

New Zealand Medical Student Journal

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This new publication offers New Zealand medical students the opportunity to have their own research published. The academic papers are reviewed by leading authorities in the field from one of New Zealand's universities or hospitals. The journal aims to assist students in writing and presenting their work professionally as well as providing a source of information and opinions for other students.

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CONTACTS

New Zealand Medical Student Journal
C/- Medical Teaching Support Unit
Dunedin School of Medicine
PO Box 913, Dunedin, New Zealand
Telephone 0064-3-474-0999 ext. 8514
medstudentjournal@otago.ac.nz

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Editorial

The editors are honoured to present this sample of research and writing by New Zealand's medical students. The first issue of the New Zealand Medical Student Journal cannot do justice to the breadth and quality of research that exists within the student community. Instead we have the more modest aim of demonstrating the potential benefits to medical education that could arise from this publication.

The era of evidence-based medicine requires that practitioners use medical literature to guide their clinical practice. Contributing to that literature forms an important part of a practitioner's role. The primary benefit of a medical student journal is to provide doctors-in-training with an entry point into this world, both as authors and as readers. The NZMSJ is a forum through which students can learn from the experiences and insights of other students across the country.

Parallel to developments in medical science are growing demands that practitioners have a greater awareness of the ethical and social elements of their practice. The NZMSJ offers students a nationwide forum to debate such issues.

We hope the current issue stimulates contributions and ideas for the development of the journal. Although in its first year the journal has been published by a small group of students working from Dunedin, its aim is for closer collaboration with students from all medical schools. Support from the University of Otago has been crucial in the journal's development. University staff in various positions have assisted with funding and provided technical assistance as well as advice and ideas. The work of academic reviewers in critically appraising submissions has been invaluable as a quality check for the publication, and a source of feedback for authors.

Other organisations have generously provided financial support for the journal's first issue and they are acknowledged throughout the journal.

Although supported by hospital clinicians and university academics, the journal is ultimately managed by students, and its continuation is dependent on student participation as contributors and as volunteers involved in publication.

Enjoy the inaugural issue. We hope it stimulates contributions for the next.

Notes to contributors

The NZMSJ offers New Zealand medical students a supported forum to make the transition from writing for medical school to publishing quality academic work in professional journals.

The journal publishes research papers produced by medical students, case reports and appreciations, and other content that is educational and/or of interest to medical students and deemed suitable by the governing Editorial Board. The NZMSJ aims to have at least a national distribution and readership. The NZMSJ aims to have at least a national distribution and readership.

The quality of the journal will reflect the strength of the research New Zealand's medical students can produce.

You can contribute to the NZMSJ by writing articles or features.

Guidelines for authors follow the Uniform Requirements for Manuscripts submitted to Biomedical Journals, and authors are encouraged to consult the BMJ Stylebook (online at www.bmj.com).

The NZMSJ Editorial Board makes all decisions about content on the basis of its content policy.

For full details about making a submission to the NZMSJ, author guidelines, and helpful hints, consult the website www.otago.ac.nz/nzmsj or contact the Editors.

Future treatment options for Parkinsonism: Stem cell therapy

Cindy Towns

Dunedin School of Medicine

Abstract

Parkinson's disease (PD) and multiple systems atrophy (MSA) are neurodegenerative disorders with distinct clinical and pathological features. Both disorders are severely debilitating and although sufferers may respond to dopamine agonists in the short term, there is currently no effective long-term treatment option. Embryonic stem (ES) cells have attracted much hype and optimism with regard to neurodegenerative diseases. ES cells are regarded as having the potential to overcome the material shortages and technical difficulties that have hindered fetal neural transplants. However, the interactions between ES cells and their microenvironment are complex and further research is required in order to accurately and consistently control proliferation and differentiation. Ethical issues will also need to be considered before ES cells make the transition from the laboratory to mainstream medical practice.

Parkinson's Disease (PD) was first described by James Parkinson in 1817 and is characterised by bradykinesia, resting tremor, cogwheel rigidity and postural reflex impairment.¹ Degeneration of the dopamine-containing neurons and deposition of Lewy bodies in the substantia nigra are the most obvious pathological features of PD although damage may also occur in the cortex, brainstem, cranial nerve nuclei and the autonomic nervous system. Multiple systems atrophy (MSA), by comparison, is a neurodegenerative syndrome in which Parkinsonism is associated with signs of more extensive neurological damage.

Extrapyramidal signs in MSA are similar to those appearing in PD, for example, bradykinesia, rigidity and postural instability, but cerebellar dysfunction and autonomic signs may also be present; a result of neuronal loss and damage in multiple neurological structures. Cerebellar signs include ataxia of speech, ataxia of limb movement, and difficulties with gait whilst autonomic insufficiency can result in orthostatic hypotension, urinary retention or incontinence, constipation and sweating.² The terms striato-nigral degeneration, Shy-Drager syndrome and olivo-pontocerebellar atrophy refer to various manifestations of MSA although such disorders may be referred to by the more general term "Parkinsonism plus".³

In PD, the clinical triad of akinesia, rigidity and tremor reflects damage to the substantia nigra and responds to treatment with levodopa (L-Dopa), a precursor to

dopamine. However, despite often marked initial improvements, response to L-dopa diminishes over time. In patients treated for over five years, greater than 50% will develop instability of their motor response.⁴ Administration of L-dopa may also provide MSA sufferers some relief from bradykinesia, rigidity and tremor but the response is usually small and not well sustained.² This lack of response to L-dopa assists in distinguishing MSA from PD, particularly in the early stages.

Thus PD and other Parkinsonism syndromes are characterised not only by their distinctive clinical and pathological features, but also by their continual progression. Although pharmacological treatment offers amelioration of motor deficits, effects decline within five to ten years. The debilitating nature of these diseases and the lack of long-term treatment options have prompted patients, their families and physicians to look beyond traditional therapies. To many of these people, the successful derivation of human embryonic stem (ES) cells represents the future miracle cure for PD and other neurodegenerative conditions.

ES cells have gained unprecedented attention both in the scientific and general media. Predicted to have a greater impact on health care than the advent of anaesthesia or the development of antibiotics⁵ and hailed as the next revolution for medicine, ES cells have been described as the future of molecular biology and the

biggest development since recombinant DNA.⁶ Many believe that stem cells will create a whole new genre of medical therapies.⁷

The two unique properties of ES cells are pluripotency and immortality. Pluripotency refers to the ability of stem cells to form cells from all three germ layers: ectoderm, endoderm and mesoderm. In essence, it denotes a capacity to form all cell types within the human body. Immortality refers to the ability of stem cells to self-renew; to divide for an indefinite and potentially infinite period of time. It is these properties that render these cells of particular interest to PD sufferers and their families. ES cells have the capacity to differentiate into neural stem cells, and subsequent neuronal subtypes, that deteriorate during the course of this disease.

Neural stem cell transplantation is receiving considerable attention with regard to neurodegenerative disorders due, partly, to the success with fetal neural transplants. Fetal dopamine cell transplants have been used in treating PD for many years. Positron emission topography used to image the brain following surgery with L-dopa producing neurons (derived from fetal material) has demonstrated that transplants are still alive, producing dopamine and providing therapeutic benefit, ten years after replacement.⁸

Although fetal neural transplantation has demonstrated success in Parkinson's disease, efforts are constrained for at least two reasons. First, deriving material from aborted fetuses is difficult and the tissue itself is in short supply. It takes six fetuses to provide enough material for one graft, as 90-95% of neurons die shortly after grafting.⁹ Secondly, the low efficiency of producing dopamine neurons from fetal, neonatal and adult stem cells has limited the therapeutic benefit of transplants for Parkinson's disease.¹⁰ Freed notes that an unlimited supply of dopamine cells produced in culture would solve both the accessibility and mortality problems in these cells.¹¹ ES cells could be used to produce a potentially infinite supply of neural stem cells in culture that could then be used to produce the dopamine-producing neurons that are deficient in PD. This would render the shortages in fetal material and the effects of early apoptosis inconsequential.

Initial results provide some encouragement toward eventual clinical goals of symptom alleviation. For example, Connor et al note that embryonic cells have shown potential in restoring neurochemical and behavioural problems in animal models of degenerative disease.¹² ES cells have generated dopamine-producing neurons that function in an animal model of PD¹³ and there is also an unpublished report of an autologous transplant of neural stem cells alleviating symptoms in a human PD sufferer.¹⁴ Other recent work has illustrated that stem cells implanted into the brains of rats and mice can grow into L-dopa producing neurons.

This work suggests that all of the instruction mechanisms necessary for maturation are present in the adult brain.¹⁵

Of particular interest is the work by Gökhan and Mehler, who cite an increasing body of evidence suggesting that neurodegenerative disorders may represent fundamental disorders of neural development.¹⁶ These may result from pathogenic mutations in the neurodisease-related genes, which then have delayed neuropathologic consequences. According to these authors, ES cells represent an essential experimental tool for strategies aimed at intervening prior to irreversible neural injury. Specifically, the study of ES cell lines, and their *in vitro* and *in vivo* development, will provide insights into gene-environment interactions and critical periods in neurogenesis. Regenerative strategies can then be used to target vulnerable neural precursor populations during the 'presymptomatic' stages of disease.

Early promising signs need to be accompanied by care in interpreting experimental data. Collier and Kordower state that animal studies show advanced age and a long history of dopamine depletion have a negative influence on behavioural efficacy and anatomic features of dopamine neuron transplants.¹⁷ They suggest that some early animal models do not accurately reflect PD as they are based on grafts into young adult rats within only one to two months of experimentally-induced dopaminergic denervation of the striatum. A 2001 trial further indicates the importance of age and history of neural degeneration.¹⁸ The double-blind, placebo-controlled surgical trial demonstrated that 85% of patients under the age of 60 had surviving grafts and a reduction in their symptoms, but that similar benefits were not displayed in older patients.

Freed (2002) states that it is too early to say whether ES cells will provide an infinite and safe supply of dopamine neurons.¹¹ This author explains that much work remains to be done with regard to optimising conditions for accurate differentiation, proliferation and transplantation. He also notes that although ES cells are opening "an exciting era in human therapies", success will also depend upon eliminating the threat of uncontrolled proliferation. This risk is inherent to undifferentiated, self-renewing stem cells and one that will require extensive testing if stem cells are to enter mainstream medical practice.

Although it can be stated that stem cell therapy provides some hope for PD, it remains questionable as to whether sufferers of other Parkinsonism-type disorders, such as MSA, will benefit. MSA patients do not show the marked response to L-Dopa, or other dopamine agonists, that characterises the early stages of PD. It is, therefore, unlikely that such patients will benefit from the replacement of dopamine-producing cells that current stem cell research focuses on. Although transplants may ameliorate some of the motor symptoms associated with MSA, greater success may rely on the transplanted cells homing to other sites of neuronal loss, for example, the putamen, globus pallidus, caudate

and subthalamic nuclei and differentiating into the required cell type. Such activity would rely heavily on cues within the host environment. Unfortunately, much work remains to be done in accurately delineating the components of this "stem cell niche" and its effects on stem cell survival and differentiation.

It is necessary to acknowledge the controversy that surrounds ES cell research as the successful isolation and culturing of these cells has opened a Pandora's box of ethical dilemmas. Dissenters to the research argue that medicine is being advanced by means of sacrificing human life. Central to these heated debates is the fact that ES cells are being derived from human embryos. Specifically, they must be derived from a blastocyst, which develops approximately five to seven days post-fertilisation and, therefore, represents the very early embryo. ES cells are derived from the 'inner cell mass' of the blastocyst, and the process of acquisition necessitates its destruction; hence, there is a moral and ethical debate surrounding this research. It is not my intention to elaborate on the moral status of the human embryo and resulting societal divisions, but readers should be aware that the field is fraught with ethical issues. This is of particular relevance to ES cell research undertaken in countries such as the US and Germany, where ethical concerns have played a significant role in research guidelines.

In summary, there is therapeutic potential for ES cells and their derived sublineages in the treatment of Parkinson's disease. Accurate and safe cellular differentiation is a fundamental prerequisite to mainstream clinical application. Research currently relies heavily on animal models and hence success, as measured by human clinical trials, is likely to be long term rather than short term. The potential of similar transplants for treating MSA remains more questionable due to a lack of response to dopamine agonists in these patients.

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Cindy Towns is an MBChB/PhD student entering her fifth year at the Dunedin School of Medicine. Her thesis considers the ethical issues relating to embryonic stem cell research. She is the co-author of a paper on stem cells and embryos recently accepted by *The Journal of Medical Ethics*. This paper was written originally as a Case Appreciation.

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Hip problems in adults with spastic quadriplegic cerebral palsy

Han Truong, Tim Gregg
Wellington School of Medicine

Abstract

The objective of this study was to review the prevalence of hip pain, hip dislocation, sitting balance difficulty and perineal care difficulty in adults with spastic quadriplegic cerebral palsy (SQCP). A total of 36 patients with SQCP were identified by the study, and 35 completed questionnaires. Hip related problems were common in the study group with 43% reporting current hip pain, 40% reporting difficulty with sitting balance and 40% reporting difficulty with perineal care. No association was found between these hip related problems.

Cerebral palsy is a diagnosis dependent on the presence of a non-progressive lesion of the central nervous system, motor impairment caused by this lesion, and onset before the age of two. Patients with SQCP suffer from severe motor impairment in all four limbs and abnormal posture. Cognitive impairment is common, with full-time care often required. Spasticity in the lower limbs is the cause of hip dislocation and can lead to hip pain, impaired sitting balance, problems with perineal care and fracture.

Reported prevalence of hip pain in patients with SQCP varies between 29% and 47%.^{2 4 6-8} Studies show an association between hip pain and hip dislocation. Moreau et al⁵ and Sherk et al⁹ found that half (52.4%, 53.3% respectively) of their patients with a dislocated hip experienced hip pain. However, Hodgkinson et al noted that 22% of his patients with reduced hips also experienced hip pain,² suggesting that there are other contributory factors and that hip reduction alone may not improve pain in some patients with a dislocation.

Sitting balance influences the ability to use wheelchairs, the degree of nursing care required, and the likelihood of decubitus ulcers. Impaired sitting balance has a prevalence between 33 and 100%⁴⁻⁶ depending on the degree of pelvic obliquity and scoliosis. A higher prevalence of impaired sitting balance may reflect studies involving more severely affected patients. However, Pritchett⁶ suggested that achieving sitting balance is better determined by the efforts of nursing staff than the state of a patient's hips.

Difficulty with perineal care occurs due to severe

adduction contractures at the hip, with or without hip pain. Moreau et al⁵ and Knapp and Cortes⁴ found a prevalence of 33% and 38% respectively. However, the prevalence of perineal care difficulty can vary depending on the number of patients who undergo corrective surgery.

Hip dislocation is a major problem for patients with SQCP and has been associated with hip pain,^{1 2 5 7 9} scoliosis,^{1 4 5} pelvic obliquity,^{1 5} fracture,⁶ and interference with ambulation.^{3 7} The reported incidence in adults ranges between 25 and 75%.^{1 4 7 9} Prevention and early intervention is the recommended treatment,^{1 3 4} but reduction of an established dislocation is dependent on the severity of associated symptoms.

In patients with a dislocated or subluxated hip secondary to SQCP, pelvic obliquity and scoliosis frequently co-exist and have a prevalence between 41 and 71%^{1 4-7} and 47 and 72%^{1 4 5} respectively. This association is not thought to be causative,^{1 6 10} but it does increase the more severely affected a patient is.¹ Unilateral hip dislocation is more frequently seen on the high pelvis side in patients with pelvic obliquity.^{1 6 7 10}

The aim of this study was to review the prevalence of hip pain, hip dislocation, sitting balance difficulty, and perineal care difficulty in adults with SQCP as identified on the Capital Coast District Health Board (CCDHB) database.

Method

A retrospective audit of patients diagnosed with SQCP

who had been admitted to Wellington Hospital between 1992 and 2003 was undertaken. Patients were identified through the CCDHB inpatient database and the Wellington Hospital Paediatric Department inpatient database using appropriate ICD 09 (1992-1998) and ICD 10 codes (1999-2003). The searches were limited to inpatients, as equivalent outpatient databases do not currently exist. Medical records were then checked to exclude deceased patients, those not diagnosed with SQCP, and those under 16 years of age. Patients were asked to complete questionnaires, with the aid of the main caregiver as appropriate. Patients preferring not to participate in the study were asked to return their questionnaire blank. Patients who did not reply were then contacted by telephone and the questionnaire completed in that manner.

The CCS Wellington office (formerly Crippled Children's Society), on behalf of researchers, also sent questionnaires to patients as identified on the CCS database. Patients who replied allowed researchers to access their medical records and thus confirm inclusion or exclusion from the study. There was no follow-up of patients who did not reply, as their contact details remained confidential to CCS.

Results

A total of 197 patients were identified from the CCDHB database searches. Of those, 50 patients were confirmed to have SQCP and be over the age of 16. Of those 50 patients, 9 were deceased and 9 were unable to be contacted due to out-of-date contact details. Of the remaining 32 patients, 16 mailed completed questionnaires, 15 questionnaires were done by telephone, and one patient did not reply (reply rate = 97%).

Ninety patients were identified on the CCS database and sent questionnaires. Of those, 37 replied (41%) but only four patients were confirmed to have SQCP and included in the study. The remaining 33 patients were excluded (not spastic quadriplegic cerebral palsy = 11, blank questionnaire = 11, too young = 6, already received questionnaire from Wellington Hospital = 4, incorrect address = 1).

The total number of SQCP patients in the study was 36 (CCDHB = 32, CCS = 4) of which 35 (97%) completed questionnaires. There were 17 males and 18 females, and the mean age was 25 (range 16-52). A total of 89% (31/35) of patients were non-ambulatory, 3% (1/35) required crutches and 9% (3/35) were able to walk without aids.

Questionnaire results

43% (15/35) of patients suffered from current hip pain severe enough to interfere with regular daily activities. 43% had difficulty with sitting balance indicated by difficulty with being positioned in a chair.

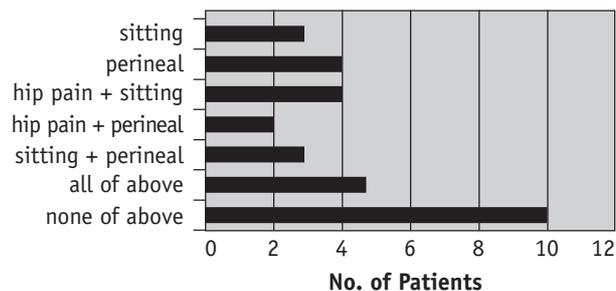


Figure 1: Hip problems in spastic quadriplegic cerebral palsy patients.

40% (14/35) of patients had difficulty with perineal care attributable to hip immobility.

Unmanageable pain was prevalent in 7% (1/15) of patients reporting hip pain. The remaining 93% of patients with current hip pain were adequately managed either with (5/15) or without (9/15) medication.

Multiple hip problems were reported by 40% (14/35) of patients as shown in Figure 1.

All the problems of hip pain, sitting balance difficulty and perineal care difficulty were experienced by 14% (5/35) of patients. In 29% (10/35) of patients, none of the above hip problems were prevalent.

Of the 15 patients with current hip pain, 60% (9/15) also experienced difficulty with sitting balance, compared to 30% (6/20) of patients without hip pain. This difference was not statistically significant ($\chi^2 = 3.15$, $df = 1$, $p = 0.076$) and does not suggest an association between current hip pain and difficulty with sitting balance.

Of the 15 patients with current hip pain, 47% (7/15) also experienced difficulty with perineal care compared to 35% (7/20) of patients without hip pain. This difference is not statistically significant ($\chi^2 = 0.49$, $df = 1$, $p = 0.486$) and does not suggest an association between current hip pain and difficulty with perineal care.

Table 1: Types of hip surgery

Surgery Type	No.	%
girdlestone	1	8
proximal femoral resection	3	25
femoral osteotomy	4	33
soft tissue release	2	17
unable to remember	2	17
total	12	100

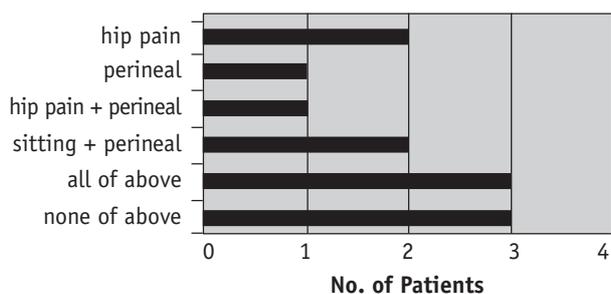


Figure 2: Hip problems in surgery patients.

Of the 15 patients that had difficulty with sitting balance, 53% (8/15) also had problems with perineal care compared to 30% (6/20) of patients without sitting difficulties. This difference was not statistically significant (chi-sq = 1.94, df = 1, p = 0.163).

Of the 35 patients in the study, 34% (12/35) were found to have had hip surgery. Of those patients, 83% (10/12) experienced hip pain prior to undergoing their hip surgery and all stated a reduction in hip pain post-recovery.

Table 2: Current hip state in patients reporting a previous hip dislocation

patient	Self Report		Radiograph	
	right hip	left hip	right hip	left hip
1	reduced	disloc	reduced	disloc
2	disloc	reduced	sublux	reduced
3	disloc	disloc	resected	disloc
4	disloc	reduced	resected	reduced
5	disloc	reduced	reduced	reduced

NB: disloc = dislocated sublux = subluxated

Table 3: Current hip state in patients not reporting a previous hip dislocation

patient	Self Report		Radiograph	
	right hip	left hip	right hip	left hip
1	reduced	reduced	reduced	reduced
2	reduced	reduced	disloc	sublux
3	reduced	reduced	sublux	reduced
4	reduced	reduced	reduced	reduced
5	reduced	reduced	reduced	reduced
6	reduced	reduced	reduced	reduced
7	reduced	reduced	reduced	sublux
8	reduced	reduced	reduced	reduced

NB: disloc = dislocated sublux = subluxated

Of the 12 patients who had surgery, 50% (6/12) had current hip pain, 42% (5/12) had difficulty with sitting position, and 58% (7/12) had difficulty with perineal care.

Of the patients who had surgery, 25% (3/12) currently suffer from all the problems of hip pain, difficulty with sitting balance and difficulty with perineal care. In another 25% (3/12) of patients, none of the above hip problems were prevalent.

The questionnaire results show that 37% (13/35) of patients reported having had a past hip dislocation. This involved the right hip in 54% (7/13) of cases, the left hip in 15% (2/13) of cases and both hips in 31% (4/13) of cases. The current state of a patients' hips – whether they be reduced, dislocated, subluxated or resected – was assessed by examining the patient's most recent hip radiograph. The radiographs of 16 patients were located and of these, 13 were radiographs of the hip.

Of the 13 patients who reported having had a previous hip dislocation, hip radiographs could be located for five of them. The current state of right hips was reduced in 40% (2/5), subluxated in 20% (1/5) and resected in 40% (2/5). The current state of left hips was reduced in 60% (3/5) and dislocated in 40% (2/5).

Of the 22 patients who did not report having ever had a hip dislocation, hip radiographs could be located for 8 of them. The current state of right hips was reduced in 75% (6/8), subluxated in 13% (1/8) and dislocated in 13% (1/8). The current state of left hips was reduced in 75% (6/8) and subluxated in 25% (2/8). This shows there was either a hip dislocation or subluxation in 38% (3/8) of patients who reported never having had a hip dislocation.

Discussion

The aim of this study was to review the prevalence of hip pain, hip dislocation, sitting balance difficulty and perineal care difficulty in adults with SQCP. No association was found among these problems but they were found to affect a significant number of patients within the study population.

The prevalence of hip pain among adults with SQCP was 43%. This is comparable with other studies which report a prevalence between 29 and 47%.^{2,4,6-8} It was found that 43% of patients also had impaired sitting balance. Again, this compares with the literature which reports between 33 and 100%,⁴⁻⁶ depending on the degree of pelvic obliquity and scoliosis.

Difficulty with perineal care was reported by 40% of participants in this study. This is slightly higher than the 33% and 38% reported by Moreau et al⁵ and Knapp and

Cortes⁴ respectively. However, the incidence of difficulty in perineal care was influenced by whether the patient had surgical correction of their adduction contractures.

The reported incidence of hip dislocation in adults with SQCP ranged from 25% to 75%.¹⁴⁷⁹ No assessment of hip dislocation was possible in this study due to the unreliability of self-reported dislocation and lack of hip radiographs. The 37% of patients reporting a previous hip dislocation is likely to be an underestimate, because dislocated or subluxated hips were evident from radiographs of a further 38% of patients not reporting a previous hip dislocation.

All 12 patients who had previous hip surgery reported an improvement in pain post-recovery. However, the questionnaire showed that half of these patients currently experience hip pain, and 25% experience all the problems of hip pain, difficulty with sitting balance and difficulty with perineal care. Comparisons between patients with prior hip surgery and those without cannot be made, but it is important to note that many hip-related problems remain prevalent in both groups.

Obstacles complicating this study included patient identification, contacting patients, patient response, and interpreting medical records. Identifying patients with SQCP was difficult as "343.9 Infantile cerebral palsy, unspecified" and "G80.9 Cerebral palsy, unspecified" were the diagnosis codes most commonly encountered in the CCDHB databases. This forced the use of non-specific search terms to reduce premature exclusion from the study, and meant that medical records were necessary to confirm diagnoses of SQCP.

CCS clients were contacted through the CCS Wellington office to assess how effective the CCDHB database was at identifying patients with SQCP, and also to include any patients not yet identified. This was problematic as the coding system previously used by CCS did not differentiate between different types of cerebral palsy, and meant that questionnaires were sent to clients without SQCP.

Having identified 41 patients appropriate for inclusion in the study, nine were subsequently excluded because of out-dated contact details, and patient information outside the CCDHB database was inaccessible. Details of CCS clients are confidential to CCS, so patients could not be excluded before questionnaires were sent, and only patients returning questionnaires could be confirmed to have SQCP.

Many of the questionnaires were completed by telephone (47%), as the response by mail was poor (50%). Caregivers were often reluctant to answer on behalf of patients with significant communication difficulties. With their concerns acknowledged, caregivers were more willing to interpret

patients' behaviour to answer the questionnaire.

Changes in caregiver also meant that the past medical history of some patients was incomplete. This may explain why some patients have radiographic evidence of a previous hip dislocation despite reporting the opposite. It was not possible to accurately assess the current state of patients' hips as only 16 patients had previous radiographs that could be located. Radiographs at Wellington Hospital are destroyed after seven years (adult) or when a patient reaches age 17 (paediatric). Written medical records did not prove a reliable way to assess the current state of a patient's hips.

There are several ways that the study could be improved.

1. Access to the databases of more district health boards would have provided a larger study population.
2. A better way of establishing patients' current contact details would further increase the study population and reduce selection bias.
3. Physical examination of patients would allow a more uniform and objective assessment of hip pain, sitting balance, and perineal care.
4. Radiographing the pelvis would provide information regarding current hip state, pelvic obliquity, and scoliosis. These could then be analysed for associations with each other and also with the symptoms of hip pain, perineal care difficulty, and sitting balance difficulty.
5. A prospective study into SQCP would improve patient diagnosis coding, ensure contact details were kept current, and monitor the long-term outcomes of medical and surgical treatments.

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Han Truong is currently studying as a trainee intern at the Wellington School of Medicine and is a Medical Officer in the Royal New Zealand Army. Han's research into spastic quadriplegic cerebral palsy was part of a summer studentship in orthopaedics run through the Wellington School of Medicine Surgical Research Trust.

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'She feels I hold too much in': exploring romantic intimacy, mental illness and masculinity

Chris Ansley

Dunedin School of Medicine

This research begins to explore relationships between masculinity and mental health, as experienced by men. For this paper, I have selected small excerpts of speech to explore patterns in how men described their experiences of mental health problems as they impacted on relationships with women. Employing a discourse analytic perspective, I identified three patterns of intimacy where men interwove talking about their relationships with women and their experiences of mental distress. Discourse analysis can be thought of as uncovering the cultural resources used by people to construct their identity and relationships that would otherwise remain tacit.¹

Research has shown that men with physical disabilities emphasise the importance of emotion and trust in communication as defining features of their intimacy with romantic partners. This involves a negotiation of masculine notions of sexuality, which stress the physicality of sexual intimacy unavailable to them due to physical disability.² We might expect that men with mental disabilities might also handle intimacy differently, since relationships with self and others are strongly affected by mental health problems. There appears to be very little literature that systematically addresses men's views about mental health problems and intimacy; this research begins to address that gap.

Focusing on the material structure of gender relations, attention has been paid to the notion of hegemonic masculinity, ie the practices employed by men in order to sustain and legitimate a dominant and privileged position in their relationships to women.³⁻⁵ A discourse analytic perspective suggests that men are involved in a process of positioning "themselves in relation to conventional notions of the masculine".⁶ Together these strategies suggest that attention must be paid to men's descriptions of their relationships with women alongside the nature of the positions they assume within these relationships.^{7 8}

Relationships between women and men are a critical site for the construction of masculinity and femininity.³ For the purpose of this paper 'intimacy' is defined as talk by men about their close relationships with women contributing to the formation of masculine identity. My questions are: how do men negotiate conventionally

masculine notions of manhood that reject emotional expressiveness? What influences do dominant and privileged forms of masculinity have over patterns of intimacy? How are women portrayed within this process? In what ways do men who have experienced mental health problems resist conventional masculinity? And what consequences do these processes produce in relationships between women and men?

A similar study found that although men had experienced long-term unemployment they had not necessarily moved away from hegemonic forms of masculinity.⁹ We might also expect to find that the experience of mental illness would not necessarily bring about the adoption of equitable practices by men even though mental illness might lead to different patterns of relating.

Interviewing men: Face-to-face interviews

Excerpts from three face-to-face interviews with men have been selected for this discussion. The larger study involves investigating mental health problems as they impact upon masculinity as a whole. The research conducted by Lapsley, Nikora and Black into recovery from mental health problems provided a context from which I designed the larger study.¹⁰ A semi-structured interview schedule was employed where men who have experienced mental health problems were given freedom to talk about themes of masculinity as they related to their lives. They were selected according to their identification as male and Pakeha (NZ European) and were recruited through professional and personal networks. Face-to-face

interviews were chosen so as to produce a rich source of qualitative data.^{11 12} The interviews were recorded on audiotapes and transcribed with basic notation. By matching the gender of the participant with the interviewer it was anticipated that the participant would more readily and safely talk about their experience.

Three patterns of intimacy

Intimacy within a mental health discourse

Jo, in his mid-thirties and currently employed, told me that a manic phase destroyed his first marriage, but now, in his second marriage, he and his wife actively discuss and co-manage his mental illness. Jo talked of being emotionally inexpressive until a suicide attempt confronted him with the nature of his mental health problem. He and his wife began a gruelling process of marriage counselling from which a pattern of emotional expressiveness emerged and continued in their relationship. Reflecting on intimacy, he believes this relationship has been his first 'close' relationship.

Discussing a period of depression, he frames intimacy between him and his wife within a mental health discourse. He says, "So you don't really notice yourself out of it [depression], you just notice yourself in there. I spent, my wife spends more time with me self-monitoring I suppose just to make sure I know where I'm at ..."

Jo's description of being 'close' to his wife draws upon a mental health discourse that suggests monitoring one's mental health status prevents mental distress and promotes recovery. He says his wife encourages him to be emotionally open and together they adopt monitoring practices. This pattern of intimacy stimulates openness between them, his wife "likes that I share with her. She feels I hold too much in". The self-monitoring pattern of intimacy enhances and constitutes an aspect of the intimacy of their marriage.

Intimacy within a self-awareness discourse

Bill, now in his early fifties, talked of two marriages ending with suicide attempts that have led him to emphasise the importance of self-awareness as a self-protective strategy. In recent times his romantic relationships have developed 'complications' and at these times he experiences "spinning out. Everything turns to shit, I lose my focus, and I lose my balance, I just, you know." Contending with emotionally 'spinning out' is made more complicated by women who are 'stuck into that mode of thinking', that is, lacking self-awareness. He says, "I certainly know what my feelings are, I'm certainly really in tune with what's going on for me. I have to contend with other people who aren't." He went on to recount the history of a recent relationship. A feature was a mutual identification over issues of trauma and recovery experienced during their lives.

The pattern of intimacy Bill described provided a stable emotional platform to begin a romantic relationship at the same time maintaining his own mental health. Such an account of intimacy gives explicit esteem to frankness and self-awareness, allowing this potential new partner to negotiate relationship options she was comfortable with. Bill says of her decision:

... she decided that she couldn't handle a relationship because of her stuff that happened to her as a child. She just, closed herself off and she's not able to have sexual relationships with men... But we ended up becoming friends in the end *quite good friends*. I know she does like me, if she was able to have sexual relationships she probably, she would, she's not able to and I'm not going to.

Through an account of intimacy with self-awareness at its centre, Bill and his friend were able to negotiate a mutually fulfilling friendship whilst maintaining his own mental health.

Intimacy within a heterosexual discourse

Anastra, in his 40s, married, unemployed and a father of three children spoke with great enthusiasm about the role of women in his life. He spoke to me of a history of sexual promiscuity as a prominent and exciting feature of his life. This sexualised pattern of relating to women was imbedded within heterosexist notions of gender relations, saying they "[women] are God's greatest gift to man ...". He described a sexualised pattern of intimacy through which he has gained support when he has experienced mental distress:

That soft melodic tone of the voice of a woman is something that mellows the soul. And makes you more, what's the word, sort of within yourself you can, um, retreat within yourself and feel that there's something there. I'm a breast man myself, you know. I enjoy all aspects of women. I think that they are gorgeous.

The pattern of intimacy described by Anastra is constituted through a heterosexual discourse. Women are constructed as sexualised objects that provide sensual comfort that "mellows the soul".

Conclusion

Drawing upon various discourses the three men display diverse patterns of intimacy, which offer them different ways of relating to women. Anastra's account resembles hegemonic masculinity in light of the privileged nature of the relationship he described. Jo and Bill adopted discourses that appear to have enhanced both intimacy and their mental health simultaneously resisting conventional notions of masculine inexpressiveness.

However, positions in gender relations are contradictory. An enhanced pattern of intimacy may not reflect the presence of non-oppressive practices in other dimensions.⁸

This paper is the initial analysis of talk around relationships with women, in which intimacy emerged as a concern. Other relationship issues included custody cases, separation and divorce, breaking up and homicide. The larger study will also explore the impact of mental health problems and mental health institutions on fatherhood, employment, manhood and sexuality.

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Chris Ansley is a third year medical student with the Faculty of Medicine, University of Otago. Chris has a BA and a MSocSc(Hons) from the University of Waikato in English Literature and Community Psychology respectively. Chris has drawn this article from his masters thesis which explored Masculinity and Mental Health.

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Physician burnout: a pilot study

Shelley M. Bruce

Wellington School of Medicine

Abstract

This study assesses the level of burnout in a sample of New Zealand physicians, associated work and personal characteristics, and the need for development of a peer supervision or support system. Questionnaires that measured a number of work and personal characteristics, including the Maslach Burnout Inventory, and additional questions regarding mistakes, and need for support, were sent to 83 physicians in the Waikato and Bay of Plenty areas. Of the 50 respondents, 28% experienced high levels of two or three of the three aspects of burnout (emotional exhaustion, depersonalisation, low personal accomplishment). Emotional exhaustion correlated with a greater need for support. Most respondents favoured a one-to-one support system. This study highlights the need for a nationwide survey of physicians to measure levels of burnout with a view to developing a preventative support system.

It is well documented that doctors experience a high level of stress in their profession and that this can lead to physical, psychological and emotional harm, in particular, burnout.¹⁻³ Burnout is a syndrome defined by Maslach and Jackson as consisting of emotional exhaustion, depersonalisation (a tendency to have negative and cynical thoughts towards other people, patients included), and a reduced sense of personal accomplishment.⁴ Burnout is of particular concern in the medical setting as it is believed to reduce the quality of care doctors are able to provide patients.^{1,2}

Researchers in the UK and USA have investigated levels of stress, burnout and associated psychiatric morbidity in health professionals across many specialties, with a view to prevention of these adverse outcomes.^{1,5-11} In previous work the main correlations and possible causes of burnout appear to be lack of autonomy, excessive bureaucratic interference and paperwork, work overload, role conflict, helplessness to influence policy, and lack of variety in one's daily work.^{1,2,3,6,7,12} Burnout has also been correlated with psychological disturbance (assessed using the 12-item general health questionnaire^{6,7}), and greater levels of anxiety and depression.² Age tends to be negatively associated with burnout,^{6,7,12} and although males and females seem to be affected differently by burnout, there is no strong evidence that either are more at risk.²

In New Zealand, the limited research into stress and burnout in doctors has focused on general practitioners,^{13,14} with

little emphasis on the stresses of clinical practice on physicians, and no studies on the impact of burnout. In 2001, Dowell et al reported that 12.5% of 279 physicians described a level of symptoms associated with severe psychological disturbance,¹³ similar to the 9.9% found in 377 GPs in 2000.¹⁴ In addition, physicians reported lower levels of job satisfaction.^{13,14} Pressures facing physicians may well differ from colleagues in general practice. It is, therefore, important to determine the needs of physicians with a view to developing a system to improve their health and well-being, and the quality of patient care.

Research focusing on stress in GPs has prompted the implementation of peer support groups and systems for mentoring.^{8,9,15} These support systems enable GPs to acknowledge, discuss and solve professional and personal problems with peers or a professional supervisor at an early stage, and have been documented to reduce stress and improve morale for those involved.^{8,9,15} Despite the success and benefits of these support systems in general practice, however, there is little confidential support or supervision for physicians.

The aim of this pilot study was to determine the need for a support system for New Zealand physicians by measuring the levels of burnout and effective well-being, in a sample from the Waikato and Bay of Plenty. We report on the impact of work characteristics and educational activities on burnout, how physicians deal with problems due to mistakes in clinical practice, and their views on introducing a system for peer support/supervision.

Methods

The participants were 83 physicians, comprising 76 members of the Royal Australasian College of Physicians in the Waikato and Bay of Plenty area, and seven additional consultants in these areas. All were sent a questionnaire in early December 2002 that was numbered to ensure confidentiality, and accompanied by a letter explaining the purpose of the study. A single reminder letter was sent out one month after the initial questionnaire had been sent.

The questionnaire aimed to assess the following attributes of the participants:

Demographic information: Personal details were obtained on age, gender, marital status, number of dependent children and ethnicity. Details were obtained on qualifications, specialty, number of years employed as a consultant, primary place of employment, and number of hours worked at primary place of employment.

Burnout was assessed using the Maslach burnout inventory (MBI).⁴ The inventory measures the three aspects of burnout; *emotional exhaustion* (feeling emotionally drained), *depersonalisation* (negative/cynical attitudes and feelings about one's patients), *reduced personal accomplishment* (tendency to evaluate one's work with patients negatively). Scores were totalled to give a single figure for each of the three aspects of burnout, but there was no combined total score for burnout. Scores were then assessed as being high, medium or low for each aspect of burnout according to normative ranges for medical workers, found in the MBI.

Work characteristics: Nine work characteristics were assessed as developed by Haynes et al.¹⁶ These characteristics were autonomy and control, feedback, influence over decisions, leader support, professional compromise, role clarity, role conflict, peer support and work demands.

Job satisfaction was assessed using 16 items developed by Warr et al.¹⁷ Total job satisfaction-A is calculated by totalling an individual's scores for the first 15 items, and overall job satisfaction is measured by the response to the 16th item. A second figure for total job satisfaction (total job satisfaction-B) was measured using nine of the first 15 items as selected by Dowell et al.^{14 15} This selection of nine items was found to be more relevant to physicians and GPs than the full 15 questions.

Effective well-being was assessed using three scales developed by Warr.¹⁸ The three scales were anxiety-contentment, depression-enthusiasm, and tiredness-vigour.

Educational activities were assessed by questions developed by Benbow et al.²⁰ The physicians were asked how much time they spent on personal study, research, educational courses, and teaching students or trainees each week. Responses could range from 0 ("0-1/2 hours/week") to 6 (">5 hours/week").

Mistakes and subsequent need for support was assessed using a series of 15 questions developed from Marc et al.²¹ Questions such as "Do you feel the need for support in response to your mistakes?" were scored on a 5-point scale from 1 ("not at all") to 5 ("a great deal"). Responses were defined as "yes" if respondents scored 3 "a moderate amount" or above, and "no" if they scored 1 or 2 "just a little".

The final page of the survey consisted of six questions regarding the relevance of the survey, and of setting up a peer support or supervision system in the respondent's work place, and what type of support service they would prefer. Some questions only offered a selection of answers, for example "If a peer support system was to be developed, would you prefer a one-to-one mentoring or a group support system?" Other questions were left open, for example, "What are the most important and key issues you would want in this peer support programme?"

Table 1
Demographic profile of respondents

		(N = 49)	
Male	42	(86%)	
Female	7	(14%)	
Mean Age (sd) range	46.4	(7.4)	34_69
Married	45	(91%)	
Mean number of dependent children (sd) range	2.2	(1.7)	0_9
Pakeha/ NZ European	42	(86%)	
Other	7	(14%)	
Mean years employed as consultant (sd) range	11.5	(7.3)	
Hours/week at primary place of employment (sd) range	47.2	(11.6)	

Note. One respondent refused to enter demographic details

Table 2

Number and percent of respondents who fall in the low, average and high ranges of burnout for emotional exhaustion, depersonalisation and personal accomplishment

	Number respondents (%) Low Burnout	Number respondents (%) Average Burnout	Number respondents (%) High Burnout
emotional exhaustion			
Maslach Ranges*	≤18	19-26	≥27
Present Study (N=50)	20 (40%)	13 (26%)	17 (34%)
depersonalisation			
Maslach Ranges	≤5	6 - 9	≥10
Present Study (N=50)	23 (46%)	13 (26%)	14 (28%)
personal accomplishment**			
Maslach Ranges	≥40	39 - 34	≤33
Present Study (N=50)	16 (32%)	15 (30%)	19 (38%)

* Ranges established from normative data of 1,104 physicians and nurses in Maslach Burnout Inventory Manual⁴.

** Respondents who score high on personal accomplishment fall in the low range of experienced burnout. Those who score low on personal accomplishment fall in the high range of experienced burnout.

Data was analysed using Microsoft Access, Excel, and *Statistica*[®]. The differences between sample means and normative data were computed with statistical significance set at $P=0.05$. The strength of relationships between the three aspects of burnout and other study variables were measured using Pearson's correlation coefficients.

Results

Of the 83 physicians surveyed, 50 returned usable questionnaires, giving a response rate of 60%. Of the 49 respondents who completed this section, the mean age was 46.4 years, with 86% being male and 91% married. Most respondents were Pakeha/NZ European (86%), and the other 14% were South African, European, Asian, and Sri Lankan. No physicians in the sample were Māori. The mean number of years employed as a consultant was 11.5, and mean number of hours worked per week at primary place of employment was 47.2. Twenty-four percent of respondents were paediatricians, with the rest representing other specialities.

Overall, sample means were not significantly different to normative data for medical workers in the Maslach Burnout Inventory Manual.⁴ Mean scores (and standard deviations) for emotional exhaustion, depersonalisation, and personal accomplishment were 21.8 (10.6), 7.1 (5.1), and 36.0 (6.5), respectively. However, 34% showed a high degree of emotional exhaustion, 28% showed a high degree of depersonalisation, and 40% showed a level of low personal accomplishment, all of which fall in the range indicating a high risk of burnout. Five respondents (10%) scored in the high range for all three aspects of burnout. They were all married men who worked most of their time in hospital practice. Of these five, one would prefer a one-to-one mentoring programme, two would prefer a peer support group, and two did not answer the open question. Only two individuals (4%) scored in the low category for

all three aspects of burnout. Twenty-eight percent of respondents scored in the high level of burnout on two or more of the burnout subscales.

The only significant correlate between the three subscales of burnout and demographic information was age, which was negatively correlated with emotional exhaustion (Pearson's correlation coefficient -0.35, $p<0.05$). This relationship suggests that younger physicians are associated with higher levels of emotional exhaustion.

Higher levels of emotional exhaustion correlated significantly with a greater degree of depersonalisation, anxiety, depression, tiredness, and psychological disturbance. Emotional exhaustion was also associated with higher levels of professional compromise, role conflict and work demands, and lower levels of autonomy and control, feedback, role clarity, and job satisfaction.

Higher levels of depersonalisation were associated with lower levels of autonomy and control, and higher degrees of professional compromise and work demands. Higher levels of personal accomplishment were associated with a lower degree of anxiety, depression, tiredness, and psychological disturbance, a higher degree of role clarity, and greater time spent on personal study and teaching. In this sample, none of the three factors of burnout correlated significantly with peer support or leader support, influence over decisions, or amount of time spent on research or attending educational courses.

Correlations between burnout and questions on making mistakes in Clinical Practice, and the subsequent need for support

In general, higher levels of emotional exhaustion were associated with a greater need for support after making mistakes in clinical practice. High emotional exhaustion

scores correlated significantly with greater feelings of self-doubt, disappointment and self-blame in response to mistakes and a greater need for reassurance. Individuals with emotional exhaustion reported a greater need to talk to someone about their mistake, greater need for validation of their decision-making process, and reaffirmation of their professional competence. Depersonalisation was significantly correlated with a greater need to talk to someone about their mistakes, and a greater need for reassurance of personal self-worth. Higher levels of personal accomplishment correlated significantly with respondents being more willing to offer a colleague unconditional support if s/he made a mistake in Clinical Practice.

Twenty-nine participants responded to "What would be the relevance of setting up a peer support programme for your clinical practice?" Of these, 16 (55%) believed this would be relevant, or very relevant, and two (7%) thought this would be somewhat relevant. Three

individuals (10%) thought this would be irrelevant, or of limited relevance. Eight (28%) felt that support already existed in their practice informally, and three of these would welcome formalisation of this support.

In response to "If a peer support programme was developed, would you prefer a one-to-one mentoring or a group support system?" 18 did not answer. Of the 32 who did respond, 17 (53%) would prefer a one-to-one mentoring system, nine (28%) would prefer a peer support system, and three (9%) would like a combination of the two systems. Three (9%) did not want either, one of whom felt they already had support informally at work.

Twenty-two of these respondents went on to list the most important and key issues they would want in such a support system. The most frequently stated responses were confidentiality and trust, the ability to talk about concerns, difficulties and feelings, and for meetings to be regular and in protected time.

Table 3
Pearson's correlation coefficients showing the relationship between the three subscales of the Maslach burnout inventory and work characteristics, job satisfaction, effective well-being, and educational activities

Variable	EE	DP	PA
Maslach burnout subscales			
Emotional exhaustion	-		
Depersonalisation	0.41**	-	
Personal accomplishment	-0.12	-0.19	-
Work characteristics			
Autonomy and control	-0.54**	-0.30*	0.29
Feedback	-0.46**	-0.19	-0.23
Influence over decisions	-0.13	0.03	0.16
Leader support	0.08	0.24	-0.02
Professional compromise	0.35*	0.34*	-0.27
Role clarity	-0.46**	-0.20	0.44**
Role conflict	0.39*	0.24	0.04
Peer support	-0.14	0.17	-0.12
Work demands	0.58**	0.32*	-0.30
Job satisfaction			
Total job satisfaction-B	-0.53**	-0.13	-0.001
Overall job satisfaction	-0.63**	-0.17	0.17
Effective well-being			
Anxiety-contentment	-0.66**	-0.21	0.42**
Depression-enthusiasm	-0.68**	-0.25	0.41**
Tiredness-vigour	-0.70**	-0.16	0.40*
Educational Activities			
Personal study	0.33	-0.04	0.33*
Research	0.13	0.14	0.13
Educational courses	-0.06	0.12	-0.06
Teaching	0.30	-0.12	0.30*

Items in bold indicate significance (*p<0.05, **p<0.005) with respect to the present study. Emotional exhaustion (EE), depersonalisation (DP), personal accomplishment (PA)

Discussion

The 50 Waikato and Bay of Plenty physicians who took part in this study reported levels of the three aspects of burnout similar to normative data from medical workers in the Maslach Burnout Inventory Manual.⁴ Mean scores for these three aspects – emotional exhaustion (21.8), depersonalisation (7.1), and personal accomplishment (36.0) – all fell in the middle ranges for the level of burnout experienced. However, 34% of respondents scored in the high range for emotional exhaustion, 28% scored in the high range for depersonalisation, and 38% scored in the high range for reduced personal accomplishment. Ten percent scored in the high range for all three aspects of burnout, indicating the likely presence of burnout, and 18% scored in the high range for two of the three aspects. These 28% are at greatest risk of suffering from the symptoms of burnout, which are associated with significant personal dysfunctions. Physical exhaustion, increased use of drugs and alcohol, marital and family problems,⁴ anxiety and depressive disorders, psychological dysfunction, reduced job satisfaction, increased job turnover, medical errors, and a reduction in patient care and satisfaction² have all been associated with higher levels of burnout. This pilot study is the first to report on the level of burnout experienced by New Zealand physicians.

The three aspects of burnout were also associated with a range of personal and work characteristics. Emotional exhaustion was negatively associated with age, indicating that younger physicians are at greatest risk of experiencing burnout. This finding supports previous research on burnout in the UK and US, which shows that younger employees are more likely to experience burnout,^{6,7,12} but these studies do not specifically link this to emotional exhaustion.

Correlations between the three burnout subscales and work and personal variables have been researched extensively overseas across many professional groups including nurses, teachers, social workers, and various medical specialities.²⁻⁷ Not all studies agree which factors correlate with which aspects of burnout, but some general trends have emerged. The present study found that emotional exhaustion, in particular, was associated with a lack of autonomy, control and role clarity, and increased role conflict and work demands. These findings reflect the trends from previous studies.^{2 5 12}

Job satisfaction is commonly negatively correlated with burnout,^{1 6} specifically to emotional exhaustion, as was found in the present study, but also with depersonalisation and reduced personal accomplishment.⁶ Ramirez et al suggested that job satisfaction actually protects consultants from burnout.⁷

A study of 1045 psychiatric nurses showed that positive affect was associated with all three factors of burnout,

and negative affect was associated with higher levels of emotional exhaustion and depersonalisation.⁶ The present study showed that anxiety–contentment, depression–enthusiasm, and tiredness–vigour scales significantly correlate with emotional exhaustion and personal accomplishment, but not with depersonalisation.

Previous studies showed that peer cohesion, peer support, and supervisor support correlate with reduced levels of burnout,^{6 12} whereas the present study showed no significant relationship between peer or leader support, and burnout. Leiter et al suggest that professional support plays a dual role of alleviating and aggravating burnout.²² A larger study is needed to confirm such a correlation in a New Zealand-wide survey of physicians.

Amount of time spent on personal study, and teaching students or trainees, significantly correlated with increased personal accomplishment, but had no association with emotional exhaustion or depersonalisation. The relationship of these educational activities with burnout has, to our knowledge, not previously been assessed.

This study is the first to compare how making mistakes in clinical practice, and subsequent feelings, correlate with the three aspects of burnout. Findings suggest that physicians showing high levels of emotional exhaustion report a greater need to talk to someone after making a mistake, and need support. They also have a greater need to be reassured of their personal self-worth, their professional competence, and their decision-making process. This suggests that setting up a peer support or one-to-one supervision system would greatly benefit physicians who are at high risk of burnout.

Of the 32 physicians who responded to the question regarding preferred support, the majority (53%) chose one-to-one supervision, 28% preferred peer-support, and 9% would like a combination of the two. A further 9% were opposed to both these options. From these responses we suggest that if a peer support or supervision service was developed in New Zealand by the RACP, it should be voluntary, and perhaps a component of audit in the maintenance of profession standards programme.

Limitations of this study include response rate, survey length, small sample size and study design. The response rate of 60% is a possible source of error. Larger samples are always desirable for more representative results. This survey was 11 pages long and may have taken a considerable amount of time to complete, which would have been a deterrent to many doctors.

We have been able to identify the level of burnout in a sample of 50 Waikato and Bay of Plenty physicians, determine some correlating factors, and assess the physicians' views on the need for support in their clinical practice. With a larger sample, however, we would be

able to assess which factors best predict burnout using multiple regression techniques.

As a cross-sectional study, the results show the impact of burnout at 'one point in time'. Some respondents mentioned that the timing of the survey coinciding with Christmas could have had some impact on responses. Longitudinal studies, although much more difficult to achieve, would give insight into the development of burnout over time. Such studies may be desirable in the future, but it is important in the first instance to identify how many physicians may be at risk of burnout at one time, as can be done via a cross-sectional study.

Conclusion

This pilot study provided important information on the levels of burnout in Waikato and Bay of Plenty physicians, and work factors and personal characteristics associated with those levels. We recommend a nationwide study to assess burnout in New Zealand physicians as a whole, and the work and personal factors that significantly correlate with burnout in that group. Further studies should also establish physicians' preferences for setting up peer support or supervision services.

Shelley Bruce is a fifth year medical student at the Wellington School of Medicine. Prior to commencing medical studies, Shelley completed a BSc in Neuroscience through Otago University. Shelley wrote this paper as a completion of a summer studentship at the Waikato Clinical School in early 2003 and presented the study findings at the RACP/NZRA/IMSANZ Meeting held in Rotorua in September.

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Intramuscular vitamin K in the newborn and childhood cancer – a literature review of evidence for best practice

Lachlan Smith

Dunedin School of Medicine

Newborn infants are born deficient in vitamin K and its associated coagulation factors, and are therefore prone to developing vitamin K dependent bleeding (VKDB). This haemorrhagic disease is severe, but its incidence has been successfully reduced through a single dose of intramuscular Vitamin K given to newborns soon after birth. Oral administration is possible but requires repeated doses and is prone to failure due to poor feeding, regurgitation and cholestatic disease.

In 1992, a case-control study of two English maternity hospitals revealed a link between intramuscular vitamin K and childhood cancer (odds ratio 1.97 (confidence level 1.3-3.0)).⁴ There was no link found with oral administration. A number of criticisms were made of the study, particularly its method of data collection, matching, and generalisability. Nevertheless, its findings generated significant concern. Recommendations from the British Paediatric Association resulted in substitution of intramuscular for oral vitamin K, and the unfortunate recurrence of VKDB. Larger studies have been unable to satisfactorily confirm the proposed link between vitamin K and cancer, and it is felt the risk is extremely small, if real at all. As it is certain that the risk of VKDB is virtually eliminated with a single intramuscular dose of vitamin K, this remains the most prevalent practice worldwide.

In order to establish the influence of vitamin K on childhood cancer, the author carried out a literature review on the Medline database and discussed the matter with a Dunedin paediatrician. Further background material was provided by a New Zealand consensus statement, published in 2000, on the use of vitamin K in the newborn.¹ The following introduction includes a description of neonatal vitamin K deficiency, types and manifestations of VKDB, and a brief history of the use of supplemental vitamin K in the newborn. The article continues with critical appraisals of research and review articles published over the previous decade, in order to establish the validity of statements regarding the risks of supplemental vitamin K. The article concludes with a summary of the New Zealand consensus statement.

It is standard practice in Dunedin Public Hospital to administer a single dose of intramuscular vitamin K to all newborn infants, in order to prevent vitamin K dependent bleeding (VKDB),¹ a practice consistent with the world's major teaching hospitals. All newborn infants are deficient in vitamin K, detectable by an elevated prothrombin time and low plasma concentrations of vitamin K and the vitamin K-dependent coagulation factors II, VII, IX, and X.² As the concentration of vitamin K in breast milk is low and it has a half-life of only 24

hours, there is a high likelihood that deficiency will worsen if the baby feeds poorly, regurgitates excessively, or suffers from malabsorption.³

VKDB is typically separated into three categories: early, classic, and late. Early VKDB causes bleeding in the first 48 hours and is attributed to maternal anticonvulsant therapy,³ particularly with barbiturates and phenytoin. Classic VKDB occurs in the first week of life in 0.4-1.7 per 100 births. It is associated with severe internal, gastrointestinal, and intracerebral bleeding. Bleeds may result in significant mortality and neurologic sequelae. Late VKDB is more rare, varying from 4.4-10.5 per 100 000 births, and occurs in infants 2-12 weeks of age. It is strongly associated with breast feeding and malabsorption, for example in cholestasis or biliary atresia.

The risk of VKDB is made negligible by a single intramuscular dose (1.0mg) of vitamin K at birth. This intervention was standard practice during the last 50 years. At times there were concerns raised that such an intervention may be harmful or unnecessary for the newborn. This led to varied practices including omission of therapy, treatment with oral vitamin K, or treatment reserved for 'at risk' babies ('at risk' implies babies born pre-term, with significant perinatal illness, or any delay in the onset of feeding). All

of these practices resulted in the recurrence of VKDB and an increase in perinatal mortality.³

In 1990 Golding et al reported results from the Oxford Survey of Childhood Cancers that suggested an increase in leukaemia and other cancers in children who received intramuscular vitamin K at birth.⁴ These findings were supported by a case-control study published in 1992 by Golding et al⁵ that found a statistically significant two-fold increase in risk of childhood cancer in children who received intramuscular vitamin K at birth. There was no association found between oral vitamin K and cancer.

These findings created an uproar in the field, as any increase in cancer would far outweigh a reduced risk of VKDB. A flood of studies emerged over the decade, some finding no link and others inconclusive.

Childhood cancer, intramuscular vitamin K and pethidine given during labour

A retrospective case-control study was used to assess the relative risk of childhood cancer in babies given oral or intramuscular vitamin K at birth.⁵ Cases included 195 children with cancer born in the two major Bristol (England) maternity hospitals, and controls were 558 children identified from the delivery books. A significant association was found in children receiving intramuscular vitamin K when compared to oral vitamin K or no vitamin K. The odds ratio was 1.97 (1.3-3.0, $p = 0.002$). There was no increased risk found with oral vitamin K.

There were a number of limitations to the study in its collection of data and selection of subjects. It used only two hospitals for drawing its subjects, meaning the study population may not have been a fair representation of the general population. The cases and controls were unmatched for age and sex, making it less likely for the two groups to be comparable. Finally data collection was often unable to assess by what route vitamin K had been given, if at all. In identifying the probable route of administration the clerks used the practice endorsed by the hospitals at the particular time when the child was delivered. This method may have introduced a significant uncertainty in data collected.

Despite its drawbacks, the Golding study could be considered a pilot study that generates a hypothesis, for larger, more rigorous, population-based studies to confirm.

Vitamin K and childhood cancer: a population-based case-control study in Lower Saxony, Germany⁵

Von Kries et al⁶ made it their objective to confirm or refute the possible association of parenteral vitamin K prophylaxis and childhood cancer. The authors labelled

this a 'population-based study' as subjects were taken from 162 different hospitals. Therefore any results from the study may be generalisable to the wider population. The cases included 272 children with leukaemia and other cancers, and the controls included 334 children matched for sex and age from a broad population base. Their results found no significant associations between vitamin K and cancer, with an odds ratio of 1.04 (0.74-1.48). The risk of leukaemia only was 1.24 (0.68-2.25). These results were almost unchanged with adjustment for potential confounders.

The design of this study lends it more credibility than that of Golding et al, yet it is also comparable because it assessed the same preparation of vitamin K. It included data from 162 hospitals, whereas Golding et al used only two, matching cases to both local and general population controls and matching for age and sex. Golding et al did not age and sex match, and it may be that the certainty of vitamin K delivery is more reliable than Golding's.

In accurately assessing the mode of exposure to vitamin K, the data clerks took a systematic approach. If the dose and route were not documented in the child's records the clerks would instead use the information of the child nearest it in the book, given the same perinatal morbidity. If this was unavailable, a nurse, doctor or midwife who worked at the hospital at the time said what would have been given, according to the birth and type of delivery. The vitamin K history was 'unknown' if nothing was recorded and nothing remembered. The authors did not consider the results to be due to the inclusion of cases or controls with an uncertain vitamin K history, as the results remained the same when analyses were performed with those particular subjects excluded.

Review articles and evidence-based medicine

In 1996, Professor A. Zipursky summarised the evidence for use of vitamin K, the clinical actions that were taken in response to findings, and results of these actions.² He outlines the biological plausibility of vitamin K as a carcinogen.

Israels and Israels reported the addition of vitamin K to lymphocyte suspensions increased the rate of sister chromatid exchange, correlating to mutagenicity. However, other tests for mutagenicity have found no link.⁸ For example, a study of the incidence of chromosomal abnormalities in a small number of newborn babies given vitamin K found no change. Therefore, there is no conclusive and repeated experimental evidence for vitamin K as a potential carcinogen in humans.

In response to the concerns raised by Golding et al, the British Paediatric Association recommended that newborns receive supplemental vitamin K orally rather than intramuscularly. It was felt this would not only reduce

the risk of cancer, but also avoid invasive procedures, pain, infection, bleeding and errors. However, by 1993 there were five reports of late VKDB in babies who received only oral vitamin K.

Important evidence was brought to light by Olsen et al, who used data from the Danish national cancer registry to determine whether the incidence of cancer in children had increased since the introduction in 1975 of intramuscular vitamin K to all newborns. Before 1975, no Danish babies received vitamin K. No difference in the rate of cancer during the period of 1975-90 was found.^{8,9}

Zipursky concludes that although late VKDB may be prevented with repeated oral doses in the first two months of life, "compliance for such a regimen has been shown to be poor, leaving infants at risk".² The overall tone of his review is strongly in favour of intramuscular vitamin K for all newborns as evidence against its use is inadequate.

By comparison, von Kries⁶ is more circumspect. As vitamin K concentrations in the blood following intramuscular administration "exceed endogenous levels by a factor of up to 10 000" he points out the need for clarification of vitamin K's potential for harm. He considered two recent studies reassuring, though two others concerned him.

One found a significant two-fold increase for leukaemia in one to six-year olds has some important biases, including a lack of blinding in the data collectors to the case/control status of the subject, and only half of the eligible cases being included. Another study found a 'borderline' significant result of 1.44 (1.00-2.08) for all cancers, principally for acute lymphoblastic leukaemia. However, it was felt to be a questionable analysis, as the increased risk of leukaemia was associated with abnormal deliveries in hospitals with a policy to give vitamin K only to those babies deemed 'at risk'.

It is presumed that 'at risk' refers to those babies who suffered from prematurity, birth asphyxia or other conditions which may delay feeding and hence worsen vitamin K deficiency, or whose mothers were on anticonvulsant medications. There was no increased cancer risk where hospitals were not selective – where vitamin K was either given to all newborns or to none. This suggests that babies deemed 'at risk' and given intramuscular vitamin K may have developed cancer due to their perinatal morbidity (for example, perinatal hypoxia), rather than to the vitamin K. Here perinatal morbidity operates as a potential confounder. It is felt that the practice of giving vitamin K only to those 'at risk' is poor practice as VKDB is as common in babies born by normal delivery.³ The review concluded that "almost all cases of late VKDB are preventable with intramuscular vitamin K prophylaxis, with a potential risk for some forms of leukaemia that seem more hypothetical than real".

Vitamin K prophylaxis in the newborn: Consensus statement

This consensus statement of the recommended practice for vitamin K prophylaxis in New Zealand points out that the risk of leukaemia is small but "does nevertheless influence the decision making of some families".¹ The report reiterates that several large studies in Europe and North America have been unable to prove the association found by Golding et al, and that the oral route for vitamin K was not as successful for preventing the late VKDB.

The report cites recent data from Australia that place the risk of late VKDB at 34.4 per 100 000 babies given no vitamin K (Konakion brand), 4.1 with three oral doses of vitamin K, and 0.2 with intramuscular vitamin K at birth. The report recommends that the lead maternity carer must discuss vitamin K prophylaxis with parents, that all babies should receive vitamin K and the preferred route is intramuscular (1mg Konakion MM).

Conclusion

All babies are born deficient in vitamin K and the vitamin K dependent coagulation factors. They are therefore at risk of developing VKDB, previously known as haemorrhagic disease of the newborn. This risk is virtually eliminated with a single dose of intramuscular vitamin K at delivery. Oral vitamin K is more difficult to administer and is proven to be less effective at reducing late VKDB.

Many have argued that low levels of vitamin K at birth may be somehow protective against disease as yet unidentified. Since Golding et al's findings⁴ there has been no consistent evidence vitamin K increases the risk of childhood cancer. However, there is good evidence for the efficacy of intramuscular vitamin K in preventing VKDB, which outweighs the insubstantial evidence for its carcinogenicity.

Lachie Smith is a trainee intern at the Dunedin School of Medicine. He entered Medical School from Health Sciences as a school leaver. He is heading to Cambodia in April of this year for the 6th Year Elective. He wrote this paper during his Clinical Paediatric Longitudinal Case.

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Does obesity affect outcomes of patients undergoing coronary artery bypass surgery?

Kent Chow

Dunedin School of Medicine

Obesity, derived from the Latin *obesus* meaning “fattened by eating”, is a state of excess body fat contributing to morbidity. It is a growing global epidemic, especially in the developed countries.¹ In New Zealand, obesity affects at least 17% of the population, and results in the loss of 4.7% total years of life.² Obesity is commonly defined as individuals having a body mass index (BMI) >30 kg/m², and extremely obese as having a BMI >40 kg/m².³

Obesity has long been identified as an independent risk factor for atherosclerotic coronary artery disease.⁴ In addition, obesity also predisposes to hypertension, hyperlipidaemia and type II diabetes mellitus, all of which further increase the risk of ischaemic heart disease in obese individuals.⁵ Thus surgical procedures, notably coronary artery bypass grafting (CABG), are often required to treat their severe coronary heart disease.

Common perceptions about obese patients and poor CABG outcomes

Obesity has been widely assumed, particularly by clinicians, to predispose patients to adverse outcomes during and after CABG.^{6,7} As a result, obese patients, especially severely obese, are often declined the opportunity of undergo CABG.⁸ This commonly held perception is contributed by multiple factors.

Firstly, obesity is often reported to pose additional technical challenges during surgical procedures. Such complications include difficult airway and anesthetic management, special positioning of the patient and the need for dual bypass pump oxygenators.⁹

Secondly, obese patients have been well documented by studies of other major surgical procedures as having increased incidence of many post-operative complications. These include atelectasis,¹⁰ pneumonia,¹⁰ deep vein thrombosis,^{11,12} pulmonary embolism^{11,12} and wound infections.¹³ Such increased incidences have been related to pulmonary functional abnormalities,⁸ accelerated coagulation,⁹ decreased fibrinolytic activity,¹⁰ as well as impaired immunity and healing¹² as a result of obesity and its strongly associated type II diabetes mellitus.

In addition, obesity, with its strongly associated hyperlipidaemia and hyperglycaemia, significantly increases risk of atherosclerosis.⁵ Therefore, it is commonly believed that the vein-grafts of obese patients are more susceptible to late stenosis and eventual graft failure.⁷ Indeed, obesity has been identified by the American College of Cardiology / American Heart Association guidelines for CABG as a predictor for recurrence of angina and myocardial infarction after CABG.⁷ However, the group did not provide any comprehensive clinical evidence upon which their prediction was based, nor did it state whether poorer long-term survival would result.

Does clinical evidence support this common assumption about obesity?

Studies assessing the effects of obesity on CABG outcomes are either retrospective or prospective observational studies. Increased incidence of wound complications such as sternal dishiscence¹⁴ and wound infections^{8,15-20} have been consistently detected in obese patients (Table 1). Increased length of post-operative hospital stay has also been noted, and is explained as reflecting the increased efforts needed to ambulate obese patients after CABG.^{8,16,19} Higher risk of post-operative arrhythmias in obese patients has also been reported.^{8,18,19}

In recent large-series studies, however, obesity was not found to be associated with higher risk of myocardial infarction, stroke or pulmonary complications.^{8,17,18,21} Risk of operative mortality of obese patients is also similar to that of non-obese.^{14-16,19,20,22} These results contrast with earlier studies^{19,20} as well as the results of Prabhakar et al,¹⁶ as all of these associated obesity with adverse short-term outcomes. While the earlier studies were limited by

Table 1: Survey of various publications studying obesity and short-term CABG outcomes^a

	Kim et al ¹⁵ (2003)	Gurm et al ²¹ (2002)	Kuduvalli et al ⁸ (2002)	Prabhakar et al ¹⁶ (2002)	Schwann et al ¹⁷ (2001)	Birkmeyer et al ¹⁴ (1998)	Moulton et al ¹⁸ (1996)	Fasol et al ¹⁹ (1992)	Prasad et al ²⁰ (1991)
No. of patients	6728	1526	4713	559,004	3560	11,101	2299	502	500
Confounding factors adjusted	yes	yes	yes	yes	yes	yes	yes	no	no
Operative mortality	=	=	=	▲	=	=	=	=	▲
Pulmonary complications							=		▲
Arrhythmias			▲				▲	▲	
Wound infection	▲		▲	▲	▲		▲	▲	▲
Sternal dehiscence						▲			
Stroke		=	=	=	=				
Myocardial infarction		=	=	=	=				▲
Length of stay			▲	▲	=		▼	▲	
Reexploration	▼		=			▼		▲	
Renal failure			=	▲					

a ▲ increased risk in obese patients; ▼ decreased incidence in obese patients; = no difference between obese and non-obese

small sample sizes and failure to adjust for potential confounding factors,^{19, 20} the results of Prabhakar and colleagues were significant, particularly because of the large sample size.¹⁶ By including 559,004 patients in their study, Prabhakar et al reported that extremely obese patients had up to 50% increased risk of operative mortality, while increased risk of 21% was noted in the moderately obese.¹⁶ They also demonstrated an increased risk of post-operative renal failure in both groups of obese patients.¹⁶ In contrast, Kuduvalli et al found no difference in risk between obese patients and their slimmer counterparts in developing renal failure.⁸

Attempts to assess the impact of obesity on long-term CABG outcomes have been made by several observational studies that analysed the long-term survival of patients (Table 2). Aside from Kim et al,¹³ all groups demonstrated that obese patients, particularly extreme ones, suffered from increased 4- or 5-year mortality, with the adjusted relative risk ranging from 1.28-1.79 compared with non-obese patients.^{17, 21-23} However, apart from Gurm et al, studies failed to identify whether the cause of death was of cardiac origin. While Gurm et al reported a linear rise in risk of cardiac mortality with increasing BMI, they included only 28 and 103 patients respectively in the groups of underweight (BMI<20) and severely obese (BMI>35).²¹ Such small samples at the extremes of BMI undermine the statistical power of the results. No data is available in the literature to compare long-term vein-graft quality or incidence of graft failure between obese and non-obese patients.

Should obese patients be offered CABG in the same way as non-obese patients?

Current clinical evidence has been conflicting over the effect of obesity on short-term CABG outcomes. Besides

increased risk of wound complications, post-operative arrhythmias and prolonged length of stay, most recent studies show that obese patients have similar short-term outcomes as non-obese ones. However, the contrasting results of Prabhakar et al¹⁷ are significant because of the study's large sample size.

Although most studies suggest that obesity has adverse impact on long-term CABG outcomes, the evidence is not convincing. The findings of greater long-term post-operative mortality in obese patients can be confounded by the increased likelihood of non-cardiovascular morbidity and mortality as a result of obesity. The significance of increased cardiac mortality in obese patients found by Gurm et al is weakened by the study's small sample size.²² For the effect of obesity on long-term CABG outcomes to be adequately assessed, other important parameters including graft quality, incidence of post-operative cardiac events, and quality of life need to be taken into account.

Conclusion

The available evidence is limited, so there are no grounds for obese patients being denied CABG when this operation constitutes the most appropriate therapy. Instead of avoiding the selection of obese patients for CABG, as some clinicians admit, efforts should focus on preventing serious post-operative complications by appropriate perioperative precautions and on-going monitoring and treatment. The role of therapeutic measures, such as aggressive pre- and post-operative weight loss regimens, in improving CABG outcomes of obese patients should also be investigated by future randomised-controlled studies.

Table 2
Survey of various publications studying obesity and long-term CABG outcomes^b

	Kim et al ¹³ (2003)	Kuduvalli et al ²² (2003)	Gurm et al ²¹ (2002)	Schwann et al ¹⁷ (2001)	Birkmeyer et al ²³ (2000)
No. of patients	6728	4713	526	3560	10,686
Confounding factors adjusted	yes	yes	yes	yes	yes
4- or 5-year mortality	=	▲	▲	▲ (only BMI>34)	▲ (only BMI>37)
5-year cardiac mortality			▲		

^b ▲ increased risk in obese patients; ▼ decreased incidence in obese patients; =, no difference between obese and non-obese

Kent Chow is a fifth year medical student at the Dunedin School of Medicine. He completed a BMedSc(Hon) two years ago on "The interaction between 5HT_{2A} receptor and RACK1". Kent wrote this paper during fourth year medicine. He plays for Southern Sinfonia.

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The philosophical examination: Evaluating medicine and its related systems

Daniel Hobbs

Dunedin School of Medicine

In recent years complementary and alternative health practices have gained growing popularity in Western countries, with up to 50% of the public using complementary, alternative and integrated medicine (CAIM) products.^{1 2} CAIM is also gaining acceptance among conventional Western biomedical practitioners. CAIM has, however, often received fierce opposition from many advocates for Western biomedicine. Is such opposition justified, or are CAIM practitioners providing a legitimate form of health care? This paper compares biomedicine with various systems of CAIM, and explores the philosophical basis and validity of each.

Philosophical basics

Biomedicine is founded on traditional cultural assumptions that originate from Western secular philosophy: empiricism, realism, positivism and materialism.³

Empiricism is the belief that knowledge must be gained through experience and experiment.⁴ This is the basis of the 'scientific method', a system of experimenting with the world in order to find more out about it.

Realism assumes that the world that we perceive is actually 'there' in some objective real sense, in exactly the form that we perceive it. This is in opposition to the sort of world portrayed in the film *The Matrix*, in which the world that most people inhabited relied for its existence upon the human perception of electronic data that was generated by a massive computer network.

Positivism is the belief that we must confine ourselves only to what we experience as sources of knowledge.⁴ It rejects all metaphysical speculation and abstract theorising, and even forbids a critical examination of its own presuppositions.⁴

Materialism in its most common form is defined as the belief that every phenomenon in the universe can be explained in terms of the basic laws governing physical matter.⁴

Medical philosophy: strengths and weaknesses

Biomedicine's underlying empiricism leads it to value highly the 'scientific method', which seeks classification, explanation and elucidation of cause.³ This is different to the philosophical underpinnings of many branches of CAIM, particularly traditional Chinese medicine (TCM). TCM is based most notably upon the concepts of yin and yang;⁵ its philosophy is speculative and mystic; its concerns are 'order' and 'pattern'.⁵ This shows where TCM explains disease in terms of an imbalance of the yin and yang aspects of a person. TCM practitioners look for patterns in aspects of a whole person (physical, psychological, social and spiritual) to elucidate the problem with a person's health and decide on a treatment regimen. The question is not 'what X is causing Y' as in biomedicine, but 'what is the relationship between X and Y'.⁵ 'Cause and effect' is not an acknowledged concept in traditional Chinese philosophy and medicine; the spontaneous cooperation of events is the focus. By contrast, biomedicine attributes sickness to clearly defined causes.

Differences in the philosophical basis of medical systems are where the strengths and weaknesses lie. The empiricism of biomedicine leads to limitations: the 'gold standard' observation method of biomedicine, the randomised controlled trial (RCT), is not infallible. RCTs were originally designed to test agriculture,³ where there

are fewer variables to account for. Wild variables like weather and soil conditions can be assumed to be reasonably constant between test fields in the same geographic area at the same time. Humans are more complex systems, which leaves a number of weaknesses when RCTs are used to test medicine. An enormous number of variables relate to humans and to health-care provision, and much effort must be spent accounting for possible bias in medical RCTs. Even after the necessary adjustments, the trial is not immune to scepticism on the grounds of unaccounted bias. This is one of the most frequent reasons that the findings of well-conducted trials are doubted, especially when the findings are unexpected or inconvenient. A faith element to medical belief, therefore, is easy to maintain, even in evidence-based medicine.

Another limitation of medical RCTs is that they are poor at testing groups of people who can be divided into many subgroups. For example, in acupuncture trials a different treatment is administered to each individual, depending upon each unique cluster of symptoms;⁶ biomedicine, however, groups all the tested individuals into one disease category. This makes it difficult to obtain statistically significant results in any RCTs of acupuncture. Similar problems have been met when testing homeopathy, with consequential write-off of the discipline by many biomedical groups. It should be noted, however, that this limitation on the practicalities of testing CAIM products is a reflection on biomedicine, not on CAIM.

Realism also has its flaws: it is an unprovable assumption about the nature of the world and about biomedicine. Biomedicine has no choice about adopting the realistic philosophy; it must assume realism or else the practice of biomedicine is worthless. However, CAIM is not limited to realism. Healing by prayer is one example: the most frequently ventured explanation for the efficacy of prayer healing appeals to a belief in the reality of an existence above and beyond our own. Randomised, double-blinded trials have demonstrated the efficacy of Christian prayer healing in producing favourable medical outcomes.

Positivism produces a narrow view of the world, which, at its extremes, excludes anything not explicable at the current level of knowledge. The Bradford-Hill criteria for causation contains an example of a positivistic medical view – the need for ‘biological plausibility’ in order to establish a cause-effect relationship.⁷ Such positivism can produce a dogma that condemns “as heretics those who dare to question the ultimate truth of the biomedical model”.⁸ This can inhibit the progress of knowledge and the development of treatment. Medical positivism can be good too, most notably in ensuring that trials of new medical interventions are ethical.

Homeopathy has been much attacked by biomedical patrons with positivistic worldviews. Two of its basic tenets have caused its discarding: 1) that medicines that

produce certain symptoms in an unaffected individual will cure those symptoms in an affected individual; and 2) that the higher the dilution of a therapeutic substance in a solvent, the higher the therapeutic ‘potency’. Some homeopathic dilutions are so high that less than one molecule of the original substance remains in the solution.⁹ These ideas central to homeopathy’s rationale make it difficult to form biomedical ideas on how homeopathy could physically work.

Vandenbroucke illustrates this: “the problem with homeopathy is that the ‘infinite dilutions’ of the agents used cannot possibly produce any effect”.¹⁰ Despite this, Linde et al¹¹ conducted an excellent meta-analysis on homeopathy trials located in a literature search of both published and unpublished papers. They used rigorous trial inclusion criteria, two different trial quality-rating scores, statistical analysis of outcomes odds ratios, and a statistical test that can detect ‘publication bias’ (the phenomenon of only publishing trials if they have certain outcomes). Even when only the highest quality trials were included for analysis and results had been adjusted for publication bias, the overall odds ratio favoured homeopathy compared to placebo (1.78, 95% CI: 1.03 – 3.10).

Writing to the *Lancet*, Vandenbroucke suggested that “unknown and unidentifiable sources of bias seem to exist in randomised trials”.¹² The writer said that the most arrogantly positivistic researchers (“those investigators with Bayesian inclinations”) might use such arguments to maintain their faith against homeopathy, since to a Bayesian researcher, existence of a credible prior hypothesis for treatment mechanism is required before trial results can be of any meaning.¹⁰

However, Vandenbroucke also points out that “whatever is happening in randomised trials of homeopathy might also be happening in randomised trials of allopathic medicine ... it might be impossible to identify false-positive findings in trials of allopathic medicines, because our belief in the proposed mechanism could blind us to the possibility that the trial results are wrong”.¹⁰ The letter goes on to pinpoint the great irony that this leads to: “what is fact? The answer from fields as diverse as history and the philosophy of science has been remarkably similar: events become ‘facts’ when they are invoked to support a theory”.^{10 13 14}

The final philosophical limitation of biomedicine is that its basic assumption of materialism has led to inadequate treatment of patients and disillusionment with biomedicine, because it excludes the psychological, social and spiritual aspects of disease. Kleinman et al¹⁵ reveal the importance of all aspects of a person, including his/her beliefs, in a medical system. They describe a study in which the majority of patients attending a traditional Taiwanese shrine for healing rated the treatment as effective, even though in some cases the patients’ physical

symptoms did not change, or worsened. For many patients, the importance of medicine (in whatever form it comes) is not necessarily in curing the physical *disease*, but in treating the *illness*: obtaining a meaningful explanation for the disease and responding to the personal, family, and community issues surrounding the experience.¹⁵

To its credit, biomedicine has recently been retuned with the introduction of the biopsychosocial model of disease,⁸ yet it still lacks acknowledgment of the spiritual, except an occasional mention where the spiritual aspect is assumed to be a trivial extension of the psychological aspect of an individual's health. Ironically, materialism has been responsible for much loss of confidence in biomedicine among Westerners, despite the secular Western philosophies. Beyerstein suggests that for many people the attraction of CAIM lies in the mystical New Age philosophies that many branches of CAIM are based upon.¹⁶

Biomedicine is not devoid of its own cultural biases, and this can be to its patients' detriment. Biomedicine in different countries is tilted toward certain types of treatment.¹⁷ For example, in the USA, unopposed oestrogens are often prescribed for hormone replacement therapy (HRT) even in women with a uterus, as the gynaecologist subsequently 'must' do regular hysteroscopies to screen for endometrial cancer; in New Zealand, the presence of a uterus is an absolute contraindication for unopposed oestrogen HRT. This difference is perhaps because the privatised health system in the USA encourages generous intervention (procedure and consultation = profit); in New Zealand, however, the reserved culture and limited public resources encourage more of a minimalist approach to health-care provision.

Biomedicine has strengths as well. Its confidence in empiricism and realism has driven experimentation and the attainment of new knowledge, leading to many new treatments of high efficacy. Advances have replaced older, evidence-unsupported, and dangerous interventions that caused unnecessary hardship. However, it is the view of many that biomedicine cannot attain the success it seeks until it seriously considers the strategies that CAIM uses to approach sickness. Biomedicine still views its patients more as physical machines than as dynamic entities in which psychological, social and spiritual aspects are as important as physical ailments. It is CAIM's wider focus on the whole individual that lies behind much of its success with Westerners who are disillusioned with biomedicine.

One of CAIM's weaknesses is its lack of regulation and evidence-based observation. This means that unnecessary and harmful treatments can prevail unchecked; it also means that useful treatments might remain in obscure use, rather than being brought into mainstream health care. CAIM could potentially be integrated into mainstream medical therapy if ways were found to properly test its efficacy.

Conclusion

In investigating the issues of biomedicine and CAIM, it becomes clear that as biomedical practitioners, we should remain open to new ideas and not be limited by biomedical philosophy. By these means, we have the potential to use complementary, alternative and integrated medicine to benefit our patients in ways that biomedicine, in its current state, cannot achieve alone.

Daniel Hobbs is a trainee intern at the Dunedin School of Medicine. His interest in philosophy has also inspired him to complete a summer studentship for the Medical Council of New Zealand on maintaining patient dignity in clinical practice.

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The effect of a chin strap when using CPAP in neonates

Jethro LeRoy, Joe Baker, Roland Broadbent

For nasal continuous positive airway pressure (CPAP) to be effective, there must be transmission of pressure from the nose through to the larynx. Release of pressure from the pharynx and out through the mouth will limit the effectiveness of CPAP. A pharyngeal pressure seal can perhaps be optimised if the mouth is kept closed, and one way of achieving this is with a chin strap.

Aim

The aim was to measure the effect that a chin strap has on the transmission of pressure from the nose through to the pharynx.

Method

Ten premature infants requiring CPAP, but on minimal oxygen supplementation, were recruited after informed consent was obtained from their parents. An air-filled, size 8 French feeding catheter was introduced to the pharynx with the tip placed just above the larynx and the other end attached to a pressure transducer. The CPAP was supplied by an EME Flow Driver and the CPAP pressure measured through a pressure transducer attached to the CPAP pressure line by a Y-arm. The flow rate of the flow driver was adjusted before the start of monitoring to deliver a CPAP pressure of 5 cm H₂O pressure, and the flow rate was thereafter left unchanged. A nonelastic chin strap was used and attached to the CPAP hat with elastoplast. Babies were randomised to have the chin

strap either first or second while being monitored for an hour with the chin strap on and an hour with the chin strap off.

Results

The average pharyngeal pressure was higher ($p < .05$) with the chin strap on (4.02 cm H₂O) than with it off (2.52 cm H₂O).

Conclusions

In premature infants a chin strap makes a significant difference to the transmission of CPAP pressure to the lungs. Further research is warranted to determine whether this leads to significantly improved clinical outcomes.

Jethro LeRoy is currently a trainee intern at the Dunedin School of Medicine. He previously completed a Bachelor of Health Science with Honours in Queensland, Australia.

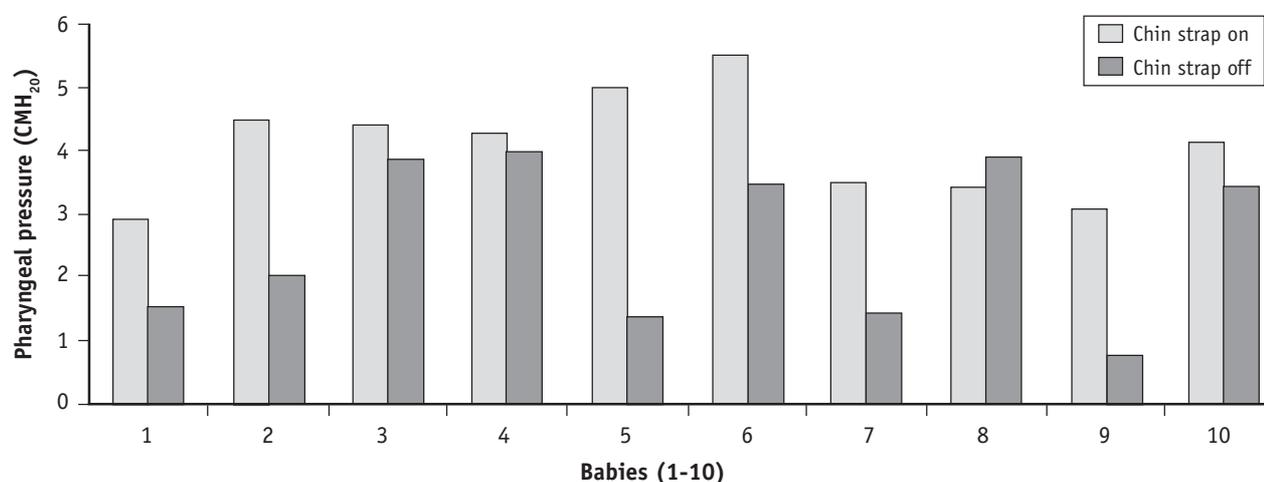


Figure 1: Pharyngeal pressure in 10 babies with chin strap on and chinstrap off.

Love: something for the silly season

Rachel Highton
Dunedin School of Medicine

I am on my general medical attachment for fourth-year medicine and life is grand. Sadly, for all the patients on my ward life ain't so grand. On the eighth floor of gloom you are tired, sick, depressed and hate the hospital food. It's the rules. That's what sick people do.

Which was why I was so surprised when I met Henry. He is a ray of light. A 77-year-old ray of light with only one and a-half arteries supplying his brain when usually you have four. He has frequent transient ischaemic attacks, COPD, hypertension and peripheral vascular disease, which is enough to make anyone feel unwell. But Henry is profoundly, unrepentantly and irrevocably happy. He expressed no concern whatsoever over his health problems – “what problems?” – except for some regret over not being allowed to help to fold tea towels at his rest home because of his TIAs. So what is it that makes Henry feel so ‘well’?

Henry is deeply in love. He met Mary, the first and only love of his life, when he moved into the same rest home as her two years ago. They were married soon after and have been living in contentment ever since. He acts like a love-struck teenager, talking to her for hours on the phone at the nurses' station. Even the tea towels matter little as long as he can be with Mary. Life is pretty simple. He relishes each minute of each day and the imposition of being forced to stay in hospital is just outrageous. He might miss Housie! If only we could tap into just exactly what it is that makes Henry feel so good and supply it to the rest of the elderly. So I decided to explore this mysterious world: does love make us healthy?

Marital status, morbidity and mortality

For the purposes of this essay I have assumed that “love and marriage, love and marriage, go together like a horse and carriage”.¹ While there are many ways people receive love in their lives marriage seems to have been the most thoroughly studied. Love is also somewhat abstract and therefore difficult to measure.

Love makes you live longer! Yay! There is a well-established association between marriage and longevity.²

This benefit is greater for men than for women and some studies show that women can have an increased mortality due to marriage³ suggesting that men act as a kind of incubus, draining the very life fluids from the poor unsuspecting women. Luckily, the majority of studies suggest that love is good for women. In fact, the more the better. Women who are married multiple times have significantly reduced rates of breast cancer with greater numbers of marriages conferring greater benefit.⁴ More love = more health. Divorced women have been found to have a higher rate of remarriage than widowed women.⁵ This suggests that if the love is still alive in the marriage when a husband dies, then it is so powerful that it transcends death so that those who have been widowed don't need anybody else. They are eternally satisfied.

Love has a panacea of health benefits. Married people suffer fewer accidents and assaults, have fewer acute and chronic conditions, fewer activity limitations, a lower probability of becoming disabled, less psychiatric morbidity, and lower physician and hospital use rates than those without love in their lives.³ There is some debate as to whether this is an effect of selection of healthy people into marriage³, but I know better; love is a cure-all. Despite these benefits love is considered to be a chronic disease in Canada, as discussed in their National Longitudinal Mortality study.³

It is not just the feeling of love that confers benefit. A healthy sex life gives improved quality of life,⁶ even taking into account the psychological trauma placed on the extended family with the knowledge that Gran and Pop have sex. Quality of sex is important though, and women are eternally cursed by the ineptness of men because the quality of intimacy has been proved to be a significant factor influencing older women's physical health.⁷ Fortunately not just sex, but all non-violent touching

makes you healthier. Simple physical contact has been found to make you less likely to suffer from depression and better able to cope with stress. People will go crazy just for a touch (Higher rates of psychological illness with inadequate physical contact).⁸

With the sexual revolution have come new ideas regarding sex and it is now much more acceptable for elderly people to have sex. They are encouraged and can even get detailed sex and romance advice books.⁶ However, despite this open-minded attitude the elderly are still denied or discouraged from dating or remarriage.⁶ A travesty! Love, the greatest of all health benefits and the purpose of existence being discouraged in a significant proportion of the population! We as health professionals have an obligation to spread this love.

Love brings direct health benefits and thereby can reduce the health budget but love can be employed in other ways to further reduce the health budget. If people would only love the elderly more they would invest more energy in caring for them and decrease institutionalisation.⁹ This is the power of love according to Diane Wilson from Toronto. The Toronto conventions bureau even agrees, believing that love is good business practice.

In considering Henry, love is extremely important, but he also likes to fold his tea towels and I don't think he should be denied this pleasure. In fact, lying idle is likely to cause Henry's death because there are higher mortality rate among unemployed people than those in employment when all other confounding factors are controlled for.¹⁰

Love can adversely affect your health

Love confers some outstanding benefits but the marriage side of it all does have some downfalls.

- Wedding rings despite being a poignant symbol of the deep connection between two people in a loving relationship are also a significant source of hospital acquired infection because large amounts of grossness and bacteria are stored under the band.
- Eating food at weddings seems to be an extremely dangerous pastime. There are a huge number of papers documenting food poisoning of guests at weddings including one called: Tape worm infection resulting from pork eaten at a wedding banquet. Conclusion: your marriage may improve your health but your wedding will balance the benefit by making sure you get good and poisoned. See Murphy's Law.

Conclusion

1. Love is grand and everybody should have some.
2. My Arthur is lovely.

Disclaimer: On reading this essay you may have found that some parts of what I have written are true. This is purely unintentional and I apologise for any inconvenience it may have caused you. No elderly citizens were harmed during the making of this essay, although my Grandma has a sore hip and we should all feel very sorry for her. These references should not be taken seriously.

Rachel Highton is a trainee intern studying at the Dunedin School of Medicine, having entered Health Sciences after high school. This essay was the final in a series case write ups appreciation required in fourth year. This particular essay was an attempt at a vaguely humorous case appreciation. She is a die-hard socialist with crazy anthropological and feminist ideas that may have led to this topic: love. She is currently IN love with a House Surgeon, which has confirmed for her the findings in her essay but led her to other new hypothesis: Men are crazy. Women are also crazy. Love spells evol backwards.

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A brief review of warfarin and the international normalised ratio

Darryl Tong

Dunedin School of Medicine

Abstract

The use of warfarin anticoagulation is a common therapy that acts on the vitamin K dependent coagulation factors II, VII, IX and X by blocking gamma-carboxylation. Indications for warfarin therapy include deep vein thromboembolism prophylaxis and treatment, atrial fibrillation, pulmonary embolism and mechanical heart valve prostheses. Warfarin efficacy is monitored using the international normalised ratio (INR), which standardises laboratory results and allows meaningful interpretation of patient data between centres. This article provides a summary for medical students and highlights the importance of using INR in monitoring patients on warfarin.

As a medical student going through the clinical years of training it is interesting to finally confirm what our teaching staff have been telling us for years: that common things occur commonly. We will in our training encounter patients on warfarin anticoagulation on the wards, in outpatient clinics and in the community, therefore knowing something about the drug itself, some of the more important applications and how it is monitored makes good sense and good future clinical practice. Perhaps one of the more abstract concepts in managing patients on warfarin is the use of the INR.

Warfarin (warfarin sodium) is a medication that patients take for reasons ranging from deep venous thrombosis to atrial fibrillation. It remains one of the most effective forms of anticoagulation especially in the outpatient setting, due to the fact that it can be taken orally. Cynics would remind us that warfarin is also used in rodenticides giving rise to the colloquialism of 'rat-poison' when referring to warfarin.¹

The INR is used to monitor warfarin efficacy in the context of a therapeutic range of anticoagulation for a given condition. The INR is the prothrombin time ratio using an international reference thromboplastin, which allows for greater standardisation in clinical practice.

This article briefly summarises the pharmacology and clinical uses of warfarin and how the international normalised ratio is used in monitoring patients on warfarin.

Pharmacokinetics and mode of action

Warfarin is a synthetic derivative of dicoumarol, which in turn is a derivative of bishydroxycoumarin, a toxic agent found in spoiled sweet clover silage. This toxin produces a deficiency of plasma prothrombin and subsequent haemorrhagic disease in cattle that died after de-horning or castration.²

Warfarin, like all its relatives, blocks the gamma-carboxylation of prothrombin, the vitamin K-dependant coagulation factors II, VII, IX and X and the endogenous anticoagulant proteins C and S. The result of this blockade is the production of incomplete molecules that are biologically inactive in the coagulation cascade.³ Although warfarin prevents the reduction of vitamin K epoxide (relevant in synthesising factors II, VII, IX and X), natural mutation may occur in the responsible enzyme vitamin K epoxide reductase, which may give rise to genetic resistance to warfarin in humans and rats.

Warfarin is usually administered as a sodium salt and has 100% bioavailability. Over 99% of warfarin is bound to plasma albumin. A delay in the anticoagulation effect of warfarin is attributed to the time taken for degradation of coagulation factors already in circulation not affected by the drug. Half lives of the four vitamin K dependent factors II, VII, IX and X are 6, 24, 40 and 60 hours respectively. A larger loading dose, of up to 0.75 mg/kg warfarin, may accelerate the onset of action.

Therapeutic use

Patients requiring anticoagulation in hospital will tend to receive heparin in the first instance.⁴ Given that warfarin may require 1-2 days to reach a therapeutic range of effect, the patient must be maintained on heparin until that goal is reached. Heparin may then be discontinued and the patient maintained on warfarin in anticipation of discharge. Herein lies the most important advantage of warfarin, especially in the outpatient setting – the ability for it to be taken orally.

The initial dose of warfarin varies from 5–10 mg daily until a therapeutic range is reached.⁵ The therapeutic range should be monitored daily using the INR, although the prothrombin time is also used. The prothrombin time should be increased to reflect a level 25% that of normal clotting activity. The dose of warfarin used for maintenance is then adjusted using the prothrombin time and clinical judgment and experience.

Patients on warfarin anticoagulation may have a variety of conditions that require a higher degree of prevention from thromboembolism than aspirin or dipyrimadole can offer, and in some instances it may be used in conjunction with them. These conditions include post-myocardial infarction, mechanical heart valve prostheses of all types, atrial fibrillation, cardioembolic cerebral ischaemic events, venous thromboembolism, and rheumatic mitral valve disease. Each requires different levels of anticoagulation.^{4,6} Patients with malignancies may also have hypercoagulability as part of a neoplastic syndrome, and should also be considered for anticoagulation. The therapeutic INR for these conditions is set out in Table 1.

Warfarin readily crosses the placenta and is therefore generally contra-indicated during pregnancy.⁶ Warfarin toxicity may arise from intentional or unintentional overdose, including ingestion of rodenticides. Clinically, common findings of excessive anticoagulation include ecchymoses, subconjunctival haemorrhage, epistaxis, vaginal bleeding, bleeding gums, and haematuria. Life-threatening complications include massive gastrointestinal bleeding or intracranial haemorrhage.⁷ Reversal of warfarin is achieved by administering intravenous vitamin K as 50 mg infusions, factor IX concentrates or fresh frozen plasma (FFP). Patients with higher than desired INR but no bleeding may only require a temporary cessation or lower warfarin dose.

The international normalised ratio

The therapeutic range for oral anticoagulation with warfarin is defined in terms of the INR. The method of performing prothrombin time (PT) was developed in the 1940s and involved adding calcium and thromboplastin to citrated patient blood.³ Thromboplastin is derived from phospholipid-protein extracts such as brain, lung and

placenta with rabbit brain thromboplastin the most commonly used. However, each laboratory prepared its own and, while effective reference ranges were established in their own institutions, there was huge variation between centres. Also, rabbit-derived thromboplastin was found to be less sensitive than human-derived thromboplastin.

As a result, patients in Europe were being anticoagulated to a lesser degree than their US counterparts, due to the sensitivity of the thromboplastin used in measuring PT. In other words, laboratories using a less sensitive thromboplastin were over-anticoagulating patients compared to those monitored using a more sensitive thromboplastin. The World Health Organization (WHO) in 1978 recommended a standardisation of PT and in 1983 published recommendations using an international standard thromboplastin, the basis of INR measurement.⁸

The INR attempts to normalise the PT test based on the sensitivity of different thromboplastins and is calculated as $INR = (PT / \text{mean normal PT})^{ISI}$ where the mean normal PT is the prothrombin time based on a mean of 20 fresh plasmas of healthy patients and ISI, the international sensitivity index.^{8,9}

Using this WHO calibration, inter-laboratory variation is ~4% worldwide. INR is a useful measure of warfarin therapy but is unsuitable for assessing the clotting function of liver disease patients, as other bleeding problems may be present concurrently, such as platelet dysfunction. Therefore, prothrombin time and activated partial thromboplastin time (aPTT) should be used for these patients.

Drug interactions

Drug interactions and other disease states can affect the level of anticoagulation with warfarin.¹ These interactions can be divided into pharmacokinetic and pharmacodynamic effects. Pharmacokinetic interactions include enzyme induction, enzyme inhibition and reduced plasma protein binding. Pharmacodynamic interactions include synergism, competitive antagonism (vitamin K) and hereditary resistance to oral anticoagulants. The most serious interactions are those that cause an increase in anticoagulation effect resulting in an increased risk of bleeding. Table 2 summarises the drug interactions and their effects on warfarinisation.

Summary

Warfarin is an effective form of oral anticoagulant and is used therapeutically for various conditions that require long-term anticoagulation. Using the INR to monitor warfarin therapy has allowed greater standardisation between laboratories, and a greater degree of uniformity in clinical practice. Unfortunately, drug interactions are

Table 1: INR ranges based on medical condition (adapted from Lacy CF, Armstrong LL, Goldman MP, Lance LL)⁶

Medical condition	Target INR range
Atrial fibrillation	2.0 – 3.0
Mechanical valve prosthesis (aortic, mitral, leaflet and other types)	2.0 – 3.5
Cardioembolic cerebral ischemic events	2.0 – 3.0
Venous thromboembolism (including deep venous thrombosis)	2.0 – 3.0*
Rheumatic mitral valve disease	2.0 – 3.0
Malignancy-related hypercoagulability	Up to 4

* active treatment of DVT however may necessitate a higher INR of up to 3.5

Table 2: Drug interactions with warfarin (adapted from Blann AD, Fitzmaurice DA, Lip GY)⁹

Enhanced anticoagulation effect: Alcohol, allopurinol, steroids, analgesics (including paracetamol), antiarrhythmics, antidepressants, oral hypoglycaemics, antimalarials, antiplatelet medications, anxiolytics, disulfiram, influenza vaccine, levothyroxine, lipid lowering agents, testosterone, uricosurics.
Reduced anticoagulation effect: Oral contraceptives, retinoids, vitamin K (including dietary supplements).
Variable effect: Antibiotics, cholestyramine, anti-epileptics, antifungals, barbiturates, cytotoxics, hormone antagonists, cimetidine.

Note: Although antibiotics are listed as having variable effects on warfarin therapy, generally antibiotics enhance anticoagulation and require more intensive monitoring of the INR while the patient is taking the antibiotic.

very common with warfarin usually resulting in an increased level of anticoagulation and requiring more intensive monitoring of the INR. Nonetheless, warfarin remains the mainstay of outpatient anticoagulation therapy.

Darryl is currently a trainee intern at the Dunedin Medical School and juggles family, friends, study and the military.

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ACE – coming up trumps?

Nicola Mutch

Spare a thought, trainee interns, for those who have gone before you.

Until 2002, the process of securing a first-year house surgeon's job involved writing letters to your preferred district health boards (DHB) asking for work. And waiting. And perhaps getting a job offer from your third favourite employer before hearing from your first or second. That's not to say the others wouldn't want you. Job offers could arrive at any time until the day you started work, as others rejected their job offers at the last minute. The DHBs, who one moment thought they had a full contingent of house surgeons, would then be left to scavenge around for those who were left, if they could find them. The whole process took months.

"Imagine," then-president of the Otago University Medical Students' Association Chris Jackson was saying as far back as 1996, "if there were some sort of system that allowed applicants to rank their preferred employers, and vice versa, and the whole sorry business could be over with at the press of a button."

Thus began an epic journey of lobbying, letter-writing, meetings, steering groups and moving of mountains that finally resulted in ACE – Advance Choice of Employment – being implemented for the first time in 2003. Meanwhile, the torch had been handed on to successive medical student leaders, ending with New Zealand Medical Students' Association president Brandon Adams.

The result, says Jackson, now a registrar at Dunedin Hospital, reflects the work of "a lot of people over a long time. I am absolutely amazed that such a good idea, benefiting so many people, took so long to come to fruition."

The concept wasn't new. Similar schemes are used in Britain, Australia and America and – in a previous incarnation known as MATCH – in New Zealand, though they differ in crucial areas. Chiefly, the matches made in the ACE scheme equate to job offers, not official contracts. There is, therefore, no compulsion to take the position.

It is perhaps something of a Clayton's distinction. To fail to take up the job, one imagines, would be viewed rather

dimly by potential employers. They would be denied the opportunity to offer the position to the next-favourite applicant who would no doubt have been snaffled up by another DHB (the very process that happened in slow, non-transparent motion under the old system). The yearly surplus of graduating doctors does mean DHBs would have a reasonable chance of finding someone to fill the place, and at least under ACE it's possible to find out who is left over.

For your part, you would have few options other than to head overseas. But remember, you get the job that the highest-ranked DHB on your list offers you. And if you hadn't wanted to work there, you wouldn't have ranked them, right? Sort of.

This issue of ranking is among many that rankle with the Resident Doctors' Association (RDA). "We do not support the ACE scheme as it stands," declares RDA's Gerard Fennessy. "We did not think it would work, and it has proved not to for a numbers of doctors. And now it's up to us to pick up the pieces."

"People are ringing us saying, 'This was supposed to guarantee us a job, and it hasn't.' It was marketed on this issue."

This allegation does not in fact square with the ACE information on www.newdoctors.co.nz, which clearly states the scheme is aimed at simplifying the application process and that some applicants will remain unmatched at the end of the process.

An article in the journal of the RDA (vol 58, Oct 2003), alleges flaws in the ranking system. It cites instances where trainee interns (TI) ranked specific DHBs highly on their list, and equally were ranked highly by those employers, but didn't get jobs at all. It also describes an example where TI 'A' ranked DHB X highly but got matched to DHB Z. Meanwhile TI 'B' ranked DHB Z highly but was matched to DHB X – "a simple swap being required to resolve".

Fennessy was unable to share specific cases, although advises a number were directed to the ACE coordinator for investigation. The RDA reports it was notified of 33

TIs without jobs in New Zealand at the end of the matching process.

Furthermore, Fennessy contends that ACE allowed immigration law to be contravened by allocating positions to foreign doctors while “New Zealand TIs were left without jobs. We don’t have enough first-year positions to employ all New Zealand doctors. But this system allowed [overseas doctors] to be offered jobs in preference to New Zealanders. That’s unacceptable.”

But perhaps RDA’s biggest gripe is that they were not involved in developing the system and had no representative on its steering group, despite their primary concern with employment and conditions for doctors.

Fennessy argues that ACE fails to address broader issues, such as the need for better workforce planning for second- to fifth-year doctors – of which there are shortages – to generate more first year jobs, and hence keep New Zealand-trained doctors in the country.

“The Medical Students’ Association [MSA] doesn’t have any knowledge of the workforce,” says Fennessy. That sounds harsh... but you can’t make placement and employment separate issues. We are intrinsic to that process yet ACE excludes us from it.

“The crazy thing is,” Fennessy continues, “why the MSA is getting involved at this level at all? TIs are our future members. We work hard to get these guys jobs. The MSA should be tapering off its involvement in TI issues and letting us pick up from there.”

Brandon Adams, unsurprisingly, disagrees. The RDA is alone in the sector in its opposition, he points out, referring to the 21 DHBs, the Ministry of Health, and the students’ associations who all strongly support the scheme.

“Our members complained to us about the confusion and uncertainty created by the previous system for applying for jobs, and that’s what we set out to address.

“We absolutely have a legitimate role in this arena. Students are concerned about entering the workforce. The six-to-eight week period of applying for jobs can lead to significant anxiety for students. Now they can have job surety much earlier, and make plans around that.”

And he offers a reality check on the matter of unmatched applicants. “There are two.”

“Last year, there were 301 advertised positions and 330 New Zealand graduates, so there was always going to be a mismatch – ACE didn’t cause that.

“But what happened is, when the DHBs saw there were

leftover qualified doctors they then said, ‘Oh yes, we could use a few more’. And because their details were centralised they were able to get in touch with them easily. The scheme actually generated positions.” Under the old system, says Adams, unemployed doctors simply drifted away.

As for the overseas doctors being employed ahead of New Zealanders, Adams investigated several such cases, and two scenarios emerged: “One was doctors lying on their application forms, claiming to be New Zealand residents. They got found out, and their positions were rescinded.”

The other scenario involved New Zealand applicants ranking very few, or very popular, DHBs. If they were not the preferred applicants at any of those employers, their names were dropped from the list.

“ACE couldn’t then sign you up to another DHB you hadn’t indicated you were prepared to be employed at; that would be unreasonable compulsion,” explains Adams, acknowledging that it is vital that future applicants understand this aspect of the ranking process.

At hospitals with insufficient Kiwi applicants, an international doctor might well be appointed under this system, rather than a New Zealand application being diverted from elsewhere. The MSA is campaigning so that, in future, only New Zealand graduates could use ACE.

But on the whole, says Adams, ACE’s first outing “went very well” and the management of the scheme was good. Of the 11 cases Adams investigated this year he found “no evidence of any mishandling”. Rumours that the applicants’ ranking lists may not have been confidential he considers untrue.

“The trouble with comparing outcomes with the previous year, is there are no previous data to compare them to. And sometimes people mistake not getting what they want with a problem with the system,” he concedes.

“But the good thing about this system is that it is an auditable, transparent process. We can track our graduates, track the applications, publish league tables, see which DHBs consistently rank highly and why – and generally identify what some of the issues surrounding placement are.

“In the past,” says Adams, “it was guesswork.” ■

Nicola Mutch is a freelance writer.

Reflections on a medical education

Matt Goodyer

House Surgeon, Hawkes Bay DHB

As my undergraduate medical education draws to a close, it is timely and interesting to reflect back on the first six years of what has become an intimate part of my life, for no-one can complete even a fraction of a medical degree and remain untouched.

From the first few days as a determined yet naive health sciences student to the last few as an elective student overseas, I've gone from having a rudimentary understanding of the human body, coupled with a few preconceived ideas, to appreciating its functioning and a deeper understanding of the way health and humans interact. Yet I remain in awe of it and my inability to change the final destination. I can do my best to delay the inevitable, but that inevitable will still arrive. My duty, therefore, is not just to prolong a life, or alleviate suffering, but also, and I would suggest more importantly, to make that life a better one.

In a modern Hippocratic Oath, Lasagna (1964) states: "I will remember that there is art to medicine as well as science, and that warmth, sympathy, and understanding may outweigh the surgeon's knife or the chemist's drug". It reads like a paragraph from a Patient, Doctor & Society handout, and yet the farther I get into medicine, the more I realise it's true.

If we measure our success as doctors, not by the medical gains we make for our patient, but by how satisfied they are with their treatment, we often find that the less competent but friendlier doctor is better regarded by patients than the more competent but emotionally distant one. Perhaps it is a case of "the deluded happy", "ignorance is bliss", or "what you don't know won't harm you", but the lesson is the same.

We can gain immense job satisfaction in performing our clinical duties competently, unearthing the rare diseases, and using the latest treatments, but we must not lose sight of the fact that this means little to patients if they are left feeling like just another among many. Of course, we do all struggle at times. Who hasn't experienced the hypochondriac, the drug user, the chronic bronc who won't quit smoking, the neurotic parent, the plain weird? And yet, they too, deserve our understanding and compassion, even if we must duck away from time to time to vent frustration!

Medical training is not just about patients though, it is also about us, the doctors-to-be. I have observed not only my own development into a young doctor, but also that of my own classmates. With them, I have had some of the funniest, saddest, weirdest, most boring, most exciting, most challenging, and most stressful moments of my life. And we have become the closer for it.

Each of us would probably only count a minority of the class among our good friends, and yet between each of us exists the bond of being a doctor-in-waiting, and the privilege of that position. Perhaps that is why so many doctors end up marrying each other: not only because of the time spent together, but also because of the ability to empathise with the lot of our confreres. The medical community does truly exist.

The community might be alive and well, but we each have a responsibility to carve our own paths outside medicine. Medicine can easily become all-consuming, a leech that sucks away our other-life blood. We could just as easily measure the success of a doctor by his or her ability to keep a balanced life. Tradition plays a strong part, but a legacy of high divorce and suicide rates is not one that we need inherit. How satisfying will it be, in the years to come, to learn not only of our classmates' achievements in the field of medicine, but also out of it!

So to my fellow classmates, I say: "Reflect on what you've learnt and experienced! Revel in your achievements! Go out and conquer the world!" But have a life while you do it ... ■

Matt is an Otago graduate, now working as a first-year house surgeon at Hawkes Bay DHB. He enjoys writing, and a bit of poetry on the side. Matt is also a rugby fanatic, enjoys warm weather and hiking. He is currently trying to learn German ...

Medicine's heretic bible nearly 30 years onward

Kit Boyes reviews *The House of God* by Samuel Shem
Auckland School of Medicine

Thirty years ago. Thirty years ago our half gallon quarter acre pavlova paradise had twice as many sheep, half the elderly and the third highest standard of living in the world. There were 14 people on the dole. That's right, 14. Women in the civil service could be sacked for marrying. Petrol was cheap. Hippies were flocking to Bert Potter's commune. The Springboks had just toured unmolested. The Treaty was "a praiseworthy device for the amusement of ignorant Savages" and Howick was as white as the skin beneath a civil servant's walk shorts. We had troops in Vietnam and Tim Shadbolt got himself arrested for saying "bullshit".

Thirty years ago. Auckland's new School of Medicine sent its first crop of doctors nervously out into hospitals, hospitals that were run by elected DHBs. As they always had been. Thirty years ago the Arab League got Yom Kippured, the economy OPECed and no one wondered why only men went to the moon. Richard Nixon was dragged out of the Whitehouse lying and smirking and a Harvard MD-cum-Rhodes scholar named Stephen Bergman was winding up the internship he recalled with horror in *The House of God*.

Every profession has its joke laws; soldiers know that tracer works both ways. Lawyers never ask a question unless they know the answer. And in medicine, gomers (get-out-of-my-emergency-room) go to ground. Yet no other profession has exposed its unwritten rules into an unholy bible like our iconic *The House of God*.

I did do my research before entering medicine. I spoke to six doctors. The first told me I was nuts, and to buy a book called *The House of God*. The second said exactly the same, and it's been translated into 20 languages. Docs 3 through 5 checked that I'd read it. And the sixth, well I started this review with the sixth.

But were they right? Is *The House of God* still relevant? Thirty years is a long time in the health sector. Hey, restructuring has only been going for twenty. *The House of God* was not written for posterity. It was written for the here and now, or rather, the there and then. Has *The House of God* passed the test of time? Is there still really

a need for med students to torture themselves with all its anger and despair and fart jokes?

Let's have a look.

That 70s show

The House of God assumes you'll know quite a bit about 70s medicine, but most of this makes sense, because anatomy doesn't change and there's only so many ways you can treat a pneumothorax'.

It's also assumed you'll know quite a bit about 70s USA. This is a bit more of a headache. If you're a med student born in the 80s wondering who this Nixon schmaltz is, quite a bit is going over your head.

The narration is dated by a running account of the collapsing Nixon administration. Literally. Nowhere in the book does it say 1973 or 1974, but you can track most events by the recurring cross-references to Watergate. The author kicks the crooked Richard Nixon round to mirror medical management's desire to accumulate power and delegate blame. Details of Tricky Dicky's decline and plummet will be unfamiliar to many 21st century kiwis.

Consider a couple of obscure references – Mo Dean's dresses and 'Wrong Way' Corrigan's hair do.

The newly wed stunning Mrs Maureen Dean sat in the public gallery, dressing for photographers four days in a row watching as her hot-shot husband, Whitehouse junior counsel John Dean, caught by his conscience, confessed to crimes that jailed him, broke her and implicated the President.

Real life Mister Magoo 'Wrong Way' Corrigan took his little plane up for a little hop, and got a lot lost. He aimed for Long Island and landed in Ireland.

What Corrigan's hair looked like, I've no idea. Mo Dean's dresses I've seen only in black and white. No doubt these were common knowledge in 70s Boston. I was alive at

the time, if not potty trained, but don't know how many other references I've missed.

Many med students will miss these asides. But they are asides, and easily ignored. Someday, maybe some anorak can halve the book's readership by annotating the obscurities. We read Robinson Crusoe without footnotes and thirty years is a lot less than three hundred.

Karma police, arrest that book

The House of God has been criticised for negative depiction of women and African-Americans. Its language doesn't pass the PC of PC – John Updike, who wrote an apologetic introduction.

Liberals tend to judge literature by how PC it is, rather than how good it is. *The House of God* is not great literature – intro by John Updike or not – but if we're judging its medical utility, its political soundness is no more relevant than whether Hippocrates was a sexist or a slave owner. But then I'm a male and mostly white, so I would say that, wouldn't I? We'd better have a look at the problem.

Sexism? The women in this book are characterised by their breast shape. Some receive a lot of characterisation. Many of the women are smart, powerful, and moral. Berry is about the only indisputably "good" person in the book. Our narrator's first words are to praise her. Well, okay, her Cooper's ligaments.

Race relations? Chuck is da funny-talkin' black intern. Chuck no sittin' dem exams he fillin' in these affirmative discriminashun post-cards ... Then again Chuck's competent, caring, and his clinical skills are about the best of the interns. What's the author's message? Well there is no message. Not about race or sex anyway.

However, it does stand out that doctors come in all races, creeds and genders, and no one in the book sees that as unusual. It's not unusual in 2003 New Zealand, but how usual was it in 70s Boston? Maybe there's a message after all. However, to look for a message is to miss the point.

The first-person narrative style gets you to identify with the narrator, and then only gradually reveals that the narrator is as deeply flawed as any other character. Not an original device – think of *One Flew over the Cuckoo's Nest* or *The Murder of Roger Ackroyd* – but it's effective, once you've identified with the character, you may recognise the faults you see in him in you too.

The tale begins by quoting the conquistador Bernal Diaz:
We came here to serve God.
And also to get rich.

The narrative is not politically correct because the narrator is not PC. None of the characters are. They are not supposed to be. The doctors smoke, take drugs, have unprotected adulterous sex, and drink and drive. It's almost *Shortland Street*.

The House of God is about forcing you to see yourself when you don't want to recognise the jerk in the mirror. That is one service it provides med students, and one reason why it is recommended to us. The other is it tells us what to expect apart from the fairy tale.

Through the Looking Glass

In medicine there is a self-imposed censorship. The protestant work ethic Thought Police. Medicine is Good. Doctors are Good. Medicine and Doctors cure patients. Patients are grateful. Long after the lie wears thin, long after Michael Botteril and Herbert Green, after CHEs and RHAs and after Thalidomide and leeches, the illusion is still something we want.

That is what the infamous counter-intuitive rules of *The House of God* are all about – the knowledge that doctors need but don't dare speak about. *The House of God* is recommended because it is supposed to let you see medicine as it really is.

Or does it show medicine as it was? Do the rules of *The House of God* apply in the 21st century? Let's look at a few.

Placement comes first. Speaking from experience, I broke a leg and had to use nepotism, bribery *and* corruption to escape orthopaedic inter-hospital pass the parcel.

Gomers don't die. Life expectancy has increased, birth rates fallen and there is no cure for dementia. Geez, there are more retirement villages in Auckland than cell phone towers. In every lifetime lease, there is a little clause reserving the right to dump residents requiring residential care. The Gomer is alive and well and coming soon to an emergency room near you.

Gomers go to ground. Well, yes and that's what hip protectors are for.

The patient is the one with the disease. As far as I can work out, under WHO guidelines, we are all diseased. This could explain increasing health expenditure.

The delivery of medical care is to do as much nothing as possible. The idea appeals to Pharmac, but for most New Zealanders it is tainted by Herbert Green and the Unfortunate Experiment. Thanks to ACC New Zealand has never been quite as prone to defensive medicine as America. Though so far in Medical School I have never, ever, heard anyone use the phrase 'first do no harm'.

Well, that's a mighty long book review and you still haven't told us if we need the book.

Dunno, ask me after I've been a house officer. ■

Kit is a medical student who has a BA, LLB, a Clifford the Big Red Dog certificate in cycling proficiency and an unhealthy obsession with cricket. He has worked variously as a pizza delivery boy, soldier and McGillicuddy Serious shadow minister for legalised theft (taxation). He also practised law, but has since repented. Kit wrote this article as displacement activity between exams and bomb scares.



Those of us lucky enough to live in Dunedin have discovered it already, but visitors to New Zealand's most congenial city have the pleasure of discovering it for the first time all by themselves. No, we're not talking about the Albatross Colony or the Captain Cook (although both are worth a visit).

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Life as a first-year doctor

Marnie Cox

House Surgeon, Whangarei Hospital

At my seventh-form dinner, the final event before we were sent forth to tertiary study and beyond, we had a female junior doctor as our guest speaker. She was a former head girl of the school; had gone on to study medicine, and was invited along to inspire us.

I have now forgotten most of her speech and also her name, but I can vividly recall an anecdote she told us from her first week at work. She was called to see a patient on the ward on an evening duty. To her horror, she discovered the man was frighteningly unwell. Her first instinct was to urge the nearest nurse to “call the doctor!” Her heart sank as she realised *she* was the doctor. Oh how we laughed.

The next six years passed merrily on until that magical day when I went to bed a medical student and woke up a doctor. I had applied for a job at Whangarei Hospital for many reasons. First, it was a smaller hospital which meant greater responsibility. I’d heard that jumping in at the deep end was the best way to go: I was hoping to swim rather than sink. Whangarei was also close to Auckland where I had grown up and had been away from for six years while studying at Otago. Lastly, and most importantly, Whangarei was only an hour’s drive from my parents’ house – definitely close enough for me to retreat, cry, and drink cups of tea when the job got all too much.

My first job at Whangarei was General Surgery. In at the deep end was right. I miserably remembered the former head girl’s speech many times during that first week. The first occasion was when an elderly male tourist had massive PR bleed after massive PR bleed and dropped his haemoglobin to 46 in a matter of hours. I was fluffing about the bed with intravenous fluids when the charge nurse helpfully suggested it might be time for me to call my registrar. The team took his colon out later that night. My first evening on call in my first week involved my first cardiac arrest. In keeping with the theme I was first at the scene. Thank God for the recently completed Advanced Cardiac Life Support training, and the cavalry that arrived within minutes.

I would not have survived that first quarter without the endless help of my other first-year colleagues. Our predecessors had recommended we help each other out

when busy. This certainly happened but we also developed an invaluable support network for minor procedures. If we couldn’t succeed with a luer, arterial blood gas, or even a blood test, we’d ring around for a hand. This was particularly useful for me because when I started I couldn’t get a luer in a drainpipe. Within a matter of weeks, however, there were the odd occasions when I could get a luer in a patient where one of my colleagues had failed. Now that was job satisfaction.

Those first few weeks were terrible. I felt useless at best and a hindrance at worst. Slowly things got better: I found I could answer nurses’ questions (rather than asking their advice), have a calculated guess at what was wrong with a patient in the Emergency Department, AND get most of my luers. After surviving Surgery I moved to my first Medical run. Under a brilliant consultant and registrar I learned a lot, completed many different procedures, and began to feel like I was good at my job.

The rest of the year passed in a blur of winter medicine and orthopaedics. Soon we were welcoming the next group of first-year house surgeons to Whangarei. The best advice I was given that I can pass on to budding first-years is to ask questions. Ask – even if you are afraid it is a stupid question (it probably is). For example, in my first week I rang my surgical registrar to tell him one of our patients was hypokalaemic – it was 3.3 I think. Looking back now, I cringe at that episode, but at the time, words of kind reassurance from my registrar helped me sleep that night. (Incidentally, the next day I discovered Slow K and Chlorvescent and I was away laughing.)

Lastly, when you are thinking in those first weeks that you are the worst doctor ever, worrying you can’t do the job, and feeling like you’re as much use as a chocolate teapot: keep telling yourself it will get better. Medical school can only teach you so much and there is a point where you must learn on the job. All your registrars and nursing colleagues will understand this. Plus they’ve been through those first awful weeks with your predecessors countless times. And remember, all your first-year friends across the country will be feeling the same way.

Now I am a big bad second-year doctor.

I did it.

I survived. ■

The contribution of community organisations to the health and disability sector

Fran Renton

Community organisations contribute significantly to the health and disability sector by providing direct services, information, education, advocacy and support. The term community is broad and encompasses independent community groups, non-governmental organisations and iwi/M_ori organisations that operate on a not-for-profit basis. An organisation's background and ideology leads it to identify in different ways, for example, as voluntary organisations or third sector organisations.

In Dunedin (population ~120,000), the Dunedin Council of Social Services directory lists 70 community organisations whose work is specifically in the health sector, such as Diabetes Otago and the Otago Asthma Society. Pam Warren, executive officer for the council, estimates that there are another 70 organisations (for example, Age Concern), that contribute to the health and disability sector although it may not be their primary focus. Community organisations in Dunedin range from Presbyterian Support Otago, which has hundreds of paid staff members plus volunteers, to Carers' Society Otago, which in 2004 will employ the equivalent of 1.5 full-time staff.

Many community organisations developed around groups with specific needs or characteristics that were not being met in the public sector. In 1949, a small group of parents dissatisfied with the way their children were treated by health and education professionals formed the Intellectually Handicapped Children's Parents' Association. Now known as IHC, it is the largest provider of services to people with intellectual disabilities and their families in New Zealand.

Health system changes in the 1980s and 90s, such as the overall reduction in funding by central government and a move towards community care for people previously in institutions, prompted a proliferation in community organisations, especially in the areas of disability and mental health. During this time 'self-help' groups also became a popular way of people coming together to support and assist each other. Umbrella organisations such as Health Care Aotearoa (which was formed from

union health services, community and Maori groups) developed to provide support and a united voice for the issues of the rapidly growing community sector.

Today community organisations accept a broad range of referrals from other community organisations, health providers and doctors, as well as self-referrals, and they actively seek out people who may need their services. To raise awareness, they run public campaigns, educational presentations and seminars, and liaise with other groups and services. In Dunedin, community groups offer opportunities and resources to the city's many tertiary students. Lynnette Keith, coordinator of Disability Information Services, says that they welcome enquiries from students as an important way of building links between the community and public health sector.

Direct services provided by community organisations range from alcohol and drug withdrawal services provided by the Richmond Fellowship to the emergency response teams of Red Cross. Support services can be one-on-one, or in groups and networks. Support groups bring people together to share, learn from, and gain support from a common experience, and to build support networks. Practical support might also be offered such as assistance with transportation or childcare to facilitate access to services. Many organisations provide support for families affected by a health condition or disability, such as Parent to Parent which runs camps for siblings of children with disabilities. Julie Butler, manager of Alzheimers Otago, says the main advantage of community organisations is that they have more time to spend with people in this support role than those working in the public sector. Butler also believes because of their specific focuses, community organisations can keep up-to-date with rapidly changing areas and become familiar with information that is commonly asked for, or found to be useful, by their clients.

Direct and support services may be complimented by assessment, referrals and advocacy so that clients can access appropriate care from the other community organisations, or the private and public health systems.

Arthritis New Zealand, a national organisation with 22 service centres, has educators whose roles include education, one-on-one support, and an assessment and referral service. Otago Arthritis educator Julie Pickford says that a typical visit and assessment for an older person living in their own home can result in referrals to community occupational therapists and physiotherapists, to government-contracted home support providers, to other community organisations for activities programmes, and to exercise and support groups run by Arthritis New Zealand. The assessment may also result in vouchers for half-price taxis administered by Arthritis New Zealand in conjunction with the Regional Council. Additionally, educators can offer more in-depth information, or clarify information that may not have been understood or taken in during doctors' appointments.

Such organisations let citizens become involved in their community's wellbeing. Other advantages are their ability to change direction quickly, the provision of culturally appropriate services, their insights into their community's needs, and their flexibility to meet changing demands. Peter Glensor of Health Care Aotearoa says that the type of integrated care offered by community health agencies is driving the strategic directions in primary health, such as the development of Primary Health Organisations. PHOs are required to work with those parts of their population that have poor health or are missing out on services, and to address their needs. They are also to be not-for-profit bodies with accountability for the use of public funds.

The two main difficulties facing community organisations are ensuring adequate funding and co-ordinating services between the public and community sector. Some services, especially access to emergency support and community support workers, are free. Organisations may attract some government funding but this rarely covers the full cost of the services offered. The shortfall is made up by volunteers, grants, donations, fundraising, corporate sponsorship, and membership fees.

In 2000, the government established a Community and Voluntary Sector Working Party in response to disillusionment about the relationship between the government and community organisations. Community organisations' feedback was that they felt as though they were not listened to, or recognised as legitimate contributors to health policy and decision-making. This isolation combined with a lack of funding contributed to the lack of co-ordination of their services with those offered by the public sector. In response, the government signed a *Statement of Government Intentions for an Improved Community-Government Relationship* in December 2001. This committed the government to improving relationships with the community sector. The Ministry of Health has also committed itself to strengthen its relationship with community groups providing health and disability services.

Community organisations offer many health and disability services and have proved able to respond to the needs of their particular client groups. Ongoing support from the government and public sector will ensure that community organisations continue to play an important role in improving the quality of health for the people of New Zealand. ■

Fran Renton is Southern Regional Volunteer Co-ordinator for the Arthritis Foundation. She has recently graduated with an LLB and BA (psychology) from the University of Otago.
