitudes toward (and use of) complementary and alternative medicine: a New Zealand nationwide survey

L Poynton, A Dowell, K Dew, T Egan

Complementary and alternative (CAM) therapies are accessed by a significant proportion of the population and international research indicates that the use of CAM is increasing. This study provides an up-to-date perspective on how general practitioners (GPs) are administering and prescribing CAM therapies, as well as their attitudes towards CAM. The number of GPs administering CAM had decreased over the past 15 years, although the number who refer patients to CAM had increased. Two-thirds of the respondents felt that CAM therapies should be included in conventional medical education. This finding is consistent with earlier research and should be considered in the development of medical curriculum.

Basic science confidence in senior medical students from the University of Auckland, New Zealand: results of the 2005 Senior Students Survey

P Insull, P Blyth

A survey was conducted in August of 2005 of senior medical students from the University of Auckland to determine the proportion of senior medical students who felt their knowledge of the basic medical sciences (such as pathology, physiology, pharmacology, and anatomy) was adequate for safe medical practice. Students were also asked to comment on various teaching methods employed by the School of Medicine to teach basic sciences. The results showed a surprising lack of confidence in the students’ knowledge of basic medical science. Students were found to prefer more traditional methods of learning such as text-books, anatomy atlases and cadaver dissection compared to newer methods such as anatomy with radiology. Students felt that teaching was not made adequately clinically relevant in their pre-clinical years. The authors hope to use this information to improve the teaching of pre-clinical basic medical science, to address the low level of student confidence in their own knowledge.

SIDS-protective infant care practices among Auckland, New Zealand mothers

L Hutchison, A Stewart, E Mitchell

Sudden infant death syndrome (SIDS) is still the major cause of death in the post-neonatal period. This survey aimed to find out what mothers know about SIDS risk factors, and what SIDS-protective child care practices they observe. Most mothers knew that sleeping their infant on the back and not smoking were protective, but they were less able to cite other protective practices. High breastfeeding rates and low smoking rates were reported in this group of mothers. Few infants (3%) were sleeping prone, and 65% usually slept only in the supine position. Co-sleeping with a parent was practised by 16%, while 39% slept in their own bed in the parental bedroom. SIDS protection could be improved if more infants slept in their own bed in their parent’s room rather than alone in a bedroom.
Adventure sports in New Zealand: dangerous and costly recklessness or valuable health-promoting activity? Be careful to judge

Erik Monasterio

Bentley and colleagues’ article (published in this issue of the Journal) on injuries to New Zealanders participating in adventure tourism and adventure sports is timely—it occurs against a background of significant media interest in accidents and mortality associated with risk-taking sports.  

The current attention and debate has once again been precipitated by tragic events and controversy at Mount Everest (called “Sagamartha” by the Nepalese) where New Zealander Mark Inglis made the “first double leg amputee ascent” of the mountain and incurred significant injuries during the climb as a result. Furthermore, Inglis was part of a large contingent of climbers (including several mountain guides) who walked past a dying fellow mountaineer, David Sharp, without offering help. Indeed, the controversy surrounding this event has led to significant criticism of adventure sport attitudes and current commercial adventure practices.

Recent reports in the literature involving accidents to New Zealanders and foreign visitors have also highlighted the human and health costs associated with adventure sports and they have focused attention on the legal and ethical obligations of commercial adventure companies.  

Moreover, the rapid growth and the economic importance of the adventure tourism industry—and the increasing number of independent participants involved in adventure sports such as mountain biking, rock climbing, and white water rafting—makes this a topic of national importance, especially to emergency medical services, search and rescue workers, and (increasingly) the tourism industry.

To date, little reliable quantitative information has been published on the risks involved in adventure sports in New Zealand. Bentley and his colleagues point out that as there is no single national body or organisation responsible for safety across this broad sector, opportunity for data collection is limited. Thus the extent of the problem is difficult to determine which limits the scope for interventions and education in minimising risk of injury and improving current risk management practices.

In their survey Bentley and colleagues examined the involvement of adventure tourism and adventure sports activity in injury claims made to the Accident Compensation Corporation (ACC). They aimed to estimate the extent of the problem by extracting information from the ACC database for compensation claims occurring at a place for sport or recreation, between July 2004 to June 2005. They identified a total financial burden of over NZ$12 million for the year, and found that (not surprisingly) male claimants in the 21–50 age range incurred the largest proportions of claims.
Significantly, 27 fatalities were identified—most frequently the results of fishing, mountaineering, and diving/snorkelling. Four adventure tourism activities (horse riding, tramping/hiking, mountain biking, and surfing) accounted for 60% of the claims—and as these activities had distinct injury patterns, the authors recommend that preventive measures target those specific risk factors.

The author’s claim that the findings provide a useful baseline picture of adventure tourism and adventure sports injury, and they suggest that there is a significant problem in New Zealand. They further contend that improved risk management practices are required for commercial adventure tourism and adventure sports operators. However, the significant limitations of the data preclude these conclusions from being reached.

Firstly, as the study only looks at New Zealand residents and does not differentiate between commercial and individual activity, it is unable to provide accurate information on the commercial sector’s performance and the risk of injury. The call for improved risk management practices and the introduction of codes of practice for commercial operators therefore cannot be justified.

Secondly, this is not an “epidemiological analysis” but rather a descriptive analysis of poor quality data. As freely acknowledged by the authors themselves, the use of ACC data is problematic:

- There is a culture of claim in New Zealand and the compensation claim population is likely to be an unrepresentative, self-selected group;
- The use of a proxy measure (the monetary size of the claim) to estimate the extent of injury is open to serious bias. For example, higher claims in older age groups may reflect slower recovery times and work compensation, rather than the severity of injury; and
- Information on foreigners is not included in claims data.

Therefore the use of ACC data in estimating injury rates (numerator data) is unreliable. The use of SPARC’s (Sport and Recreation New Zealand) participation rates (denominator data)—which is also unreliable, dated and only available in a limited number of activities—to determine claims incidence rates is similarly problematic and misleading. Any useful comparison between activities and the identification of high-risk areas on the basis of this information is therefore unreliable.

Thirdly, the authors have determined that certain activities are “high injury risk areas” and base this on the cost and number of compensation claims, without differentiating or commenting on the severity of the injury.

The breadth of the study is too large as it compares broadly different activities such as fishing and mountaineering. Some of the data reporting is trivial and not surprising—for example, the fact that most injuries occurred in the 20 to 50 year age range.

Fourthly, without information on participation or base rates it is difficult to determine the seriousness of the fatality data.

Fifthly, cost and injury—in comparison to other non-adventurous sporting activities, work-related injuries, or tourism misadventure—have not been provided, and therefore it is not possible to determine the significance of the findings and to conclude that it is a “significant problem”.

The negative public perception that adventure tourism and adventure sports activities are dangerous is problematic. Bentley et al point out that perceptions of risk in the host country can have a profound effect on the choice of holiday destination by potential visitors. An inaccurate estimation of the extent of the problem may therefore deter visits from potential holiday-makers and have economic implications for New Zealand. Given the current level of media interest and the possible repercussions to the data presented, it is imperative that the researchers’ interpret their findings cautiously.

It is also important to bear in mind that New Zealand is currently experiencing significant public health problems related to the rapid rise in obesity, diabetes, and other metabolic problems. This appears in part to be related to changing lifestyles and decreasing participation in exercise activities. But by highlighting the risks associated with sporting activities without an adequate cost-benefit analysis, and introducing codes of practice and regulatory interventions without good evidence of benefit, may deter exercise participation, and paradoxically compound the problem.

In summary, the interpretations of the findings in this study have been taken too far, they run the risk of being unnecessarily alarmist, and their lack of specificity preclude premature advice from being given with respect to interventions.

Further research is required to more clearly understand the risks of morbidity and mortality associated with adventure sports activities. Collaboration between the adventure tourism industry and medical researchers would be helpful.

Future researchers would benefit from an approach that focuses more on a narrower range of activities, measures exposure and injury rates more accurately, and which clarifies confounding factors more clearly.

**Conflict of interest statement:** In the past I have worked as a mountain and jungle guide (10 years ago) and mountain cycle guide (4 years ago).

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**References:**


Injuries to New Zealanders participating in adventure tourism and adventure sports: an analysis of Accident Compensation Corporation (ACC) claims

Tim Bentley, Keith Macky, Jo Edwards

Abstract

Aims The aim of this study was to examine the involvement of adventure tourism and adventure sports activity in injury claims made to the Accident Compensation Corporation (ACC).

Methods Epidemiological analysis of ACC claims for the period, July 2004 to June 2005, where adventure activities were involved in the injury.

Results 18,697 adventure tourism and adventure sports injury claims were identified from the data, representing 28 activity sectors. Injuries were most common during the summer months, and were most frequently located in the major population centres. The majority of injuries were incurred by claimants in the 20–50 years age groups, although claimants over 50 years of age had highest claims costs. Males incurred 60% of all claims. Four activities (horse riding, mountain biking, tramping/hiking, and surfing) were responsible for approximately 60% of all adventure tourism and adventure sports-related injuries. Slips, trips, and falls were the most common injury initiating events, and injuries were most often to the back/spine, shoulder, and knee.

Conclusions These findings suggest the need to investigate whether regulatory intervention in the form of codes of practice for high injury count activities such as horse riding and mountain biking may be necessary. Health promotion messages and education programs should focus on these and other high-injury risk areas. Improved risk management practices are required for commercial adventure tourism and adventure sports operators in New Zealand if safety is to be improved across this sector.

The risks associated with adventure tourism and adventure sport activity are increasingly highlighted in media reports of fatalities and serious injuries involving overseas and domestic recreationalists in New Zealand and elsewhere.1,2 No single organisation or body in New Zealand is responsible for safety across this broad sector,3 thus making it difficult to get an objective picture of risk for the various adventure activities provided commercially and undertaken independently. However, researchers in New Zealand have recently begun to examine the problem of adventure tourism and adventure sports safety through epidemiological and survey research, with the aim of establishing an injury surveillance baseline for this sector.

Early research in this field found that certain New Zealand adventure activities (notably whitewater rafting, scenic flights, and mountain recreation) were responsible for a number of fatalities and serious injuries involving overseas visitors.4–8 More recent research, involving surveys of New Zealand adventure tourism operators and analysis of a national hospitalisation database, has found that other activities—
including horse riding, mountain biking/cycle touring, snow sports (i.e. skiing and snowboarding), and tramping (i.e. hiking)—are associated with relatively large injury counts.9–11

The present study seeks to examine the involvement of adventure tourism and adventure sports activity in injury claims made to the Accident Compensation Corporation (ACC).

This analysis, together with findings from the hospitalisation study and operator survey research cited above, will provide important injury risk information for participants, operators, and industry bodies (amongst others) and will assist in the prioritisation of injury-control measures as well as the identification of high-risk areas that require improved risk management practice and other intervention.

Method

Compensation claims data for adventure tourism and adventure sport-related injuries to adult (16 years and over) New Zealand residents occurring during the 12-month period July 2004 to June 2005 were extracted from ACC’s database for injuries occurring at a place for sport or recreation.

The initial dataset of approximately 40,000 cases was contained in a single Microsoft Excel data file. The involvement of adventure tourism and adventure sport activity was identified by content analysis of the one-line narrative ‘accident descriptions’ provided for each case—with non-adventure cases removed from the dataset, and adventure activities coded under one of 28 categories of adventure tourism/sports.

Unfortunately, many cases contained insufficient information in the narrative to determine whether adventure tourism or adventure sport was involved in the injury, stating only, for example, that the claimant had ‘slipped off a rock’, was ‘walking down a steep bank’ or ‘was riding my bike’, meaning many incidents involving tramping, mountaineering, rock climbing, and mountain biking may have been erroneously omitted from the analysis.

Boating activities (apart from kayaking, jet boating, and rafting) were not included in the dataset in line with other related studies. The final dataset of cases, therefore, is likely to underestimate the total number of compensated adventure-related injuries during the period of the analysis.

After data coding, the following variables were available for analysis for each case: age and gender; region where the incident occurred; month of incident; adventure activity; injury initiating event; body part injured; injury diagnosis; and cost of claim.

The majority of these variables were categorical—the exceptions being age and cost of claim, for which interval and ordinal (age and cost groups) variables were provided.

Once coded, the data were transferred from Excel to ‘SPPS for Windows version 13’. Descriptive analyses were undertaken for each of the variables (including cross-tabulation). Non-parametric inferential statistics (including Chi-squared and Kruskal-Wallis tests) applied where differences and associations between categories and variables were examined.

Claim incidence rates were calculated for variables where suitable denominator data were available. Denominator data were 2005 population data provided by Statistics New Zealand and New Zealand adult participation in sport and active leisure, as derived by SPARC (Sport & Recreation New Zealand) from sample surveys conducted during 1997, 1998, and 2000.

It is noted, therefore, that participation data are only indicative of New Zealander participation in adventure tourism and adventure sports activities.

Results

Distribution and cost of claims by age and gender—The content analysis and coding of the narrative data for compensated injuries (occurring in a place for recreation and sport) produced a total of 18,697 adventure tourism and adventure sports cases; 27 of these were fatalities.
These cases were coded into some 28 activity sectors. Table 1 shows the distribution of claimants by age group as well as median and total costs of claims (as best available proxy for injury severity) for each age range.

Table 1. Distribution and cost of claims by age

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>n</th>
<th>%</th>
<th>Median cost of claim NZ$*</th>
<th>Q1†</th>
<th>Q3‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>16–20</td>
<td>2435</td>
<td>13</td>
<td>91.8</td>
<td>38.5</td>
<td>233.7</td>
</tr>
<tr>
<td>21–30</td>
<td>4609</td>
<td>25</td>
<td>106.5</td>
<td>44.4</td>
<td>298.63</td>
</tr>
<tr>
<td>31–40</td>
<td>4481</td>
<td>24</td>
<td>122.3</td>
<td>52.88</td>
<td>306.1</td>
</tr>
<tr>
<td>41–50</td>
<td>3829</td>
<td>21</td>
<td>135.1</td>
<td>54.7</td>
<td>344.0</td>
</tr>
<tr>
<td>51–60</td>
<td>2153</td>
<td>12</td>
<td>152.0</td>
<td>58.3</td>
<td>391.2</td>
</tr>
<tr>
<td>61–70</td>
<td>800</td>
<td>4</td>
<td>138.7</td>
<td>56.9</td>
<td>358.9</td>
</tr>
<tr>
<td>&gt;70</td>
<td>283</td>
<td>1</td>
<td>138.7</td>
<td>51.6</td>
<td>390.5</td>
</tr>
<tr>
<td>Total</td>
<td>18590</td>
<td>100</td>
<td>118.6</td>
<td>50.7</td>
<td>316.7</td>
</tr>
</tbody>
</table>

Note: These figures exclude the cost of cases (n=1296) for which no cost data was provided in the dataset; *New Zealand dollars; †First quartile; ‡Third quartile.

Age groups differed significantly in their number of claims for adventure tourism and adventure sport injuries ($\chi^2(7)=10,355.6$, $p=.000$). Claimants in the 21–50 years age range incurred the largest proportion of claims (approximately 70% of all claims). However, claims were most expensive, and therefore injuries potentially most severe, in the 51–60 years age group.

A Kruskal-Wallis test using the Monte Carlo method showed that the cost of claims for adventure tourism and sports injuries is related to the age of the claimant ($H(6)=132.1$, $p=.000$).

As indicated in Table 1, the median cost of claims increases through to the 51–60 age group, and then reduces slightly for the 61–70 and >70 age groups. Jonckheere’s test supports this observed trend in the data of claims costs increasing with claimant age ($Z=10.7$, $p=.000$).

Males (60%) made significantly more claims than females (40%) ($\chi^2(1)=749.6$, $p=.000$), although gender of claimant distributions varied considerably across the various activities (see below).

The injury claim incidence rate for male claimants was 533.4 per 100,000 people, compared to a rate of 356.9 for females (based on 2005 population data provided by Statistics New Zealand). However, the median cost of claims was significantly lower for male ($111.90$) than for female ($130.37$) claimants ($U=33,263,846$, $p=.000$). The proportion of claims for each age group was very similar for male and female claimants, with the majority of claims for both genders in the 21–50 age range.

Distribution and cost of claims by activity—Table 2 shows the major activity categories for adventure tourism and adventure sports injuries in New Zealand for the
period of the analysis, along with an analysis of claims costs by activity—and, for activities where participation data is available, injury claim incidence rates.

Land-based activities comprised 61% of all cases, 38% involved water-borne activities, and just 1% cases were aviation-based. Approximately 60% of all adventure tourism-related injuries were incurred during participation in just four activities: horse riding, tramping, mountain biking, and surfing. Moreover, of these high-risk activities, horse riding had a significantly higher rate than the other three activities.

Table 2. Distribution and cost of claims by activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Claim (n)</th>
<th>Claims (%)</th>
<th>Claims incidence rate per 1000 participants*</th>
<th>Fatalities (n)</th>
<th>Median cost per case (NZ$)</th>
<th>Q1</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse riding</td>
<td>3810</td>
<td>20.4</td>
<td>28.6</td>
<td>3</td>
<td>134.4</td>
<td>54.2</td>
<td>413.3</td>
</tr>
<tr>
<td>Mountain biking</td>
<td>2618</td>
<td>14.0</td>
<td>14.8</td>
<td>0</td>
<td>148.2</td>
<td>53.7</td>
<td>360.0</td>
</tr>
<tr>
<td>Tramping</td>
<td>2468</td>
<td>13.2</td>
<td>7.6</td>
<td>2</td>
<td>127.4</td>
<td>51.6</td>
<td>297.4</td>
</tr>
<tr>
<td>Surfing</td>
<td>2238</td>
<td>12.0</td>
<td>11.1</td>
<td>0</td>
<td>103.7</td>
<td>42.5</td>
<td>232.0</td>
</tr>
<tr>
<td>Waterskiing</td>
<td>1110</td>
<td>5.9</td>
<td>0</td>
<td>0</td>
<td>128.9</td>
<td>49.9</td>
<td>296.0</td>
</tr>
<tr>
<td>Fishing</td>
<td>980</td>
<td>5.2</td>
<td>1.5</td>
<td>6</td>
<td>74.3</td>
<td>46.2</td>
<td>184.9</td>
</tr>
<tr>
<td>Kayaking/canoeing</td>
<td>864</td>
<td>4.6</td>
<td>0</td>
<td>0</td>
<td>110.7</td>
<td>46.2</td>
<td>254.6</td>
</tr>
<tr>
<td>Wakeboarding/sea surfing</td>
<td>650</td>
<td>3.5</td>
<td>0</td>
<td>0</td>
<td>92.4</td>
<td>37.3</td>
<td>233.1</td>
</tr>
<tr>
<td>Diving/snorkelling</td>
<td>491</td>
<td>2.6</td>
<td>3</td>
<td>2</td>
<td>72.7</td>
<td>33.2</td>
<td>223.1</td>
</tr>
<tr>
<td>Rock climbing</td>
<td>421</td>
<td>2.3</td>
<td>1</td>
<td>1</td>
<td>164.4</td>
<td>64.5</td>
<td>401.0</td>
</tr>
<tr>
<td>Hunting</td>
<td>392</td>
<td>2.1</td>
<td>1</td>
<td>1</td>
<td>106.3</td>
<td>38.5</td>
<td>283.9</td>
</tr>
<tr>
<td>ATV/quad bike</td>
<td>310</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>138.2</td>
<td>60.7</td>
<td>711.2</td>
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<tr>
<td>BMX biking</td>
<td>297</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
<td>126.5</td>
<td>55.6</td>
<td>701.6</td>
</tr>
<tr>
<td>Wind surfing/kite surfing</td>
<td>287</td>
<td>1.5</td>
<td>1</td>
<td>1</td>
<td>109.1</td>
<td>56.3</td>
<td>309.4</td>
</tr>
<tr>
<td>Luge</td>
<td>239</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>108.7</td>
<td>59.1</td>
<td>337.1</td>
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<td>Snowboarding</td>
<td>234</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>133.9</td>
<td>40.4</td>
<td>530.2</td>
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<tr>
<td>Jet skiing</td>
<td>229</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>106.0</td>
<td>56.8</td>
<td>296.9</td>
</tr>
<tr>
<td>Skiing</td>
<td>126</td>
<td>0.7</td>
<td>0.8</td>
<td>0</td>
<td>136.0</td>
<td>44.9</td>
<td>371.6</td>
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<tr>
<td>Mountaineering</td>
<td>206</td>
<td>1.1</td>
<td>6</td>
<td>6</td>
<td>148.7</td>
<td>56.8</td>
<td>366.1</td>
</tr>
<tr>
<td>Whitewater rafting</td>
<td>106</td>
<td>0.6</td>
<td>2</td>
<td>2</td>
<td>74.3</td>
<td>38.5</td>
<td>138.1</td>
</tr>
<tr>
<td>Skydiving</td>
<td>106</td>
<td>0.6</td>
<td>0</td>
<td>0</td>
<td>153.1</td>
<td>43.6</td>
<td>586.7</td>
</tr>
<tr>
<td>Jet boating</td>
<td>86</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>140.4</td>
<td>34.6</td>
<td>512.0</td>
</tr>
<tr>
<td>Paragliding/parasailing/</td>
<td>56</td>
<td>0.3</td>
<td>1</td>
<td>1</td>
<td>335.7</td>
<td>90.2</td>
<td>1546.8</td>
</tr>
<tr>
<td>hang gliding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bungy jumping</td>
<td>54</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
<td>71.8</td>
<td>33.2</td>
<td>208.7</td>
</tr>
<tr>
<td>Other</td>
<td>213</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>18697</td>
<td>100</td>
<td>27</td>
<td>27</td>
<td>114.3</td>
<td>50.7</td>
<td>296.3</td>
</tr>
</tbody>
</table>

Note: Based on SPARC Aotearoa estimates of participation in sport and active leisure by New Zealand adults.

Specifically, the horse riding injury claim incidence rate was almost two-times greater than the rate for mountain biking and four times that for tramping. Moreover, horse riding was associated with three fatalities. Only fishing (n=6; 0.6% of all fishing injury claims) and mountaineering (n=6; 2.9%) had more fatalities than horse riding. A further three fatalities involved diving/snorkelling and two white water rafting.

Paragliding/parasailing/hang gliding participants incurred highest median costs, with injuries costing over two-times more than the next highest cost activity: rock climbing.
Of the high claims count activities, mountain biking had the highest cost per claim, while horse riding was also well above the overall median cost for all activities. Relatively low costs of claims were associated with diving, bungy jumping, fishing, and white water rafting, although these activities were associated with 11 fatalities combined.

Type of activity during which the injury occurred was found to differ significantly by gender \( \chi^2(24)=4237.51, p=.000 \). Specifically, male claimants had notably more claims for the majority of activities, the major exceptions being horse riding (78.5% of claimants were female), skiing (52.4% female), and tramping (54.6% female).

Indeed, women horse riders had an estimated client incidence rate of 34.5 per 1000 annual participants, which is two-times that of male participants (17.4), based on SPARC participation in sport data. A relatively even distribution of claims by gender was found for bungy jumping, abseiling, and jet boating. Male claimants dominated claims for hunting (91.6% of claims), fishing (84.0%), surfing (81.3%), mountain biking (77.2%), snowboarding (65.8%), and paragliding/parasailing/hang gliding (69.6%).

Geographical distribution of claims—Adventure tourism and adventure sports injuries clustered around the main population centres and adventure tourism regions. Thus, 16.0% of claims were for adventure tourism-related injuries occurring in the Auckland area, 14.3% in Canterbury, 13.0% in Waikato, and 9.4% in the Bay of Plenty. A further 9.7% of cases were from Otago, which is the region where Queenstown, the ‘world capital for adventure tourism’, is situated.

Mountain biking injuries were most frequently incurred in the Central North Island town of Rotorua and in Queenstown, while snow sports injuries were predominantly based around the Southern Alps and Central North Island regions.

Month of claim—52.4% of cases occurred during the period, January to April, thus reflecting the seasonal (summer) nature of New Zealand adventure tourism and adventure sports. Figure 1 shows the distribution of the top four injury claims count activities by month of injury occurrence. The distribution of activities across the New Zealand summer season is highlighted, while surfing injuries occur in significant quantities during the mid-summer January holiday period.

Injury-initiating events—The vast majority of adventure tourism and adventure sports injuries resulted from falls, including overbalancing, slipping, and tripping (68.6%). The activities contributing most commonly to fall counts included horse riding, mountain biking, snowboarding, and tramping. Other event categories included lifting and/or carrying (8%) and colliding with something (10%). Lifting and carrying injuries most frequently occurred during kayaking, tramping, surfing, and waterskiing.

A large number of cases involved the claimant being injured while lifting or carrying a pack or piece of equipment such as a kayak.
Body part injured and injury diagnosis—The most frequently injured body parts for adventure tourism and adventure sports claims were the lower back/spine (13.0%), shoulder (10.2%), knee (10.5%), neck (7.8%), and ankle (7.1%). Major body part injury areas for the four highest claims frequency activities are shown in Figure 2.

From Figure 2 it can be seen that each of the four highest injury claims count activities have distinct injury patterns, with horse riders commonly suffering injuries to the back/spine and head/face, while ankle and knee injuries are most prevalent for trampers. Mountain biking injuries were most commonly to the shoulder. Surfing injuries were most commonly to the back/spine and head/face, presumably through being struck by surf boards.

Soft tissue (strains and sprains) injuries were most frequent for adventure tourism and adventure sports, with nearly two-thirds (63.0%) of all injuries having this diagnosis. Puncture/stings (12.6%) and fractures/dislocations (11.6%) were the other major diagnosis categories.
Discussion

This study suggests a significant adventure tourism and adventure sport injury problem, although further research is required to better understand the extent of the problem and to identify key areas for preventive action.

More than 18,500 domestic adventure injury cases were compensated by ACC; this figure underestimates the true scale of the problem as many cases will not have been captured by ACC’s database, and many that were included on the database had insufficient information from which to code them as involving adventure activities.

It is also noted that the study omitted injuries to overseas visitors, although international tourists have been found to incur large numbers of hospitalised injuries due to adventure activity in previous studies by Bentley et al. Adventure sport-related claims by New Zealand residents comprised a total financial burden of over NZ$12 million over the one-year period of the analysis.

As found previously by Bentley et al., activities that are often undertaken independently (but which are also available commercially) were associated with the greatest number of incidents.

Adventure activities that are not currently covered by regulatory bodies and approved codes of practice, including mountain biking and horse riding, had highest injury counts and high claims incidence rates. These activities also had relatively high severity as measured by cost of claims.
These findings indicate a need to explore whether some form of regulation may be necessary to improve safety and risk management for these sectors, and to determine the extent to which such intervention might be effective in reducing injury to participants of these activities.\textsuperscript{3,10} Injury prevention should also focus on the risk to younger male participants, with the exception being horse riding, where attention should be directed towards females of all age groups.\textsuperscript{10}

Other preventive activity should focus on risk factors for slips, trips, and falls as these events were the most common mechanism of injury.\textsuperscript{3,9,11} For example, tramping, mountaineering, and hunting operators; guides; and individual recreationalists should consider carefully the underfoot conditions on their walking tracks and the footwear used by their clients.

Secondary safety issues such as the design of personal protective equipment that may reduce injuries at the most vulnerable body areas should also be considered, including the hand and wrist for mountain biking and surfing, the head for surfing, and the lower back for horse riding. Indeed, further research is required to identify appropriate protective equipment and its likely effectiveness in reducing injuries to these body areas.

Limitations of the findings of the data analysis for adventure sport-related claims include the inability to identify a large number of cases that may have been adventure-related from the available data. Moreover, the potential for bias in the reporting of injuries that result in claims to ACC must be acknowledged. A further problem was the absence of reliable participation (denominator) data from which to determine incidence rates for many of the activities, thus making a full comparison of risk among activities impossible. Indeed, the participation data that was available was not up-to-date and should be considered as indicative only of the extent of participation by New Zealanders in these activities.

Despite these shortcomings, the current study’s findings support those of the authors’ previous studies in providing a useful baseline picture of the adventure tourism and adventure sports injury situation in New Zealand.

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\textbf{References}:


Work-related bystander deaths in New Zealand: a significant hidden problem

John Langley, Bronwen McNoe, Anne-Marie Feyer

Abstract

Objectives To estimate the extent of bystander work-related traffic fatal injury for New Zealand as well as the contribution of all bystander events to the total burden of work-related fatal traffic injury and work-related fatal injury in general.

Methods Potential cases were identified from national administrative databases. The circumstances of the deaths in each incident were reviewed directly from coronial files to determine work-relatedness.

Results For 1985–1998 we identified 1447 people whose death was associated with another person’s work activity on a public road and who were not working at the time. This compares with 241 “working” and 192 “commuting” deaths on a public road for the same period. Bystanders thus represented approximately 75% of the work-related fatal traffic crash injury problem. We estimate that (on average) approximately 115 bystanders were killed each year and this represents approximately 52% of the total work-related fatality problem.

Conclusions Work-related bystander deaths are a major contributor to work-related injury in New Zealand, the majority occurring in the context of road traffic crashes. These deaths deserve more attention than they have received to date.

Worldwide, national occupational injury databases typically exclude deaths of persons who were not working at the time of their death, but who nevertheless were killed due to work-related activity. This is particularly the case for work-related fatal traffic crashes. Special studies of work-related injuries (non-traffic and traffic) also appear to exclude bystanders—as the authors typically fail to make any mention of them. An exception to this has been the recent work in Australia that has estimated that there were 3630 work-related deaths for 1989–1992. Workplace bystanders accounted for 9% of these deaths. A further 13% were road bystanders whose death resulted from collisions with working vehicles in which the working vehicles were deemed to be at fault. Not included in the estimate of total work-related deaths were a further 1600 deaths which occurred in similar motor vehicle incidents to above, but where the non-worker’s vehicle was considered at fault.

If these estimates are typical for other countries it suggests that the occupational injury prevention community is overlooking a significant adverse effect of work activity by focusing almost exclusively on worker deaths.

Our primary aim was to estimate the extent of the bystander work-related road traffic fatal injury problem for New Zealand. Our secondary aim was to estimate the contribution of all bystander events to the total burden of work-related fatal traffic injury and work-related fatal injury in general.
Methods

Estimates for bystander work-related traffic deaths were derived from the Work-Related Fatal Traffic Injury Study (WRFTIS), which sought to estimate the incidence of work-related traffic crashes for the period 1985–1998.7,8 The WRFTIS complements two earlier studies. The first of these was the Work-Related Fatal Injury Study (WRFIS), where we sought to determine the incidence of work-related fatal injury for the period 1985–1994.9,10 The WRFIS specifically excluded road traffic crashes and persons less than 15 years of age. The latter were addressed in our second study, the Work-Related Fatal Injury Child Study (WRFICS) covering the period 1985–1998.11 Data from all three studies has been used here to address our secondary aim.

The generic methods for the WRFTIS were consistent with those used for WRFIS and WRFICS and have been described in detail elsewhere.5 The methods employed in our three studies were based on those employed in similar research in Australia.6 They are briefly summarised below.

Potential cases were identified from national databases held by the Accident Compensation Corporation (ACC), the Land Transport Safety Authority (LTSA), and the New Zealand Health Information Service (NZHIS). The circumstances of the deaths in each incident were reviewed directly from coronial files to determine work-relatedness.

A worker was defined as a person who was paid for services. A commuter was a worker who died while travelling (not in the course of a job) directly from home to work, work to home, or between two jobs. A bystander was a person killed directly as a result of someone else’s work activity.

There were two categories of bystander:

- Work-bystander: person in a mobile workplace at the time of their death; and
- Road-bystander: not working or commuting but killed by a working or commuting vehicle.

Persons who were working were not considered bystanders even if they were killed as the result of the work activities of another worker. These deaths were considered "working" deaths and have been described elsewhere.7,9

The person in the working or commuting vehicle did not necessarily have to make an active contribution to the crash for the death to be counted as a case. For example, a ‘road bystander’ may have been driving and overtaking dangerously on a corner then hitting a truck coming in the opposite direction—thus resulting in the ‘bystander’ death. The truck driver in this case did not actively contribute to the ‘bystander’ death, however.

For all deaths, we determined whether the working vehicle or the bystander vehicle was the primary contributor to the crash according to the police or coroner. We did not seek to determine fault per se, primarily because such a specific determination was often not explicitly made when the driver of a heavy vehicle was deemed by the police not to be at fault.

In most of these situations the police suggested that the bystander contributed to the incident but rarely did they say he/she was at fault. We suspect this is because there is little point in pursuing this line with any rigor given the bystander is deceased. The inability to interview the deceased also obviously hinders attempts to rule out all other external factors. For example, the bystander’s behaviour may have been due to some factor (unwitnessed by others) such as swerving to avoid a dog and crossing the centre line into the path of truck.

The three studies from which the data were derived were approved by the Otago Ethics Committee–Dunedin.

Results

For the period 1985–1998 we identified 1447 people whose death was associated with another person’s work activity on a public road. This compares with 241 “working” and 192 “commuting” deaths on a public road for the same period. Bystanders thus represented approximately 75% of the work-related fatal traffic crash injury problem.

The majority of the bystander deaths (n=1391, 96%) were road bystanders. The most common vehicle involved in bystander fatalities was a truck. In 71% of cases the bystander was judged to be the primary contributor to the crash. In only 225 of all
cases were we able to clearly identify a working driver as having actively contributed to the crash. Seven percent of all our cases were judged to be indeterminate.

Table 1 provides a summary of the estimates of the mean number “working”, “commuting”, and “bystander” work-related deaths per year derived from the WRFIS, WRFTIS, and the WRFICS.

Table 1. Estimate of the mean number of work-related fatal injuries per year

<table>
<thead>
<tr>
<th>Source of estimate</th>
<th>WRFIS</th>
<th>WRFTIS</th>
<th>WRFICS</th>
<th>Estimated mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working</td>
<td>74</td>
<td>17</td>
<td>1</td>
<td>92</td>
</tr>
<tr>
<td>Commuting</td>
<td>N/A</td>
<td>14</td>
<td>N/A</td>
<td>14</td>
</tr>
<tr>
<td>Bystander</td>
<td>7</td>
<td>103</td>
<td>5</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>134</td>
<td>6</td>
<td>221</td>
</tr>
</tbody>
</table>

WRFIS: Work-related Fatal Injury Study 1985-1994 (excludes traffic)
WRFICS: Work-related Fatal Injury Child Study 1985-1998 (excludes traffic)

The WRFIS estimated that for the period 1985–1994 there were approximately 74 non-traffic "working" deaths for persons aged 15 years of age and older, and a further 7 bystander deaths.\(^8\)

The WRFTIS, which focused specifically on traffic crashes and examined a longer time period, identified 103 bystander deaths. The WRFICS, which excluded road traffic crashes, has estimated that (on average) 1 child (i.e. a person less than 15 years of age) per year was killed while engaged in work-related activity between 1985 and 1998, and (on average) a further 5 per year were killed as a result of someone else's work activity. We thus estimate that (on average) approximately 115 bystanders were killed each year and this represents approximately 52% of the total.

Discussion

The results are comparable with those for Australia in showing that work-related bystander deaths are the major contributor to work-related injury in New Zealand and that the majority of these incidents occur in the context of traffic crashes.\(^6\)

We acknowledge that there is a case for only including bystanders deaths in databases/studies where it can be shown that work activities of others directly contributed to the bystander death.

On the other hand, it is undoubtedly the case that for a significant portion of the remaining bystander deaths, death would not have occurred if there were fewer opportunities for (say) collisions with trucks.
Our primary aim in the more inclusive approach was to identify the public health impact of work-related traffic activity in terms of fatal injury. We note that the New Zealand Parliament Transport Committee adopted a similar approach in its inquiry into the cases of fatal truck crashes on New Zealand Roads.\textsuperscript{12}

Our estimates of worker and bystander contribution to crashes need to be treated with caution given we were unable to make a determination on the role each played in 7% of the cases and that detail on this matter in Coroner files was at times very limited.

In this context, it should be noted that the Coroner’s role is not to determine fault. It should be noted our estimates are based on two studies covering 14 years (WFTIS, WRFICS) and one study covering 10 years (WRFIS). Given the 10-year overlap in data this is unlikely to have introduced major bias in our estimates.

The question arises as to why such a significant problem has remained hidden. Section 15 of the New Zealand Health and Safety in Employment Act (1992) (HSEA) clearly includes those persons affected by the work of other people as being covered by the legislation.\textsuperscript{13}

The Occupational Safety and Health Service (OSH) of the Department of Labour is responsible for administering the HSEA for all workplaces except ships and aircraft in operation. The HSEA specifically requires that serious harm to employees at work must be registered with OSH.

Prior to 5 May 2003, there wasn’t a duty to notify OSH of serious harm to bystanders, nor was there any duty on self-employed persons and principals to notify any serious harm.

The effect of the HSE Amendment Act 2002 is that OSH must now be notified:

- By employers, of serious harm to any person in a place of work controlled by the employer (section 25(1)(a)(ii)); and
- By self-employed persons, of serious harm to any person resulting from the work of the self-employed person (section 25(1A)(b)); and
- By principals where they are aware of serious harm to any person resulting from the work of a self-employed person contacted to do work for the principal (section 25(1B)(b)).

While these changes represent a positive change, they do not cover the situation where the actions of an employee driving a vehicle on a public road have been shown to have contributed to the death of a bystander. This is because the employer does not control the place of work in these cases.

OSH records in its “HASARD” database all work that its staff undertake. They have advised that members of the public who are killed as a direct result of some non-traffic work process (e.g. struck by scaffolding falling from building site) would be recorded.

Members of the public killed as a result of some traffic work process would be recorded in the database, but only if these cases were notified to OSH and OSH carried out an investigation.
OSH advises that as a general rule they are rarely advised of workers being killed in motor vehicle traffic crashes, let alone bystanders (Rex Moir, personal communication, 2005).

Typically these incidents are dealt with by the New Zealand Police who have responsibility for investigating fatal and non-fatal injury transport related crashes on public roads. The police traffic crash report form makes no provision, however, for recording whether the crash was work-related.

Since early 2005, however, the Department of Labour has been active in partnering with the Commercial Vehicle Investigation Unit (CVIU) of the New Zealand Police to apply the HSEA more effectively in relation to commercial vehicles.

In 2005 approximately 70 CVIU staff have received warrants to act as health and safety inspectors. This relationship is particularly appropriate when it is considered that for the period 1985–1998 there were (on average) 652 fatal motor vehicle deaths on public roads.\(^{14}\) Using the estimates derived here approximately 20% of the deaths would have been work-related bystander deaths.

**Conclusion**

The estimates produced here for bystander deaths were derived from ad hoc special studies. Collectively government agencies with responsibilities for reducing this burden have no ready method of reliably determining the size and nature of the problem. This is no different to the situation for worker deaths.\(^{15}\)

A solution to both problems lies in the Coroner’s Bill 2005 which was recently introduced into Parliament. That Bill is in response to a Law Commission Review of Coroners.

A major finding of the review was that, with certain notable exceptions, deaths tend to be considered without any system for broad appraisal of the background factors contributing to the death to establish whether it is an isolated episode, or a symptom of a deep-seated problem.\(^{16}\)

The Bill makes provision for a Chief Coroner and reduced number of Coroners. One of the functions of the Chief Coroner will be to ensure that deaths are investigated in a systematic and consistent manner.

Since all sudden deaths come to the attention of a Coroner, the determination of whether an injury death is work-related (and the recording of the same) should be the function of the Chief Coroner. This would potentially provide for the first time a cost-effective, up-to-date, and reliable estimate of the burden of work-related deaths subject to the valid application of the work-related definition by Coroners.

**Conflict of interest statement:** There are no potential conflicts of interest.

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References:


Characteristics of general practitioner consultations prior to suicide: a nested case-control study in New Zealand

Rebecca Didham, Susan Dovey, David Reith

Abstract

Aim To examine characteristics of general practice consultations in a New Zealand primary care population of patients who died by suicide.

Methods Case control study design, with data linkage between the RNZCGP Research Unit Database, the National Mortality Database and the Hospital Separation Diagnosis Database (hospital discharges) from 1996 to 2001. The cases were suicides who had attended a general practice contributing data to the Research Unit database. Each case was matched by gender and age to three randomly selected patients from the Research Unit database.

Results There were 221 cases of suicide identified, of which 60% had a general practice consultation in the 6 months prior to death. The significant exposure variables, corrected OR (95% CI) in the multivariate analysis were: any previous hospital admission (between January 1996 and date of death) for a psychiatric condition, 23.75 (9.01 to 62.63); any notation in the general practice record of depression, suicidal ideation or self-harm, 14.97 (4.61 to 48.65); previous hospital admission with self-harm, 8.39 (1.73 to 40.65); and general practice prescription of sedatives, 4.34 (1.69 to 11.10).

Conclusions In general, general practice patients who commit suicide have higher rates of depression, suicidal ideation, previous self harm, and sedative prescription than average.

Reducing the rate of suicide and suicide attempts is a priority population health objective of the New Zealand Government,1,2 and part of its Suicide Prevention Strategy is to provide early identification, support, and treatment for those who have risk factors or who are suicidal.

The rates of suicide for the general population of New Zealand are higher than in the USA, UK, and Australia.3 In 2001, the rate of suicide in New Zealand was 11.7 deaths per 100,000 population, and 76.6% of the persons completing suicide were male.4 Latest statistics from 2003 show this rate has remained similar at 11.5 deaths per 100,000 population, with males representing 72.6% of suicides.5

New Zealand’s age-standardised rate of suicide is currently the 6th highest amongst OECD countries for males and the 4th highest for females. Suicide rates are highest among females aged between 15 and 24 years and males aged between 25 and 44 years.5

Although some limited evidence shows that interventions aimed at treating patients at risk of suicide are effective, there has been little examination of whether screening strategies for patients at risk of suicide are viable.6
In New Zealand, reports on the rate of primary healthcare attendance prior to suicide are limited. For instance, in 2002, a small case control study involving 31 people who committed suicide found that 32% visited their general practitioner (GP) in the month before suicide, compared with 24% of controls.7

A review of international literature found that rates of contact with mental health services within 1 month prior to suicide ranged from 7% to 28%, for the year prior to suicide 16% to 46%, and for “contact ever” 39% to 63%.8 Older age and female gender were associated with an increased rate of mental health services contact.

The corresponding rates of contact with primary health care providers were 45% (range from 20% to 76%) in the month prior to suicide and 77% (range from 57% to 90%) in the year prior to suicide. Again, the rates of contact were higher in older patients and it appeared that all women who committed suicide had contact with their primary care provider in the year prior to suicide.8

Given this evidence, primary care attendances could provide an important opportunity to intervene in patients who may go on to commit suicide.

Previous studies of general practice consultations prior to suicide indicate that a prior psychiatric diagnosis, hospitalisation for a psychiatric disorder, previous suicide attempt, referral to specialist mental health services, alcohol abuse, a higher frequency of general practice visits, and prescription of psychotropic medication are all associated with patients who suicide.9–11 Other social factors associated with an increased risk of suicide include unemployment, single marital status, low income, and low socioeconomic status.11

A family history of suicide poses a strong risk and may indicate genetic factors which predispose a family member to suicide or psychiatric disorders that are associated with suicide.12 In older patients (≥60 years) physical illness burden, functional limitations, depressive illness, psychiatric hospital admission, limited social network, prescription of antidepressants, anxiolytic agents, and narcotic analgesics were all associated with patients who subsequently suicide.7,13

Suicide remains a substantial health concern in New Zealand. It is important to continue investigation into the factors surrounding suicide to develop a better understanding of the risks and to provide evidence for developing tools that aid in suicide prevention, especially at the general practice level where a majority of patients may be seen.

The present study aims to describe and examine characteristics of general practice consultations, including prescribed medications, and hospital admissions in a population of patients from a primary care setting in New Zealand from 1996 to 2001, who subsequently died by suicide.

Methods
The study used a case control design using data-linkage between the Dunedin Royal New Zealand College of General Practitioners (RNZCGP) Research Unit database as well as both the New Zealand National Mortality Database and the New Zealand Hospital Separation Diagnosis Database (hospital discharges).

Cases were suicides identified from the New Zealand National Mortality Database who had attended a general practice contributing data to the Research Unit database.
Study cohort—The Research Unit database comprises a non-random sample of general practices, encompassing approximately 10% of the population of New Zealand each year, with a total of 1.4 million unique patient records between 1996 and 2003.

Data include anonymised patient identifier codes, consultation dates, free text notes, prescribing dates, and prescription details. All patients were selected from 1996 to 2001 (to correspond with mortality records available at the time of the study). Patient records were excluded from the analysis if they did not have a valid encrypted National Health Index number (eNHI), date of birth, or gender.


The classification of death is based on final coroner reports and follows WHO Rules and Guidelines for Mortality Coding. The cases were linked to this database by their eNHI number. Patients with a recorded death by suicide were identified using the corresponding ICD-9 and ICD-10 codes.

Each case was matched by gender and age to three randomly selected patients from the Research Unit database. The date of death was used as the index date for the control patients. Controls must have had a consultation on this date and also must have been active (at least one consultation or prescription per year) for the same years as cases, prior to the index date.

Exposure variables—The exposure variables extracted from the Research Unit database were drugs prescribed within 90 days prior to suicide or the index date (by drug class), clinical note of depression, suicidal ideation or self-harm, and frequency of general practice visits.

The presence of suicidal ideation, depression or noted self harm was determined by key word search and clinical record review. The exposure variables extracted from the New Zealand Hospital Separation Diagnosis Database were discharge diagnosis of psychiatric disorders, accident, self-harm, substance misuse, and live birth (as determined by ICD-9 codes).

Statistical analysis—Hypothesis testing was performed using conditional logistic regression, using the matched cases and controls as the grouping variable. Multivariate analysis to test associations between prior general practice use and confirmed suicide was performed using backward stepwise conditional logistic regression using Stata® software. To be included in the multivariate analysis, the variables had to be statistically significant on univariate analysis (p<0.05). Where variables interacted, they were tested in bivariate analysis and the variable with the greater association was included in the final model.

Results

A total of 3137 suicides were identified from the National Mortality database between 1996 and 2001. Of these cases, 638 patients (20.3%) appeared at some time in the Research Unit database. 221 of these patients were defined as active (as discussed above) and were included in the study. 164 (74.21%) patients were male, and for males the median (range) age at death was 38 (15 to 89) years; 57 (25.79%) were female and the median (range) age at death was 35 (14 to 76) years.

The most frequent method of suicide in the case group was hanging (Table 1), with relatively few patients committing suicide with medicinal poisons (although this was the most common method for females). Over a quarter of the group (28.7%) visited their general practitioner within 1 month prior to suicide and 69.3% consulted at least once within 6 months prior to their death (Figure 1).
Table 1. Method of suicide for the case group

<table>
<thead>
<tr>
<th>Method of suicide</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanging</td>
<td>41 (25.0)</td>
<td>16 (28.1)</td>
<td>57 (26.4)</td>
</tr>
<tr>
<td>Unspecified</td>
<td>36 (21.9)</td>
<td>6 (10.5)</td>
<td>42 (19.4)</td>
</tr>
<tr>
<td>Vehicle exhaust</td>
<td>27 (16.5)</td>
<td>3 (5.3)</td>
<td>30 (13.9)</td>
</tr>
<tr>
<td>Self poisoning by drugs</td>
<td>8 (4.9)</td>
<td>18 (31.6)</td>
<td>26 (12.0)</td>
</tr>
<tr>
<td>Firearms</td>
<td>22 (13.4)</td>
<td>1 (1.7)</td>
<td>23 (10.6)</td>
</tr>
<tr>
<td>Gas at home</td>
<td>12 (7.3)</td>
<td>3 (5.3)</td>
<td>15 (6.9)</td>
</tr>
<tr>
<td>Drowning</td>
<td>10 (6.1)</td>
<td>2 (3.5)</td>
<td>12 (5.6)</td>
</tr>
<tr>
<td>Fall from height</td>
<td>3 (1.8)</td>
<td>5 (8.8)</td>
<td>8 (3.7)</td>
</tr>
<tr>
<td>Cutting and piercing</td>
<td>1 (0.6)</td>
<td>1 (1.7)</td>
<td>2 (0.9)</td>
</tr>
<tr>
<td>Suffocation by bag</td>
<td>0</td>
<td>1 (1.7)</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (2.4)</td>
<td>1 (1.7)</td>
<td>5 (2.3)</td>
</tr>
<tr>
<td>Total</td>
<td>164 (100.0)</td>
<td>57 (100.0)</td>
<td>221 (100.0)</td>
</tr>
</tbody>
</table>

Figure 1. Time from last visit to suicide (95% CI)

Univariate analysis—A previous hospital admission for a psychiatric condition had a strong association with subsequent suicide, and had occurred in 28% of the cases (Table 2). The psychiatric diagnoses with a strong association with suicide included mood disorders; psychoses; personality disorders; acute stress and reactions; and phobia and anxiety disorders. Disorders of substance misuse and dependence also had strong associations with suicide.

Sedatives, anxiolytics, and antidepressants were associated with suicide, with the strongest association being for sedatives (Table 3). Patients prescribed antibacterials and non-steroidal anti-inflammatories (NSAIDs) had a reduced risk of suicide. A notation in the general practice record of either depression, suicidal ideation, or self-harm was a significant risk factor for suicide (Table 4).
### Table 2. Hospital separation diagnoses and risk of suicide

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Case, n (%) or median (range)</th>
<th>Control, n (%) or median (range)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital separation diagnosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Dependence/disorder</td>
<td>15 (6.8%)</td>
<td>5 (0.7%)</td>
<td>2.20 (1.18–3.21)</td>
</tr>
<tr>
<td>Harmful non-dependent drug use</td>
<td>4 (1.8%)</td>
<td>1 (0.1%)</td>
<td>2.48 (0.29–4.68)</td>
</tr>
<tr>
<td>Just alcohol dependence/disorder</td>
<td>11 (5.0%)</td>
<td>2 (0.3%)</td>
<td>2.80 (1.30–4.31)</td>
</tr>
<tr>
<td>Any drug taking code</td>
<td>17 (7.7%)</td>
<td>5 (0.7%)</td>
<td>2.32 (1.32–3.32)</td>
</tr>
<tr>
<td>Depressive episode (including recurring)</td>
<td>21 (9.5%)</td>
<td>2 (0.3%)</td>
<td>3.45 (2.0–4.90)</td>
</tr>
<tr>
<td>Depressive disorder</td>
<td>22 (9.9%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Neurotic depression</td>
<td>8 (3.6%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Any depressive code (excluding dysthymia)</td>
<td>32 (14.5%)</td>
<td>2 (0.3%)</td>
<td>3.87 (2.44–5.30)</td>
</tr>
<tr>
<td>Dysthymia/cyclothymia</td>
<td>8 (3.6%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Other unspecified neurotic disorders</td>
<td>5 (2.3%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Schizoid delusional</td>
<td>8 (3.6%)</td>
<td>1 (0.1%)</td>
<td>24.0 (3.0–191.89)</td>
</tr>
<tr>
<td>Schizophrenia excluding schizophrenic episodes</td>
<td>6 (2.7%)</td>
<td>2 (0.3%)</td>
<td>9.0 (1.82–44.59)</td>
</tr>
<tr>
<td>Bipolar and other affective disorder</td>
<td>13 (5.8%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Adjustment disorders</td>
<td>7 (3.2%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Personality disorders</td>
<td>6 (2.7%)</td>
<td>1 (0.1%)</td>
<td>18.0 (2.17–149.49)</td>
</tr>
<tr>
<td>Phobia and anxiety disorders</td>
<td>7 (3.2%)</td>
<td>2 (0.3%)</td>
<td>10.5 (2.18–50.54)</td>
</tr>
<tr>
<td>Eating disorder</td>
<td>2 (0.9%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Acute stress and reactions</td>
<td>10 (4.5%)</td>
<td>1 (0.1%)</td>
<td>30.0 (3.84–234.35)</td>
</tr>
<tr>
<td>Impulse disorder / obsessive compulsive</td>
<td>2 (0.9%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Mania</td>
<td>1 (0.4%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Conduct disorder</td>
<td>1 (0.4%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Alzheimer’s</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
<td></td>
</tr>
<tr>
<td>Other and organic</td>
<td>4 (1.8%)</td>
<td>1 (0.1%)</td>
<td>12.0 (1.34–107.36)</td>
</tr>
<tr>
<td>Any psychiatric diagnosis (excluding substance abuse)</td>
<td>62 (28.0%)</td>
<td>9 (1.4%)</td>
<td>35.64 (14.32–88.74)</td>
</tr>
</tbody>
</table>
Table 3. Prescribed medications and risk of suicide

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Case, n (%) or median (range)</th>
<th>Control, n (%) or median (range)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication history (psychotropic or &gt;2.5% in either group)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>3 (1.4%)</td>
<td>4 (0.6%)</td>
<td>2.25 (0.50–10.05)</td>
</tr>
<tr>
<td>Anxiolytics</td>
<td>10 (4.5%)</td>
<td>5 (0.7%)</td>
<td>6 (2.05–17.55)</td>
</tr>
<tr>
<td>Sedatives</td>
<td>21 (9.5%)</td>
<td>9 (1.36%)</td>
<td>11.13 (4.17–29.73)</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>34 (15.4%)</td>
<td>22 (3.3%)</td>
<td>5.50 (3.06–9.89)</td>
</tr>
<tr>
<td>Analgesics</td>
<td>16 (7.2%)</td>
<td>54 (8.1)</td>
<td>0.87 (0.48–1.58)</td>
</tr>
<tr>
<td>Asthma preventer</td>
<td>6 (2.7%)</td>
<td>25 (3.8%)</td>
<td>0.71 (0.29–1.76)</td>
</tr>
<tr>
<td>Bronchodilator</td>
<td>6 (2.7%)</td>
<td>39 (5.9%)</td>
<td>0.46 (0.19–1.08)</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>7 (3.2%)</td>
<td>49 (7.4%)</td>
<td>0.41 (0.18–0.92)</td>
</tr>
<tr>
<td>Antibacterial</td>
<td>12 (5.4%)</td>
<td>84 (12.7%)</td>
<td>0.40 (0.21–0.75)</td>
</tr>
<tr>
<td>Anti ulcer</td>
<td>4 (1.8%)</td>
<td>28 (4.2%)</td>
<td>0.41 (0.14–1.19)</td>
</tr>
<tr>
<td>Beta blocker</td>
<td>6 (2.7%)</td>
<td>17 (2.6%)</td>
<td>1.06 (0.41–2.77)</td>
</tr>
<tr>
<td>ACE</td>
<td>3 (1.4%)</td>
<td>39 (5.9%)</td>
<td>0.20 (0.06–0.67)</td>
</tr>
<tr>
<td>Topical corticosteroid</td>
<td>5 (2.3%)</td>
<td>22 (3.3%)</td>
<td>0.67 (0.25–1.80)</td>
</tr>
<tr>
<td>Nasal preparation</td>
<td>6 (2.7%)</td>
<td>24 (3.6%)</td>
<td>0.74 (0.30–1.84)</td>
</tr>
</tbody>
</table>

Table 4. General characteristics and risk of suicide

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Case, n (%) or median (range)</th>
<th>Control, n (%) or median (range)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General practice visit characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visits</td>
<td>6 (1–281)</td>
<td>6 (1–152)</td>
<td>1.0 (1.0–1.01)</td>
</tr>
<tr>
<td>Visits in 90 days</td>
<td>0 (0–26)</td>
<td>1 (0–24)</td>
<td>1.03 (0.97–1.09)</td>
</tr>
<tr>
<td>Visits in 1 year</td>
<td>3 (0–79)</td>
<td>3 (0–92)</td>
<td>1.0 (0.98–1.02)</td>
</tr>
<tr>
<td>Visits in 2 years</td>
<td>1 (0–60)</td>
<td>1 (0–54)</td>
<td>1.01 (0.98–1.04)</td>
</tr>
<tr>
<td>Self-harm</td>
<td>27 (12.2%)</td>
<td>2 (0.3%)</td>
<td>40.50 (9.63–170.30)</td>
</tr>
<tr>
<td>Accidents</td>
<td>30 (13.6%)</td>
<td>37 (5.6%)</td>
<td>2.76 (1.63–4.67)</td>
</tr>
<tr>
<td>Live birth (n=228)</td>
<td>2 (0.9%)</td>
<td>22 (3.3%)</td>
<td>0.19 (0.04–0.92)</td>
</tr>
<tr>
<td>Note depression</td>
<td>21 (9.5%)</td>
<td>5 (0.7%)</td>
<td>12.60 (4.75–33.41)</td>
</tr>
<tr>
<td>Note ideation</td>
<td>11 (5.0%)</td>
<td>2 (0.3%)</td>
<td>16.50 (3.66–74.44)</td>
</tr>
<tr>
<td>Note self-harm</td>
<td>2 (0.9%)</td>
<td>0 (0%)</td>
<td>–</td>
</tr>
<tr>
<td>Note either depression, ideation, or self harm</td>
<td>25 (11.3%)</td>
<td>5 (0.7%)</td>
<td>15.0 (5.74–39.18)</td>
</tr>
</tbody>
</table>

A recent pregnancy resulting in live birth was protective against suicide. There was no significant difference between cases and controls in the frequency of GP visits.

Multivariate analysis—The multivariate analysis included as exposure variables previous admission with self-harm; prescription of anxiolytics, sedatives, and antidepressants; any previous hospital admission for a psychiatric condition; any previous hospital admission for substance misuse; and any notation in the general practice record of either depression, suicidal ideation or self-harm.

The significant exposure variables, OR (95% CI) in the final model were any previous hospital admission for a psychiatric condition, 23.75 (9.01–62.63); any notation in the general practice record of either depression, suicidal ideation or self-harm, 14.97 (4.61–48.65); previous admission with self-harm, 8.39 (1.73–40.65); and prescription of sedatives, 4.34 (1.69–11.10). The adjusted R² for the model was 0.31.
Discussion

People who committed suicide in New Zealand visited their GP at the same rate during the year prior to suicide as people in the control group who did not commit suicide. However, they were significantly more likely to have had a hospital admission for treatment of a mental health condition and have been prescribed anxiolytics, sedatives, and antidepressants in primary care.

Additional risk factors identified were a general practice notation of depression, suicidal ideation or self harm, and previous hospital admission with self harm. Although this result was significant, suicidal ideation, depression, or self harm was not noted in 87.7% of the cases. These findings emphasise the importance of identifying psychiatric conditions at general practice consultations.

In a British study, only 13% of patients who presented to hospital with deliberate self harm expressed suicidal ideation to their GP. In addition, following deliberate self-harm only 57.9% of patients discussed it with their GP.

In a Dutch study, the final general practice contact prior to deliberate self harm recognised only 31% of the patients at high risk, thus suggesting that it is important to further develop strategies for identifying underlying psychiatric illness in general practice patients.

Previous studies have indicated that a large proportion of patients who commit suicide or self harm have consulted their general practitioner in the 6 months prior to the event. The present study found that almost 70% of patients had at least one consultation in the 6 months prior to their death, and over one-quarter visited their general practitioner within 1 month of their suicide—although these patients were drawn from a database of known general practice attendees.

Haste et al (1998) found that only 29% of people who committed suicide had not consulted their GP in the 6 months prior to death. Houston et al (1993) found that 56% to 62.5% of patients who self harmed had consulted their GP in the month prior this event.

Again this provides evidence that the general practice consultation presents an opportunity to intervene in patients at risk of suicide or self harm. However, prior recognition of psychiatric illness does not necessarily result in a response to treatment.

In a previous study of people who committed suicide but were not in contact with mental health services, 68% had clear evidence of mental illness, and of those 56% had seen their GP in the month leading up to suicide, and 76% of the patient group who had seen their GP were recognised as having mental illness and treated.

Overall, 62 of the 221 active cases in this study were admitted to hospital with a psychiatric disorder prior to their suicide. This had a significant association with subsequent suicide, and as found in previous studies, affective disorders had one of the strongest associations.

Admission history, especially multiple admissions, is also thought to increase suicide risk relatively more in women than men. However, most people who have mental disorders are not admitted to hospital. Admission for a mental disorder is also unevenly distributed according to factors such as social and marital status.
It has been reported that the majority of young people (80%) in New Zealand making serious suicide attempts have had contact with mental health services and 30% have prior history of hospital admission for a psychiatric disorder.\textsuperscript{12}

Given that a psychiatric-related hospital admission is strongly associated with subsequent suicide, it is extremely important that these patients receive ongoing support and follow-up care after discharge. It is thought that there are two peaks for the risk of suicide in such patients—one in the first week after admission and another in the first week after discharge.\textsuperscript{18}

A general practitioner is well positioned to provide this support, given the evidence that a significant proportion of people do have contact with their doctor in the weeks prior to suicide.

An unexpected finding of the present study is that the strength of association of anxiolytics and sedatives with suicide was greater than that for antidepressants. Anxiolytics have previously been associated with suicide in older patients.\textsuperscript{13} This could indicate that in primary care, anxiety, and sleep disorders are markers for underlying mood disorders.

Although a recent meta-analysis of randomised controlled trials indicated no increase in the risk of completed suicide for selective serotonin reuptake inhibitors compared with either tricyclic antidepressants or placebo, there was an increased risk of suicide attempt with selective serotonin reuptake inhibitors compared with placebo but not compared with tricyclic antidepressants.\textsuperscript{20}

A New Zealand study using longitudinal data from the RNZCGP Research Unit database confirmed this by finding no significant association between SSRIs and suicide but an association between SSRIs and self harm.\textsuperscript{21} This indicates that drug classes may also contribute to suicidal behaviour in addition to being markers of risk.

Clearly there is an opportunity for GPs to identify patients at risk of suicide. It may never be known how successful doctors already are at doing this because their success will result in the non-appearance of a death by suicide—a “non-statistic”. There has been limited examination of screening strategies for suicide in primary care populations.\textsuperscript{6}

One strategy that has been tested against structured interview is the Symptom Driven Diagnostic System for Primary Care, where one item (thoughts of death) had 100% sensitivity and 81% specificity for detection of patients with a plan to commit suicide.\textsuperscript{6}

Such a single item test could prove useful in detecting at-risk patients who could undergo further evaluation of risk factors. A panel of worldwide experts recently conducted an extensive review of suicide research and examined the evidence for the effectiveness of suicide prevention interventions. Educating physicians and restricting access to lethal means were found to be effective in preventing suicide.

In various studies, primary care physician education accounted for declines in suicide rates between 22% and 73%. This was associated with an increase in the number of patients diagnosed and treated for depression. Constant re-education is required, however, with evaluation of the success of the interventions based on an increase in depression diagnoses and prescriptions for antidepressants.\textsuperscript{22}
An intervention to decrease suicidal ideation in depressed older patients in primary care has been demonstrated to be effective. Additional strategies may need to be developed for younger and general categories of patients. This also gives rise to the debate of whether publicity and awareness surrounding suicide actually contributes to an increase in the suicide rate. There has been an historical effort to keep reports of self-inflicted death confidential in order to avoid suicidal contagion.

The cases included in the present study represent only a proportion of the approximately 2800 people who died by suicide during the study period. These cases were drawn from a database of known general practice attendees. The majority of suicide victims in New Zealand over this time did not attend general practices included in the RNZCGP Research Unit database or may not have had a general practitioner at all. The variables identified in this study need to be considered in the context of the proportion of the community that regularly attend a general practice.

Additional limitations of the study include potential misclassification of suicide and failure to identify cases, incomplete data fields, the absence of psychiatric outpatient data, and the generalisability of the study (conducted in New Zealand) to other countries.

The rates of suicide in New Zealand, although high, are comparable to similar developed economies and have followed similar patterns, suggesting that the results of the present study should be applicable to other countries. Although death certificate data tend to understate the numbers of suicide deaths a resulting bias in a case control study design would be unlikely.

In turn, cohort studies (the alternative study design) frequently have patients lost to follow-up. Incomplete data fields would result in estimates of the rates of depression, suicidal ideation and self-harm being under-reported. However, a systematic bias in the recording of these data fields would be unlikely.

The rates of psychiatric diagnoses would have been underestimated by the present study, and would represent the more severely affected patients. It is also difficult to achieve statistical significance and small confidence intervals when dealing with a rare event such as suicide.

The variables included in the study were limited by the data fields recorded by general practices and therefore available in the Research Unit database. Several known risk factors for suicide such as socioeconomic status, history of abuse, substance abuse, family issues, bereavement, and loss of employment were not able to be considered in this study, but some protective factors, such as recent live birth, were seen.

This is a protective factor in suicide as there is a sense of dependence and duty in caring for the child. Studies have shown that the presence of children, especially younger children is a protective factor against suicide, particularly in women. Conversely, parents of children hospitalised with a serious illness or children who have died, are at an increased risk for suicide.

Conclusions

This study provides an insight into characteristics of consultations prior to a death by suicide and confirms that general practitioners are well placed to take an important role in suicide intervention.
General practice patients at risk of suicide have higher rates of depression; suicidal ideation; previous self harm; and anxiolytic, sedative, and antidepressant prescription. Screening tests for suicidal ideation are appropriate and necessary for use in primary care as most patients have contact with their general practitioner shortly prior to suicide.

As other authors have agreed, the detection and treatment of mental illness should be a focus for preventative interventions for GPs. It is important that this care extends beyond apparent recovery.

**Conflict of interest statement:** The authors have no conflicts of interest.

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**References:**


General practitioners’ attitudes toward (and use of) complementary and alternative medicine: a New Zealand nationwide survey

Louise Poynton, Anthony Dowell, Kevin Dew, Tony Egan

Abstract

Aims This study aimed to update our understanding of how general practitioners view and use complementary and alternative medicine (CAM).

Method A nationwide cross-sectional postal questionnaire sent to 500 randomly selected general practitioners (GPs) of the 2358 who met the inclusion criteria of the study in December 2005.

Results 300 completed questionnaires were returned thus giving a response rate of 60%. Twenty percent of the GP respondents practiced (and 95% referred patients to) one or more forms of complementary and alternative medicine. The most common CAM therapy practiced by GPs was acupuncture, and chiropractic manipulation was the most common GP-referred therapy for patients. Thirty-two percent of respondents had formal training and 29% had self education in one or more CAM therapies. Sixty-seven percent felt that an overview of CAM should be included in conventional medical education.

Conclusions The number of GPs practising CAM therapies has decreased over the past 15 years, although the number referring patients to CAM has increased. The finding ‘that GPs feel information about CAM should be included in medical education’ is consistent with earlier research and should be taken into account when developing medical curriculum.

Complementary and alternative medicine (CAM) is a term which covers a very wide range of therapies. Some of these therapies are on the border of acceptance by the medical profession whereas others that have little evidence behind them are still viewed with much scepticism.

Many New Zealanders access CAM therapies, with one study conducted between 2002 and 2004 showing that 25% of adults visited a CAM practitioner during the previous 12 months.1

The definition of complementary and alternative medicine used by the Cochrane Collaboration is as follows:

Complementary and alternative medicine (CAM) is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. Boundaries within CAM and between the CAM domain and that of the dominant system are not always sharp or fixed.2
The boundary between CAM and conventional medicine can be fluid. It is largely based on cultural and political attitudes and is therefore subject to change over time.\(^3\)

International research shows that the popularity of CAM amongst the general population seems to be increasing. Consumer pressure is considered to be the major driving force behind this growth: \(^3\)

- Expenditure on alternative medicines in Australia was estimated to be A$621 million in 1993.\(^5\)
- Sales of St John's wort (for mild depression) in the United States (US) increased by 2800% between 1997 and 1998.\(^4\)
- In Germany, the prevalence of CAM use amongst the population increased from 52% in 1970 to 65% in 1996.\(^4\)
- The proportion of people using CAM in the US increased from 33.8% in 1990 to 42.1% in 1997.\(^6\)
- A United Kingdom (UK) study has found that the provision of CAM in general practice increased from 39.5% in 1995 to 49.4% in 2001.\(^7\)

Several New Zealand (NZ) studies on general practitioners' attitudes toward complementary and alternative medicine have been carried out, predominantly at a regional level. Notably, in 1988, 27% of Wellington GPs currently practiced some form of CAM and 80% had referred patients for one or more therapies; 54% expressed an interest in training in CAM therapies.\(^8\)

In 1990, 30% of Auckland GPs practiced some form of alternative medicine, and 68.7% referred patients to one or more alternative therapies.\(^9\) In 2003, 24% of Wanganui GPs were currently practising or had practiced CAM and 92% had at some time referred patients to one or more forms of CAM (although this study had a very small sample of GPs).\(^10\)

These large studies into GP attitudes were carried out 15–17 years ago; since then, CAM has seen an upsurge in popularity and level of use amongst the general population. Patient interest has been shown to be a major influence on GPs referral to CAM therapies\(^11\) and given that patients' use of CAM has changed since these two studies were carried out, there is a need to identify whether there have also been changes in GPs’ attitudes toward and uses of CAM. Hence the reason for the current study.

**Method**

The New Zealand medical register was searched for all vocationally registered GPs who held a current annual practising certificate—a total of 2358 GPs. From this total a random sample of 500 GPs were mailed a double-sided A4 questionnaire, a covering letter explaining the study, and a prepaid return envelope. Participants were asked to return the questionnaire within 10 days, and a second questionnaire was sent to non-responders 2½ weeks later (again asking for a response within 10 days).

The survey was designed to draw (in part) on a number of previous papers on this topic, both in New Zealand and overseas. Papers by Hadley\(^8\) and Marshall\(^9\) in NZ, Lewith\(^12\) in the UK, Boucher\(^11\) in the US, and Hali\(^13\) in Australia contributed significantly to the development of the survey questionnaire.

The survey aims to provide an overview of general practitioners’ attitudes toward and uses of complementary and alternative medicine. Limited demographic information was asked about for the purpose of describing the study population. The demographic questions used the same format as the 2001 New Zealand census.
The 13 therapies specifically mentioned in the questionnaire were selected after looking at previous literature and the NCCAM website (see Table 1). Traditional Māori and traditional Pacific Island medicine were included due to their cultural relevance to New Zealand society.

The survey was designed to provide some comparisons with earlier New Zealand research with the aim of identifying changes over the past 15 years in attitudes toward and use of CAM by New Zealand GPs.

Results

300 of the 499 eligible participants returned a completed questionnaire thus giving a response rate of 60%. One member of the original sample was no longer working as a general practitioner and was therefore excluded. The largest ethnicity group was NZ European (n=216, 72%). The second largest group was ‘other’ ethnicities (n=60, 20%). The majority (n=180, 60%) of the respondents were male. The mean age of respondents was 50.3 years with ages ranging from 33–79 years.

Of the 13 therapies specifically mentioned in the questionnaire (Table 1), acupuncture was the most commonly perceived as conventional rather than CAM, with 134 (44.7%) selecting this option. 128 (42.7%) saw chiropractic manipulation as conventional, while 125 (41.7%) saw osteopathy as conventional. Homeopathy and reflexology were the most commonly seen as CAM (n=282, 94%).

### Table 1. GP identification of therapies as conventional or CAM

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conventional</th>
<th>CAM</th>
<th>DK</th>
<th>Both</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>134 44.7</td>
<td>143 47.7</td>
<td>11 3.7</td>
<td>9 3.0</td>
<td>3 1.0</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>1 0.3</td>
<td>280 93.3</td>
<td>12 4.0</td>
<td>1 0.3</td>
<td>6 2.0</td>
</tr>
<tr>
<td>Chiropractic manipulation</td>
<td>128 42.7</td>
<td>146 48.7</td>
<td>14 4.7</td>
<td>7 2.3</td>
<td>5 1.7</td>
</tr>
<tr>
<td>Herbal medicines</td>
<td>15 5.0</td>
<td>264 88.0</td>
<td>11 3.7</td>
<td>4 1.3</td>
<td>6 2.0</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>7 2.3</td>
<td>282 94.0</td>
<td>5 1.7</td>
<td>0 0.0</td>
<td>6 2.0</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>88 29.3</td>
<td>195 65.0</td>
<td>7 2.3</td>
<td>3 1.0</td>
<td>7 2.3</td>
</tr>
<tr>
<td>Naturopathy</td>
<td>6 2.0</td>
<td>279 93.0</td>
<td>9 3.0</td>
<td>0 0.0</td>
<td>6 2.0</td>
</tr>
<tr>
<td>Osteopathy</td>
<td>125 41.7</td>
<td>153 51.0</td>
<td>12 4.0</td>
<td>5 1.7</td>
<td>5 1.7</td>
</tr>
<tr>
<td>Reflexology</td>
<td>1 0.3</td>
<td>282 94.0</td>
<td>11 3.7</td>
<td>0 0.0</td>
<td>6 2.0</td>
</tr>
<tr>
<td>Spiritual healing</td>
<td>6 2.0</td>
<td>278 92.7</td>
<td>11 3.7</td>
<td>0 0.0</td>
<td>5 1.7</td>
</tr>
<tr>
<td>Traditional Chinese Medicine</td>
<td>22 7.3</td>
<td>249 83.0</td>
<td>21 7.0</td>
<td>3 1.0</td>
<td>5 1.7</td>
</tr>
<tr>
<td>Traditional Māori Medicine</td>
<td>10 3.3</td>
<td>258 86.0</td>
<td>24 8.0</td>
<td>1 0.3</td>
<td>7 2.3</td>
</tr>
<tr>
<td>Traditional Pacific Island Medicine</td>
<td>10 3.3</td>
<td>257 85.7</td>
<td>27 9.0</td>
<td>1 0.3</td>
<td>5 1.7</td>
</tr>
</tbody>
</table>

DK=don’t know; NA=not answered.

Perceived benefit of therapies was measured on a Likert scale of 1 to 5 where 1=no benefit, 3=moderate benefit, and 5=highly beneficial. Beneficial was defined as leading to an increase in global well-being, thereby including psychosocial benefit as well as physical improvement. The distributions were skewed for many of these answers (Table 2).

Acupuncture was the most commonly perceived as beneficial, with 260 (86.7%) respondents rating it as moderately beneficial or higher. 239 (79.7%) respondents rated chiropractic manipulation as moderately beneficial or higher and osteopathy received this rating from 219 (73%) participants. Reflexology was rated as having no benefit by 155 (51.7%) respondents and aromatherapy also received a rating of no benefit by 116 (38.7%) respondents.
Table 2. GPs’ opinions on the benefits of various CAM therapies to patients
(1=no benefit → 5=highest beneficial)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1 (n=8)</th>
<th>2 (n=116)</th>
<th>3 (n=12)</th>
<th>4 (n=102)</th>
<th>5 (n=101)</th>
<th>DK (n=6)</th>
<th>NA (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>8</td>
<td>2.7</td>
<td>20</td>
<td>6.7</td>
<td>101</td>
<td>33.7</td>
<td>126</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>116</td>
<td>38.7</td>
<td>84</td>
<td>28.0</td>
<td>42</td>
<td>14.0</td>
<td>6</td>
</tr>
<tr>
<td>Chiropractic manipulation</td>
<td>12</td>
<td>4.0</td>
<td>35</td>
<td>11.7</td>
<td>122</td>
<td>40.7</td>
<td>102</td>
</tr>
<tr>
<td>Herbal medicines</td>
<td>63</td>
<td>21.0</td>
<td>95</td>
<td>31.7</td>
<td>74</td>
<td>24.7</td>
<td>19</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>94</td>
<td>31.3</td>
<td>93</td>
<td>31.0</td>
<td>51</td>
<td>17.0</td>
<td>22</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>28</td>
<td>9.3</td>
<td>68</td>
<td>22.7</td>
<td>102</td>
<td>34.0</td>
<td>54</td>
</tr>
<tr>
<td>Naturopathy</td>
<td>88</td>
<td>29.3</td>
<td>84</td>
<td>28.0</td>
<td>64</td>
<td>21.3</td>
<td>14</td>
</tr>
<tr>
<td>Osteopathy</td>
<td>24</td>
<td>8.0</td>
<td>34</td>
<td>11.3</td>
<td>96</td>
<td>32.0</td>
<td>97</td>
</tr>
<tr>
<td>Reflexology</td>
<td>155</td>
<td>51.7</td>
<td>60</td>
<td>20.0</td>
<td>26</td>
<td>8.7</td>
<td>4</td>
</tr>
<tr>
<td>Spiritual healing</td>
<td>74</td>
<td>24.7</td>
<td>83</td>
<td>27.7</td>
<td>49</td>
<td>16.3</td>
<td>37</td>
</tr>
<tr>
<td>Traditional Chinese Medicine</td>
<td>39</td>
<td>13.0</td>
<td>68</td>
<td>22.7</td>
<td>86</td>
<td>28.7</td>
<td>32</td>
</tr>
<tr>
<td>Traditional Māori Medicine</td>
<td>44</td>
<td>14.7</td>
<td>75</td>
<td>25.0</td>
<td>71</td>
<td>23.7</td>
<td>24</td>
</tr>
<tr>
<td>Traditional Pacific Island Medicine</td>
<td>46</td>
<td>15.3</td>
<td>72</td>
<td>24.0</td>
<td>68</td>
<td>22.7</td>
<td>21</td>
</tr>
</tbody>
</table>

DK=don’t know; NA=not answered.
Although 30% viewed traditional Māori medicine and traditional Pacific Island medicine as moderately beneficial or higher, there were a considerable proportion who selected ‘don’t know’, 74 (25.7%) for traditional Māori medicine and 81 (28%) for traditional Pacific Island medicine.

The number of GPs who practiced one or more CAM therapies was 61 (20.3%). Acupuncture was practiced by 31 (10%) respondents, and herbal medicine by 15 (5%) respondents. Four (1%) respondents practiced chiropractic manipulation and seven (2%) practiced osteopathy (Table 3).

Table 3. Administration and referral patterns for CAM therapies

<table>
<thead>
<tr>
<th>Variable</th>
<th>Administer</th>
<th>Refer</th>
<th>Administer &amp; Refer</th>
<th>Neither</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>19</td>
<td>6.3</td>
<td>226</td>
<td>75.3</td>
<td>12</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>1</td>
<td>0.3</td>
<td>6</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>Chiropractic manipulation</td>
<td>3</td>
<td>1.0</td>
<td>233</td>
<td>77.7</td>
<td>1</td>
</tr>
<tr>
<td>Herbal medicines</td>
<td>12</td>
<td>4.0</td>
<td>29</td>
<td>9.7</td>
<td>3</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>6</td>
<td>2.0</td>
<td>37</td>
<td>12.3</td>
<td>3</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>4</td>
<td>1.3</td>
<td>113</td>
<td>37.7</td>
<td>2</td>
</tr>
<tr>
<td>Naturopathy</td>
<td>1</td>
<td>0.3</td>
<td>37</td>
<td>12.3</td>
<td>1</td>
</tr>
<tr>
<td>Osteopathy</td>
<td>3</td>
<td>1.0</td>
<td>210</td>
<td>70.0</td>
<td>4</td>
</tr>
<tr>
<td>Reflexology</td>
<td>2</td>
<td>0.7</td>
<td>5</td>
<td>17.7</td>
<td>0</td>
</tr>
<tr>
<td>Spiritual healing</td>
<td>5</td>
<td>1.7</td>
<td>26</td>
<td>8.7</td>
<td>3</td>
</tr>
<tr>
<td>Traditional Chinese Medicine</td>
<td>1</td>
<td>0.3</td>
<td>33</td>
<td>11.0</td>
<td>2</td>
</tr>
<tr>
<td>Traditional Māori Medicine</td>
<td>1</td>
<td>0.3</td>
<td>31</td>
<td>10.3</td>
<td>0</td>
</tr>
<tr>
<td>Traditional Pacific Island Medicine</td>
<td>1</td>
<td>0.3</td>
<td>13</td>
<td>4.3</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>2.3</td>
<td>7</td>
<td>2.3</td>
<td>0</td>
</tr>
</tbody>
</table>

NA=not answered.

284 (94.7%) respondents referred patients to one or more CAM therapies. Acupuncture was referred to by 238 (79.3%) respondents, followed by chiropractic manipulation which was referred to by 234 (78%) and osteopathy by 214 (71%) respondents. 115 (38%) respondents referred patients to hypnosis.

The therapies that were least commonly administered or referred to were reflexology with 289 (97%) respondents stating they neither administered nor referred patients to this therapy, followed by aromatherapy (n=288, 96%) and traditional Pacific Island medicine (n=282, 94%).

Acupuncture was most commonly used to treat musculoskeletal problems and pain. Smoking cessation, anxiety, and sleeping disorders were the most common reasons for treating with or referring patients to hypnosis. Chiropractic manipulation and osteopathy were most commonly used to treat back pain and musculoskeletal problems. Treatment of menopausal symptoms was the most common use of herbal medicine.

When asked about reasons for (or against) referring patients to CAM, respondents could select more than one option. Patient request was the most common reason for referring patients to CAM therapies (n=259, 86.3%). This was followed by conventional treatment failure (n=181, 60.3%) and past positive experience (n=180, 60%). Patient belief and cultural needs were also mentioned as reasons for referral.
The most common reasons against referring to CAM therapies were lack of evidence (n=264, 88%), lack of regulation (n=234, 78%), and the financial cost (n=151, 50.3%). Other reasons given for not referring to CAM therapies included concerns about exploitation of vulnerable patients and risk of adverse effects or harm.

When asked about training in CAM, 96 (32%) GPs had formal training in one or more therapies. Formal training was defined as ‘training run by a person with qualifications in the therapy concerned’. Acupuncture was the most common therapy participants had training in. Sixty-five (21.7%) GPs had formal training, and 26 (8.7%) stated they had self education in this therapy. Twenty-two (7.3%) had formal training in hypnosis and 12 (4%) in osteopathy and homeopathy. Thirty-nine (13%) participants stated they had self-education in herbal medicines, 26 (8.7%) in chiropractic manipulation, and 25 (8.3%) in homeopathy.

The number of respondents interested in training in one or more CAM therapies was 34 (11.3%). The two therapies that participants were the most interested in training in were acupuncture (n=13, 4.3%) and herbal medicine (n=12, 4%).

There were 21 (7%) participants who felt that there were CAM therapies that should be practiced only by GPs. The most commonly mentioned were acupuncture, herbal medicine, and hypnosis. However the comments regarding hypnosis often had the qualifier that it needed to be practiced by a trained healthcare worker rather than exclusively by GPs, but should not be used by people with no training.

The majority felt that there were therapies that should not be practiced by general practitioners (n=144, 48%). In a free text section following this question, 171 (57%) GPs offered comments. Of these, 141 were comments about therapies that should not be practiced. Some respondents named specific therapies and others made more general statements.

The major theme that came through was concern about the appropriateness of general practitioners using therapies with no evidence base in the current climate of evidence-based medicine:

- Doctors should stick to evidence based scientific medical treatments
- We should not practice snake oil medicine

Of the specific therapies mentioned that respondents felt should not be practiced by GPs, the most frequent were reflexology, aromatherapy, and spiritual healing.

The attitudinal statements asked about CAM as a field rather than as individual therapies and respondents stated their opinion on a Likert scale ranging from 1=strongly disagree, 3=neutral, and 5=strongly agree. 230 (76.7%) strongly or mildly agreed that CAM therapies need more scientific testing before being used in conventional medicine (Table 4).

Only 30 (10%) strongly or mildly disagreed with this statement. The majority (n=165, 55%) either strongly or mildly disagreed that most CAM therapies are safe with very few side effects. The majority (n=179, 59.7%) also strongly or mildly disagreed with the statement that CAM has a more holistic approach to health than conventional medicine.
Table 4. GP attitudes to statements about CAM as a field of medicine
(1=strongly disagree → 5=strongly agree)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>DK</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>CAM therapies need more scientific testing before being used in conventional medicine *</td>
<td>13</td>
<td>4.3</td>
<td>17</td>
<td>5.7</td>
<td>35</td>
<td>11.7</td>
<td>57</td>
</tr>
<tr>
<td>The results from CAM therapies are mainly due to a placebo effect *</td>
<td>11</td>
<td>3.7</td>
<td>31</td>
<td>10.3</td>
<td>89</td>
<td>29.7</td>
<td>97</td>
</tr>
<tr>
<td>Most CAM therapies are safe and have very few side effects *</td>
<td>61</td>
<td>20.3</td>
<td>104</td>
<td>34.7</td>
<td>88</td>
<td>29.3</td>
<td>32</td>
</tr>
<tr>
<td>CAM has a more holistic approach to health than conventional medicine</td>
<td>102</td>
<td>34.0</td>
<td>77</td>
<td>25.7</td>
<td>46</td>
<td>15.3</td>
<td>59</td>
</tr>
<tr>
<td>CAM therapists should have some basic medical training</td>
<td>21</td>
<td>7.0</td>
<td>73</td>
<td>24.3</td>
<td>89</td>
<td>29.7</td>
<td>79</td>
</tr>
<tr>
<td>An overview of CAM should be included in conventional medical education</td>
<td>17</td>
<td>5.7</td>
<td>14</td>
<td>4.7</td>
<td>66</td>
<td>22.0</td>
<td>101</td>
</tr>
<tr>
<td>CAM can offer patients benefits that conventional medicine cannot</td>
<td>31</td>
<td>10.3</td>
<td>96</td>
<td>32.0</td>
<td>87</td>
<td>29.0</td>
<td>38</td>
</tr>
<tr>
<td>General Practitioners should regularly ask patients if they are using CAM</td>
<td>5</td>
<td>1.7</td>
<td>8</td>
<td>2.7</td>
<td>54</td>
<td>18.0</td>
<td>98</td>
</tr>
<tr>
<td>I am confident discussing CAM therapies with my patients</td>
<td>27</td>
<td>9.0</td>
<td>48</td>
<td>16.0</td>
<td>78</td>
<td>26.0</td>
<td>92</td>
</tr>
</tbody>
</table>

*These statements were adapted from Lewith.12

200 (66.7%) respondents either strongly or mildly agreed that an overview of CAM should be included in conventional medical education. 231 (77.1%) strongly or mildly agreed that general practitioners should regularly ask patients if they are using CAM. The statement ‘I am confident discussing CAM therapies with my patients’ had a mixed response; 25% strongly or mildly disagreed; 26% neither agreed nor disagreed; and 48.4% strongly or mildly agreed.

Discussion

This study highlights the importance of reassessment of general practitioners’ attitudes toward complementary and alternative medicine. The proportion of practitioners referring patients to CAM therapies has increased markedly from both the 19888 and 19909 studies into general practitioners’ attitudes toward CAM.

The proportion of GPs who referred patients to CAM in this study (94.7%) is comparable to a 2003 study of 30 Wanganui GPs that found 92% had referred patients to CAM therapies.10 This was expected given the increase in patient use of CAM therapies in the period since the 1988 and 1990 study were conducted and because overseas research that shows patient interest can be a major influence on doctors’ referrals.11 Patient request was cited as a reason for referral by 86.3% of respondents to this survey.

However the total number of GPs practising CAM therapies has decreased to 20.3% from 30% in 1990.9 The number of GPs practising CAM in this study is also much lower than the 37.6% found in a 2001 Perth study.13 The low number of GPs
practising CAM may in part be due to time constraints, an issue that has been identified as a major barrier to the practice of CAM by GPs overseas.\textsuperscript{14}

This study also provides important insight into the effect that the culture of evidence-based medicine is having on general practitioners’ attitudes toward CAM. A considerable proportion of respondents cited lack of scientific evidence of benefit or efficacy as a reason that these therapies should not be offered by general practitioners. This may have contributed to the lower number of GPs administering CAM therapies compared to earlier NZ studies.

The response rate of 60\% was acceptable in terms of the usual response rate to surveys of general practitioners, although it does leave room for bias and may limit the extent to which these findings are representative of all New Zealand GPs. Indeed, it is possible that those who responded to the questionnaire were the GPs with a higher level of interest in CAM, which could lead to an exaggeration of the proportions administering and referring patients to CAM therapies.

Definitions of each therapy were not provided in the questionnaire, due to the tension between response rate and practicality and length of the questionnaire. Instead, respondents were required to decide for themselves what each therapy included. This may have led to increased variability in respondents’ answers.

Given the important role of Māori and Pacific Island culture in New Zealand society it was concerning that many GPs seem to be unsure about these traditional medicine systems. Taylor\textsuperscript{10} also found that Wanganui GPs seemed to be uncertain about rongoa Māori (Māori medicine) although many of their patients were using these treatments.

Medical Council guidelines regarding complementary and alternative medicine recommend that doctors are aware of CAM therapies even if they do not intend to use them, and that doctors should be mindful of their patients ‘cultural beliefs, mores, and behaviours’.\textsuperscript{2} Awareness of the traditional medicines patients may be taking alongside their prescribed treatment may play an important role in providing quality care and avoiding adverse interactions.

Within New Zealand, the Accident Compensation Corporation (ACC) funds acupuncture, chiropractic manipulation, and osteopathy. Acceptance from a major government agency could be seen to mean these therapies have been included as part of the dominant healthcare system and therefore no longer fall under the banner of CAM as defined earlier in this paper.

Opinion amongst respondents was evenly divided, with 44.7\% saying acupuncture is part of conventional medicine and 42\% saying chiropractic manipulation and osteopathy are conventional.

The number of GPs with formal training in CAM has increased from 24\% in 1988 to 32\% in 2005.\textsuperscript{8} This study separated training into formal training and self-education, a distinction not made in the 1988 study. When these two categories are looked at together, the total proportion of GPs that have received some form of training in this study is 61.3\%. The proportion of respondents expressing interest in training has declined from 54\% in 1988 to 11.3\%, possibly because the number who have already had some training or education is so much higher.

Many doctors feel an overview of CAM should be included in conventional medical education; a finding that is consistent with earlier New Zealand research.\textsuperscript{8,10} However
the present undergraduate medical curriculum does not appear to provide a large amount of teaching on these topics (a finding that has been consistent since 1988).

We suggest that appropriate teaching and learning about CAM should be included in the medical curriculum, particularly in those therapies with a specific relevance to Māori, Pacific Island, and other cultural groups within New Zealand.

Conflict of interest statement: The authors are unaware of any potential conflicts of interest.

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References:


Basic science confidence in senior medical students from the University of Auckland, New Zealand: results of the 2005 Senior Students Survey

Phillip Insull, Phil Blyth

Abstract

Aims To determine the proportion of senior medical students who feel their knowledge of the basic sciences is adequate for safe medical practice.

Design Cross-sectional survey. Twenty-five point questionnaire. Likert scale response ranking.

Setting University of Auckland School of Medicine, Auckland, New Zealand.

Participants 218 surveys were emailed to functioning addresses of fourth and fifth year students. 156 students emailed responses (71.60% response rate), comprising 55% of the total fourth and fifth year student population.

Results: Thirty-three percent of respondents (95% CI 0.26–0.41) felt their knowledge of anatomy was adequate. Seventeen percent (95% CI 0.12–0.24) of students felt their knowledge of pharmacology was adequate. Fifty-six percent (95% CI 0.48–0.64) of all respondents felt their knowledge of physiology was adequate. Forty-six percent (95% CI 0.38–0.54) of all respondents felt their knowledge of pathology was adequate. Seventy-six percent (95% CI 0.69–0.83) felt their behavioural science knowledge was adequate. A greater proportion of respondents were confident in behavioural science than any other basic science (p<0.01).

Conclusion Respondents to the 2005 senior medical students survey from the University of Auckland School of Medicine are most confident in their behavioural sciences knowledge. Respondents are least confident in their knowledge of pharmacology.

The practice of medicine relies on sound understanding of basic science. Basic science teaching, though, has long been unpopular with preclinical students—many become bored with concepts which they consider irrelevant.

The problem is that what may seem irrelevant as a student may become relevant in medical practice. Indeed, inadequate basic pharmacological understanding leads to errors in practice. It is a challenge, therefore, to balance clinical relevance and fundamental basic science concepts in the preclinical curricula.

Clinically integrated and problem-based learning approaches are an attempt to make basic science concepts more relevant for students; however, a major shortcoming of such strategies is inadequate coverage of anatomy.

Many consider anatomy teaching to be a casualty in modern medical education reforms. Indeed, senior doctors have commented on the lack of anatomical understanding in their trainees.
Students taught in non-problem based schools have a higher level of basic anatomical knowledge than students taught in a clinically integrated manner.\textsuperscript{8} Indeed, a large proportion of final year medical students are interested in revising their knowledge of anatomy during clinical teaching.\textsuperscript{9} And introduction of cadaver dissection during specialist clinical rotations meets the need for senior students to revise anatomy before graduation.\textsuperscript{10}

The University of Auckland School of Medicine teaches preclinical students basic science in a relatively integrated manner. Core concepts are taught in an organ-systems approach alongside clinically based sessions and training in clinical examination. Certain aspects of the basic science curricula have been condensed or lost to accommodate the increasingly clinically-based additions to the programme.

The primary aim of this study is to determine whether those students who have moved onto the clinical phase of their studies believe their basic science knowledge is adequate to practice medicine safely.

Secondary aims include assessment of student satisfaction with the clinical relevance of their preclinical teaching; investigation of teaching preferences in anatomy; and gauging interest in returning to cadaver dissection during surgical attachments to revise relevant anatomy.

**Method**

**Development of the survey**—Ethical approval was sought from the Multi-regional Ethics Committee. After reviewing a summary of the projects aims and proposed methodology, the Committee’s Chair consented to completion of the project without formal ethical review, under the proviso that responses would be kept anonymous.

The anonymous survey questionnaire included 25 items. These items were either ‘tick box’ replies or Likert scale ranking (1=strongly agree; 5=strongly disagree). Demographic information included only gender and year of medical study. Three pairs of control questions were included to provide a measure of reliability in responses.

If answers were reliable the response to each item per pair clearly correlated and the response was included in the analysis. Responses with no (or only one) consistent pair were to be excluded from the analysis. Pre-testing was conducted using a sample of 10 5th-year medical students who were also included in the final sample. These respondents were asked to comment on the questionnaire’s content, consistency, clarity, appearance, and potential for bias. Potential ambiguities and inconsistencies were identified and corrected prior to the study sample being completed.

**Survey administration**—Fourth and fifth-year class email lists were obtained through class representatives from the University of Auckland School of Medicine. 284 email addresses were mailed a pilot message; 66 messages were returned to sender by service providers stating permanent failure—thus questionnaires were not sent to those 66 addresses. The survey form was sent to 218 email addresses. 156 responses were received. These responses were organised and any personally identifiable information removed by a third party.

**Statistical analysis**—Questionnaire responses were manually entered into an electronic spreadsheet. Statistical analysis was performed using Microsoft Excel and SPSS software. Confidence intervals for proportions were calculated using a continuity correction for categorical data. P values were calculated using the standard error of the difference between two proportions; 11 two-tailed p values of less than 0.05 were defined as significant.

**Results**

**Responses**—In response to the email, 156 of 218 (71.60\%) medical students with functioning email addresses returned a completed survey, thus responses were received from 55\% of the 284 students registered on the 4th and 5th-year class email
lists. In all responses at least two of the pairs of control questions were consistent, thus no responses were excluded from the analysis. See Table 1.

**Table 1. Response rate**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>72</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>84</td>
</tr>
<tr>
<td>Total</td>
<td>156</td>
</tr>
<tr>
<td>Response rate to functioning email addresses</td>
<td>71.60%</td>
</tr>
<tr>
<td>Proportion of 4th and 5th-year student population</td>
<td>55.00%</td>
</tr>
</tbody>
</table>

Basic medical sciences are made adequately relevant to the clinical situation in pre-clinical years—45% (95% CI 0.37–0.52) of respondents agreed basic medical sciences are made adequately relevant to the clinical situation. See Table 2.

**Table 2. Are pre-clinical basic sciences made adequately clinically relevant?**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students (%)</td>
<td>44</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>5th-year medical students (%)</td>
<td>45</td>
<td>28</td>
<td>26</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>45 (0.37–0.52)</td>
<td>29 (0.22–0.36)</td>
<td>26 (0.19–0.33)</td>
</tr>
</tbody>
</table>

Do you feel your knowledge of anatomy is/will be sufficient for safe medical practice?—33% of all respondents (95% CI 0.26–0.41) felt their knowledge of anatomy was adequate to practice medicine safely. See Table 3.

**Table 3. Do you feel your knowledge of anatomy is sufficient for safe clinical practice?**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students (%)</td>
<td>33</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>5th-year medical students (%)</td>
<td>32</td>
<td>25</td>
<td>43</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>33 (0.26–0.41)</td>
<td>27 (0.20–0.34)</td>
<td>40 (0.32–0.48)</td>
</tr>
</tbody>
</table>

How did you learn anatomy?—Text books and atlas’ are the most commonly used instruments by students to learn anatomy (p<0.01). Radiology was the least commonly cited method of learning anatomy (p<0.01). See Table 4.

**Table 4. What methods do you use to learn anatomy?**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Dissection</th>
<th>Prosection</th>
<th>Radiology</th>
<th>Atlas</th>
<th>Text book</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students (%)</td>
<td>54</td>
<td>47</td>
<td>31</td>
<td>63</td>
<td>76</td>
</tr>
<tr>
<td>5th-year medical students (%)</td>
<td>60</td>
<td>60</td>
<td>41</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>57 (0.49-0.65)</td>
<td>54 (0.46-0.62)</td>
<td>36 (0.29-0.44)</td>
<td>67 (0.59-0.74)</td>
<td>73 (0.66-0.80)</td>
</tr>
</tbody>
</table>
Radiology and pro-sections are preferable to dissection in anatomy teaching—13% (95% CI 0.08–0.20) of respondents felt radiology was preferable to dissection in anatomy teaching. See Table 5.

Table 5. Are radiology and pro-sections preferable to dissection for learning anatomy?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th years (%)</td>
<td>11</td>
<td>33</td>
<td>56</td>
</tr>
<tr>
<td>5th years (%)</td>
<td>14</td>
<td>38</td>
<td>48</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>13 (0.08–0.20)</td>
<td>35 (0.28–0.42)</td>
<td>52 (0.44–0.60)</td>
</tr>
</tbody>
</table>

Would returning to the dissection room during surgical rotations be helpful to revise relevant anatomy?—87% (95% CI 0.81–0.92) of respondents felt this would be beneficial. See Table 6.

Table 6. Would returning to the dissection room during surgical rotations be helpful to revise relevant anatomy?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>88</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>87</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>87 (0.81–0.92)</td>
<td>10 (0.06–0.15)</td>
<td>2.5 (0.01–0.07)</td>
</tr>
</tbody>
</table>

Do you feel your knowledge of physiology is/will be sufficient for safe medical practice?—56% (95% CI 0.48–0.64) of all respondents felt their knowledge of physiology was adequate to practice medicine safely. See Table 7.

Table 7. Do you feel your knowledge of physiology is/will be sufficient for safe medical practice?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>54</td>
<td>15</td>
<td>31</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>57</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>56 (0.48–0.64)</td>
<td>17 (0.12–0.24)</td>
<td>27.5 (0.21–0.35)</td>
</tr>
</tbody>
</table>

Do you feel your knowledge of pharmacology is/will be sufficient for safe medical practice?—Only 17% percent (95% CI 0.12–0.24) of students felt their knowledge of pharmacology was adequate to practice medicine safely. See Table 8.
Table 8. Do you feel your knowledge of pharmacology is/ will be sufficient for safe medical practice?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>14</td>
<td>41</td>
<td>45</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>20</td>
<td>31</td>
<td>49</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>17 (0.12–0.24)</td>
<td>36 (0.29–0.44)</td>
<td>47 (0.39–0.55)</td>
</tr>
</tbody>
</table>

Do you feel your knowledge of pathology is/ will be sufficient for safe medical practice?—46% (95% CI 0.38–0.54) of all respondents felt their knowledge of pathology was adequate to practice medicine safely. See Table 9.

Table 9. Do you feel your knowledge of pathology is/ will be sufficient for safe medical practice?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>44</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>48</td>
<td>37</td>
<td>15</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>46 (0.38–0.54)</td>
<td>34 (0.27–0.42)</td>
<td>20 (0.14–0.27)</td>
</tr>
</tbody>
</table>

Do you feel your knowledge of behavioral science is/ will be sufficient for safe medical practice?—Seventy-six percent (95% CI 0.69–0.83) felt their behavioral science knowledge was adequate for safe medical practice. See Table 10.

Table 10. Do you feel your knowledge of behavioural science is/ will be sufficient for safe medical practice?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Agree (%)</th>
<th>Neutral (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th-year medical students</td>
<td>70</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>5th-year medical students</td>
<td>82</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>All (95% CI)</td>
<td>76 (0.69–0.83)</td>
<td>16 (0.11–0.23)</td>
<td>7 (0.04–0.12)</td>
</tr>
</tbody>
</table>
Figure 1. Spread of responses to each item

- Medical sciences are made relevant
- Radiology and pro-sections preferable to dissection
- Dissection during surgical rotations
- Knowledge of anatomy safe
- Knowledge of physiology safe
- Knowledge of pharmacology safe
- Knowledge of pathology safe
- Knowledge of behavioral science safe

Disagree  Neutral  Agree
Discussion

The intention of this paper is to provide a frame of reference for further studies. These studies will follow this cohort of students into the workforce, and review their responses, once they are actually practicing.

To improve the education of medical students, feedback from students (both during their training and once they are practicing) is vital, as there is no-one else in the faculty who experiences the entire course. In addition, it allows the analysis of other cohorts of students to assess the impact of changes in the curriculum.

Methodological issues—Socially-desired response bias and self under-evaluation were probably the major issues for many items, and the investigators assume that proportions reported in this paper would tend to underestimate basic science confidence due to this. Consequently, we regret not having asked students to assess their fellow student’s knowledge to check for this possible source of error.

When performing curriculum evaluation, other factors should always be considered alongside student opinion. Assessment outcomes, comparisons of teaching methods, staff opinions, and a myriad of other evaluation tools must all be a part of any decision-making process.

This analysis is not intended to make a definitive statement on curriculum performance, but it does provide a valuable snapshot of student opinion. Caution should be applied when generalising the results of this survey, and proportions should be interpreted as trends rather than absolute values.

Reliability (in student responses) was tested by responses to pairs of matched questions. These questions required similar responses to both questions in each pair. These were found to be acceptable. Because selection of the sample was not randomised, systematic biases are possible. For instance, more females responded to the survey than males, yet this is reflective of medical student demographics in New Zealand.

It was difficult to capture a higher response rate as unsolicited e-mails are frequently blocked or put into junk-mail folders by service providers. However, responses were received from 55% of all 4th and 5th-year students and from 72% of students with functioning email addresses included on class email lists.

It is entirely possible that the non-responders to this survey were a source of bias, as the opinions of these students may not have been typical of the student population. The response rate to this email survey from functioning addresses was higher than the mean response to such surveys previously published in medical journals.

Clinical relevance of basic science teaching—45% (95% CI 0.37-0.52) of respondents agreed basic medical sciences are made adequately relevant to the clinical situation. This result demonstrates the difficult balance medical educators face in designing pre-clinical training for medical students.

With the advantage of hind-sight experienced doctors know that basic sciences are important to the safe practice of medicine. Without such experience, medical students often struggle with the question of “why do I need to know this?” This leads
to both boredom and poor performance, especially in the more technical and specialized topics.\textsuperscript{14}

Debate surrounding the relevance of detailed pre-clinical anatomy teaching is an excellent example.\textsuperscript{35} By reducing the amount of material taught, students should be able to retain a greater proportion of material, however this needs to be balanced with the students having confidence that they have covered enough material, such that they do not feel exposed.

\textbf{Confidence in basic science knowledge for safe medical practice}—The survey results seem to suggest that Auckland’s School of Medicine is failing its students, however several biases must be considered:

- Firstly, these students have been surveyed at the time when they are being exposed to different medical specialties for the first time, and the amount of knowledge required appears daunting.
- Secondly, stresses of the clinical environment may mean that the students are less able to access their otherwise sound knowledge of basic science, with subsequent decreased levels of confidence.

These results are relevant to junior medical students, as being aware that their senior counterparts are struggling with science knowledge motivates the junior students to study harder. Furthermore, these results may help the Auckland School of Medicine to encourage students to be more self assured, and to teach them strategies for practicing safely when they do not know the answer.

A greater proportion of respondents were confident in behavioural science than any other basic science (p<0.01). A greater proportion of respondents were confident in physiology than pharmacology and anatomy (p<0.05). A greater proportion of respondents were confident in anatomy than pharmacology (p<0.05). No significant difference was found between physiology and pathology (p>0.05), and no significant difference was found between pathology and anatomy (p>0.05).

\textbf{Anatomy}—Only 33\% of the respondents (95\% CI 0.26–0.41) felt their knowledge of anatomy was adequate to practice medicine safely.

The relevance of anatomy in the pre-clinical medical programme has often been brought into question.\textsuperscript{15} As a result, the relative emphasis given to anatomy in the undergraduate curriculum has undoubtedly reduced\textsuperscript{16} and students are now less capable in anatomy.\textsuperscript{17} This is a problem for those entering surgical specialties, where surgeons have commented that they are forced to take on the additional role of anatomy tutor for their trainees.\textsuperscript{17}

The Royal Australasian College of Surgeons seems to have undertaken this responsibility, in conjunction with the University of Melbourne, in instituting the Diploma of Surgical Anatomy for basic surgical trainees.

More respondents used textbooks to learn anatomy than radiology (p<0.01), dissection, and prosection (p<0.05). A greater proportion of students used dissection to learn anatomy than radiology (p<0.01). No significant difference was found between anatomy textbooks and anatomy atlas’ (p>0.05). This may suggest the two are used in combination by the majority of students. No significant difference was
found between dissection and prosection \( (p>0.05) \) probably due to the fact these modalities were offered in the same anatomy lab.

Fifty-seven percent \( (95\% \ CI \ 0.49-0.65) \) of students said that dissection labs helped them learn anatomy. Radiology was the least commonly cited method of learning anatomy \( (p<0.01) \), despite radiology registrars tutoring in cadaver dissection labs and leading radiologic-anatomy tutorials.

Only 13\% \( (95\% \ CI \ 0.08–0.20) \) of respondents felt radiology was preferable to dissection in anatomy teaching. Eighty-seven percent \( (95\% \ CI \ 0.81–0.92) \) of respondents felt it would be beneficial to return to dissection during surgical attachments to revise anatomy. This may suggest that respondents regret not taking full advantage of cadaver dissection in pre-clinical teaching, given the significantly smaller proportion of students who stated they used dissection to learn anatomy.

Radiology is becoming an increasingly large component in the undergraduate anatomy curricula.\(^1\) This survey implies that students find the more traditional gross anatomy teaching methods more beneficial: textbook, atlas, and dissection.

**Pharmacology**—Only 17\% \( (95\% \ CI \ 0.12–0.24) \) of students felt their knowledge of pharmacology was adequate to practice medicine safely. Medical students frequently criticise preclinical teaching in pharmacology.\(^2\) Rational prescription of medicines is based on basic pharmacology.\(^3\)

Preclinical pharmacology is taught in an integrated lecture-based paper at Auckland Medical School. Problem-based therapeutics tutorials are held later in the clinical programme. Problem-based pharmacology teaching is more acceptable to students than traditional methods and leads to a greater retention of knowledge.\(^4\)

**Physiology**—56\% \( (95\% \ CI \ 0.48–0.64) \) of all respondents felt their knowledge of physiology was adequate to practice medicine safely. Physiology is taught in organ-systems approach at Auckland Medical School, with lectures and laboratory experiments forming the majority of the teaching time.

Some students find it difficult to integrate basic physiology into clinical practice.\(^5\) Computer simulations and operating theatre experiences are integrated into the physiology teaching programme at Harvard Medical School.\(^6\) These modalities highlight real-life consequences of physiologic phenomena in a way which is hoped to aid retention of knowledge and early clinical understanding.\(^7\)

**Pathology**—46\% \( (95\% \ CI \ 0.38–0.54) \) of all respondents felt their knowledge of pathology was adequate to practice medicine safely.

There is great variability in the way pathology is taught in medical schools. Clinical integration is common.\(^8\) Formerly important tools such as autopsy attendance are now unavailable in a large number of modern medical schools including.\(^9\) This may have been to the detriment of undergraduate pathology education.\(^10\) Suggestions for improvement in pathology teaching include real-life case-studies with cytopathological integration and computer based learning.\(^11\)

**Behavioural science**—Most complaints about doctors concern their communication and behavioural skills. Seventy-six percent \( (95\% \ CI \ 0.69–0.83) \) felt their behavioural science knowledge was adequate for safe medical practice. In the stressful clinical situation, long hours, a high workload, coupled with role models who necessarily
spend less time with each patient means that the students knowledge of behavioural science may not reflect their practice.

Auckland Medical School’s emphasis on practitioner development, Māori health and ethics teaching is hopefully meeting the needs of students.\textsuperscript{29} This is in contrast with the experience of medical schools in the United States, where it is felt teaching of behavioural science is impeded by numerous difficulties, in particular faculty ambivalence to its clinical relevance.\textsuperscript{30}

Since this survey was undertaken a major initiative has been undertaken within the dissection laboratory to enable students to integrate knowledge from a multitude of disciplines. Students have access to their own cadavers premortem clinical information, including medications, pathology results, and radiology. Within the laboratory, radiology and pathology staff act as tutors, and students take sections for histological examination.

In addition, students practice procedures such as thoracocentesis and joint aspiration. At the end of the year the clinicopathological correlate of the students “first patient” is presented. It is intended to survey students to ascertain the impact of this project on their learning.

Conclusions

Respondents to the 2005 Senior Medical Students Survey from the University of Auckland School of Medicine are most confident in their behavioural sciences knowledge. Respondents are least confident in their knowledge of pharmacology. More students were able to learn anatomy from traditional teaching methods than radiological methods. There is considerable interest in returning to cadaver dissection during surgical attachments to revise relevant anatomy.

Conflicts of interest statement: The authors have no conflicts of interest.

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References:


SIDS-protective infant care practices among Auckland, New Zealand mothers

Lynne Hutchison, Alistair Stewart, Ed Mitchell

Abstract

**Aim** To survey the knowledge and implementation of sudden infant death syndrome (SIDS)-protective infant care practices in mothers of infants aged less than 4 months.

**Methods** A postal survey was carried out of knowledge of SIDS risk factors and infant care practices of 200 mothers with infants aged 6–8 weeks and 3–4 months.

**Results** Mothers who could cite supine sleeping as protective comprised 84%, while 73% knew that smoking was a risk factor. Fewer knew that room sharing, keeping the face clear of bedding, and avoiding bed sharing and overheating are also protective. Fifty-four percent of the infants usually room-share with a parent, while 39% both room-share and sleep in their own bed. Sixteen percent usually co-slept for part or all of the night. Nearly one-third used pacifiers. Mothers who smoked during pregnancy comprised 8%, while 7% had smoked in the last 24 hours. Most infants (97%) had been breastfed at some time.

**Conclusions** Maternal education of the benefits of supine sleeping, not smoking, and breastfeeding appear well understood by these mothers. However, more education is needed about other SIDS-protective behaviours such as keeping the face clear and sleeping the infant in their own bed in the parents’ room.

New Zealand research into risk factors for sudden infant death syndrome (SIDS) resulted in the National Cot Death Prevention Programme in New Zealand commencing in 1991 after preliminary results of the first year of the Cot Death Study became available.

The advice at this time concentrated on promoting a smokefree environment for the infant, breastfeeding, and the use of the side or back sleep position (not prone). As further results became available, the message was changed to back or side position, and bed sharing with a smoking parent was added as a risk factor. By 1996-1997, it was evident that the lateral sleep position was also a risk, and sleep position advice was refined to promote the supine position only, with the face clear of any loose bedding or soft objects in the cot.

These recommendations have been taught by Plunket, hospitals, and public health providers, and in 2000 a pamphlet entitled *Back is Best* was released for public health use. This promotes supine positioning; smokefree from conception; face-clear positioning; bedding to be securely tucked in; the use of firm, clean, snug-fitting mattresses; not bed sharing until 6 months of age (especially if a parent smokes); breastfeeding; and information on pacifiers.

Similar prevention messages are provided in the UK by the Foundation for the Study of Infant Deaths (http://www.sids.org.uk/fsid/), while in the US, the Task Force on SIDS of the American Academy of Pediatrics (AAP) has recently issued a policy statement after analysing studies of SIDS prevention in the last 20 years.

This policy statement includes the following recommendations:
• Use the supine sleep position for every sleep;
• Avoid soft sleep surfaces;
• Avoid soft objects in the sleeping environment, and tuck blankets in firmly;
• Do not smoke during pregnancy; and avoid smoking in the infant’s environment;
• Place the infant to sleep in their own bed in the same room as the parent;
• Offer a pacifier when placing the infant to sleep;
• Avoid overheating the infant;
• Avoid positioning devices and apnoea monitors;
• Avoid the development of positional plagiocephaly by implementing positioning strategies; and
• Continue public education programmes to teach Back to Sleep.

In New Zealand, SIDS is still the major cause of death in the post-neonatal period, although the rate has dropped dramatically in the last 15 years. While the increased adoption of the supine sleep position for infants is undoubtedly a major factor in this reduction, little is known about mothers’ knowledge of SIDS risk factors or the prevalence of other SIDS risk-reducing behaviours among New Zealand families. This study was undertaken to evaluate the knowledge of SIDS risk factors in a group of Auckland mothers of young infants. It also aimed to quantify the prevalence of different infant sleep environments, maternal smoking, breastfeeding, and the use of pacifiers. Reasons for using these infant care practices and concerns about them were also documented.

**Method**

A random sample of 400 mothers who had delivered infants at National Women’s Hospital, Auckland, were mailed a questionnaire in April–May 2005.

National Women’s Hospital is the largest maternity unit in Auckland, delivering 7500 infants per year. Half of the sample infants were aged 6 to 8 weeks, and the other half were between 3 to 4 months. The mothers were encouraged to complete the questionnaire on the day they received it, and a stamped addressed return envelope was included. If there was no response received within 2–3 weeks, then a reminder phone call was made to the mother. In some cases, if a mother requested it, the questionnaire was completed over the phone at the time of the reminder call.

The questionnaire surveyed the mothers’ knowledge of infant care practices related to the prevention of SIDS. It asked them to list any factors they knew of that might help reduce the risk of SIDS. Information was also collected on the respondents’ current practices concerning sleep position, maternal smoking, breastfeeding, bed sharing, room sharing, and pacifier use. One reminder phone call was made to the mother if a response had not been received after 2–3 weeks.

The infant’s ethnicity was obtained from the mother, while the mother’s ethnicity was obtained from the hospital admission record. The final question invited the mother to comment on anything else she felt was relevant.

Statistical analysis was conducted using SAS software (Release 9.1; SAS Institute, Cary NC). The study received ethical approval from the Auckland Regional Ethics Committee.
Results

Subjects—Two mothers responded that their babies (one in each age group) had been adopted or fostered out. These infants were excluded from the analysis as no information was given about them. The remaining responders numbered 278 (70%), with 135 (68%) in the older age group, and 143 (72%) in the younger age group.

The only information available about the non-responders was ethnicity. The ethnicities of the respondents were: 60% European, 4% Māori, 10% Pacific (mostly of Samoan, Tongan, Niuean, or Cook Islands origin), 21% other ethnicity, and 4% not stated. In the whole group, the respective ethnicities were: 50% European, 6% Māori, 12% Pacific, 28% other, and 4% not stated ($\chi^2=38.2$, df=4, p<0.0001).

Over 90% of the mothers were 25 years of age or older. Approximately half of the infants were firstborn, and nearly two-thirds were European, with the remainder spread approximately evenly between Māori, Pacific, and “other” ethnicities. Twelve percent were preterm.

SIDS prevention factors cited—A high percentage of mothers cited back sleeping and not smoking as protective of SIDS; however fewer than half knew that avoiding bed-sharing and keeping the face clear were protective. A small number listed wrong answers. Twenty-four mothers (9%) knew or listed no factors, while a similar number listed one or two factors (Table 1).

Between three and six factors were cited by 73% of mothers, while 7% cited more than six factors. Some factors included in SIDS prevention programmes overseas were also cited, but these were less frequent.

Those mothers who did not cite any factors were less likely to report having received a pamphlet about SIDS prevention (OR=4.35, 95%CI 1.78–11.11), and were more likely to be of Māori, Pacific, or other ethnicities (OR=14.68, 95% CI 4.34–50.76), to be first-time mothers (OR=3.13, 95% CI 1.19–8.33), and to not sleep their infant on the back (OR=3.33, 95% CI 1.39–7.69).

The most common source of SIDS information was a midwife (54%), followed by antenatal class (40%) and Plunket (27%). The media was a source of information for almost 20%, and books for 15%. Less frequently cited sources were friends, family, and the Parent and Baby Show. Seventy percent of mothers reported that they had received a pamphlet about SIDS prevention, most commonly from the hospital, midwife or antenatal class.

Sleep position—This has been reported previously. In brief, the positions slept in “last night” were: 72% supine, 14% side, 12% side and back, and 1% prone. The “usual” position was slightly different at 65% supine, 10% side, 22% side or back, and 3% prone.
Table 1. SIDS prevention factors cited

<table>
<thead>
<tr>
<th>SIDS prevention factors</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep baby on back*</td>
<td>234 (84.2)</td>
</tr>
<tr>
<td>Don’t smoke during pregnancy or around baby*</td>
<td>202 (72.7)</td>
</tr>
<tr>
<td>Avoid bedsharing during sleep*</td>
<td>128 (46.0)</td>
</tr>
<tr>
<td>Breastfeed*</td>
<td>96 (34.5)</td>
</tr>
<tr>
<td>Keep soft objects and loose bedding out of the cot; keep face clear*</td>
<td>77 (27.7)</td>
</tr>
<tr>
<td>Avoid overheating</td>
<td>74 (26.6)</td>
</tr>
<tr>
<td>Use a firm sleep surface</td>
<td>47 (16.9)</td>
</tr>
<tr>
<td>Avoid using secondhand cot mattresses</td>
<td>26 (9.4)</td>
</tr>
<tr>
<td>Use a pacifier at nap time and bedtime</td>
<td>10 (3.6)</td>
</tr>
<tr>
<td>Sleep in same room as parent</td>
<td>4 (1.4)</td>
</tr>
<tr>
<td>Other—e.g. avoid alcohol/drugs around baby, wrap mattress in plastic, use natural fibres, use clean bedding, aired sleeping space</td>
<td>67 (24.1)</td>
</tr>
<tr>
<td>Wrong answer, e.g. side or prone sleeping</td>
<td>7 (2.5)</td>
</tr>
<tr>
<td>No risk factors cited</td>
<td>24 (8.6)</td>
</tr>
</tbody>
</table>

*New Zealand SIDS prevention programme advice.

Smoking—Smoking during pregnancy was reported by nearly 8% of mothers, and 7% reported smoking in the last 24 hours (Table 2). For those who smoked during pregnancy, the mean number of cigarettes per day was 7.4 (range 1–25). Higher rates of smoking were found in the Māori and Pacific mothers, at 22% overall, than in the European/other mothers (4%; p<0.0001).

Table 2. Smoking, breastfeeding, and pacifier use

<table>
<thead>
<tr>
<th>Variable</th>
<th>6–8 weeks n (%)</th>
<th>3–4 months n (%)</th>
<th>All infants n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking in pregnancy (missing = 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13 (9.1)</td>
<td>8 (6.0)</td>
<td>21 (7.6)</td>
</tr>
<tr>
<td>No</td>
<td>130 (90.9)</td>
<td>126 (94.0)</td>
<td>256 (92.4)</td>
</tr>
<tr>
<td>χ²=0.96, p=0.32, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking in last 24 hours (missing = 7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12 (8.7)</td>
<td>7 (5.3)</td>
<td>19 (7.0)</td>
</tr>
<tr>
<td>No</td>
<td>126 (91.3)</td>
<td>126 (94.7)</td>
<td>252 (93.0)</td>
</tr>
<tr>
<td>χ²=1.22, p=0.27, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding ever (missing = 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>140 (97.9)</td>
<td>128 (95.5)</td>
<td>268 (96.8)</td>
</tr>
<tr>
<td>No</td>
<td>3 (2.1)</td>
<td>6 (4.5)</td>
<td>9 (3.2)</td>
</tr>
<tr>
<td>χ²=1.24, p=0.26, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding, last 24 hrs (missing=11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>118 (84.3)</td>
<td>94 (74.0)</td>
<td>212 (79.4)</td>
</tr>
<tr>
<td>No</td>
<td>22 (15.7)</td>
<td>33 (26.0)</td>
<td>55 (20.6)</td>
</tr>
<tr>
<td>χ²=4.29, p=0.03, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacifier use last night (missing = 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41 (28.9)</td>
<td>39 (29.1)</td>
<td>80 (29.0)</td>
</tr>
<tr>
<td>No</td>
<td>101 (71.1)</td>
<td>95 (70.9)</td>
<td>196 (71.0)</td>
</tr>
<tr>
<td>Pacifier use usually (missing = 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>43 (30.3)</td>
<td>42 (31.6)</td>
<td>85 (31.0)</td>
</tr>
<tr>
<td>No</td>
<td>99 (69.7)</td>
<td>91 (68.4)</td>
<td>190 (69.1)</td>
</tr>
<tr>
<td>χ²=0.05, p=0.81, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Breastfeeding—97% of infants had ever been breastfed, while 84% in the younger age group and 74% in the older group had been breastfed in the last 24 hours (Table 2).

Pacifier use—A pacifier was usually used by 31% of infants (Table 2). Almost all mothers whose babies used a pacifier reported using it to settle the baby. Two mothers reported using a pacifier specifically for SIDS prevention. Most mothers had no concerns about using a pacifier, although 18 users (21%) were concerned about the infant becoming dependent. Small numbers reported concerns about misshapen teeth, baby losing it in the night, and safety.

For those mothers who did not use a pacifier for their infants, the main reasons were that the baby didn’t need it (33%), wouldn’t take it (27%), fears of dependency (16%), and the mother didn’t like pacifiers (13%). Smaller numbers were concerned about effect on teeth or mouth shape, choking, hygiene, colic, and hindering breastfeeding.

Bed sharing—For the question What bed did baby sleep in last night/usually? there was very little difference in bed sharing practices between “last night” and “usually”. Eighty-four percent of infants usually slept in their own bed, while 9% slept in the parental bed and 7% spent time both in their own bed and in the parent’s bed (Table 3).

Table 3. What bed does baby sleep in? (missing=1)

<table>
<thead>
<tr>
<th></th>
<th>6–8 weeks; n (%)</th>
<th>3–4 months; n (%)</th>
<th>All infants; n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own bed</td>
<td>119 (83.2)</td>
<td>109 (81.3)</td>
<td>228 (82.3)</td>
</tr>
<tr>
<td>Parental bed</td>
<td>14 (9.8)</td>
<td>15 (11.2)</td>
<td>29 (10.5)</td>
</tr>
<tr>
<td>Both own and parental bed</td>
<td>10 (7.0)</td>
<td>8 (5.6)</td>
<td>18 (6.5)</td>
</tr>
<tr>
<td>Twins sharing bed</td>
<td>0 (0.0)</td>
<td>2 (1.5)</td>
<td>2 (0.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>6–8 weeks; n (%)</th>
<th>3–4 months; n (%)</th>
<th>All infants; n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own bed</td>
<td>120 (84.5)</td>
<td>113 (85.6)</td>
<td>233 (84.1)</td>
</tr>
<tr>
<td>Parental bed</td>
<td>13 (9.2)</td>
<td>11 (8.3)</td>
<td>24 (8.8)</td>
</tr>
<tr>
<td>Both own and parental bed</td>
<td>10 (7.0)</td>
<td>8 (6.0)</td>
<td>18 (6.5)</td>
</tr>
<tr>
<td>Twins sharing bed</td>
<td>0 (0.0)</td>
<td>2 (0.7)</td>
<td>2 (0.7)</td>
</tr>
</tbody>
</table>

Infants who usually slept in their own bed in the parent’s room comprised 39%.

Overall, there were 44 (16%) infants who co-slept for 2 or more hours, and of these, three infants slept in a bed with a mother who smoked.

Six percent of Europeans usually co-slept for 2 or more hours, compared with 21% of Māori, 35% of “other” ethnicities, and 39% of Pacific infants (p<0.001).

When asked How long did baby share a bed? 77 mothers (28%) responded, although only 49 mothers had reported the infant sleeping in a shared bed in the previous question regarding what bed the baby slept in last night. Most of the extra 24 mothers who reported bed sharing in this question shared for less than 2 hours (Table 4). For the 77 mothers overall, 43% shared for less than 2 hours, 17% for 2 to 5 hours, and 40% for more than 5 hours.
Table 4. Bed-sharing times reported by co-sleeping mothers versus those who reported no co-sleeping

<table>
<thead>
<tr>
<th>How long bed was shared</th>
<th>Mothers reporting co-sleeping last night n (%)</th>
<th>Mothers reporting no co-sleeping last night n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 hours</td>
<td>9 (18.4)</td>
<td>24 (85.7)</td>
</tr>
<tr>
<td>2–5 hours</td>
<td>9 (18.4)</td>
<td>4 (14.3)</td>
</tr>
<tr>
<td>&gt;5 hours</td>
<td>31 (63.3)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>28</td>
</tr>
</tbody>
</table>

Mothers whose infants shared the bed for less than 2 hours most commonly gave the reason that it was for short naps or settling baby (59%), or for breastfeeding (21%). Where the bed was shared for more than 5 hours, the reasons stated were: prefer closeness (23%), baby sleeps better (20%), convenience (16%), only bed available (9%), breastfeeding (7%), and other (2%). Seventeen mothers in this group stated they had no concerns about the practice, and 10 had safety or other concerns.

Room sharing—A significantly greater number of younger than older infants usually slept in the parent’s room (Table 5). Overall, 54% usually slept in the same room as the parents, while 46% slept in their own room or other room. Responses for “last night” and “usually” in this section were almost identical. Reasons for the choice of room were convenience, parental decision, and ease in observing the infant (each 26%), followed by better sleep (21%), room arrangement (11%), and prefer closeness (10%). Twelve parents (4.3%) said it was the only room available.

Table 5. What room does baby sleep in?

<table>
<thead>
<tr>
<th>Last night</th>
<th>6–8 weeks; n (%)</th>
<th>3–4 months; n (%)</th>
<th>All infants; n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusively same room as parent/s</td>
<td>89 (62.2)</td>
<td>68 (50.4)</td>
<td>157 (56.5)</td>
</tr>
<tr>
<td>Own room / other room</td>
<td>54 (37.8)</td>
<td>67 (49.6)</td>
<td>121 (43.5)</td>
</tr>
<tr>
<td>χ²=3.98, p=0.05, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usually</th>
<th>6–8 weeks; n (%)</th>
<th>3–4 months; n (%)</th>
<th>All infants; n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusively same room as parent/s</td>
<td>86 (60.1)</td>
<td>65 (48.1)</td>
<td>151 (54.3)</td>
</tr>
<tr>
<td>Own room / other room</td>
<td>57 (39.9)</td>
<td>70 (51.2)</td>
<td>127 (45.7)</td>
</tr>
<tr>
<td>χ²=4.02, p=0.04, df=1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mothers whose infants did not room-share with them cited parental decision (without stating reasons) and better sleep as the main reasons for placing the infant in a separate room. Most mothers (89%) had no concerns about their room arrangements. The remainder expressed concerns about parental sleep quality, safety and other concerns.

Other comments—19 mothers (7%) made a comment in the general comments question at the end of the paper that they felt mothers need more information about safe child care practices.
Discussion

A high percentage (84%) of the mothers cited supine sleep position in their list of SIDS risk factors, and this was borne out by the high prevalence of supine sleeping in their infants. A similar survey in New Zealand in 1992 showed that 60% of mothers knew the prone sleep position was a risk factor, although that figure rose to 95% on prompting.

In a survey of Pacific Island families in 2000, 53% of mothers knew of the risk of prone positioning, although 39% were unable to accurately cite a single risk factor.

In this study, although many mothers cited prone sleep position and smoking as risk factors, far fewer were able to cite not bed-sharing, breastfeeding, and keeping the face clear as protective against SIDS. Some mothers were able to cite SIDS prevention messages that are promoted in the United Kingdom (UK) and United States but are not part of the New Zealand programme.

Few mothers incorrectly reported prevention factors. Women who could not report any risk factors were more likely to be first-time mothers, those of ethnicities other than European, and those who reported they had not received a pamphlet concerning SIDS prevention, thus pointing to areas that may need focusing on in order to increase SIDS knowledge among mothers.

Rates of smoking in pregnancy and post-partum in this survey, at around 7%, are noticeably lower than those detailed in other studies which have reported rates of 21% to 31%, although these were matched by our significantly higher rates in Māori and Pacific mothers. Overall, the smoking rate was less than a third of the rate of 24% for New Zealand females aged 15+ years reported in 2004. Additionally, breastfeeding rates, at 97%, are very high in this group of mothers, thus suggesting that education about these two factors (smoking and breastfeeding) may have met with considerable success in these New Zealand mothers.

Thirty-one percent of mothers usually used a pacifier for their infants, a rate similar to the 32% seen in the Auckland control group of the NZCDS and the 37% in a later study of pacifier use in 2–3 month-old Auckland infants in 1996. Reported UK, European, and Canadian rates are much higher, at 50% to 66%

Concerns expressed about pacifiers in this survey were similar to those previously reported, i.e. dependency and hygiene, however the main reasons were that the mothers felt the infant did not need a dummy or would not take one.

Although some studies have found that pacifiers are protective against SIDS, conflicting results from other studies suggest that this question is still open to debate in the light of potential disadvantages such as interference with the establishment of breastfeeding and a higher risk of otitis media, thus leading to the advice that it may now be inappropriate to discourage the use of pacifiers.

Our respondents appeared to differentiate between sleeping in a parent’s bed and sharing a parent’s bed. Sharing for many did not necessarily mean sleeping with a parent or other, and was seen as a time for breastfeeding, settling, or short naps. Indeed, bed sharing appears to be a highly variable practice. Sixteen percent of infants in this survey usually slept in a shared bed for some or all of the night, a higher percentage than the 11% in the control group of the NZ Cot Death Study.
Other reported New Zealand rates of bed sharing are 13% \(^2,25\) and 17%, \(^26\) with a much higher rate of 55% being seen in Pacific families in 2000. \(^27\) Variable rates of bed sharing have been reported overseas; in the UK, 11% to 12%, \(^28,29\) and higher rates of 29% to 47% have also been reported. \(^30,31\)

Unpublished data suggests that 45% of Australian infants bed share, with 25% of those infants bed sharing with a mother who smoked (personal communication, Dr Jeanine Young, 2005). Consistent terminology to define what constitutes bed sharing and co-sleeping is needed, as the variations in rates seen may be a product of widely varying definitions and how the practice is perceived by the parents.

The main reasons mothers in this survey gave for bed sharing (i.e. they prefer the closeness, better sleep, and convenience) need to be considered. These benefits can largely be achieved by placing the infant’s bed beside the mother’s bed, thus reducing the risk of SIDS. The fact that four mothers said that there was no other bed available is concerning.

The protective benefits of room-sharing in the first months of life were not well-known or practised in this group of mothers. The prevalence of infants who room-shared, at 54%, was slightly less than the 61% seen in the controls in the New Zealand Cot Death Study, \(^32\) but higher than the 45% seen in Ford’s study of Canterbury infants in 1997. \(^25\)

Studies from both the UK \(^28\) and Europe \(^19\) also show higher rates of room-sharing in their control groups. Importantly, however, it must be remembered that studies reporting room-sharing may also include those infants who are also bed-sharing.

In this survey, only 39% of infants were both sleeping in their own bed and sleeping in the parent’s room, strategies that have been shown to be protective for infants in this very young age group. \(^4,19,32,33\)

This study is limited by its response rate of 70%; nevertheless, for a postal-replied survey, this is relatively good. However, current infant care practices in Māori, Pacific, and other ethnicities may not be fully represented.

There is also the possibility that in a written questionnaire some questions may not be understood, and this method may be more limiting than a face to face or telephone interview. It is also possible that the dual aim of the survey, namely to gather information on both knowledge and practices, may inhibit families from providing accurate data due to a sense of guilt.

In conclusion, prone sleep position and smoking were well known as SIDS risk factors in the group of mothers of very young infants studied. The low rate of smoking and high breastfeeding rates among the mothers were particularly encouraging. Other SIDS protective factors such as not bed sharing when asleep and keeping the face clear were not well-known however.

These messages need to be disseminated to parents, particularly to first-time parents and those who may have English language difficulties. Importantly, more babies should be sleeping in their own bed in a parent’s room to decrease SIDS risk, and there needs to be discussion with parents about ways to achieve this while at the same time maintaining closeness to the infant and convenience for breastfeeding.

**Conflict of interest statement:** The authors are not aware of any conflicts of interest.
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References:


Necrotizing fasciitis after the post partum diastasis of the symphysis pubis

Anastasios Athanassopoulos, Terry Creagh, William McMillan

Necrotizing soft tissue infections are uncommon, highly lethal infections that are usually associated with trauma and surgery. The paucity of early clinical features leads to diagnostic delay and poor outcome. Post partum rupture of the pubic symphysis is a rare but debilitating complication that is associated with significant pain and delayed mobility.

We present a New Zealand case of Group B streptococcus necrotizing soft tissue infection occurring after diastasis of the pubic symphysis during a spontaneous vaginal delivery.

Case report

A 38-year-old gravida 2, para 2 woman underwent spontaneous vaginal delivery of a brow presentation that was complicated by a diastasis of the symphysis pubis. This was treated conservatively with a pelvic binder and she required 2 weeks hospitalisation for analgesia.

She was readmitted 1 week later with lower abdominal pain, swelling of the labia and erythema across the lower suprapubic area. A provisional diagnosis of cellulitis was made and intravenous antibiotics commenced. Twelve hours later, areas of blistering and skin necrosis were now evident (Figure 1) and a plastic surgical consult was requested.

Figure 1. Preoperative view
The patient was shocked, mentally obtunded, and complaining of intense abdominal pain. A diagnosis of necrotizing fasciitis was apparent and immediate resuscitative measures instituted. Laboratory studies demonstrated multiorgan dysfunction including acute renal failure, hepatic derangement, and coagulopathy.

At the time of surgery, extensive necrosis and suppuration involving the lower abdominal wall to the anterior labial commissure was evident. Dishwater exudate tracked from the site of the symphyseal diastasis with multiple separate foci of suppuration within the extraperitoneal fat, rectus abdominis, and subcutaneous tissues. There was significant destruction of both recti with exposure of transversalis fascia beneath the arcuate line and the posterior layer of the rectus sheath above (Figure 2).

**Fig 2 Post debridement defect**
Twelve days later an abdominal reconstruction component separation was performed along with an abdominoplasty procedure and a delayed extended tensor fascia lata pedicled flap. On day 19, the tensor fascia lata flap was transposed and the abdominal defect closed. The patient made an uneventful recovery.

**Discussion**

Post partum pubic symphyseal diastasis is an uncommon complication associated with severe suprapubic and iliosacral pain as well as a waddling gait. Various aetiological factors have been suggested including multiparity, instrumental vaginal delivery, cephalopelvic disproportion, and rapid labour.

Necrotizing fasciitis (NF), commonly termed by laypersons as “flesh-eating disease” or “flesh-eating bacteria”, is a rare, rapidly progressive and often fatal infection that requires early and aggressive surgical debridement. Surgery and trauma are common aetiologies and any anatomic area may be affected. Predisposing factors include diabetes mellitus, malnutrition, renal failure, and immunosuppression. NF has not previously been reported after diastasis of the pubic symphysis.

Although several distinct clinical-bacteriological entities may be described, the initial management is the same. Type I is a synergistic polymicrobial infection composed of gram negatives and anaerobes. Type II is caused by Group A and B streptococci and is associated with streptococcal toxin shock like syndrome in 50%. There is evidence to support the use of immunoglobulins in this condition. As a commensal of the female urogenital tract Group B streptococcus has a higher incidence in neonatal and obstetric related NF.

Patients present with the triad of fever, swelling, and pain. The intensity of the pain is out of proportion to the clinical findings and the tenderness extends significantly beyond the margins of the visible erythema. The skin develops a violaceous hue as its blood supply is compromised. Haemorrhagic bullae, skin necrosis, fluctuance, and sensory deficits then appear. Gas is not a reliable sign (occurring in between 20–40% of cases) but when present it is a specific sign.

Successful treatment of NF requires early diagnosis, radical debridement, antibiotics, nutritional support, and intensive treatment unit care. The commonest errors are delay in diagnosis and inadequate debridement. An incision and drainage-type approach has absolutely no role in management.

A second look in theatre the following day is mandatory, or sooner if the patient deteriorates. We have found topical negative pressure dressings a useful temporising measure.

In the obstetric and gynaecological literature, the reported mortality rate varies between 13%–48% although this includes post partum and gynaecological patients. Gallup et al attribute their low mortality of 13% to increased awareness as well as diagnosis of 86% of patients within 48 hours. Stephenson et al report a mortality of 11 out of 15 when the diagnosis was delayed greater than 48 hours.
Teaching points

A high level of vigilance and raised awareness through clinician education are fundamental to diagnosis. Urgent radical debridement, followed by a second look in theatre within 24 hours, is recommended. Moreover, a multidisciplinary approach is essential for debridement, reconstruction, and rehabilitation.

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References:

Small bowel strangulation caused by delayed penetrating diaphragmatic hernia

Chun-Wen Chen, Wei-Chou Chang, Chia-Chun Hsu, Chih-Yung Yu, Cheng-Yu Chen

Most traumatic diaphragmatic hernias are caused by blunt abdominal or thoracic trauma. However, penetrating injury to the diaphragm is also a cause, albeit infrequent, that usually results in a delayed diaphragmatic hernia, and causes visceral strangulation.

A young patient with incarcerated hernia due to remote penetrating diaphragmatic injury is presented. A CT scan could preoperatively suggest the diagnosis, which was confirmed by surgical repair of the diaphragmatic defect.

In this report, we stress that a CT scan can provide useful information for preoperative evaluation of diaphragmatic injuries.

Case report

A 26-year-old previously healthy man presented at the emergency department after a 2-day period of persistent left-lower chest discomfort that radiated to the upper abdomen. His vital signs were stable on arrival. Several hours later, he developed shortness of breath and vomiting at the emergency room.

The results of emergency room arterial blood gas analysis showed metabolic alkalosis. Routine chest radiography was performed, which disclosed only massive left-sided pleural effusion. Although there was no evidence of patchy infiltration in the lung parenchyma, he was admitted to our hospital with suspected pulmonary infection.

Figure 1. Contrast-enhanced axial CT scan showing a segment of strangulated small bowel (arrowed) herniated in the thoracic cavity due to a diaphragmatic defect
On admission, diffuse abdominal pain and dyspnoea were persistent. During admission, history of a remote stab injury to the left upper abdomen about 7 years ago was mentioned by the patient’s family. Therefore, a chest CT study was arranged and clearly demonstrated a segment of small bowel in the left lower thoracic cavity (Figure 1). Reformatted coronal CT images also confirmed the diaphragmatic defect with strangulated small bowel herniation.

Based on the CT findings, an emergent exploratory laparotomy was performed. A defect, which was about 1.5 cm in diameter and located over the left diaphragm, was found with a long segment of necrotic jejunum about 130 cm in length which was herniated through the diaphragmatic defect into the left-lower thoracic cavity.

The diaphragmatic defect was subsequently repaired with resection of strangulated jejunum and end-to-end anastomosis. After surgery, the patient was well without any postoperative complications. He was discharged from our hospital and had an uneventful recovery.

**Discussion**

Up to 90% of traumatic diaphragmatic hernias are caused by blunt abdominal or thoracic trauma from traffic accidents, which directly impact the chest wall and shear the diaphragm. This type of diaphragmatic tear, which is reported to often be longer than 10 cm, spreads in a radial direction and occurs at the weakest point of the posterolateral diaphragm.\(^3,4\)

Penetrating diaphragmatic injuries, on the other hand, are rare, and usually produce a small stabbing defect, which is easily overlooked at first inspection. Here, we have presented such a case of penetrating diaphragmatic defect that was undiagnosed at the time of injury and small bowel strangulation developed 7 years later.

The symptoms of diaphragmatic hernia may be clinically silent or fulminant, depending on which organs were herniated. Abdominal herniation can be depicted by its anatomic location. On routine radiography, the herniated colon sometimes creates a “picture frame” outline of the thoracic cavity, and can be distinguished from the small intestine by its haustral markings.

Barium enema may be used, although not to the full extent, to confirm the diagnosis of diaphragmatic herniation. Water-soluble contrast material should be used if strangulation or perforation is suspected.\(^1\)

CT is the mainstay in diagnosis of diaphragmatic hernia. In a series of 23 cases, Killeen et al reported that CT had a high sensitivity of 71% and specificity of 100% in the diagnosis of diaphragmatic rupture.\(^6\) Specific CT signs—including “diaphragm discontinuity,” “intrathoracic herniation of abdominal contents”, “collar sign”, and “dependent viscera”—have been proposed.\(^7\)

Nowadays, with the introduction of the multidetector row CT scan, the reformatted coronal or sagittal image provides a better image resolution than single helical CT scan and provide a more detailed anatomy.

In conclusion, diaphragmatic hernia can develop from a remote abdominal penetrating wound. In the present case, the symptoms, which included respiratory distress and bowel strangulation, would never have been spontaneously resolved without surgery.
Accurate diagnosis rests on appropriate imaging studies, especially CT images, which directly visualise the diaphragm discontinuity with intrathoracic small bowel herniation.

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The case for a New Zealand acute care strategy

Michael Ardagh

Abstract

People are coming to harm due to deficiencies in the provision of both elective and acute care. New Zealand cannot provide care to all who might benefit, but it behoves us to use whatever resource we can afford to its maximum utility.

Acute and elective patients share the same resource, and the overwhelming of the acute services is causing both acute and elective patients to suffer. To fix this requires that DHBs know how to, are able to, and want to fix the problem. To muster the knowledge and the ability, and to encourage the desire, we need a national acute care strategy.

Consideration of three conceptual models gives us six principles guiding solutions to the problems in acute care provision. Combining these principles with meaningful performance measures and with strong incentives to perform, will form the basis of an acute care strategy.

Introduction

- Demand for acute care is increasing. This is an international trend, and, although there is scope for some amelioration of demand in the long term (such as prevention of heart disease, type 2 diabetes, and road trauma), increasing demand for acute care is inevitable.¹
- Demand has overwhelmed the capacity of many of our hospitals and this manifests in many ways, not the least of which is emergency department (ED) overcrowding.²⁻⁷
- There is good evidence that ED overcrowding correlates with prolonged inpatient length of stay and several adverse outcomes, including strong evidence of a correlation with increased mortality.⁸⁻¹³
- ED overcrowding can be fixed.¹⁴
- The acute care system shares the same resource as the elective care system.
- Maximised performance in the elective system can only occur if the acute care system is maximally efficient, and therefore demanding a minimum of the shared resource.

Electives

Elective patients usually access care by following a pathway of referral by their general practitioner (GP) to a public hospital specialist, waiting for a first specialist assessment, having the assessment, waiting on a list for definitive care, being admitted for definitive care, and finally having definitive care delivered.
The bottlenecks in this pathway (the first specialist assessment and definitive care—particularly surgery) tend to occur in a public hospital. The waiting lists for specialist assessment and definitive care, which offered a false promise of care to all, have been replaced by a booking system, which explicitly denies care to many.

While most would concede that New Zealand cannot afford to provide definitive care to all who might benefit, many are concerned that too many are missing out. An advantage of the booking system is a guarantee that definitive care (for those who are offered it) will be delivered within a defined period of time—no more than 6 months.

The 6-month deadline was intended to be a quality target—those who warrant definitive care will get it within 6 months. Regrettably, however, the 6-month target has become a rationing tool—if you can’t get it within 6 months then you don’t warrant it.

Patients are ranked (mostly by clinicians) according to considerations of ability to benefit and urgency of need, and are ordered in the queue as a consequence. The volume of elective surgery the district health board (DHB) is contracted to do ideally reflects a predetermined threshold of ‘worthiness’ (ability to benefit, or urgency of need, or some combination of the two) down that queue. However, short of the contracted volume, the number getting into hospital depends on the capacity of the public hospital to accommodate them, rather than on a threshold of ‘worthiness’.

Two observations are made. First, patients who would benefit from definitive care are not getting it. Second, the number who get definitive care is a function of how many patients our public hospitals can get through in 6 months. If our hospitals get through more in 6 months then patients further down the queue of ‘worthiness’ will get definitive care. And if our hospitals get through fewer in six months then an even greater number of worthy patients will miss out.

We might argue for a greater hospital resource so that we can get further down the queue, but whatever resource our public hospitals have, it behaves us to make the best use of it so that the ‘6 month’ capacity is as good as it can be.

Acutes

Acute patients share the public hospital resource. They access public hospital care because of an urgent need (with or without a referral by their GP) and mostly by travelling to the hospital emergency department soon after the need for care is identified. Patients who seek acute care are triaged (mostly according to urgency for care, but with some influence from a consideration of ability to benefit) and wait in a queue. In contrast to elective patients, all those who seek acute care generally receive some form of it, although most have to wait to receive it.

The immediacy of the problems, which acute patients present with, demands that they be accommodated. Elective patients can be deferred. Despite acute patients ‘trumping’ elective patients, our health system is judged, largely, by how it manages elective patients.

Although there are reported key performance indicators (KPIs) for acute care (most notably waiting time to see a doctor in the Emergency Department, according to triage category), generally the performance of our larger hospitals in these indicators is well below that expected.
When these poor performance figures are reported, there may be a brief flurry of media scrutiny, but without consequence. Based on the response to poor waiting times in our major emergency departments over the last decade, it is reasonable to conclude that we don’t take these performance indicators very seriously.

The Minister of Health, Hon Pete Hodgson, in his first major address after taking on the health portfolio, told us:

…the New Zealand health system handles acute services brilliantly. Never perfectly, but brilliantly nonetheless. New Zealand is not awash with stories about hospitals turning away patients in need of acute care, or ‘ambulance bypasses’ as they are euphemistically referred to in other countries.

These few words were the only mention acute care got in a speech of nearly 4000 words. The remainder of his address concerned mostly elective care. It is no criticism of the Minister that he, his predecessor, his ministry, and many others are dismissive of the problems in acute care in this country. The elephant in the waiting room is hard to see among all the people waiting.

We have doctors, nurses, allied health practitioners, and others who are as good as any in the world and better than most. The quality of the acute care delivered by these people is excellent. This is a major contributor to hiding the elephant. The consequences of an overwhelmed acute care system are numerous and significant, but are less tangible than those related to failures of elective care.

In acute care, the pressured nursing interventions, the truncated medical assessments, the inappropriate placement of the patient in the ED or in the hospital wards, and the delay to definitive care may individually or cumulatively cause morbidity or mortality, manifesting at some stage during or after the patient’s care.

In elective care the relationship between the surgically redeemable problem and the lack of surgery, is clearer. The less direct relationship between a failing acute care system and bad outcomes contributes to hiding the elephant. However, the elephant is there and it is a big one.

In addition to the prolongation of suffering, the inhuman accommodation of people in crowded corridors and non-fatal adverse outcomes, ED overcrowding will be killing New Zealanders.

The case for an acute care strategy

ED overcrowding is real, it is bad and it has bad consequences for acute patients (who have bad outcomes) and for elective patients (who are ‘crowded-out’ by the overwhelming acute demand for the shared resource). To not realise this is naivety, and to not deal with it is negligence.

The concern that demand for acute care was increasing has been with us for at least a decade. How many DHBs in New Zealand have a 10-year (or even a 5-year) plan projecting the growth in acute demand, predicting the particular needs of that growth, defining how it might mitigate those needs, and then describing how it will accommodate the remainder?

For a DHB to produce and implement such a plan it needs knowledge, skill, and attitude (knows how to, is able to, and wants to). Of these three dimensions, the biggest hurdle is the third (wants to).
Nationally we have the ‘know how’, and we could commit to the ability. However, currently there are no incentives and few disincentives to fix the problem. This is in sharp contrast to the National Health Service ‘Acute Care Reforms’ in England. These were driven from the ‘top down’ and had significant incentives to perform and disincentives to fail. The hospitals in England had acute care performance as a top priority. Success in acute care was realised and success in elective care followed.\textsuperscript{14}

For the ‘want to’, but also to share the knowledge and the skills, New Zealand needs an acute care strategy.

**What shape might an acute care strategy take?**

The English Acute Care Reforms were revolutionary, but understanding continues to evolve. Many of the foundations of the English reforms remain relevant, but importing them wholesale to New Zealand is inappropriate. Instead, three conceptual models can be used to define the causes of the problems and the potential solutions.

From these three conceptual models, six principles fall, which could form the foundation principles of an acute care strategy.

**The cardiac failure analogy for ED overcrowding**\textsuperscript{1}—ED overcrowding is a manifestation of a failing acute care system. The cardiac failure analogy emphasises contributions to ED overcrowding in the areas of *preload* (the number and complexity of patients seeking acute care); *contractility* (the ability of the system to accommodate these patients, including the physical and human resources and the processes for getting things done); and *afterload* (the ease of getting the patient to the next phase of care, most notably into a hospital bed).

Every system tends to have contributions in all three of these areas although with differing proportions from place to place. In each centre, the most significant local contributions to overcrowding can be identified in each of these three areas, and solutions defined. Solutions will appear in all three areas.

Focusing on a single solution (for example, efforts to reduce low acuity patient presentations, or opening more hospital beds), independent of other contributing factors, will frustrate those attempting to fix the problem. So will attempts to fix the problem of ED overcrowding by focusing on the ED only, when two of the three contributing areas are outside the ED’s influence.

Therefore, from this model, two principles fall:

1. The causes and solutions are multi-factorial and should be considered together.
2. Two of the three areas of contribution are outside the authority of the ED, so solutions need to be driven at a DHB level.

**The whole patient journey paradigm**—This model encourages us to take the whole patient journey perspective, from referral to discharge. A number of different patient journeys will need to be considered, based on presenting problem, whether referred by GP, age, local patterns of practice, and so on.

The pathways are examined (diagnostics) to identify which parts of the pathway are unnecessary and where (in the pathway) the tightest ‘bottlenecks’ to patients accessing the required next phase of care.
Solutions then have two focuses: to eliminate unnecessary steps (referred to as ‘lean thinking’) and to prioritise solutions which fix the narrowest ‘bottlenecks’ first. Fixing obstructions to patient care (when there are bigger obstructions in the same pathway) will not improve patient movement and instead will disillusion and frustrate.

So, from this model, two further principles fall:

3. Unnecessary steps in the patient journey should be identified and eliminated.

4. The narrowest bottlenecks in the patient journey should be fixed first.

The ‘models of care’ paradigm—A variety of models of acute care have been proposed and trialled, some with success. The common features of these models are that they take the patient’s perspective (what is good for the patient is good for the model); they continue the whole patient journey (therefore whole system) paradigm; and they emphasise ‘lean thinking’ and working on the narrowest bottlenecks first.

The additional contribution they make is the emphasis on ‘value added’ tasks, and how best to achieve them. To explain this, it is worth describing the ‘Models of Care’ paradigm as being the ‘itinerary’ of the ‘whole patient journey’. In other words; where does the patient go, what happens there, and who does it?

Patients have some ‘value added’ things happen to them on their journey, such as resuscitation, diagnosis, or definitive care. They also have a number of things happen which do not add value, such as waiting, repeated assessments and ‘storage’ in lieu of an appropriate place to go, and elimination of these steps is in keeping with the concept of ‘lean thinking’.

To do the ‘value added tasks’ well, it is appropriate to have a place resourced to do that task, with staff trained for (and focused on) that task. Putting different patients (with different required ‘value added tasks’) with multiple staff with different objectives, in a single clinical space (for example, an ED) results in inefficiency, confusion, and frustration.

One consequence of this paradigm is the formation of ‘acute medical assessment units’, where patients go specifically for the diagnostic work-up by acute general medical teams. The unit is dedicated to this task. Its formation means that the diagnostic work-up does not occur in a place not dedicated to this task (for example, an ED cubicle, or corridor) and once the task is complete, the patient moves on (home, or the ward) for the next part of their journey.

From this paradigm fall a further two principles:

5. Important tasks in the patient journey (value added tasks) need an appropriately staffed and resourced place dedicated to undertaking that task efficiently and effectively.

6. When the patient has completed that task, he or she moves to the next place, for the next task.

Consequent to the consideration of these three conceptual models, we have six principles guiding solutions to the problems in acute care provision. Combining these principles with meaningful performance measures and with strong incentives to perform, will form the basis of an acute care strategy.
Summary

People are suffering and dying due to deficiencies in the provision of both elective and acute care. New Zealand cannot provide care to all who might benefit, but it behoves us to use whatever resource we can afford to its maximum utility.

Acute and elective patients share the same resource, and the overwhelming of the acute services is causing both acute and elective patients to suffer. To fix this requires that DHBs know how to, are able to, and want to fix the problem. To muster the knowledge and the ability, and to encourage the desire, we need a national acute care strategy.

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Five cases of thoracoplasty and excision of ribs

This extract comes from A Series of Surgical Cases, Auckland Hospital by Dr Gillon, which was published in the N Z Med J 1907;5(22):7–12.

Case 1. W.E., male, aet. 31. Transferred from Medical side (where he had been admitted with acute pleurisy) to my care, 9-4-06, with Empyema of right side and diffused Cellulitis of right side of chest, abdomen and neck.

On 4-4-06 got Erysipelas. 8-4-06 when on Medical side, he had his chest explored with aspirating needle by the House Physician, and offensive pus found.

On 9-4-06, the tissues were raised up with pus formation from the bony parts, I had to make eight vertical incisions into the abscesses, open the pleural cavity in two places and insert drainage tubes.

13-4-06 I removed five inches of the 5th and 6th ribs.

13-6-06 I removed the 7th, 8th, 9th and 10th ribs right up to the tubercles.

19-4-06 a parotid abscess (right side) was opened, also two more large abscesses, one on left buttock., and one under the facia lata.

You can see from the photographs on the screen, what this man has been through; he has indeed been "marred more than the forms of men” 1st, the Y shaped incision for pleural drainage, 2nd, a scar of four inches long just behind right iliac crest; 3rd, one over right iliac crest, two inches long, 4th, one parallel with dorsal spine, four inches long, 5th, one below that in same line, two inches long; 6th; one behind scapular angle, nine inches long, 7th, one opposite side same site, two inches long, 8th, one five inches nearer axilla, two inches long; 9th, one in fold of left buttock, six inches long, 10th, one behind the -former, one inch long. 11th, on May 27th, an abscess over right elbow was opened.

On 13-6-06, weight was 8 stone, on 10-8-06, weight was 8 stone 10 lbs. He has been up and about, practically well for the last three months.

There was an opening in the lung, which may have been the result of the first aspiration, and the air whistled through this hole until 1-12-06, when it closed. I used Pyoktannin as a dressing for the pleural opening finally. Several times his condition seemed absolutely hopeless. I may mention that be he practised inflation of his lung by means of blowing into a toy balloon. I have to thank the resident staff, Drs, Walshe, C. C. Aicken and Ferguson for their attention in this case, and especially the Sisters Williams and Keyte, and Nurses in Ward 7 for their care in carrying out my instructions.

His evening temperature ran to 102 and 101.6 at-night with a morning remission to 97.4 and 98.6 until the end of May, when it fell to normal and remained so ever since. His pulse kept up to 130 and 108 from April till end of July, when it gradually registered 84, and kept at that. His respirations were from 32 to 40 from April to July 1st, from 24 to 28 from June 1st to July 15th, and from 20 to 24 till October 23rd, when they fell to 18,at which number they have remained up to the present, 31-1-07.
On six occasions his sputum was examined for T.B. but none found. Discharged cured 21-1-07, weight 10 stone 4lbs., and went 'to work as a Fire Brigade’s man.
Metastatic Crohn’s disease

Amin Sheikh, Ali Aldameh, Pennie Symmans, Andrew Hill

A 69-year-old woman presented with an 8-month history of diarrhoea, fresh rectal bleeding, intermittent left-sided abdominal pain, pain in her right elbow and left knee, and a rash on her arms and legs. She had a past history of diverticulosis of the sigmoid colon, an anal fissure (previously biopsied), and mild asthma.

On examination, she was afebrile with mild tenderness in the left iliac fossa. Sigmoidoscopy up to 15 cm showed a layer of pus but normal underlying mucosa, no blood, and one external haemorrhoid. Further physical examination revealed bilateral episcleritis of her eyes, and papular/nodular skin lesions on her palms and legs (Figures 1A,B,C,D). Both her right elbow and left knee were stiff, with mild tenderness on passive movement, and a global reduction in the range of movement.

The patient kindly consented to publication of these photographs
A distal sigmoid biopsy showed mildly irregular crypts with an occasional crypt abscess. The lamina propria showed a moderate mixed inflammatory cell infiltrate with an occasional cluster of histiocytes forming loose granulomata. Appearances were of active chronic inflammation with a granulomatous component.

**Figure 2.** 100× (left image) and 400× (right image) magnification views of the rectal biopsy

A punch biopsy of one of the papular lesions on her right thigh revealed a mild perivascular chronic inflammatory cell infiltrate within the superficial and deep dermis. Loosely formed granulomata (composed of histiocytes and Langhan’s type giant cells with occasional lymphocytes) were scattered within the reticular dermis. Occasionally there was a small amount of degenerate collagen in the centre of a granuloma. There was no palisading typical of the necrobiotic granulomatous conditions. Eosinophils were not a feature.

There was no evidence of vasculitis, panniculitis, atypia, or malignancy. Special stains for fungi and acid fast bacilli were negative. The features were characteristic of granulomatous dermatitis.

**Figure 3.** 400× magnification of a skin lesion punch biopsy
The clinical picture in conjunction with the skin, rectal, and sigmoid biopsies and an earlier biopsy of an anal fissure (which had shown granulomata) lead us to believe that the skin lesions were highly likely to be the entity known as metastatic or cutaneous Crohn’s disease.

**Discussion**

Up to 50% of patients with Crohn’s disease have at least one extraintestinal manifestation of their inflammatory bowel disease. Cutaneous disorders are commonly associated with Crohn’s disease and may occur in up to 15% of patients. Rarely, patients may develop granulomatous dermatitis at locations remote from the gastrointestinal tract and these lesions are known as metastatic or cutaneous Crohn’s disease.

Cutaneous Crohn’s disease may manifest clinically as nodules, plaques, or ulcers located on the extremities or in intertriginous areas. It is often associated with Crohn’s disease confined to the colon. The presence of lesions does not necessarily relate to the severity of the gastrointestinal disease.

Histologically, as in our case, cutaneous Crohn’s disease is characterised by non-caseating granulomata composed of collections of epithelioid and histiocytic giant cells surrounded by a scant rim of lymphocytes and plasma cells. The aetiology is unknown but the mucosa from the underlying bowel disease is thought to provide the associated immune response responsible for the cutaneous lesions.

As the relationship between the cutaneous lesions and intestinal symptoms is variable, the treatment of gastrointestinal disease may not influence the skin lesions. However, it is generally accepted that the treatment for the cutaneous lesions is treatment of the underlying intestinal disease. Most of these skin lesions will resolve with time with or without treatment.

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Cervical cancer in Australia and the United Kingdom

In Australia, organised cervical screening was initiated in 1991 for sexually active women aged 18–69 years, with a recommended 2-yearly interval. In the UK, organised screening began in 1988 for women aged 20–64 years, with a recommended 3-yearly interval in most regions.

The authors of this paper have compared the outcome of these two screening programmes. They conclude that after the introduction of organised screening, similar reductions in cervical cancer incidence and mortality were achieved in Australia and the UK. Therefore, the 2-yearly screening policy and the predominantly 3-yearly screening policy in the UK appear to have been of broadly similar effectiveness.

An editorial further discusses this matter and presents data showing that Australia now has the lowest mortality and second lowest incidence in the developing world. Unfortunately it also shows that New Zealand has the greatest incidence and mortality rates from this unpleasant disease. Bring on the human papillomavirus (HPV) vaccine.


Antiplatelet drugs and the risk of bleeding

The use of aspirin and other antiplatelet agents has sky rocketed in the past decade as the indications have widened to include primary and secondary prevention of myocardial and cerebrovascular ischaemia. In the United States, an estimated 34.8% of men and 26.2% of women over 40 years use aspirin every day or on alternate days.

Many patients use a combination of antiplatelet drugs. A report from Denmark has assessed the risk of serious upper gastrointestinal bleeding associated with the newer antithrombotic agents used alone or in combination with other antithrombotic drugs. Their population-based case-control study identified 1443 cases of serious upper gastrointestinal bleeding identified over a 4-year period in a study population of 470,000. The adjusted odds ratios associating drug use with upper gastrointestinal bleeding were 1.8 for low dose aspirin, 1.1 for clopidogrel, 1.9 for dipyridamole, and 1.8 for vitamin K antagonists. Corresponding figures for combined use were 7.4 for clopidogrel and aspirin, 5.3 for vitamin K antagonists and aspirin, and 2.3 for dipyridamole and aspirin.

Unsurprisingly they concluded that combined antithrombotic treatment confers particular risk and is associated with high incidence of gastrointestinal bleeding. An accompanying editorial from Hong Kong recommends strategies to avoid such bleeding.

BMJ 2006;333:726–8 & 712–3
Phase I clinical trials: a call for papers

No, not the NZMJ, the Lancet. Phase I trials are non-therapeutic and are testing only toxicity and maximum tolerated dose. They have had a rather bad press recently over the TGN1412 debacle. You will recall that a handful of (paid) healthy volunteers were given the new agent TGN1412, a superagonist anti-CD28 monoclonal antibody, which was designed to stimulate T cells. The outcome was disastrous both for the volunteers and the company promoting the drug—the volunteers very ill and the company bankrupt. However, the Lancet feels that there is a place for well conducted phase I trials on patients with a specific disease that may benefit from a novel therapy.

Lancet 2006;368:827

Wait-and-see prescription for the treatment of acute otitis media

Acute otitis media (AOM) is the most common reason for which an antibiotic is prescribed to children in the US and I presume the situation is the same in NZ. 283 children aged 6 months to 12 years with AOM presented to paediatric emergency departments. They were randomised to either a wait-and-see prescription (WASP) of antibiotic or a standard prescription of antibiotic. All patients received ibuprofen and otic analgesic drops for use at home. The parents of the WASP group were instructed to fulfill the prescription if their child was not better or worse at 48 hours. Substantially more parents in the WASP group did not fill the antibiotic prescription (62% vs 13%; P<.001). There was no statistically significant difference between the groups in the frequency of subsequent fever, otalgia, or unscheduled visits for medical care. The conclusion was that the WASP approach substantially reduced unnecessary use of antibiotics in children with AOM seen in an emergency department and may be an alternative to routine use of antimicrobials for treatment of such children. An associated editorial concurred but felt that it would be unwise to extrapolate these results to very sick children.

JAMA 2006;296:1235–41

Atypical antipsychotic drugs and Alzheimer’s disease

Atypical antipsychotic drugs are widely used to treat psychosis, aggression, and agitation in patients with Alzheimer’s disease in the US and I believe also in NZ. Should they be so used? The Food and Drug Administration (FDA) in the US has stated that elderly patients with dementia-related psychosis treated with atypical antipsychotic drugs are at an increased risk of death compared to placebo. In a recent double-blind trial, the effects of olanzapine (mean dose, 5.5 mg per day), quetiapine (mean dose, 56.5 mg per day), and risperidone (mean dose, 1.0 mg per day) were compared with a placebo. 24% of patients who received olanzapine, 16% of patients who received quetiapine, 18% of patients who received risperidone, and 5% of patients who received placebo discontinued their assigned treatment owing to intolerability (P=0.009). And no significant differences were noted among the groups with regard to improvement. The authors, and an editorial commentator, conclude that the adverse effects offset the advantages of such treatments.

Redefinition of the metabolic syndrome—useful or creating illness?

The existence and definition of pre-diabetes and the metabolic syndrome have been sources of controversy over recent years and were further debated by Kahn and Grundy in the July 2006 edition of Diabetes Care.1,2

Pre-diabetes is a term used to describe individuals with either impaired fasting glycaemia (IFG) or impaired glucose tolerance. The metabolic syndrome has been used to describe the clustering of several risk factors (visceral obesity, dyslipidaemia, hyperglycaemia, and hypertension) for cardiovascular disease. The key reason for defining pre-diabetes or the metabolic syndrome is that it helps to identify individuals at high risk of developing diabetes or cardiovascular disease.

Recently the American Diabetes Association (ADA) recommended that the definition of impaired fasting glycaemia be reduced from a fasting plasma glucose (FPG) of ≥6.1 mmol/L to ≥5.6 mmol/L.3 The metabolic syndrome has also been dogged by redefinition. Most recently, the International Diabetes Federation (IDF) has redefined the diagnosis of the metabolic syndrome: lowering abdominal circumference and fasting glycaemia cut-offs.4

In a recent audit based in Wellington Hospital we sought to determine the frequency of impaired glucose metabolism (type 2 diabetes, impaired glucose tolerance, and impaired fasting glucose) and the metabolic syndrome in 297 patients presenting for elective cardiac catheterisation.5

We analysed the data using both definitions of IFG (≥6.1 and ≥5.6 mmol/L). We also assessed the frequency of the metabolic syndrome utilising the recently developed IDF consensus worldwide definition of the metabolic syndrome4 and the National Cholesterol Education Programs Adult Treatment Panel III (ATP III) criteria.6 The ATP III criteria previously being the most widely used in clinical practice and epidemiological studies.

In our study, established or newly diagnosed diabetes was present in 82 (30.5%) patients. Using a FPG cut-off of ≥6.1 mmol/L, IFG was diagnosed in a further 25 patients (9.3%). Use of the newer ADA definition more than doubled the number of patients diagnosed as having IFG 68 patients (22.9%, p<0.001).

Growing evidence suggests that the higher FPG cut-off level of ≥6.1 mmol/L is predictive of increased cardiovascular mortality.7–9 However, when the FPG cut-off is lowered to ≥5.6, the predictive power for cardiovascular mortality is removed completely.7 It is beyond the scope of this report to explore all the reasons for lowering the FPG cut-offs for IFG, however the change was not based on long-term outcome studies.

The rates of the metabolic syndrome also varied depending upon the definition used with 39.1% meeting the ATP III criteria. Using the lower cut-offs for abdominal obesity and impaired fasting glucose as outlined in the IDF definition diagnosis of the metabolic syndrome increased to 49.2% (p=0.01).
In our study, patients with the metabolic syndrome as defined by the ATP III criteria were more likely to have 3-vessel coronary artery disease compared to those without (42.9% vs. 29.3%, odds ratio 1.8; 95% CI 1.1 to 2.9). However, use of the new IDF criteria to define the metabolic syndrome reduced the strength of this association between the metabolic syndrome and the presence of 3-vessel disease (39.0% versus 31.8%, odds ratio 1.4; 95% CI 0.9 to 2.2).

Consistent with our findings, Athyros and colleagues\textsuperscript{10} recently reported that the prevalence of the metabolic syndrome was more frequent using the IDF criteria compared to the ATP III criteria (43.4% versus 24.5%, p<0.0001) and that the age-adjusted prevalence of cardiovascular disease was significantly less common in patients with the metabolic syndrome defined by the IDF compared to the ATP III criteria (18.3% versus 23.3%, p<0.0001). More importantly, those who meet the IDF criteria for the metabolic syndrome, but not the ATP III criteria, had a similar CVD prevalence to the population as a whole.

Our study along with others suggests that the new definitions have resulted in increased rates of diagnosis of both IFG and the metabolic syndrome. However, we need to ask (in moving the goalposts defining normal metabolism) have we better identified patients at increased risk of morbidity and mortality? Or, are we merely labelling patients unnecessarily? What really matters is the ability of these definitions to predict risk. Prospective studies to evaluate this are urgently required before the goalposts are moved for another season.

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References:


Cigarette pack covers (of health warnings) and the public good

Dr McGrath wrote—in response to our letter published in the 13 October 2006 issue of the Journal—that the New Zealand Bill of Rights Act 1990 ‘guarantees individuals and groups ... (such as tobacco companies) freedom of expression’. He appears to suggest that this right might extend to selling ‘sleeves or even stickers which cover up health warnings on cigarette packs’.

So as to provide some context for his statements, we note that Section 5 of the New Zealand Bill of Rights Act 1990 reads:

Subject to section 4 [Other enactments not affected] of this Bill of Rights, the rights and freedoms contained in this Bill of Rights may be subject only to such reasonable limits prescribed by law as can be demonstrably justified in a free and democratic society.

In practice, this means that limits on tobacco companies’ freedom of expression may ‘be demonstrably justified in a free and democratic society’ for the public good. One of the limits on that expression is section 32 of the Smoke-free Environments Act 1990, as currently amended. This section provides the power to regulate to require health warnings that effectively communicate to consumers (and potential consumers such as children).

We suggest that limits on selling ‘sleeves or even stickers which cover up health warnings on cigarette packs’ is very likely to ‘be demonstrably justified in a free and democratic society.’ Besides the rights of consumers to get information, such action can be justified from a ‘freedom maximising’ perspective, given that addiction to nicotine is freedom-eroding for smokers. That is, there is evidence from developed countries that the great majority of smokers regret having started smoking.3

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References:
New Zealand workforce issues

On present trends, before long almost half the doctors working in New Zealand will be foreigners, whilst current figures suggest almost half our graduates work in Australia. Of 40 doctors hired in recent years by one provincial District Health Board, only 4 were Kiwis.

District Health Boards cast their eyes and their nets overseas, where the job applicant cannot accurately match the job description with the grim reality. He will not know until he gets here that one dollar buys less than half an ice-cream, and that after taxes there are few dollars to spend anyway. Once this discovery is made, the wise medico will treat his sojourn in New Zealand as an excursion to our clean green paradise, taking generous holidays, and moving on (and out) when his credit card limit has been reached. As a bird of passage, he will prefer to work in hospitals and private practices with efficient roster arrangements.

Forty-six years ago, Professor C. Northcote Parkinson pointed out that New Zealand, “having exceeded the bounds of safety in the matter of taxation, had little time to struggle back to a position of financial stability, and that the effort was long overdue.” We have chosen to elect one government after another with a mania for raising taxes.

The present government gave the clearest possible warning that, if elected, it would raise the top rate to 39 cents in the dollar. It swept to victory 7 years ago, and is now claiming that to give any of the money back would “raise inflation”. Parkinson, quoting impeccable sources, held an exactly opposite point of view.

The New Zealand Medical Association, and the Association of Salaried Medical Specialists, are made up of people who would perish without taxpayer support. The latter body simply tries to secure improvements in fees and salaries that can only be met by more demands on an overtaxed population.

Recurring strikes in the health sector tell their own story. Inflation destroys living standards and capital. Nobody on a wage or a salary can get ahead whilst the government continues to harvest the nation’s income for its own poorly declared objectives.

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Professional Misconduct – Sexual Relationship with a Patient

Charge

The Notice of Charge charged that Dr Patel was guilty of professional misconduct and contained particulars as follows:

1. Between 28 July 2004 and 10 February 2005 you had a sexual relationship with Mrs X (“your patient”) while she was your current patient;

2. Between 28 July 2004 and 10 February 2005 you failed to provide health services with reasonable care and skill to your patient; in particular:
   a) You failed to take appropriate steps to immediately terminate the relationship; and you failed to take appropriate steps to immediately refer your patient to another medical practitioner; and/or
   b) You continued to treat your patient whilst having a sexual relationship with her; that treatment including ongoing care/management of a psychiatric illness.

The Director of Proceedings alleged that the conduct set out in particulars 1 and 2 either separately or cumulatively amounted to professional misconduct.

Prior to the hearing Dr Patel indicated that he wished to plead guilty to the charge.

Finding

The Tribunal found Dr Patel guilty of professional misconduct.

Background

Dr Patel was a general practitioner. He ceased being a general practitioner in May 2005.

Mrs X first saw Dr Patel in September 2003 where she presented with symptoms of insomnia and stress. Dr Patel prescribed Amitriptyline (anti depressant medication) and Imovane (medication for insomnia).

He saw her four times in October and once in December. At one of the October appointments Dr Patel offered Mrs X a referral to a psychiatrist. In January 2004 Mrs X again consulted Dr Patel and was diagnosed with anxiety and depression.

Mrs X saw Dr Patel on other occasions in April and then on 22 April 2004 she reported an improvement. At that appointment she requested an appointment with a psychiatrist. The psychiatrist diagnosed a major depressive illness with marked symptoms of anxiety.
Mrs X continued to see Dr Patel and other doctors frequently. She was seen primarily for her symptoms of depression and anxiety (3 consultations in May 2004; 4 consultations in June 2004 and 1 on 11 July 2004).

At a further appointment on 28 July 2004 Mrs X became very distressed. Dr Patel put his arm around her to comfort her. They hugged and Mrs X kissed Dr Patel on the neck. Dr Patel responded in the same manner. Subsequently, they would visit each other at home. They also met in town, talked and shared lunch. On occasions, they had sexual intercourse. Discussions occurred where they talked about leaving their partners and living together. Emails and text messages of a romantic nature were sent between them.

Dr Patel continued to treat Mrs X as his patient. The last time Mrs X consulted Dr Patel at his surgery was in December 2004. In December 2004 and January 2005 Mrs X telephoned Dr Patel requesting prescriptions.

On 31 January 2005 Dr Patel informed the Chief Executive Officer of his medical practice of his relationship with Mrs X. Dr Patel’s professional relationship with Mrs X ended on 8 February 2005 when her records were transferred to another medical practitioner.

Dr Patel admitted having a sexual relationship with Mrs X, while she was a current patient and while she was being treated (primarily) for depression. He accepted that his behaviour was inappropriate and his actions amounted to professional misconduct. He was fully co-operative with the Health and Disability Commissioner (HDC) in its investigation of the complaint and from the outset admitted his actions.

**Reasons for Tribunal finding**

The Tribunal was satisfied:

- That while there are no longer tiers of professional misconduct the conduct complained of is the type that must be regarded as the most serious and meriting condemnation by the Tribunal.

- Dr Patel’s misconduct was a breach of trust, misuse of power and an exploitation of the vulnerability of Mrs X and her family.

- The purpose of the penalty must be to protect the health and safety of members of the public and also to punish Dr Patel for his behaviour.

- The penalty must fit the facts of each case and the Tribunal must determine whether the misconduct is such that the public interest necessitates erasure from the register, or whether some other sanction is appropriate.

- The Tribunal was satisfied on the facts that the conduct admitted by Dr Patel was serious misconduct.
Penalty

The Tribunal considered there were a number of aggravating features in this case as follows:

- Mrs X was coming to see Dr Patel with a psychiatric illness which was not resolved at the time their relationship commenced. She was accordingly very vulnerable.
- Dr Patel continued to treat Mrs X’s daughter. Mrs X’s husband remained on the register as Dr Patel’s patient although he did not see him at this time.
- Dr Patel did not appear to recognize that in having a relationship with Mrs X he was compromising Mrs X’s care. He accordingly did not end the relationship or the doctor-patient relationship and continued to treat her during their relationship.

However, the Tribunal considered Dr Patel should be given credit for the following matters:

- He made no attempt to evade the consequences of his actions.
- He entered the earliest possible guilty plea and had indicated this to the HDC from the commencement of the investigation.
- He made endeavours to address why the sad state of affairs may have occurred.
- He contacted the Medical Council and voluntarily gave up his practise of medicine.
- He took full responsibility for his actions.

The Tribunal was of the view that it was unlikely Dr Patel would offend again which meant that the cancellation of registration was not the appropriate penalty in this case. However, the Tribunal considered it needed to punish Dr Patel and to take steps to ensure that Dr Patel was properly assessed by the Medical Council’s Sexual Misconduct Assessment Committee and that he undertake appropriate treatment after completing this assessment.

The Tribunal ordered that:

- Dr Patel be suspended from practice for a period of 2 years from 1 September 2006;
- During the currency of Dr Patel’s suspension he is to undertake the Medical Council’s Sexual Misconduct Assessment (SMAT) and to undertake such treatments and conditions as the Medical Council may impose upon him as a result of this programme;
- Once Dr Patel’s suspension is lifted Dr Patel is to comply with such conditions as the Medical Council may impose upon him relating to the treatments and conditions ordered by SMAT;
During the currency of the suspension, Dr Patel is to maintain and to continue to participate in an approved recertification programme relevant to the scope of general practice;

Dr Patel be fined $10,000;

Dr Patel be censured;

Dr Patel pay 50% of the costs of the hearing and prosecution; and

The Executive Officer arrange for publication of a summary of the decision in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal web site at www.hpdt.org.nz

Reference No: Med06/36D.
Professional Misconduct – Inadequate Care

Charge

The Notice of Charge contained three particulars as follows:

- That on or about 1 December 2004 when Dr Johri’s patient returned for a follow up appointment in relation to a breast lump he failed to record whether an examination had occurred;
- That on or about 1 December 2004 when Dr Johri’s patient returned for a follow up appointment in relation to a breast lump he failed to refer her to a specialist; and
- That a follow up appointment for Dr Johri’s patient was made for 6 December 2004, that the patient failed to attend that appointment, and that Dr Johri failed to make arrangements either for a further appointment, other monitoring or referral to a specialist.

The Director of Proceedings alleged that the conduct set out in all three particulars amounted to professional conduct when viewed cumulatively. At the hearing Dr Johri admitted the facts, and that his conduct constituted professional misconduct.

Finding

The Tribunal found Dr Johri guilty of professional misconduct.

Background

The case concerned the management of a 40 year old patient who was 21 weeks pregnant.

On 24 November the patient and her partner attended a consultation with Dr Johri regarding a lump in her left breast. On examination there was a 3 cm lump which Dr Johri considered was most likely a blocked duct with infection or a tumour. It was Dr Johri’s intention to refer the patient to a breast surgeon if the lump did not respond to a 10 day course of antibiotics and panadol. A further appointment was made for 1 December 2004.

The Director of Proceedings did not take any issue with the service provided by Dr Johri at the 24 November 2004 consultation.

On 1 December the patient attended a second consultation with her partner. The patient advised Dr Johri that there was some reduction in the size of the lump; it was not as sore and there was no discharge. The patient said Dr Johri did not examine her breast lump or make a follow up appointment. Dr Johri said that he did examine the
lump and made a follow up appointment for 6 December 2006 but his records were incomplete. No referral was made to a specialist.

Dr Johri’s record of the 1 December consultation was a follows:

“…the lump has gone down in size not as sore also no discharge, wait and see in March when baby is due” (emphasis added)

In February 2005 the patient and her husband moved to Dunedin where she saw a new mid-wife and explained she had a lump in her breast. The patient was immediately referred to Dunedin hospital. She was seen by a house surgeon on 15 March 2005 and upon examination a fixed solid lump measuring 6 cm by 4 cm was found. Following a mammography and fine needle cytology a diagnosis of left breast carcinoma was confirmed.

The patient was induced and gave birth by way of caesarean section to a baby girl on 25 March 2005. On 14 April 2005 she underwent a left mastectomy and axillary dissection. Sadly, the patient died on 15 November 2005.

Reasons for Tribunal finding

The Tribunal considered Dr Johri should have been alert to the possibility that his patient was suffering an aggressive form of breast cancer and that it was essential that she be carefully monitored.

The parties accepted breast cancer in pregnancy is particularly aggressive and needs urgent management. It was accepted by Dr Johri that he should have recorded whether or not an examination occurred on 1 December 2004 and that he should have insisted on some review in the next week.

The Tribunal considered it was incumbent on Dr Johri to arrange for a referral to a specialist once he appreciated that the lump had not completely disappeared in response to antibiotic treatment. Dr Johri should have alerted the patient’s midwife and made sure her progress was monitored. If there had been an appointment made for 6 December 2004 which the patient did not attend then Dr Johri should have left no stone unturned and made sure that the patient was again seen and examined.

The Tribunal was satisfied Dr Johri’s acts and omissions were a serious departure from the standards ordinarily expected of a general practitioner in his circumstances. Dr Johri’s omissions met the test of negligence as set out in s100 (1) (a) of the Act

Penalty

The Tribunal ordered that:

- Dr Johri be censured; and
- Dr Johri pay 30% of the costs of the prosecution and the Tribunal; and
- a summary of the hearing be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal web site at www.hpdt.org.nz

Reference No: Med06/33D.
Professional Misconduct – Forgery to Obtain Drugs

Charge

The charge alleged that on 3 February 2005 Dr Keshvara forged the signature of another practitioner on a prescription form to enable him to obtain DHC (Dihydrocodeine Tartrate) for his own use from a pharmacy.

The Professional Conduct Committee (PPC) alleged that Dr Keshvara’s conduct amounted to professional conduct. At the hearing Dr Keshvara admitted the facts, and that his conduct constituted professional misconduct.

Finding

The Tribunal found Dr Keshvara guilty of professional misconduct.

Background

Dr Keshvara wrote out a prescription for DHC using Dr Harrison’s prescription pad. Dr Keshvara signed the prescription by forging Dr Harrison’s signature. DHC is a narcotic analgesic with potency between morphine and codeine.

Dr Keshvara presented the prescription to a pharmacy where it was dispensed and then collected by him.

Reasons for Tribunal finding

The Tribunal had no difficulty in concluding Dr Keshvara’s actions were a serious departure from the standards expected of any medical practitioner. His actions were illegal, and a fundamental breach of trust reposed in him, not just by Dr Harrison, but by society as a whole. His actions constituted malpractice and brought discredit to the medical profession.

Penalty

Dr Keshvara had a long standing history of opioids and alcohol dependence. His addiction first came to the attention of the Medical Council in 1987. In November 1999, Dr Keshvara was convicted of two charges under the Misuse of Drugs Act 1975 and in January 2000, he was convicted of a drink driving offence. In November 2000, the Medical Practitioner’s Disciplinary Tribunal found the convictions reflected adversely on Dr Keshvara’s fitness to practise medicine. He was censured, fined, and was only allowed to practise subject to a series of conditions which were put in place for three years, which was the maximum time period allowed under the Medical Practitioner’s Act 1995.
When considering the penalty to be imposed at this hearing, the Tribunal gave careful consideration to removing Dr Keshvara’s name from the Register. However, the Tribunal resolved to impose penalties that were designed to protect the public, maintain professional standards and to provide Dr Keshvara one final opportunity to practise medicine. The Tribunal reached this conclusion primarily because it had not been suggested that patient safety had been compromised by Dr Keshvara.

The Tribunal ordered that Dr Keshvara be suspended for a period of 12 months. The Tribunal further imposed 11 conditions for a period of three years. The conditions fell into two categories:

- Conditions designed to assist Dr Keshvara’s possible rehabilitation; and
- Conditions designed to ensure that if Dr Keshvara returns to practice, appropriate professional standards are maintained and the safety of the public is not compromised.

The Tribunal noted that under the Health Practitioners Competence Assurance Act 2003 the maximum period of time conditions can remain in place is three years from the date of the Tribunal’s order. As Dr Keshvara was suspended for 12 months, those conditions which were designed to maintain appropriate professional standards would not have any practical effect until Dr Keshvara’s period of suspension expired and he returned to practise. However, the Tribunal made those orders to ensure appropriate protections were in place in the event that Dr Keshvara returned to practice within the next three years.

The Tribunal had no hesitation in warning Dr Keshvara that any failure on his part to comply with any of the conditions would be viewed most seriously.

The Tribunal also ordered that:

- Dr Keshvara pay 1/3 of the costs of the PCC and the Tribunal in relation to the prosecution and hearing of the charge; and
- A summary of the decision be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal web site at www.hpdt.org.nz Reference No: Med06/29P.
David Graeme Ross

*Pioneered radiology work in Christchurch. Born Palmerston (Otago), 22 August 1946; died Christchurch, 9 November 2006*

Scientific advances brought huge changes in radiology in the last 30 years. Christchurch doctor David Ross was at the forefront of these changes. He kept updating his knowledge with studies overseas. He pioneered work in Christchurch with such new equipment as CT and MRI and with angiography and neuro-radiology procedures. He then shared his expertise in the training of others.

Professional partner Tony Young says Ross, who died on November 9 aged 60, was a “key player” in radiology and a “significant contributor” to their group practice. “He will be very much missed,” Young says.

Ross was only 2 years old when his father, an East Otago farmer, died. The lack of a father as he grew up had a profound effect on him, making him determined to be a good father himself. His wife, Judith, says he achieved this by always putting family first. He kept work and home separated as much as possible. He put non-work pursuits aside until his children had grown up.

He attended Palmerston Primary School, in Otago, before going to Christ's College as a boarder from 1960 to 1964. He studied medicine at Otago University and graduated in 1970.

Ross returned to Christchurch as a house surgeon at Christchurch Hospital in 1971. Apart from time overseas, he lived in the city for the rest of his life. After 2 years as a house surgeon, he began specialist training in surgery but changed to radiology after a year. He completed his specialist radiology training in 1977 and headed to California for further postgraduate studies.

In 2 years at Loma Linda University Medical Centre, near San Bernardino, he was brought up to date with the latest developments in CT scanning, ultrasound, and angiography. Back in Christchurch, as full-time consultant radiologist at Christchurch Hospital, he became a leader in the use of these technologies and trained radiology registrars and radiographers in their application.

In 1985, Ross reduced his hours at the hospital and became a partner in Christchurch Radiology Group, a leading practice and the largest of its type in New Zealand. He was on the group's management committee from 1987 to 1994.

Ross continued working at the hospital and for the practice until ill-health forced his retirement 4 months ago. Tony Young says Ross was hard working and totally dependable. “He was technically very skilled and was very popular with everyone he worked with. His main areas of interest were angiography and neuro-radiology. He rode the wave of great technical advances in these areas. He kept up with the unparalleled advances in this time and he passed on his knowledge to others.” He kept
himself up to date by completing short courses and study fellowships in the United States, England, Australia, South Korea, and New Zealand.

Young said Ross was “right in the forefront, in Christchurch, in the use of CT, MRI, and angiography”. He also contributed greatly to professional organisations, most notably as secretary and co-ordinator of the New Zealand section of the Royal Australasian College of Radiologists. The College made him a fellow in 1984 and a life member this year, in recognition of his services.

He worked closely also with the National Radiation Laboratory (NRL), in the field of medical radiation. He was chairman of the NRL’s advisory council and of Canterbury Health's Radiation Safety Committee. Young says Ross was an excellent committee man who did a lot of behind-the-scenes work.

Coming from a musical family, Ross had been a choir member through his school years and beyond. He met his wife, Judith Hutton, through their membership of the Royal Christchurch Musical Society. They married in 1974 and had two children.

Ross took a break from the choir as the children grew up but later rejoined (after it had become the City Choir). He and his wife remained enthusiastic members for the rest of his life, earning a tribute from the choir, which sang at his funeral.

His other passion was golf, although he took it up only when his son, Michael, introduced him to it. As a member of the Christchurch Golf Club, at Shirley, he became a serious and analytical player who quickly got his handicap down to a respectable 18, his son said.

His visits to the US sparked a deep interest in American history. He read widely on the topic, with his focus on the American Civil War, on which he became quite an authority.

Judith Ross says her husband was “a most unassuming man and very easy to live with”. “He was quiet and self-contained, a man of integrity, and very considerate.”

David is survived by wife Judith, son Michael, and daughter Anna.

This obituary was written by Mike Crean of The Press (Christchurch) under the headline Leading radiologist and city chorister. It was published on December 2. We are also grateful to Bruce Rennie of The Press.
Medical Benevolent Fund

NZMA Members, and families of deceased Members, may apply for aid when in situations of financial hardship or distress.

Applications should be directed through the NZMA:

Central Office
P O Box 156
Wellington
Tel: 0800 656161
National Heart Foundation: 2007 Grant Applications

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Māori Cardiovascular Research Fellowship

$30,000 per year for 2 years

This Fellowship is designed to support graduates who propose to engage in research to improve cardiovascular health in Māori. The Māori Cardiovascular Research Fellowship is available for a medical graduate or non-medical graduate enrolled for a higher degree. Preference will be given to applicants with a working knowledge of “Kaupapa Māori” and who are committed to Māori health. This fellowship is tenable in New Zealand at a rate of $30,000 per year for 2 years.

Application forms for the Māori Cardiovascular Research Fellowship are available on our website [www.heartfoundation.org.nz](http://www.heartfoundation.org.nz) or from

Helen Stewart
Heart Foundation
PO Box 17160
Greenlane
AUCKLAND 1130

Ph: (09) 571 9191
Fax: (09) 571 9190
Email: HelenS@nhf.org.nz

Applications close 1 June 2007
National Heart Foundation: 2007 Senior Fellowship

((Libraries, print the PDF version and replace this page))
Medical Interviews and Professional Development: the essential handbook for the junior doctor (second edition)


The title of this book is somewhat misleading as only 1 of 20 chapters deals directly with medical interviews; in terms of practical assistance, that chapter is one of the better ones. The other chapters do not deal with medical interviews or with ‘professional development’, as conventionally defined.

The subtitle states that this is ‘the essential handbook for the junior doctor’. While this might promote sales by trading on the anxiety of junior doctors finding their way into a complex and daunting career, the content does not support such a claim. The subjects covered in the other sections are medicolegal issues, medical ethics, medicosocial issues, clinical governance, research, publications, and medical statistics. These are all important, but most readers will be disappointed because the chapters are an unrelated collection of essays that are of variable standard, depth, and relevance. For instance, Chapter 5 on ‘Financial Decisions’ deals with types of power of attorney, court protection, and receiverships, and it is not clear how this helps the junior doctor.

There are many financial issues to be faced with the sudden jump in income including investment strategies, financial planning, budgeting, and income protection insurance. The book is not a “depiction of the journey of a junior doctor through a series of hurdles along their career pathway” as the author suggests in the preface.

The book would be best used as a ready reference for an introduction to some of the issues that might be encountered as a junior doctor. Much of the material is a personal view of previously published material, the benefit of which are helpful reference lists for those who want to read in greater depth.

Written for the UK market, particularly in regards the health sector and legal issues, it has limited appeal for the rest of the world.

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