

CONTENTS

This Issue in the Journal

- 3 A summary of the original articles featured in this issue

Editorials

- 6 A country left behind: folic acid food fortification policy in New Zealand
Lisa A Houghton
- 10 Unmet need or medicalising distress?
Roger T Mulder

Original Articles

- 13 Sleep disorders, depression, anxiety and satisfaction with life among young adults: a survey of university students in Auckland, New Zealand
Chinthaka B Samaranayake, Bruce Arroll, Antonio T Fernando, 3rd
- 23 Coming to work sick: a survey of hospital doctors in New Zealand
Pei Chyi (Melissa) Tan, Geoff Robinson, Sisira Jayathissa, Mark Weatherall
- 36 Progress of successful New Zealand Registration Examination (NZREX Clinical) candidates during their first year of supervised clinical practice in New Zealand
Steven Lillis, Heather Roblin
- 43 Adoption of endovenous laser treatment as the primary treatment modality for varicose veins: the Auckland City Hospital experience
Ruchira S W Fernando, Carl Muthu
- 51 Acute surgical treatment of cutaneous abscesses: cost savings from prioritisation in theatre
Vincent Chong, Lifeng Zhou, Hardeep Hundal, Jonathan Koea
- 58 A review of the Christchurch Hospital Breast Cancer Service in 2012: meeting the new Tumour Standards
Valerie Davey, Gavin Harris, Birgit Dijkstra, Melissa James, Bridget Robinson

Viewpoint

- 74 Where does New Zealand stand on permitting research on human embryos?
D Gareth Jones

Letters

- 83 When enough is not enough: folic acid fortification in New Zealand
Barry Borman, Maria Poynter
- 85 Possible impact of the Tick Programme in New Zealand on selected nutrient intakes: tentative estimates and methodological complexities
Nick Wilson, Nhung Nghiem, Helen Eyles, Cliona Ni Mhurchu, Linda J Cobiac, Amber L Pearson, Cristina Cleghorn, Tony Blakely

100 Years Ago in the NZMJ

- 89 Psychotherapy

Methuselah

- 91 Selected excerpts from Methuselah

Notices

- 93 Heart Foundation Grants Awarded July 2014
- 97 Medical Benevolent Fund

Book Review

- 98 The Dark Side of Nursing (Ingrid Teresa Pryde)
Liane Dixon

This Issue in the Journal

Original Articles

Sleep disorders, depression, anxiety and satisfaction with life among young adults: a survey of university students in Auckland, New Zealand

Chinthaka B Samaranayake, Bruce Arroll, Antonio T Fernando, 3rd

Sleep symptoms are distressing and greatly impact on quality of life. The aim of this study was to determine the rates of sleep disorders, depression, anxiety, and substance use, and identify correlations between satisfaction with life among university students at The University Auckland. A questionnaire was given to 1933 students; 66.8% completed the questionnaire. The median age of the students was 20 years (range 16–38); 63.9% were women. This study which is a first of its kind in New Zealand showed that a large number of university students (39.4% of the students who completed the survey) are suffering from significant sleep symptoms. Depression, anxiety, substance use, and circadian rhythm disorders were the commonest causes of sleep difficulties in this population group. Clinically significant depression and anxiety were present in 17.3% and 19.7% of the students surveyed respectively. The study also showed that harmful alcohol and drug use was common among this population group and is associated with depression and anxiety. This study has the potential to aid clinicians within New Zealand in better appreciating the sleep-related health problems faced by young people in this country.

Coming to work sick: a survey of hospital doctors in New Zealand

Pei Chyi (Melissa) Tan, Geoff Robinson, Sisira Jayathissa, Mark Weatherall

Sickness presenteeism is the act of working whilst sick. This survey of Capital and Coast DHB hospital doctors revealed that many doctors are continuing to work whilst unwell (82% responded that they came to work at least once when they would have otherwise called in sick due to their poor health). Doctors knew that this was poor practice as 75% reported coming to work knowing they were too sick to perform to their usual standard, and 49% reported coming to work with an infectious illness. The main reasons given by doctors for continuing to work were due to increasing burden on colleagues and feeling of duty to patients. It is a difficult problem to solve, but is important to acknowledge due to risk to both patients' and doctors' health.

Progress of successful New Zealand Registration Examination (NZREX Clinical) candidates during their first year of supervised clinical practice in New Zealand

Steven Lillis, Heather Roblin

Some overseas trained doctors have to successfully pass a clinical examination before working in supervised positions as a junior doctor. Of those who pass the

examination, 90% do well in their first year of supervised practice. When problems occur, they usually occur in the first 6 months of practice.

Adoption of endovenous laser treatment as the primary treatment modality for varicose veins: the Auckland City Hospital experience

Ruchira S W Fernando, Carl Muthu

Varicose veins are abnormally enlarged veins generally present in the lower legs that are not functioning normally. They are usually unsightly but in some people they can result in severe skin damage and even ulceration. They have traditionally been treated by surgical removal but now, in many instances, they can be treated a laser procedure called EVLT (Endovenous Laser Therapy). This is a minimally invasive procedure that is as effective as surgery, associated with few side effects and a rapid return to normal activities. Because it is performed under local anaesthetic in a procedure room, rather than in an operating theatre, the use of this technique has enabled many more patients to be treated at Auckland Hospital than was the case when surgery was the only available treatment.

Acute surgical treatment of cutaneous abscesses: cost savings from prioritisation in theatre

Vincent Chong, Lifeng Zhou, Hardeep Hundal, Jonathan Koea

Cutaneous (skin) abscesses are an important part of acute surgical work in New Zealand. Historically these are often treated after other cases and stayed overnight for treatment. Newer processes facilitate same earl treatment of abscesses with same day discharges. This treatment is safe, well tolerated by patients and results in significant cost savings.

A review of the Christchurch Hospital Breast Cancer Service in 2012: meeting the new Tumour Standards

Valerie Davey, Gavin Harris, Birgit Dijkstra, Melissa James, Bridget Robinson

The care received by 288 breast cancer patients treated at Christchurch Hospital in 2012 was reviewed using the time points stipulated by the new Tumour Standards developed by Ministry of Health in 2013. Some of the Tumour Standards were achieved as the vast majority of patients received their first breast cancer treatment within 62 days of referral to the hospital (87%) and within 31 days of giving informed consent to the recommended treatment (89%). While only 64% of patients started chemotherapy within 42 days following their breast cancer surgery, 97% had commenced chemotherapy within 31 days of the decision for treatment. A number of interventions, such as improving the multidisciplinary meetings and the appointment of cancer nurse specialists to support patients during their treatment, have been implemented to resolve identified factors that delayed patient treatment times.

Viewpoint

Where does New Zealand stand on permitting research on human embryos?

D Gareth Jones

In vitro fertilisation (IVF) is widely available in New Zealand as a means of overcoming infertility, and is an established procedure under the Human Assisted Reproductive Technology (HART) Act. The development of IVF involved research on human embryos and continuing improvements in procedures depend upon ongoing research. However, embryo research is currently prohibited in New Zealand, even though many embryos surplus to the requirements of those in IVF programmes will eventually be discarded. While this gives the impression of protecting embryos, it fails to do this and fails to enhance the health and wellbeing of children born using IVF. This unsatisfactory situation will not be rectified until research is allowed on human embryos.

A country left behind: folic acid food fortification policy in New Zealand

Lisa A Houghton

Under a Joint Food Standards Agreement, folic acid fortification of bread in New Zealand and bread-making flour in Australia was made mandatory in September 2009—but as the deadline drew near, political and manufacturer opposition of bread fortification in New Zealand gave rise to concerns about costs to the industry, unsubstantiated harmful health effects and whether the neural tube defect (NTD) prevalence in New Zealand warranted mandatory measures.

Only Australia succeeded in implementing mandatory folic acid fortification as planned. Advocates in both countries were disheartened as the bread fortification mandate in New Zealand was deferred and eventually revoked in August 2012.

The mandatory fortification standard was replaced with the New Zealand (Permitted Fortification of Bread with Folic Acid) Food Standard 2012. Under this new policy, bakers who fortify with folic acid are subject to an annual audit to verify that they are not exceeding the maximum concentration level. In addition, the Ministry of Primary Industries pledged to continue working with the bakers in the hope of achieving a 50% bread fortification target.

As highlighted by Borman and Poynter in this issue of *Journal*¹ the recently released industry audit report indicates that only 14% of breads were fortified with folic acid by the end of 2013. The question to consider is not “Will voluntary fortification of breads reach this 50% target” but rather “Will this targeted approach be effective?”.

Even if the target goal is attained, voluntary fortification requires women to know about—and choose—fortified breads, or that commonly and regularly eaten breads are fortified and readily affordable. In other words, most women must consume fortified breads whether or not they are aware of their folic acid content.

Dietary modelling of folic acid intakes of reproductive age women based on availability of voluntarily fortified breads and actual bread consumption patterns demonstrates that this targeted programme has only modest effects on folic acid intakes.²

It should also be noted that 15 years have elapsed since the collection of food consumption data upon which New Zealand’s mandatory fortification proposal was based. More recent evidence indicates that bread consumption has decreased markedly in the target group of reproductive age women.³ Indeed, in some instances, the proposed policy will have minimal impact on certain subgroups, such as Asian women who consume little or no bread.

In addition, a recent survey of postpartum New Zealand women published in 2012 showed that while half of all women surveyed were aware that folic acid was added to some bread, less than 2% of women inspected labels in order to buy folic acid-

fortified bread in the periconceptional period.⁴ Moreover, only 14% of women deliberately consumed food in the periconceptional period due to its folate content.

While voluntary fortification of bread alone is clearly not enough, sufficient amounts of folic acid could be obtained from our food supply if fortification practices were more widely distributed.

Bread was chosen as the vehicle for mandatory fortification because at that time most women of reproductive age ate bread regularly and it was not traded internationally; however, voluntary fortification of other food products have been permitted in New Zealand since 1996 including breakfast cereals, pasta, fruit and vegetable juices and drinks, and soya and rice milk.

Consumption patterns of reproductive age women indicate that voluntarily fortified bread is the main contributor of folic acid intake to the diet followed by ready-to-eat breakfast cereals. Breakfast cereals are consumed by 70% of the population⁵ and thus, permission to increase the maximum allowable level may increase folate intakes. For example, legislation in the United States allows up to 400 mg folic acid per serving of breakfast cereal compared with current New Zealand regulations, which permits only 100 mg folic acid per serving.⁶

In addition, other suitable food staples and condiments not currently listed should be considered. Rice is not included in the list of permitted foods for fortification, however, it may present an appropriate food vehicle given the country's increasing Asian population.⁷

Despite the promise of increased targeted voluntary fortification, the lack of legal framework needed to optimise the implementation of this type of strategy is a major challenge. For example, analytical testing of fortified breads in 2011 revealed significant variability in the folic acid content of the highest selling breads, with the actual amounts measuring well below the set objective.⁸ Where mandatory fortification provides clear governance of the type of foods to be fortified and the amount that can be added, a non-binding agreement with the food industry to increase the range of voluntarily fortified foods is likely to be unreliable.

From a health inequalities perspective, mandatory fortification, unlike voluntary measures, benefits segments of the population less likely to use supplements. Health education initiatives designed to address folic acid supplement use in at risk subgroups have been met with little success.

Although most New Zealand women had heard of the need for folic acid supplements, only one-third of women consume folic acid supplements prior to conception.⁴ Indeed, even when pregnancy is planned, periconceptional supplement use is less common among Māori, Pacific and Asian women, younger women and women with lower education and income.⁴

Likewise, neural tube defects show a similar socioeconomic gradient and a higher risk among Māori women than those of non-Māori non-Pacific ethnicity (RR 2.65, 95%CI 1.64–4.29).⁹

In support of mandatory bread fortification, recent data have shown that bread consumption is higher among those with low income and the least education. As a result, the previously proposed bread fortification mandate would have remedied

many of these identified sociodemographic inequities in folic acid supplemental use.^{3,10}

In contrast, as of May 2014, breads voluntarily fortified with folic acid are typically wholegrain, which are generally more expensive and less likely consumed by those women of lower socioeconomic status.^{11,12}

Nearly 20 years have passed since voluntary fortification of food with folic acid was legislated in New Zealand for the purpose of preventing neural tube defects. Even in the early years, it was deemed unsatisfactory on the basis of poor uptake by manufacturers. Although not new, influencing health through regulatory channels has become an increasingly vital tool in modern public health practice with folic acid fortification listed as one of the *Ten Great Public Health Achievements in the United States*.¹³

In response to the success of the North American programme, flour fortification has been widely accepted and put into practice in over 70 countries. In Australia, while the impact of mandatory fortification on the incidence of neural tube defects has yet to be evaluated, survey work indicates improvements in the blood folate status of the population, and a significant decline in the prevalence of folate deficiency between April 2009 to April 2010.¹⁴

It is estimated that approximately 80 cases of fatal or seriously disabling neural tube defects occur each year in New Zealand.¹⁵ Mandatory fortification as proposed was anticipated to prevent up to 24 cases per year. Today, this 5-year loss of impact from fortification possibilities equates to a minimum of 100 cases occurring that would have been avoided.¹⁶

To progress, there are many lessons to be gained from reflecting on New Zealand's folic acid food fortification experience and roadblocks. Doing so will enable others to better anticipate potential challenges so that no country will be left behind.

Competing interests: Nil.

Author information: Lisa A Houghton, Senior Lecturer, Department of Human Nutrition, University of Otago, Dunedin

Correspondence: Lisa Houghton, Department of Human Nutrition, University of Otago, PO Box 56, Dunedin 9054, New Zealand. Email: lisa.houghton@otago.ac.nz

References:

1. Borman B, Poynter M. When enough is not enough: folic acid fortification in New Zealand [letter]. *N Z Med J* 2014;127(1399). <http://journal.nzma.org.nz/journal/127-1399/6241/content.pdf>
2. Evans SE, Mygind VL, Peddie MC, Miller JC, Houghton LA. Effect of increasing voluntary folic acid food fortification on dietary folate intakes and adequacy of reproductive-age women in New Zealand. *Public Health Nutr*. 2014;17(7):1447–1453.
3. Mallard SR, Gray AR, Houghton LA. Periconceptional bread intakes indicate New Zealand's proposed mandatory folic acid fortification program may be outdated: results from a postpartum survey. *BMC Pregnancy Childbirth*. 2012;12:8.
4. Mallard SR, Houghton LA. Folate knowledge and consumer behaviour among pregnant New Zealand women prior to the potential introduction of mandatory fortification. *Asia Pacific Journal of Clinical Nutrition*. 2012;21(3):440–449.

5. Australian Institute of Health and Welfare. Mandatory folic acid and iodine fortification in Australia and New Zealand: supplement to the baseline report for monitoring (full publication; 15/9/2011 edition (AIHW)).
<http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737420082>
6. Australian Government. Australia New Zealand Food Standards Code – Standard 1.3.2 – Vitamins and Minerals. 11 Jul 2011. <http://www.comlaw.gov.au/Series/F2008B00615>
7. Statistics New Zealand. National Ethnic Population Projections: 2006(base)-2026 update. 22 April 2010.
http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalEthnicPopulationProjections_HOTP2006-26.aspx
8. Ministry of Agriculture and Forestry. Monitoring voluntary fortification of bread with folic acid. MAF Technical Paper No: 2011/103. December 2011
<http://www.foodsafety.govt.nz/science-risk/project-reports/food-composition/nutrients/folic-acid.htm>
9. Craig E, McDonald G, Adams J, et al on behalf of the New Zealand Child and Youth Epidemiology Service. Te Ohonga Ake. The Health of Maori Children and Young People with Chronic Conditions and Disabilities in New Zealand. Report prepared for the Ministry of Health. March 2012.
<http://www.moh.govt.nz/notebook/nbbooks.nsf/0/D2CA1E4FC36D916FCC2579EC00099C01?OpenDocument>
10. Mallard SR, Gray AR, Houghton LA. Delaying mandatory folic acid fortification perpetuates health inequalities: Results from a retrospective study of postpartum New Zealand women. Human Reproduction. 2011;27:273–282.
11. Ministry of Health. A Focus on Nutrition: Key Findings of the 2008/09 New Zealand Adult Nutrition Survey. <http://www.health.govt.nz/publication/focus-nutrition-key-findings-2008-09-nz-adult-nutrition-survey>
12. Folic acid fortified breads list. <http://www.bakeinfo.co.nz/Facts/Bread-making/Folic-Acid-Fortification-of-Bread/List-of-Folic-Acid-Fortified-Breads> (as of May 2012).
13. Center for Disease Control. Ten great public health achievements. United States, 2001–2010. Morbidity and Mortality Weekly Report. 2011;60(19):619–623.
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm>
14. Brown RD, Langshaw MR, Uhr EJ, Gibson JN, Joshua DE. The impact of mandatory fortification of flour with folic acid on the blood folate levels of an Australian population. The Medical Journal of Australia. Jan 17 2011;194(2):65–67.
15. Ministry for Primary Industries. The future of folic acid fortification of bread in New Zealand. MPI Discussion Paper No: 2012/02. May 2012.
<http://www.foodsafety.govt.nz/elibrary/industry/fortification-bread-folic-acid/index.htm>
16. New Zealand Organisation for Rare Disorders (NZORD). Babies die as bakers fail miserably with bread fortification project [press release]. June 2014.
http://www.nzord.org.nz/news_and_issues/press_releases_and_submissions/babies_die_as_bakers_fail_miserably_with_bread_fortification_project

Unmet need or medicalising distress?

Roger T Mulder

The article by Samaranayake et al, in this issue of the *Journal*,¹ is a well-designed study. It managed to get a surprisingly high response rate (nearly 70%) for studies of this type by using paper versions of questionnaires (filled in prior to student lectures) rather than the usual computer-based surveys. There may be a lesson in that. The authors report high rates of sleep disorders, clinically significant anxiety and depression as well as harmful alcohol and drug use among the student population.

The question immediately arises about what these ‘disorders’ actually are and what do they mean. The authors seem to believe that their measures capture significant psychopathology and conclude that “accurate diagnosis using defined criteria will enable effective treatment for these conditions that impact greatly on the quality of life”. This implies that at least 40% and probably closer to 50% (if we add up the disorders even allowing for diagnostic overlap) of students are suffering from a significant psychiatric disorder.

Taken at face value this means that one in two students should be visiting a health professional in order to undergo a clinical intervention for a sleep disorder and/or a depressive disorder and/or an anxiety disorder and/or an alcohol and drug disorder. Obviously someone needs to warn student health services.

Could these results be seen as over-medicalisation of mental health issues? It seems reasonable to state that the University of Auckland students have quite high levels of distress including sleep disturbance, as well as anxiety and depressive symptoms. Interestingly a survey of Christchurch medical students 7 months after a major earthquake, using different instruments, reported lower rates of psychological distress. Only 6% reported significant sleep problems, 9% anxiety and 12% depression.²

Regardless, to convert what may be normal life experiences in many cases to mental disorders is difficult to justify. The authors own data supports this view. Despite the apparent high rates of psychopathology they go on to report that less than 2% of their sample are dissatisfied or extremely dissatisfied with life. Over 80% are, in fact, slightly to extremely satisfied. It is difficult to reconcile the apparent high prevalence of mental disorders with students’ general satisfaction with life.

The mental disorders that were screened for are created categories promoted in a diagnostic manual (the DSM 5)³ that has become a worldwide standard. There has been increasing concern that the diagnostic criteria for many of the disorders are too vague and encompassing and convert personal or social problems into medical ones.⁴

Particular conditions are promoted as widespread, serious, and treatable by specific interventions. Alternative approaches such as emphasising the self-limited or relatively benign natural history of a problem, or the importance of non-medicalised personal coping strategies are played down or ignored.⁵

This is not to say the DSM psychiatric diagnoses are purely social constructions but to acknowledge that accretion and practical necessity underlie most mental disorders rather than an independent set of abstract and operationalised criteria.⁶ Given our current state of knowledge, a more honest (if somewhat self-serving) definition of mental disorder might be that of Maddux et al.⁷ “Mental disorder is what clinicians treat and researchers research and educators teach and insurance companies pay for”.

We do need a guide to psychiatric disorders. While DSM 5 might be indispensable it is fallible and imperfect and this needs to be kept in mind when advocating screening and treatment for the disorders contained within it.

Criticisms of psychiatry for pathologising normality are not new. Nor is “disease mongering” confined to psychiatry.⁸ However, because distress is a fundamental symptom in psychiatry and the neuroscience underpinning its definitions is weak, psychiatric disorders are particularly vulnerable to expansion.

Some consider the widening of boundaries is cynically manipulated to expand markets for those who sell and deliver treatments, particularly pharmaceutical companies.⁵ While there is undoubtedly some truth in this view, there is also a deeply felt need to explain, or at least label, what might otherwise be seen as unexplainable human suffering or deviance. In addition, patient and advocacy groups often see such labels as a way of causing attention to neglected needs, gaining research funding and reducing stigma.⁶ Clinicians are concerned about people being denied access to health care, avoidable personal suffering and social exclusion so clamour for an extension in boundaries of the disorders they treat.⁹

What then is the harm in expanding the number of individuals suffering from mental illnesses? It might be argued that around half the students are suffering from at least some distress even if much of it is expectable and ‘normal’. I would argue that the risks outweigh the benefits. The obvious risks are unnecessary labelling (with potential consequences for such things as medical or income insurance), potential stigma, overtreatment, iatrogenic illness due to drug side-effects as well as resources diverted from treating more serious illness. Less obvious but equally important is that pathologising distress as illness may lead individuals to increasing self-identification as helpless and reliant on the services of health professionals.

Distress is seen as a signal that professional help is needed.⁴ Illness models also tend to attempt to relieve distress by focusing on individualised and private solutions rather than sociological or political explanations.⁵ If sleep, anxiety, depression and alcohol disorders are as widespread as this survey reports then rather than suggesting students attend GPs or student health services for individual treatment it might be better to focus on what stressors in university life lead to such high rates of mental disorder.

In conclusion, it appears that students at the University of Auckland often have sleep problems, depressive and anxiety symptoms, and drink too much at times. This is similar to international surveys of university students. Currently our society appears intolerant of what could be considered normal and expectable distress and labels these symptoms as disorders implying that they require professional help.

On the face of it, it seems unlikely that the majority of students have a mental disorder and a case could be made that most of these symptoms are transient and reactive and do not justify specific treatments.

Addressing general factors that may reduce stress among university students is more likely to be helpful than suggesting that around half the student body requires mental health interventions.

Competing interests: Nil.

Author information: Roger Mulder, Professor of Psychological Medicine, Department of Psychological Medicine, Christchurch School of Medicine and Health Sciences, University of Otago, Christchurch

Correspondence: Professor Roger Mulder, Department of Psychological Medicine, Christchurch School of Medicine and Health Sciences, University of Otago, PO Box 4345, Christchurch, New Zealand. Fax: +64 (0)3 3720407; email: roger.mulder@otago.ac.nz

References:

1. Samaranayake CB, Arroll B, Fernando AT, 3rd. Sleep disorders, depression, anxiety and satisfaction with life among young adults: a survey of university students in Auckland, New Zealand. *N Z Med J.* 2014;127(1399). <http://journal.nzma.org.nz/journal/127-1399/6233/content.pdf>
2. Carter FA, Bell CJ, Ali AN, McKenzie JM, Wilkinson TJ. The impact of major earthquakes on the psychological functioning of medical students: a Christchurch, New Zealand study. *N Z Med J.* 2014;127(1398):54–66. <http://journal.nzma.org.nz/journal/127-1398/6211>
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing, 2013.
4. Mulder RT. An epidemic of depression or the medicalization of distress? *Perspect Biol Med.* 2008;51:238–50.
5. Moynihan R, Heath I, Henry D. Selling sickness: the pharmaceutical industry and disease mongering. *BMJ.* 2002;324:886–91.
6. Frances AJ, Widiger T. Psychiatric diagnosis: lessons from the DSM-IV past and cautions for the DSM-5 future. *Annu Rev Clin Psychol.* 2012;8:109–30.
7. Maddux JE, Gosselin JT, Winstead BA. Conceptions of psychopathology: a social constructionist perspective. In: Maddux JE, Winstead BA, (eds) *Psychopathology: Foundations for a Contemporary Understanding.* New York: Routledge/Taylor & Francis Group, 2008:3–18.
8. Moynihan R, Doust J, Henry D. Preventing overdiagnosis: how to stop harming the healthy. *BMJ.* 2012;344:e3502. <http://www.bmj.com/content/344/bmj.e3502>
9. Bolton D. Overdiagnosis problems in the DSM-IV and the new DSM-5: can they be resolved by the distress-impairment criterion? *Can J Psychiatry.* 2013;58:612–7.

Sleep disorders, depression, anxiety and satisfaction with life among young adults: a survey of university students in Auckland, New Zealand

Chinthaka B Samaranayake, Bruce Arroll, Antonio T Fernando, 3rd

Abstract

Aim Sleep symptoms, depression and anxiety often coexist and tertiary students are a population group that are increasingly recognised to be at risk. However the rates of these conditions in the New Zealand population are poorly understood. The aim of this study was to determine the rates of sleep disorders, depression and anxiety, and identify correlations between satisfactions with life among university students in Auckland.

Method Auckland Sleep Questionnaire (ASQ) was administered to undergraduate students from six schools of The University of Auckland. The different types of sleep disorders were calculated for the students who reported a significant sleep problem lasting more than 1 month. The rate of depression, anxiety and substance use as well as the satisfaction with life scale scores were also calculated for the whole cohort.

Results A total of 1933 students were invited to participate and 66.8% completed the questionnaire. The median age was 20 years (range 16–38) and women represented 63.9% of the total group. A total of 39.4% of the students surveyed reported having significant sleep symptoms lasting longer than 1 month. The most prevalent causes for sleep symptoms were depression and anxiety. Delayed sleep phase disorder was found in 24.9% of students and parasomnias were reported by 12.4%.

Depression and anxiety were present in 17.3% and 19.7% of the total group respectively, and 7.3% of students had thoughts of “being better off dead” or self-harm. A total of 15.5% students were found to have a CAGE score ≥ 2 and 9.3% reported using recreational drugs in the last 3 months. Moderate negative correlations between SWLS scores and depression and anxiety were found ($r=-0.45$ and $r=-0.37$ respectively).

Conclusion A large number of university students are suffering from significant sleep symptoms. Mood disorders, substance use, and circadian rhythm disorders can greatly contribute to sleep difficulties in this population group. The study also showed that harmful alcohol and drug use was common among this population group and is associated with clinically significant depression and anxiety. Accurate diagnosis using defined criteria will enable effective treatment for these conditions that impact greatly on the quality of life.

Sleep symptoms are distressing and greatly impact on quality of life.¹ The prevalence of sleep disorders in the general population ranges between 10% to 48%.^{2,3} Young adults, particularly university students, are increasingly recognised as a population group that is greatly affected by sleep difficulties.³ Erratic sleep schedules due to academic or employment demands and lifestyle choices, easy access to alcohol and

other substances as well as minimal supervision are some of the contributing factors for high rates of sleep symptoms in this population.^{4,5}

Multiple biological and social risk factors often coexist to precipitate sleep symptoms in predisposed young adults.⁶ Circadian rhythm disorders, especially delayed sleep phase disorder (DSPD), is common in young adults, which can present with difficulty falling asleep at night and difficulty waking in the morning.⁷ Primary sleep disorders, such as parasomnias and restless leg syndrome often present with day time sleepiness or fatigue.^{8,9}

Sleep-related breathing disorders, such obstructive sleep apnoea, is becoming more prevalent in young adults, as well as older adults, with increasing rates of obesity. Comorbid medical conditions causing hypoxemia and dyspnoea, gastroesophageal reflux, chronic pain and neurodegenerative diseases significantly increase the risk of sleep symptoms.¹⁰

Psychiatric disorders are common comorbidities in young adults presenting with sleep symptoms.^{5,11} Up to 40% of young adults with sleep symptoms are reported to have coexisting depression and/or anxiety disorder.^{12,13} Another major contributing factor to sleep symptoms is substance use. Unhealthy alcohol use can be a major cause of sleep symptoms, particularly in the young adult populations.¹⁴

Furthermore, a high prevalence of psychological distress including depression and anxiety has been reported in tertiary students, which can be represented in a variety of ways, including burn out, depression, anxiety, poor mental and physical wellbeing, and poor quality of life.^{13, 15-17}

Depression and anxiety symptoms are also associated with lower levels of satisfaction with life.¹⁷ There is also evidence to suggest that individuals with significant psychological distress while being a student, go on to have high level of distress during their professional careers.¹⁶ High level of personal distress leads to adverse consequences in academic performance, competency, professionalism and physical health of young adults.

There is limited international literature on the prevalence of different types of sleep disorders, and contributing depression, anxiety and substance use among young adults. The currently available literature mainly focuses on the sleep patterns, severity of insomnia and impact on academic performance.⁵ Furthermore, rate of sleep disorders and co-existing depression, anxiety and substance use among New Zealand young adults has not been studied in the past.

The aim of this study was to determine the rates of sleep disorders, depression and anxiety, and identify correlations between satisfaction with life among university students in Auckland.

Method

Students from six schools of The University of Auckland (Medical, Nursing, Health Science, Engineering, Law and Architecture) were sampled. At least one whole year group from each of the six schools were invited to participate. The study investigators administered a paper version of the Auckland Sleep Questionnaire (ASQ)¹⁸ to the whole year groups prior to a lecture with the consent of the participants and lecturers. A short introduction into the study was given and the study investigators were present in the lecture theatres while the students completed the questionnaire. The students were given 15 minutes to complete the questions prior to the lecture and the questionnaires were collected at

the end of the lecture. The study was conducted in the middle of the academic semesters to avoid the acute stress of exams affecting the results.

The ASQ was designed to diagnose sleep disorders, and was validated with high sensitivity and specificity in the primary care setting in New Zealand.¹⁸ The questions used in the ASQ were derived from either standard primary care inventories—namely GAD-7 (for anxiety),¹⁹ PHQ-9 (for depression),²⁰ CAGE (for alcohol)²¹, or the International Classification Sleep Disorders (ICSD). The 5-item Satisfaction with Life Scale (SWLS) developed by Diener et al²² was used to measure the participants' life satisfaction. The assumptions relating to some of the diagnostic criteria in ASQ and the validation method is described elsewhere.¹⁸ There were no exclusion criteria for participation in the study. Ethical approval for this study was granted by the Northern Regional Ethics Committee (NTX/07/05/038).

Table 1 provides the criteria used to define the specific conditions affecting sleep which are included in this study. A similar logic to that was previously described in Arroll et al³ was used for the data analysis. The students who reported significant sleep symptoms lasting for more than 1 month were initially identified, and for these students the rates of identifiable causes of sleep symptoms as defined in Table 1 were calculated. The rate of depression (PHQ score ≥ 10), anxiety (GAD score ≥ 8), positive CAGE screen (CAGE ≥ 2) as well as SWLS scores were calculated for the whole cohort.

Subgroup analyses between ethnicity, gender and courses were carried out. The chi-squared test was used for subgroup comparison. Spearman correlation was used to quantify associations between groups. The 95% confidence intervals (95% CI) were calculated for rates. The reported differences were significant at p value < 0.05 . The analyses were carried out using Statistical Package for the Social Sciences (SPSS for Windows, IBM Corporation, Somers, NY, USA).

Table 1. Definition of significant sleep symptoms and conditions contributing to sleep symptoms used in the study

Condition	Auckland Sleep Questionnaire criteria
Reported sleep symptoms	Do you have problems getting to sleep, staying asleep or waking early such that it affects your work function the next day- this includes feeling excessively sleepy the next day, for the duration of at least one month.
Depression	PHQ score ≥ 10
Anxiety	GAD score ≥ 8
Obstructive sleep apnoea	Having ≥ 4 of (i) Have excessive daytime sleepiness (ii) pauses in between breaths during sleep (iii) morning headache, (iv) dry mouth (v) loud snoring. i and ii must be present.
Delayed sleep-phase disorder	All of the following: considers self to be an evening person, choosing to go to bed late or choosing to wake up late and has no medical problem, mood disorder, substance problem, breathing disorder or other sleeping disorder. Going to bed after midnight.
Parasomnias	Reported sleepwalking, started before a teenager, difficulty arousing during episode and no subjective awareness OR sleep-talking occurring ≥ 3 /week causing disturbance to bed partner and no subjective awareness of episode OR reported teeth grinding and one of: abnormal wear of teeth, sounds associated with grinding or jaw muscle discomfort occurring ≥ 3 /week OR unpleasant sensations (aches, pains or creeping) in legs affecting sleep, relieved by movement or rubbing occurring ≥ 3 /week.
General health problem	Significant health problems affecting ability to sleep well occurring ≥ 3 /week
Alcohol problem	CAGE score ≥ 2
Other substance use	Reported drug use in the last three months, and drugs use affecting sleep or quality of sleep.
Primary insomnia	Reports a sleep problem but has no other diagnosable disorder in Table 1.

PHQ = Patient Health Questionnaire; GAD = Generalised Anxiety Disorder Questionnaire; DSPD = Delayed Sleep-Phase Disorder.

Results

A total of 1933 students were invited to participate and 1292 (66.8%) students completed the questionnaire. The responded students included 575 (62.0%) medical, 208 (75.4%) health sciences, 170 (69.1%) nursing, 136 (69.4%) law, 108 (65.1%) engineering and 95 (77.9%) architecture students. The median age of the students was 20 years (range 16 to 38 years), and females represented 63.9% of the group. In terms of ethnicity makeup, 39.8% were New Zealand European, 12.6% Māori, 4.1% Pacific Island, 30.1% Asian and 13.4% other.

Sleep disorders—A total of 39.4% (n = 509/1292, 95% CI 37% to 42%) of students surveyed in this study reported a significant sleep problem for more than one month. Specific conditions causing sleep symptoms for the surveyed students are listed in Table 2. No gender difference in the students with sleep symptoms was observed. There was no statistically significant difference in the rate of reported sleep problem in the different course groups. In terms of ethnicity sub-group analysis, the rate of significant sleep symptoms reported by Māori and Pacific Island students were 54% and 49.1% respectively. These rates were higher than the rates reported by NZ European (39.1%) and Asian students (35.8%) when the ethnicity groups were compared amongst one another (p=0.01). In terms of specific causes of sleep symptoms,

Māori students had a higher rate of CAGE score ≥ 2 compared to other ethnicities (p=0.008). Pacific Island students had a higher rate of depression as a cause of sleep symptoms compared to other ethnicities (p=0.02). There were no other statistically significant differences in the specific causes of sleep symptoms in the ethnicity groups.

Table 2. Specific causes of sleep symptoms as a proportion of those who reported having significant sleep symptoms

Specific conditions causing sleep symptoms	n (%) (N=509)	95% Confidence Interval
Depression	153 (30.8%)	26% to 34%
Anxiety	158 (31.0%)	27% to 35%
Obstructive sleep apnoea	12 (2.4%)	1.2% to 4.1%
Delayed sleep phase disorder*	127 (24.9%)	21% to 29%
Parasomnias	63 (12.4%)	9.6% to 16%
General health problem	53 (10.4%)	7.9% to 13%
Problematic alcohol use	89 (17.5%)	14% to 21%
Other substance problem	25 (4.9%)	3.2% to 7.2%
Primary insomnia*	45 (8.8%)	6.5% to 11%

*Primary insomnia and delayed sleep phase disorder are mutually exclusive. All other conditions are not.

Depression and anxiety—In the total study population, clinically significant symptoms of depression (PHQ ≥ 10) and anxiety (GAD ≥ 8) were found in 17.3% (n=223) and 19.7% (n=254) students respectively.

Table 3 provides the details of the depression and anxiety scores. A total of 96 (7.4%) students reported having thoughts of being better off dead or of hurting themselves in some way on several days in the 2 weeks prior to the survey, and 34 (2.6%) students had these thoughts on more than half of the days of the 2 weeks prior to the survey.

In sub-group analysis, female students reported higher rates of depression (19.7% versus 12.9% in males, $p=0.04$) and anxiety (22.9% versus 14% in males, $p=0.009$). The rate of depression was lowest among medical students at 11.5% (95%CI 8.9%–14.1%). No statistically significant difference was found between students from the other courses.

Table 3. Depression and anxiety among all the surveyed students (N=1292)

Condition	Statistics
Depression	
Mean PHQ for total group	5.6 (SD 4.6)
Number of students with PHQ \geq 10	17.3% (233/1291) 95% CI (15% to 19%)
Mean PHQ for students with PHQ \geq 10	13.8 (SD 3.8)
Anxiety	
Mean GAD for total group	4.6 (SD 4.4)
Number of students with GAD \geq 8	19.7% (254/ 1291) 95% CI (18% to 22%)
Mean GAD for students with GAD \geq 8	12.0 (SD 3.5)

Substance use—A total of 15.5% (200/1292) students were found to have a CAGE score \geq 2. Males were more likely to have a CAGE score \geq 2 compared to females (19.8% versus 13.1%, $P=0.045$). Students in non-health related courses (engineering, law and architecture) were more likely to have a positive CAGE screen compared to health related course (medicine, nursing and health science); 21.8% and 13.2% respectively ($p=0.006$). Students with depression were more likely to have a CAGE score \geq 2 compared to non-depressed students (22.0% in depressed versus 15.0% in non-depressed students, $P=0.02$).

A total of 119 students (9.3%) reported using drugs in the last three months, with no statistically significant difference between health and non-health students (8.3% and 12% respectively, $p=0.16$). The most commonly used recreational drugs were cannabis and party pills.

Satisfaction with life—The mean SWLS score the total cohort was 25.6 (SD 6.6). Table 4 shows the percentages of students with different score categories. A moderate negative correlation was found between PHQ scores and SWLS scores for the total group ($r=-0.45$, $p=0.007$). A mild to moderate negative correlation was found between GAD scores and SWLS scores for the total group ($r=-0.37$, $p=0.005$). Cronbach's alpha coefficient for the five parts of the SWLS was 0.87, indicating good reliability and internal consistency of the SWLS scores.

Table 4. Rates of satisfaction with life categories in the total study population

SWLS Categories (score)	Student percentage (%)
Extremely satisfied (35–31)	21.7%
Satisfied (26–30)	40.1%
Slightly satisfied (21–25)	20.2%
Neutral (20)	11.9%
Slightly dissatisfied (15–19)	4.3%
Dissatisfied (10–14)	1.7%
Extremely dissatisfied (5–9)	0.1%

SWLS = Satisfaction with Life Scale.

Discussion

This study sought to expand the knowledge on rates of sleep disorders and commonly associated mental health conditions of depression, anxiety and problematic substance use among a group of university students in Auckland through the use of a validated diagnostic sleep questionnaire.

The study found that over one third of the surveyed students having significant sleep symptoms. The two most common causes of sleep symptoms in the surveyed student population were depression and anxiety symptoms. Another major contributing condition to sleep symptoms in our study was delayed sleep phase disorder with almost a quarter of the students reporting symptoms which are consistent with this condition. This was anticipated and is consistent with findings in international literature.²³

The rate of primary insomnia in this study population was 8.8%, which is higher than expected, but similar to the rates from a previous New Zealand study on a general practice population with an older cohort.³ The rate of obstructive sleep apnoea symptoms in our group was low at 2.4%, and is similar to the previous studies in this age group,⁹ which may reflect the lack of pathophysiological physical characteristics among this population group.

Epidemiological data on sleep disorders, particularly studies that explore different causes of sleep symptoms, in young adults are scarce. The prevalence of primary insomnia in a sample of Italian adolescents and young adults aged 15 to 29 years was 4.5% (95% CI 3.2–5.8)²⁴. Lund et al reported over 60% of university students having poor quality sleep using the Pittsburgh sleep quality index.⁵ Lack et al reported the prevalence of DSPD in a sample of 211 students to be 17%,²⁵ similar to the rates reported by students with a sleep problem in our study. To the best of our knowledge, there are no previous studies that explore rates of causes of sleep symptoms in young adults in New Zealand.

Anxiety and depression rates among the total student group surveyed in this study (17.3% and 19.7% respectively) were lower than the general population rates found in the New Zealand Mental Health Survey in 2003, which reported prevalences of 20.7% (95%CI 18.1–23.7) and 23.9% (95%CI 20.9–27.3) for depressive and anxiety disorders respectively for the ages 16 to 24 years group.²⁶ A total of 7.4% of students in our study reported having thoughts of being better off dead or of hurting

themselves in some way on several days in the two weeks prior to the survey. This rate is similar to the finding of other international studies on tertiary students.^{27,28} Nevertheless, this is a significant rate especially with the increasing youth suicide rates in New Zealand.

Rates of depression among students in The University of Auckland sample is comparable to the rates reported in the literature.^{13,16,28,29} The gender difference in prevalence of mood disorders found in our study is also consistent with other population data from New Zealand.^{26,30} As expected depression was associated with higher use of substances.

Potential causative factors for depression and anxiety among this population group include long work hours, sleep deprivation, increasing debt burdens, challenging career decisions, uncertainty about employment prospects especially in the current financial and job market, personal life events, and less than optimal learning environments. Alcohol and drug use rates observed in our study may reflect possible maladaptive coping mechanisms for dealing with the stressors of studying and training.

Our study population consisted of a relatively larger number of medical students compared to other courses. This may have skewed the results on the rates of depression and anxiety as medical students had lower rates compared to other students. However, the impact of the larger number of medical students on the overall rates of other causes of sleep symptoms is likely to be minimal as the rates were similar when compared to other course groups.

It was interesting to see a significant difference in the rates of unhealthy alcohol use among students in non-health related courses compared other students. This is in contrary to the belief that students in health related courses (particularly the medical students) may have poorer outcomes in these measures compared to other students.¹⁶

The rate of reported significant sleep symptoms among Māori and Pacific Island students (when analysed as separate groups) were higher than the rates reported by other ethnicities. This is in keeping with the findings of Paine et al, who found a significantly higher rate of reported rate of sleep problems in Māori compared to others in a New Zealand general population survey.³¹

Potential contributing factors for the higher rates of sleep symptoms in Māori and Pacific Island students may include the higher rate of alcohol use among Māori and the higher rate of depression among Pacific Island students. The results from our study further add to the evidence of disparities in health in Māori and Pacific Island populations compared to other ethnicities.

There are some limitations in this study. The lack of random selection of students is a shortcoming. Limited causal information can be derived from a cross-sectional study such as this, and conclusions about rates of sleep disorders going into mature adulthood in this population can only be speculated. Due to the limited resources available, not all of the course groups were able to be surveyed.

The lack of involvement of other tertiary institutions in Auckland, which may have a different demographic population, may impact on the generalisability study findings. Furthermore, acute stressors (such as upcoming assignments, tests or exams) may

have contributed to some of the sleep, depression and anxiety symptoms reported by surveyed the students.

Re-administering the questionnaire to the same group of students at different times of the year to use the individual students as their own control would have eliminated the impact of acute stressors on the study outcomes; however the resources of the project were limited. Due to the method used in the study, the students who did not attend the lecture on the day of the study were not able to be included. However the study investigators opted to conduct the study with paper questionnaires and being physically present in the lecture rooms during the survey to increase the response rate and participation.

The study investigators were not able to conduct the survey at a standardised time of the day for the different classes (morning versus afternoon). This may have affected the results particularly for students with circadian rhythm disorders. Furthermore, compared to non-student adults of similar age, university students have later sleep and wake times, higher rates of daytime sleepiness, and physical and mental health complaints,⁵ thus the generalisability of the results to the general population may be affected. Furthermore, the definitive diagnosis of obstructive sleep apnoea is made by observing and making measurements of patients' breathing and oxygen saturations in an overnight sleep study. However this is not immediately available to many practitioners and beyond the resources of the study. Due to the nature of the surveying tool used in this study, the amount of alcohol use was not quantified and tobacco use was not assessed.

In summary, this study which is a first of its kind in New Zealand, showed that a large number of university students are suffering from significant sleep symptoms. Mood disorders, substance use, and circadian rhythm disorders can greatly contribute to sleep difficulties in this population group

Screening for these conditions in students presenting to primary and other health care services is important. The study also showed that harmful alcohol and drug use was common among this population group and is associated with clinically significant depression and anxiety. This study has the potential to aid clinicians within New Zealand in better appreciating the sleep-related health problems faced by young people in this country. It will be of clinical use to student health services and primary care clinicians dealing with this demographic group and to mental health planners.

In terms of recommendations for future research, a larger study with random selection of study participants from different tertiary institutions and using the participants as their self-control at different times of the year will overcome many of the shortcomings in this study. However, despite the limitations, the authors believe that the results of this study provide the epidemiological evidence required for developing frameworks for identifying and prioritising interventions for these important health conditions in the young adult population.

As these issues become better understood, this should lead to better management and treatment options, and better outcomes. Greater recognition and understanding should allow for better service planning in the health sector.

Competing interests: Nil.

Author information: Chinthaka B Samaranayake, Registrar, Department of General Medicine, Middlemore Hospital, Auckland; Bruce Arroll, Professor of General Practice and Primary Health Care, Department of General Practice and Primary Health Care, Faculty of Medical and Health Sciences, The University of Auckland; Antonio T Fernando, 3rd, Senior Lecturer, Psychiatrist, Department of Psychological Medicine, Faculty of Medical and Health Sciences, The University of Auckland

Acknowledgements: We thank Gareth Roberts, Medical Student; Sam Newlands, Medical Student; Edbert Wong, Medical Student; Zarina Yap, Medical Student; and Chester Holt-Quick, Medical Registrar.

Correspondence: Dr Chinthaka Samaranayake, Registrar, Department of General Medicine, Middlemore Hospital, Private Bag 93311, Otahuhu, Auckland 1640, New Zealand. Email: csam020@aucklanduni.ac.nz

References:

1. Reimer MA, Flemons WW. Quality of life in sleep disorders. *Sleep Med Rev.* 2003;7:335–49.
2. Ohayon MM. Prevalence of DSM-IV diagnostic criteria of insomnia: distinguishing insomnia related to mental disorders from sleep disorders. *J Psychiatr Res.* 1997;31:333–46.
3. Arroll B, Fernando A, 3rd, Falloon K, et al. Prevalence of causes of insomnia in primary care: a cross-sectional study. *Br J Gen Pract.* 2012;62:e99–103.
4. Brown FC, Buboltz WC, Jr., Soper B. Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. *Behav Med.* 2002;28:33–8.
5. Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep Patterns and Predictors of Disturbed Sleep in a Large Population of College Students. *J Adolesc Health Care.* 2010;46:124–32.
6. Gaultney JF. The prevalence of sleep disorders in college students: impact on academic performance. *J Am Coll Health.* 2011;59:91–7.
7. Hazama GI, Inoue Y, Kojima K, et al. The prevalence of probable delayed-sleep-phase syndrome in students from junior high school to university in Tottori, Japan. *Tohoku J Exp Med.* 2008;216:95–8.
8. Phillips B, Hening W, Britz P, Mannino D. Prevalence and correlates of restless legs syndrome: results from the 2005 National Sleep Foundation Poll. *Chest.* 2006;129:76–80.
9. Hui DS, Chan JK, Ho AS, et al. Prevalence of snoring and sleep-disordered breathing in a student population. *Chest.* 1999;116:1530–6.
10. Katz DA, McHorney CA. Clinical correlates of insomnia in patients with chronic illness. *Arch Intern Med.* 1998;158:1099–107.
11. Kaneita Y, Yokoyama E, Harano S, et al. Associations between sleep disturbance and mental health status: a longitudinal study of Japanese junior high school students. *Sleep Med.* 2009;10:780–6.
12. McCall WV. A psychiatric perspective on insomnia. *J Clin Psychiatry.* 2001;62(Suppl 10):27–32.
13. Moo-Estrella J, Perez-Benitez H, Solis-Rodriguez F, Arankowsky-Sandoval G. Evaluation of depressive symptoms and sleep alterations in college students. *Arch Med Res.* 2005;36:393–8.
14. Singleton RA, Jr., Wolfson AR, Singleton RA, Jr., Wolfson AR. Alcohol consumption, sleep, and academic performance among college students. *J Stud Alcohol.* 2009;70:355–63.
15. Bhave S, Nagpal J. Anxiety and depressive disorders in college youth. *Pediatr Clin of North Am.* 2005;52 (1):97–134.
16. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med.* 2006;81:354–73.

17. Samaranayake CB, Fernando AT. Satisfaction with life and depression among medical students in Auckland, New Zealand. *N Z Med J.* 2011;124(1341):12–7. <http://journal.nzma.org.nz/journal/124-1341/4838/content.pdf>
18. Arroll B, Fernando A, 3rd, Falloon K, et al. Development, validation (diagnostic accuracy) and audit of the Auckland Sleep Questionnaire: a new tool for diagnosing causes of sleep disorders in primary care. *J Prim Health Care.* 2011;3:107–13.
19. Spitzer RL, Kroenke K, Williams JB, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med.* 2006;166:1092–7.
20. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA.* 1999;282:1737–44.
21. Mayfield D, McLeod G, Hall P. The CAGE questionnaire: validation of a new alcoholism screening instrument. *Am J Psychiatry.* 1974;131:1121–3.
22. Diener E, Emmons RL, Larsen RJ, Griffin S. The satisfaction with life scale. *Journal of Personality Assessment.* 1985;49:71–5.
23. Crowley SJ, Acebo C, Carskadon MA. Sleep, circadian rhythms, and delayed phase in adolescence. *Sleep Medicine.* 2007;8:602–12.
24. Ohayon MM, Smirne S. Prevalence and consequences of insomnia disorders in the general population of Italy. *Sleep Medicine.* 2002;3:115–20.
25. Lack LC. Delayed sleep and sleep loss in university students. *J Am Coll Health.* 1986;35:105–10.
26. Oakley Browne MA, Wells JE, Scot KM. *Te Rau Hinengaro: The New Zealand Mental Health Survey.* Wellington: Ministry of Health, 2006.
27. Eisenberg D, Gollust SE, Golberstein E, et al. Prevalence and correlates of depression, anxiety, and suicidality among university students. *Am J Orthopsychiatry.* 2007;77:534–42.
28. Garlow SJ, Rosenberg J, Moore JD, et al. Depression, desperation, and suicidal ideation in college students: results from the American Foundation for Suicide Prevention College Screening Project at Emory University. *Depress Anxiety.* 2008;25:482–8.
29. Dahlin M, Joneborg N, Runeso B. Stress and depression among medical students: a cross-sectional study. *Med Educ.* 2005;39:594–604.
30. The MaGPIe Research Group. The nature and prevalence of psychological problems in New Zealand primary healthcare: a report on Mental Health and General Practice Investigation (MaGPIe). *N Z Med J.* 2003;116(1171):U379. <http://journal.nzma.org.nz/journal/116-1171/379/content.pdf>
31. Paine SJ, Gander PH, Harris RB, et al. Prevalence and consequences of insomnia in New Zealand: disparities between Maori and non-Maori. *Aust N Z J Public Health.* 2005;29:22–8.

Coming to work sick: a survey of hospital doctors in New Zealand

Pei Chyi (Melissa) Tan, Geoff Robinson, Sisira Jayathissa, Mark Weatherall

Abstract

Aim To estimate the rate of sickness presenteeism in hospital doctors in a New Zealand tertiary hospital and to also identify reasons for why doctors continue to work whilst sick.

Methods An anonymous online survey about sickness presenteeism for all hospital doctors at one tertiary care hospital in New Zealand

Results The response rate for the survey was 328/685 (47.8%). Sickness presenteeism was reported by 269/328 (82%) of respondents. The main reasons for sickness presenteeism were: not wanting to burden co-workers and the desire to ensure care for patients.

Conclusions Sickness presenteeism is highly prevalent in this survey. It is likely a change in attitudes by doctors towards their illnesses, and better allocation of staff resources are necessary to prevent this to avoid potential harm to patients and health care workers

Sickness presenteeism is the act of working while sick.¹ For health care workers, particularly doctors, this poses risks to both patients and other staff. Issues include a risk of spreading infectious diseases, if this is the cause of the illness, and also impairment of the ability of doctors to provide optimal care to patients.

Rates of sickness presenteeism for doctors working in primary or secondary care vary from 51% to 86%.² A US study of 537 resident doctors reports that 57.9% of respondents worked whilst sick at least once in the previous year and 31.3% worked whilst sick more than once in the previous year.³

The literature about sickness presenteeism is usually the context of infectious illness. Due to close patient contact, doctors working whilst affected by an infectious illness risk transmitting these diseases to patients. Hospitalised patients represent a vulnerable group and may be at risk of significantly higher morbidity than the general population.

A New Zealand study of rates of sickness presenteeism after a Norovirus outbreak at a regional hospital used a self-reported survey of health-care workers. Doctors were far more likely to go to work whilst affected by an infectious illness, 76.9%, than all the other occupational groups combined, 48.7%.⁴

The reasons for sickness presenteeism identified in previous studies include a sense of obligation to colleagues and an obligation to patient care; 57% and 56% of all residents in the US study respectively.³ The most common reasons for sickness presenteeism in hospital workers in a New Zealand study were similar; they did not

want to increase the workload of others and they did not feel sick enough to stay away from work.⁴

Sickness presenteeism can in itself be a risk factor for poor health outcomes⁵ and increased rates of sickness absenteeism in the future.⁶ For example, if a person continued to work with a viral upper respiratory tract infection and did not improve, it may develop into a more serious complication such as pneumonia.

A similar comparison could be said about psychological health, where stress, fatigue and long hours can lead to burnout or other psychological disorders such as anxiety, depression and substance abuse. Such unwell doctors can negatively affect healthcare systems by affecting morale in departments, as well as directly affecting delivery of patient care.⁷

The aim of this study was to estimate the rate of sickness presenteeism in hospital doctors in a New Zealand tertiary care hospital and to also identify reasons why doctors continue to work whilst sick. Identifying these reasons has the potential to improve the health and well-being of doctors and patients.

Methods

This study was conducted at Capital and Coast DHB which provides tertiary care hospitals in New Zealand and employs 685 doctors from junior (first year post-graduate) to senior (consultant) levels. All doctors working for the organisation were invited to complete an anonymous online survey which was developed based on questions used in previous similar studies.

An invitation to complete the survey was sent to all doctors at their hospital e-mail address. The e-mail contained a link to the anonymous online survey (Appendix 1). Sickness presenteeism was defined as a response of greater than none to the question “Over the last 12 months, how many times have you gone to work despite feeling that you should have taken sick leave because of your state of health? (Physical or psychological)”.

As well as the structured part of the survey there was the ability for respondents to give 'free-text' comments about the issue of sickness presenteeism. Two further reminders were sent to all participants to improve the response rate.

We obtained data recorded on sick leave taken by doctors and other staff from Human Resources records for 12 months before the survey invitation was sent. We contacted the Health and Disability Ethics committee which advised that a study of this nature did not require formal ethics review.

Statistical analysis—Data is summarised in contingency tables by characteristics of the doctors; seniority, sex, whether full or part-time, and speciality area. ‘Days working whilst sick’ was reported on the survey as an ordinal scale variable for zero, one, two, three to five, and six or more days.

For analysis purposes respondents were further categorised by Position: House Officers, Senior House Officers, Registrars and Fellows were classed as Juniors and Consultants as Seniors; and Department, where Specialities were placed according to Clinical Directorate: Surgical, Women and Children (SWC), Medical, Cancer and Community (MCC), Mental Health Services (MHS), Clinical support services (CSS). Ordinal regression was used to examine the association between days working whilst sick, the response variable; and possible explanatory variables of:

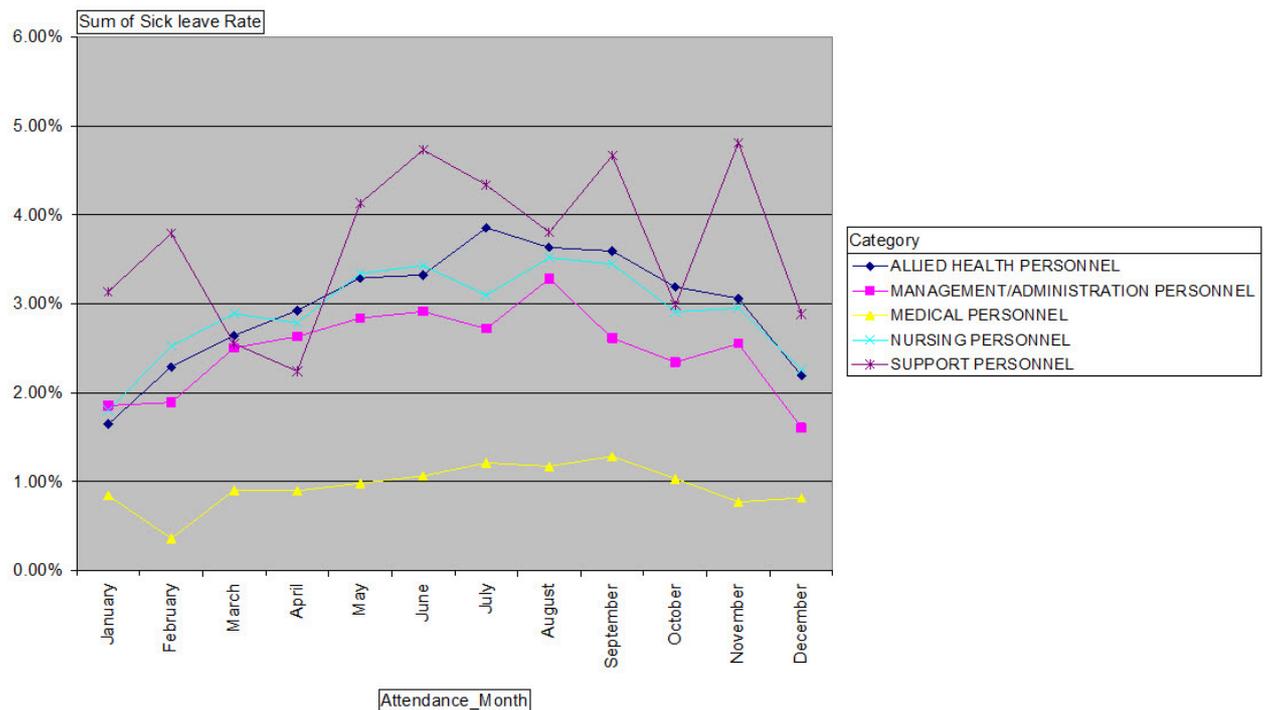
Having a general practitioner, junior versus senior doctor, sex, full-time versus part-time, and speciality. In the tables an odds ratio of more than one means that the variable is negatively associated with more days worked whilst sick and less than one, positively associated with more days worked whilst sick. This orientation of the variables is chosen because being at work whilst sick represents poor clinical practice.

Univariate and multivariate associations, adjusted for all the individual characteristics, are reported. SAS (version 9.3) software was used (SAS institute, NC).

Results

The figure shows the monthly sick leave rates by health practitioner discipline. Doctors consistently have the lowest rate of recorded sick leave. For example in the month of September 2013, the average sick leave rate over all work categories at Capital and Coast District Health Board was 3.4%. Medical staff had an average rate of 1%

Figure 1. Sick leave rates in 2013



The response rate for the questionnaire was 328/685 (47.8%). Response rate by seniority was 31/65 (47.7%) for House Officers, 10/14 (71%) for Senior House Officers, 108/242 (45%) for Registrars and 179/364 (49%) for Senior Medical Officers. Table 1 shows the characteristics of the respondents.

325 respondents reported an average annual number of days of sick leave taken of 1.76 days (range 0 to 30). One response '>6 weeks' was not included as were two responses of 'domestic sick leave' which didn't specify the number of days of leave taken. 111/328 (34%) took no sick leave days in the past 12 months.

Sickness presenteeism in the last 12 months was reported by 269/328 (82%) of respondents. The number of days is shown in Table 2.

Table 1. Characteristics of respondents

Characteristic	N/328 (%)
Position	
House surgeon	31 (9)
Senior House surgeon	10 (3)
Registrar	100 (30)
Fellow	8 (2)
Consultant	179 (55)
Sex	
Female	148 (45)
Male	180 (55)
Hours of work	
Full time	250 (76)
Part time	78 (24)
Specialty	
Medical (including sub-specialties)	100 (30)
Surgical (including sub-specialties)	52 (16)
Emergency Department	24 (7)
ICU/Anaesthetics	46 (14)
Paediatrics	21 (6)
Obstetrics and Gynaecology	15 (5)
Radiology	9 (3)
Mental Health	40 (12)
Laboratory	7 (2)
Other	14 (4)
Own GP	
Yes	279(85)
No	49 (15)

Table 2. Number of days of sickness presenteeism in the last 12 months

Days	N/328 (%)
None	58 (18)
1	51 (16)
2	111 (34)
3 to 5	82 (25)
6 or more	26 (8)

247/328 (75%) came to work knowing they were too sick to perform to their usual standards. 255/328 (78%) reported other colleagues came to work when they were too sick to work. Of those who came to work whilst sick 162/328 (49%) reported coming to work with an infectious illness, such as an influenza like illness or diarrhoea and/or vomiting, and 167/328 (51%) reported being at work whilst they could still be

infectious to others. Table 3 shows the stated reasons for not calling in sick. In this table respondents could nominate more than one reason.

Table 3. Reasons for not calling in sick (respondents could nominate more than one reason)

Reason	N/328 (%)
Not wanting to burden co-workers	234 (71)
Feeling of duty to patients	196 (58)
Clinics/theatre sessions already booked	147 (45)
It will create more work in the future	112 (34)
Didn't feel sick enough	109 (33)
Didn't want to appear weak to other co-workers or seniors	66 (20)
Sick leave had been used up/no more sick days	0 (0)

The association between respondent characteristics and the likelihood of sickness presenteeism is shown in Table 4. An odds ratio (OR) of more than one means less days of sickness presenteeism and an OR of less than one more likely to have days of sickness presenteeism.

Table 4. Ordinal odds ratio for association between respondent characteristics and likelihood of more sickness presenteeism

Characteristic	Univariate OR ¹ (95% CI)	Multivariate OR ¹ (95% CI)
Own GP (Yes versus No)	1.24 (0.72 to 2.14) P=0.44	0.99 (0.57 to 1.82) P=0.96
Junior versus senior	0.45 (0.32 to 0.67) P<0.001	0.54 (0.34 to 0.86) P=0.009
Female versus male	0.61 (0.41 to 0.91) P=0.014	0.64 (0.42 to 0.96) P=0.031
Full time versus part time	0.48 (0.30 to 0.76) P=0.002	0.52 (0.31 to 0.88) P=0.015
Work type ²	Overall P=0.66	Overall P=0.12
CCS versus SWC	1.03 (0.42 to 2.53)	0.74 (0.30 to 1.84)
MCC versus SWC	1.13 (0.40 to 1.73)	1.17 (0.76 to 1.80)
MHS versus SWC	0.76 (0.40 to 1.42)	0.53 (0.27 to 1.01)

1. OR: Odds ratio, greater than one implies less likely to have days of sickness presenteeism and less than one more likely to have days of sickness presenteeism
2. Surgical, Women and Children (SWC), Medical, Cancer and Community (MCC), Mental Health Services (MHS), Clinical support services (CSS)

On univariate and multivariate analysis neither having a GP and work type were not associated with days of sickness presenteeism. For both analyses, being female,

working full-time, and being a more junior doctor, were associated with more days of sickness presenteeism.

'Free text' comments about sickness presenteeism included the following themes: Burden on colleagues, patient care concerns, the intolerance of the hospital culture for sick leave, other work system issues, and uncertainty about the threshold for staying home. Particular examples of these comments are:

Burden on colleagues:

- Very hard to take sick leave for self without huge amount of guilt for letting colleagues down
- Calling in sick makes life worse for everyone else
- I come to work when perhaps I wouldn't as it is too dangerous not to and overburdens my already stretched colleagues

Patient care concerns:

- Concerned about patient continuity of care
- Lists get cancelled if people take sick days

Hospital culture:

- Difficult to call in sick when ...others at work will almost never believe you
- Why work...just to get a crap reference because I took a day off
- Concern is that others do not perceive you to be sick enough to be off work and resent you for creating extra work for them
- Sick leave should be greeted with "take care, hope things get better soon" rather than the first comment being "when do you think you will be back?"

Work system unable to cope with illness:

- No cover is available for sickness of SMOs
- Very limited cover for evening and night duties
- When we have been short staffed and I wanted to cancel some OP bookings I was told that wasn't allowed. There is insufficient staff to be able to cope with sudden sick leave (which of course is never planned).

Uncertainty about the threshold for staying home:

- If you're not unwell enough to be stuck in bed all day I feel like I should be at work.
- My view of what "sick" is, is probably different from the general public, because we are used to seeing VERY sick people.
- Sometimes being infectious (flu) but not feeling bed ridden means we should be able to work even though we may spread our infection.

Discussion

Human Resources data confirm that Doctors take fewer sick leave days than any other health care workers at this tertiary care hospital in New Zealand, 1% compared to 3.4%. It is possible however that this difference may in part be due to less reliable systems for recording medical sick leave.

The rate of sickness presenteeism in this study was 82%. The main reasons for coming to work whilst sick were: 'not wanting to burden colleagues' and 'feeling of duty to patients'. These reasons were not only identified by respondents as part of the questionnaire, but similar concerns were echoed in their comments.

The overall rate of sickness presenteeism in doctors in this survey is consistent with previous studies and is important as it shows there are a significant number of doctors working whilst unwell who may be compromising their own, as well as patient, health.

Another influence may be that doctors routinely interact with very sick hospital inpatients, and thus become less attuned to minor illnesses. This was reflected in a degree of uncertainty of the threshold for staying home—for example 33% listed "did not feel sick enough" as a reason for coming to work sick.

Doctors were aware that working whilst unwell was poor practice as 75% stated they came to work knowing they were too sick to perform to their usual standards and 78% reported noting other colleagues come to work when they were too sick to work. In addition 49% reported coming to work with a potentially infectious illness knowing they could still be infectious to others, which is concerning for patient safety, and may cause spread of infections to other doctors and staff. However, the impact of presenteeism on actual patient care is uncertain. For example doctors may have taken measures to prevent spread of infectious disease such as gloves, masks, and gowns; or changed work practices when unwell, such as performing more administrative tasks and reducing patient contact during the time they were unwell. The ability to do this could vary between specialities, for example Clinical support services such as Laboratory, Pathology, Radiology, and Medical administration may have less patient contact compared with other medical specialities.

The threshold for taking sick leave for infectious reasons may also vary between departments. Those working with immunosuppressed patients may have a lower threshold for staying home than those in a more administrative role. We were unable to show a difference in amounts of presenteeism when comparing work departments but likely would have lacked statistical power to detect differences by sub-specialities within large groupings. At this tertiary hospital the impact of the uniform rule requiring workers to wait for 48 hours of recovery after diarrhoea and vomiting before returning to work, seems ineffective.

We found that Junior doctors compared to Senior, women compared to men, and Full-time compared to Part-time, were all more likely to have sickness presenteeism days, and that having a general practitioner and work type were not associated. There is little previous data on senior doctors and rates of presenteeism with which to compare these results to, but both groups had similar reasons for not taking sick leave.

Additional reasons from comments from junior doctors included a perceived 'weakness' from seniors and lack of cover for out-of-hours duties. Women had higher rates of presenteeism than men, a finding similar to previous studies.¹

There were several weaknesses in our study. Low response rate may have affected the final result. Non-response bias could mean that those who responded were more likely to have sickness presenteeism days than those who had used sick leave appropriately who may not have seen this as an issue important enough to respond. Recall bias may also have been an issue as this was a retrospective survey.

More measures are required to help reduce the rates of sickness presenteeism. This is likely to be difficult but the current situation is not satisfactory. The main stated reason that doctors work whilst sick is burden on colleagues. This may require employing more doctors to act as relievers for their sick colleagues or that there is a more robust culture in seeking and providing cover. There may also be a need to change in culture of 'heroic coping' at all costs probably engendered at medical schools and the type of students that are selected.⁸

It appears that many doctors commented on fear of calling in sick due to repercussions for their careers, or worried about the way they would be viewed by their peers. Doctors personality traits of perfectionism contribute to their success in medicine but also contribute to difficulties in asking for help or admitting weakness.

Promoting a culture where sickness is not viewed as a sign of weakness is important, as well as efforts to promote wellness. It is notable, for example, that 30% of doctors failed to access the free influenza vaccination provided by the DHB in 2013, which is a matter requiring ongoing attention to improve compliance.

Anecdotally, some hospitals have sick leave or short notice relievers for their junior staff, which may be a better option than paid cross-cover systems. Although cross-cover is a less expensive way of covering sick leave, when over stretched doctors are covering someone else's work in addition, patient care can be compromised. This system could be implemented in larger hospitals where extra relieving staff could be employed to provide sick leave cover. Additionally there is currently no formal mechanism in the system for senior medical officer cover when sick and the available staff need to cover sickness. One solution may be locum cover however this would be of substantial cost to the DHB.

Some hospitals have employed specialists for leave cover and some go off periodically from acute roster for other duties. Developing a flexible pool of specialists who could be regularly employed for non-rostered duties but available to cover sick leave at short notice could help in changing the culture of "not taking sick leave" among specialist staff.

More attention should also be given to those doctors who are well enough to work but may be at residual risk of causing infections to non-clinical duties either at the hospital, or working from home with supported IT systems that are in place. Advice to doctors who are unsure of what infection control measures they should adopt must be readily available, as well as advice for the threshold for returning to work.

In summary, sickness presenteeism is an important quality and safety issue for patients and medical staff at our hospital and probably in the New Zealand health system. This requires change to systems of care provision and organisational culture to allow medical doctors to feel comfortable to take sick leave when appropriate and address the main concerns of burden on colleagues and providing patient care adequately when taking sick leave.

Competing interests: Nil.

Author information: Pei Chyi (Melissa) Tan, Medical Registrar, Capital & Coast District Health Board (CCDHB), Wellington; Geoffrey M Robinson, Chief Medical Officer, CCDHB, Wellington; Sisira Jayathissa, Clinical Director of Medicine and Community Health, Hutt Valley District Health Board, Wellington; Mark Weatherall, University of Otago, Wellington

Correspondence: Melissa Tan, Wellington Hospital, Private Bag 7902, Wellington South, New Zealand. Email: Melissa.Tan@ccdhb.org.nz

References:

1. Jena AB, Meltzer DO, Press VG, Arora VM. Why physicians work when sick. *Arch Intern Med* 2012;172:1107–8
2. Mckevitt C, Morgan M, Dundas R, Holland WW. Sickness absence and 'working through illness': a comparison of two professional groups. *J Public Health Med* 1997;19:295–300
3. Jena AB, Baldwin DC, Daugherty SR, et al. Presenteeism among resident physicians. *JAMA* 2010;304:1166–1168
4. Bracewell LM, Campbell DI, Faure PR, et al. Sickness presenteeism in a New Zealand hospital. *N Z Med J* 2010;123(1314). <http://journal.nzma.org.nz/journal/123-1314/4106/content.pdf>
5. Bergström G1, Bodin L, Hagberg J, et al. Does sickness presenteeism have an impact on future general health?. *Int Arch Occup Environ Health* 2009;82.10:1179–1190.
6. Bergström G, Bodin L, Hagberg J, et al. Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *J Occup Environ Med.* 2009;51(6):629–638.
7. Wallace JE, Lemaire JB, Ghali WA. Physician wellness: A missing quality indicator. *Lancet.* 2009;374:1714–21
8. Robinson GM, Bernau S, Aldington S, Beasley R. From medical student to junior doctor: maintaining good health during the “baptism of fire”. *Student BMJ* 2006;14:133–136

Appendix 1. Questionnaire

Tick the answers which apply to you:

Position

House surgeon	
Senior House Officer	
Registrar	
Fellow	
Consultant	

Gender

Male	
Female	

Do you work Full time or Part time?

Full time	
Part time – please specify FTE (i.e. 0.6)	

Speciality (if you are a house surgeon please enter your current run:

Medical (incl. subspecialities)	
Surgical (incl. subspecialities)	
Emergency department	
ICU/Anaesthetics	
Paediatrics	
Obstetrics and Gynaecology	

Radiology	
Mental Health	
Laboratory	
Other (please specify) :	

How many sick leave days have you taken in the last 12 months?

None	
1	
2	
3	
4	
5	
Other (please specify)	

For the following questions, please circle yes or no

Have you ever come to work knowing you were too sick to perform to your usual standards?	Yes/No
Do you think any of your colleagues have come in when they were too sick to work?	Yes/No/Don't know
Have you ever come to work with an infectious illness? (flu, cold, diarrhoea, vomiting)	Yes/No
Have you ever come to work knowing you could still be infectious? (for example, not waiting 48hrs after diarrhoea or vomiting has settled before returning to work)	Yes/No
Do you have your own GP?	Yes/No

Over the last 12 months, how many times have you gone to work despite feeling that you should have taken sick leave because of your state of health? (Physical or psychological)

Never	
1	
2	
3-5	
5 or more	

What are your reasons for not taking sick leave when you were unwell? (Tick as many that apply)

Feeling of duty to patients	
Not wanting to burden co-workers	
Clinics/theatre sessions already booked	
Didn't want to appear weak to other co-workers or seniors	
It will create more work in the future	
Sick leave had been used up/no more sick days	
Didn't feel sick enough	
Other reasons:	

Which of these is the MOST IMPORTANT reason for not taking sick leave when you were unwell?(select one only)

Feeling of duty to patients	
Not wanting to burden co-workers	
Clinics/theatre sessions already booked	
Didn't want to appear weak to other co-workers or seniors	
It will create more work in the future	
Sick leave had been used up/no more sick days	
Didn't feel sick enough	
Other reasons:	

Which is the 2ND MOST important reason? Please ensure you have a different answer to above. Select "None of the above" if no more reasons apply to you.

Feeling of duty to patients	
Not wanting to burden co-workers	
Clinics/theatre sessions already booked	
Didn't want to appear weak to other co-workers or seniors	
It will create more work in the future	
Sick leave had been used up/no more sick days	
Didn't feel sick enough	
None of the above	

Which is the 3rd MOST important reason? Please ensure you have a different answer to the previous 2 questions. Select "None of the above" if no more reasons apply to you.

Feeling of duty to patients	
Not wanting to burden co-workers	
Clinics/theatre sessions already booked	
Didn't want to appear weak to other co-workers or seniors	
It will create more work in the future	
Sick leave had been used up/no more sick days	
Didn't feel sick enough	
None of the above	

Thank you for completing this survey. Do you have any other comments?

Progress of successful New Zealand Registration Examination (NZREX Clinical) candidates during their first year of supervised clinical practice in New Zealand

Steven Lillis, Heather Roblin

Abstract

Aim To determine the frequency and nature of clinical difficulties faced in the first year of supervised clinical practice by international medical graduates (IMGs) who have successfully passed NZREX Clinical in order to be able to practise in New Zealand.

Method All doctors who successfully passed NZREX Clinical and who registered with the Medical Council of New Zealand (the Council) from 2005 to 2013 were identified. Supervisor reports for each of the four runs in the first year of practice were obtained and reports where concerns were raised over clinical performance analysed.

Results Of 353 IMGs successful in NZREX Clinical, 316 (89.6%) completed the subsequent clinical year with no adverse reports. Those requiring more than one attempt to pass NZREX Clinical had an incremental increase in number of unsatisfactory reports, where areas of the IMGs' performance were rated as 'below the expected standard'. Less than 2% of IMGs had more than one unsatisfactory report. The majority of unsatisfactory reports were generated in the first half of the clinical year. Areas of concerns found were Clinical Knowledge and Skills (28%), Clinical Judgment (35%), Patient Communication (28%) and Professional Attitudes and Behaviour (9%).

Conclusion Most IMGs who were successful in NZREX Clinical performed well in the subsequent year of clinical practice. NZREX Clinical would appear to have acceptable criterion validity.

International medical graduates (IMGs) who wish to work in New Zealand may have to undertake a series of assessments depending on prior qualifications and experience; one such pathway is the NZREX Clinical pathway. In order to be eligible for this pathway, the IMG must have successfully met the Council's English language policy and must have passed a Council approved written examination within the 5 years prior to sitting NZREX Clinical.

NZREX Clinical is a 16 station Objective Structured Clinical Examination (OSCE). A detailed description of the assessment has previously been published including psychometric data.¹

The average pass rate in the assessment over the past 5 years is 60%. Those who are successful in the assessment are eligible for provisional general registration (i.e. working under Council monitored supervision) in New Zealand and are permitted to work as an intern in specified hospital positions.

During this year, the IMG intern will be expected to complete four runs that must include one in medicine and one in surgery.² Surgical and medical runs must be given a 'category A' rating by the Medical Council of New Zealand. A 'category A' surgical run is one which provides the trainee with substantial training in basic surgical principles. A 'category A' medical run is one in which there is a substantial content of general medical training. Category A runs are usually found in general medicine, paediatrics, general surgery and orthopaedics. It is acknowledged that attachment experiences will differ, with a broader exposure characteristic of peripheral hospitals and limited exposure associated with tertiary hospitals. The two remaining runs may be more specialised but remain subject to approval. Each IMG will have a clinical supervisor for a specific run who is responsible for giving support and guidance to the IMG and also for reporting on the progress being made.

The intern supervisor for IMGs are required to complete a supervisor report form at the end of each quarter. The grades given by the supervisor are based on the work undertaken by the IMG in a work context and as such represents a workplace-based assessment (WBA). The forms assist the supervisor by directing attention to specific areas of performance graded on a 5-point Likert scale.³

An 'unsatisfactory report' is defined as having any of the 19 attributes scored as a category 1 (performs significantly below that generally observed for this level of experience) or more than one category 2 (below expectation—requires further development). The form is discussed with the IMG and is then forwarded to the Council. The Council will discuss any unsatisfactory report received with the supervisor to determine whether any additional support or input from the Council is required.

To progress from provisional general registration to general registration, the IMG must have three consecutive satisfactory reports. All supervisors of interns who are IMGs are invited to annual workshops run by the Council specifically for the purpose of assisting the supervisors to provide support in pastoral, professional and educational frameworks.

In measuring the quality of an assessment, a useful structure focuses on issues of validity, reliability, educational value, acceptability and cost.⁴ Validity refers to the ability of an assessment to measure the characteristics of a trait that it was designed to measure.⁵ Within the concept of validity, several discrete variations have been described that include face validity (the impression of the validity), content validity (does the test measure defined content), criterion (how well the test predicts the outcome of another measurement method) and construct (how well the test measures what it is supposed to measure).⁶

The stated purpose of NZREX Clinical is 'By passing NZREX Clinical, we then know you are competent to have provisional registration in New Zealand.'⁷ It is therefore of value to collect data on subsequent clinical performance in the workplace of those candidates who were successful in the NZREX Clinical as this information represents a measure of criterion validity. This paper reports on the progress of successful NZREX Clinical IMGs through the first year of provisional general registration in New Zealand.

Method

All successful NZREX Clinical candidates who registered with the Council for clinical practice between September 2005 and August 2013 were identified. For each IMG, the supervisor report forms were extracted and data was anonymised and aggregated. Demographic data was obtained and also was anonymised and aggregated.

Results

Demographic data—There were 353 successful candidates between September 2005 and August 2013. Of those, 312 (88%) had a current Practising Certificate (PC) in August 2013.

Unsatisfactory reports—The overall number of IMGs with one or more unsatisfactory reports was 37 (10.4%). There was an increase in the number of unsatisfactory reports according to the number of attempts to pass NZREX Clinical.

Of those who passed at their first attempt, 9% finished the clinical year with at least one unsatisfactory report, 13% of those who required two attempts at NZREX Clinical received one or more unsatisfactory reports and 16% of those taking three attempts received one or more unsatisfactory reports.

Overall, only six doctors (2%) had more than one unsatisfactory report. Just over 1% of the cohort of 312 actively registered NZREX Clinical doctors had an open health concern and the same number had an open complaint at August 2013. The run in which the unsatisfactory report was received shows that 42% were generated from the first run, 35% from the second, 13% from the third and 11% from the fourth.

As three consecutive satisfactory reports are required for progression to a general scope, it is important to note that the IMG who receives an unsatisfactory report in the first run is still eligible to progress to a general scope after 12 months of working within a provisional general scope. Of those with a unsatisfactory report in the first run, 11 out of the 23 had no further unsatisfactory reports and were able to meet general registration requirements by the end of that year.

Areas of concern—When an unsatisfactory report was generated, the mean number of concerns was 6.3 out of a possible 19 with a standard deviation of 4.0. The areas of concern noted in the unsatisfactory supervisor reports are presented in Table 5 in the same way as supervisor report forms are structured.

Table 5. Areas of concern in unsatisfactory reports (n=56)

Area of concern	Domain %	Sub-domain %
Clinical knowledge and skills	28	
1. Clinical Knowledge		29
2. Professional knowledge		22
3. Clinical clerking		23
4. History taking		18
5. Relevant procedural skills		7
Clinical judgment	35	
6. Diagnostic Skills		30
7. Patient management		33
8. Time management		23
9. Recognising limits		14
Patient communication	28	
10. Communication skills		26
11. Ability to communicate with patients and families		11
12. Sensitivity, ethical and cultural awareness		4
13. Ability to communicate with other healthcare professionals		27
14. Initiative and enthusiasm		23
15. Takes responsibility for own learning		9
16. Motivation to teach		1
Professional attitudes and behaviour	9	
17. Reliability and dependability		56
18. Ability to cope with stress		36
19. Personal manner		8

Discussion

The cohort entering the clinical year were, by definition, all successful in the NZREX Clinical OSCE, yet 10% went on to receive at least one unsatisfactory report. There are a number of reasons why this could happen. The OSCE reflects a traditional assessment undertaken outside the workplace where measurements of reliability are required as well as mechanisms to ensure validity.^{8,9}

The assessment undertaken by supervisors based on observation of work in a clinical setting has the theoretical basis of WBA where constructivist methods are used to observe complex contextualized performance in the workplace.¹⁰ Thus the nature of what is assessed and the theoretical basis of assessment differs between the two modalities. A study of 39 IMGs undergoing a number of tests with different modalities also concluded that this modal difference accounted for poor correlation on the same trait between WBA techniques and OSCE.¹¹ This may partially explain why some successful NZREX graduates performed poorly in clinical attachments.

A further confounding variable is the reliability of supervisor reports. Issues of feasibility prevent rigorous training and calibration of individual supervisors and thus

variability in reports can occur. There is also variable, and sometimes inadequate level of contact between intern and supervisor. The vexing question of false positives and false negatives also needs to be addressed.

The literature suggests that medical educators do pass underperforming students on occasions and that individual assessor differences in what represents adequate skills, uncertainty over accuracy of rating scales and reliance on global impressions may confound the report from a clinical attachment.^{12 13} The converse may also apply where inadvertent negative bias may exist in assessment processes as evidenced by the recent controversy over the MRCGP examinations.^{14 15}

The timing of the unsatisfactory report is of interest as there was a substantial reduction in numbers of such reports as the year progressed. Prior research has identified difficulties faced by IMGs in their intern year that include finding employment, integrating into the work role and social integration.¹⁶ It is likely that new work environments as well as the difficulties of resettling in a new country and potentially practising medicine in a second language are responsible for the initial difficulties experienced by these doctors. As experience is gained, many of the problems causing unsatisfactory reports would appear to have resolved. As already stated, three consecutive satisfactory reports are required for progression to a general scope, and the IMG who receives an unsatisfactory report in the first run is still eligible to progress to a general scope after 12 months of working within a provisional general scope.

The provisional general registration year is considered to have both service and educational functions. Some concerns exist with the overall educational value of WBA and the ability of this assessment methodology to improve educational outcomes.¹⁷ However, it is also clear that the quality of feedback in WBA is a key factor in improving clinical skills and knowledge.¹⁸

The structure of supervision for these IMGs is designed to provide feedback. The demographic data would suggest that a large proportion of those successful in the NZREX Clinical remain in the New Zealand workforce. Although the reasons for remaining in New Zealand are multifactorial, a contributor to such a decision would be the level of satisfaction with training and working environments. There would appear to be some difference in the workplace performance of NZREX Clinical IMGs according to the number of times taken to pass NZREX.

The number of unsatisfactory reports increased with the variable of numbers of attempts to pass the assessment. If it is assumed that all successful NZREX Clinical IMGs have a common minimum level of skills, knowledge and ability, but that some required longer to attain that standard, then these doctors may be less capable of adapting to new circumstances.

With 90% of IMGs completing the provisional general registration year with no unsatisfactory reports, there is a good level of concordance between the two assessments. This result is consistent with the limited published research on predictive validity of high-stakes OSCE where excellent concordance was found between a selection OSCE for clinical placement and subsequent results in the clinical attachment.¹⁹ A different study of construct validity in 3rd year medical students undertaking a psychiatry run found lesser correlations.²⁰

There was a fairly even spread of concerns across Clinical Knowledge and Skills, Clinical Judgment and Patient Communication with lesser incidence of concerns over Professional Attitudes and Behaviour. Of note is the low incidence of concerns over cultural awareness. This may reflect the considerable emphasis in New Zealand on cultural awareness with hospital orientations emphasising its importance as well as cultural issues being examinable in the NZREX Clinical.

Diagnostic skills and patient management were the most common sub-categories of concern. Both of these professional skills require complex cognitive processes in the WBA setting that require adequate clinical knowledge, communication skills etc. Weakness in these 'building blocks' will result in deficient diagnostic and management abilities as would poor clinical reasoning skills.

Conclusion

Of IMGs entering the provisional general year of registration after NZREX Clinical, 90% had satisfactory reports from all four runs. Of those who received an unsatisfactory report, it was more common for that report to come from either the first or second run. There was minor difference in clinical performance between those who take more than one attempt at the NZREX Clinical to those who pass at their first attempt.

When unsatisfactory reports are generated, the most common concerns are in the area of 'Clinical judgment', but 'Clinical Knowledge and Skills' as well as 'Patient Communication' issues were almost as common. For hospitals who take successful NZREX graduates, greater focus on these areas would be beneficial. The results of this research will inform the future direction of the NZREX clinical examination.

Competing interests: Nil.

Author information: Steven Lillis, Medical Adviser; Heather Roblin, Professional Standards Coordinator. Medical Council of New Zealand, Wellington

Correspondence: Dr Steven Lillis, Medical Adviser, Medical Council of New Zealand, Level 6, 80 The Terrace, Wellington, New Zealand. Email:

slillis@wave.co.nz

References:

1. Lillis S, Stuart M, Sidonie, Takai N. New Zealand Registration Examination (NZREX Clinical): 6 years of experience as an Objective Structured Clinical Examination (OSCE). *N Z Med J.* 2012 Sep 7;125(1361):74–80. <http://journal.nzma.org.nz/journal/125-1361/5327/content.pdf>
2. <https://www.mcnz.org.nz/assets/News-and-Publications/Booklets/Education-and-Supervision-for-interns.pdf> Accessed 19th June 2014
3. <http://www.mcnz.org.nz/assets/Forms/RP3.pdf> Accessed 1st May 2014
4. Van Der Vleuten CP. The assessment of professional competence: Developments, research and practical implications. *Adv Health Sci Educ Theory Pract.* 1996 Jan;1(1):41–67.
5. Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. *Lancet.* 2001 Mar 24;357(9260):945–9.
6. Vallevand A, Violato C. A predictive and construct validity study of a high-stakes objective clinical examination for assessing the clinical competence of international medical graduates. *Teach Learn Med.* 2012;24(2):168–76.

7. <http://www.mcnz.org.nz/get-registered/registration-exam-nzrex-clinical/> Accessed 1st May 2014
8. Turner JL, Dankoski ME. Objective structured clinical exams: a critical review. *Fam Med*. 2008 Sep;40(8):574–8.
9. Fuller R, Homer M, Pell G. Longitudinal interrelationships of OSCE station level analyses, quality improvement and overall reliability. *Med Teach*. 2013 Jun;35(6):515–7.
10. Govaerts M, van der Vleuten CP. Validity in work-based assessment: expanding our horizons. *Med Educ*. 2013 Dec;47(12):1164–74.
11. Baig L, Violato C, Crutcher R. A construct validity study of clinical competence: a multitrait multimethod matrix approach. *J Contin Educ Health Prof*. 2010 Winter;30(1):19–25.
12. Yeates P, O'Neill P, Mann K, Eva K. Seeing the same thing differently: mechanisms that contribute to assessor differences in directly-observed performance assessments. *Adv Health Sci Educ Theory Pract*. 2013 Aug;18(3):325–41.
13. Monrouxe LV, Rees CE, Lewis NJ, Cleland JA. Medical educators' social acts of explaining passing underperformance in students: a qualitative study. *Adv Health Sci Educ Theory Pract*. 2011 May;16(2):239–52.
14. Esmail A, Roberts C. Academic performance of ethnic minority candidates and discrimination in the MRCGP examinations between 2010 and 2012: analysis of data. *BMJ*. 2013 Sep 26;347:f5662.
15. Graham M, Tsisi R, Cowley G. Racial bias unlikely to be a factor in the differential performance of candidates in the MRCGP exam. *BMJ*. 2013 Oct 29;347:f6447.
16. Lillis S, St George I, Upsdell R. Perceptions of migrant doctors joining the New Zealand medical workforce. *N Z Med J*. 2006 Feb 17;119(1229):U1844.
<http://journal.nzma.org.nz/journal/119-1229/1844/content.pdf>
17. Miller A, Archer J. Impact of workplace based assessment on doctors' education and performance: a systematic review. *BMJ*. 2010 Sep 24;341:c5064.
18. Pelgrim EA, Kramer AW, Mookink HG, van der Vleuten CP. The process of feedback in workplace-based assessment: organisation, delivery, continuity. *Med Educ*. 2012 Jun;46(6):604–12.
19. Vallevand A, Violato C. A predictive and construct validity study of a high-stakes objective clinical examination for assessing the clinical competence of international medical graduates. *Teach Learn Med*. 2012;24(2):168–76.
20. Park RS, Chibnall JT, Blaskiewicz RJ, et al. Construct validity of an objective structured clinical examination (OSCE) in psychiatry: associations with the clinical skills examination and other indicators. *Acad Psychiatry*. 2004 Summer;28(2):122–8.

Adoption of endovenous laser treatment as the primary treatment modality for varicose veins: the Auckland City Hospital experience

Ruchira S W Fernando, Carl Muthu

Abstract

Aim To assess the effectiveness of adopting endovenous laser treatment (EVLT) as the primary treatment modality for varicose veins at Auckland City Hospital (Auckland, New Zealand).

Methods The outcomes of 354 consecutive EVLT procedures performed between 2007 and 2013 were reviewed. Data was collected from a prospectively maintained procedural database and by retrospective chart review.

Results Of the 319 patients who had an ultrasound, at 1 month post-procedure there was a saphenous vein occlusion rate of 96%. Side effects were minimal with no cases of DVT or skin burns and one case of self-limiting neuralgia. The procedure was well tolerated with a median pain score of 3. Since the adoption of EVLT there has been a large increase in the number of patients treated for varicose veins (28 in 2007 compared to 176 in 2013).

Conclusions EVLT is a safe and effective treatment for varicose veins and its adoption has allowed a large increase in the number of varicose vein patients treated at Auckland City Hospital.

Varicose veins are a very common complaint. Various studies have estimated the incidence to be between 20 and 40% in Western populations.^{1,2} Numerous studies have shown significant improvement in the quality of life in patients who have had their varicose veins treated.^{3,4}

Traditionally public hospitals have struggled to treat adequate numbers of patients with varicose veins. There are numerous potential reasons for this, but perhaps the most significant is the difficulty varicose vein patients have in “competing” for precious operating-room time with other patients who have “life or limb” threatening conditions.

For many years, varicose veins have been treated by surgical stripping in an operating room environment. Numerous randomised trials have now been published establishing that endovenous ablation of varicose veins (using either radiofrequency or laser energy) produces similar short and medium term results to surgery.⁵⁻⁸ Generally endovenous procedures are associated with less postoperative pain and a faster recovery time. These procedures can also be performed in the office or a “procedure room” type environment under local anaesthesia without sedation.

The aim of this paper is to describe the results of the Auckland Regional Vascular Service following adoption of endovenous laser treatment (EVLT) as the primary treatment modality for varicose veins.

Methods

All patients who underwent EVLT at Auckland City Hospital since the adoption of the procedure in July 2007 until 31 December 2013 were included. Patient information and procedural details were retrieved from a prospectively maintained procedural database. Additional information was obtained retrospectively by reviewing patients' electronic medical records.

Results were tabulated using Microsoft Excel software. Institutional ethical protocols were adhered to. In general only patients with secondary complications of their varicose veins, e.g. ulceration, skin changes, bleeding thrombophlebitis, or eczema are offered treatment at Auckland City Hospital. No formal prioritisation tools are used. Since the adoption of EVLT, surgery is reserved for patients who are anatomically unsuitable for EVLT (e.g. tortuous or very large veins) or who are unwilling or unable to have a local anaesthetic procedure.

In brief the procedure consists of a local anaesthetic puncture of the saphenous vein (usually below the knee at the mid-calf level) under ultrasound guidance. A 4Fr sheath is placed inside the vein and the laser fibre is introduced and positioned just distal to the saphenofemoral junction under ultrasound guidance. Local tumescent anaesthesia (500 ml of cold normal saline mixed with 10 ml of 8.4% bicarbonate and 20 ml of 2% lignocaine with adrenaline 1:200,000) is injected around the treated length of the saphenous vein.

The laser fibre is activated and slowly pulled back. No sedation is given for the procedure. In general calf varicosities were not directly treated at the time of EVLT with the intention being to perform top-up foam sclerotherapy at subsequent follow-up appointments if the patient has persistent symptoms.

EVLT is exclusively performed in a procedure room on the vascular ward and the only staff present for the procedure are the operator and the nurse assistant. Patients are discharged approximately 30 minutes after the procedure in a below knee TED stocking with instructions to walk regularly. No DVT prophylaxis is used.

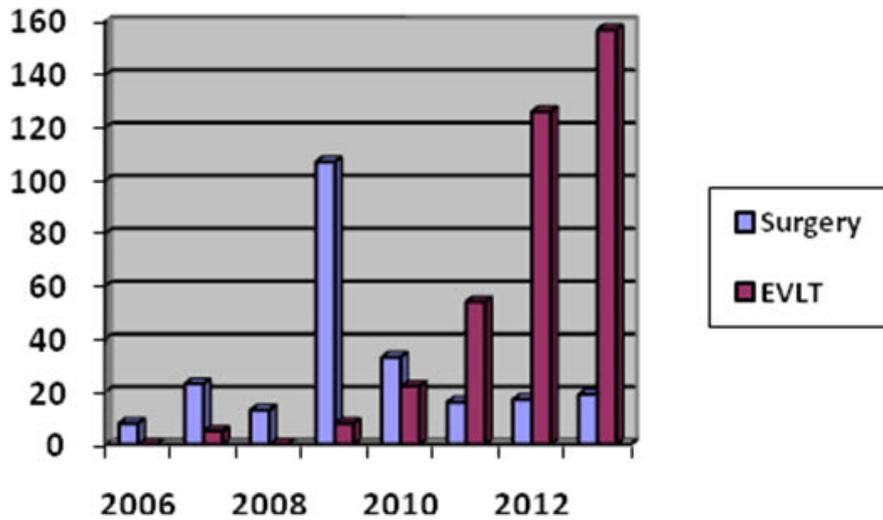
Results

During the study period there was 354 EVLT procedures scheduled. Eleven patients did not complete the EVLT procedure as planned. The reasons for this included inability to cannulate the saphenous vein due to vessel spasm (5 patients), inability to pass the laser fibre up the saphenous vein due to webs from previous thrombophlebitis (2 patients), inability to tolerate a local anaesthetic procedure (2 patients), and EVLT deemed an inappropriate treatment modality (2 patients).

Of the 11 patients who did not have EVLT as planned 4 returned at another date for successful EVLT, 4 had surgery, 1 had sclerotherapy, 2 were managed conservatively and 1 patient moved out of area while awaiting surgery.

Figure 1 compares the number of endovenous and surgical procedures for varicose veins over time at Auckland City Hospital. During the study period 7 patients were also treated by endovenous mechanical-chemical ablation using the ClariVein[®] device.

Figure 1. Trends in type of varicose vein treatment at Auckland City Hospital



The median age of patients scheduled for EVLT was 50 (range 17–86). The male to female ratio was 1:1.1 (171:183).

Figure 2 shows the distribution of ethnicities. The indications for intervention are listed in Table 1.

Figure 2. Ethnicity of patients undergoing endovenous laser treatment (EVLT)

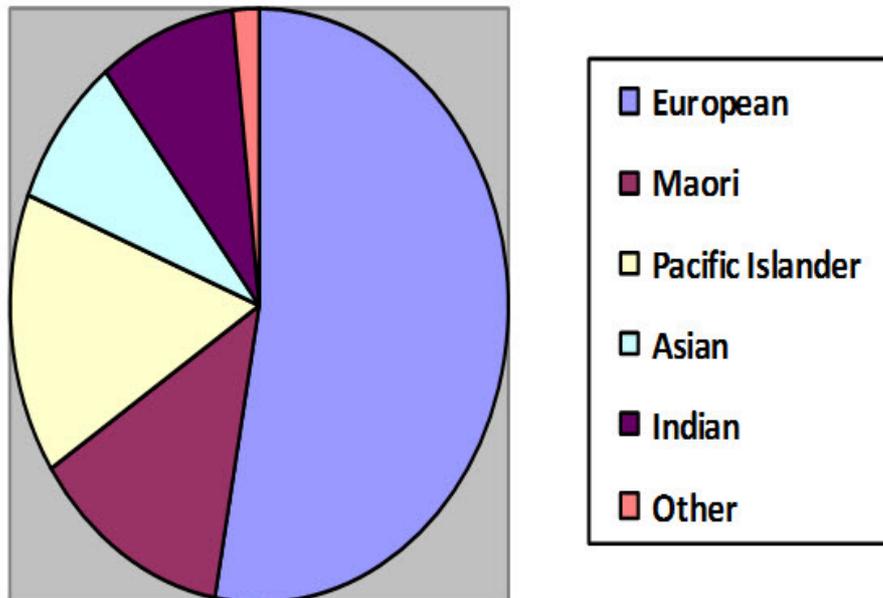


Table 1. Indications for endovenous laser treatment (EVLT)

Indication for intervention	Number of patients (%)
Pain, bleeding, thrombophlebitis	120 (34)
Leg Swelling	38 (11)
Skin changes	100 (28)
Venous ulcer (healed)	67 (19)
Venous ulcer (active)	29 (8)

The great saphenous vein (GSV) was the most commonly treated vein. 332 patients had their GSV alone treated. 19 patients had their short saphenous vein alone treated and 3 patients had an accessory saphenous vein alone treated. Three patients had a short saphenous vein treated at the same time as their GSV and one patient had an accessory saphenous vein treated at the same time as their GSV. Only 1 patient had bilateral GSVs treated simultaneously.

The median length of vein treated was 44 cm (range 2–78 cm). The average joules of laser energy delivered per cm of vein was 56 J. Pain score data was available for 310 patients. The median pain score was 3 (range 0–10). The median volume of tumescent anaesthesia used was 200 ml (range 50–500 ml). Four patients had ambulatory phlebectomies done at the same time as the primary EVLT procedure. 36 patients (10%) had post-procedure sclerotherapy for residual varicosities. All EVLT procedures were performed by three operators (141, 110 and 99 procedures each).

327 patients had a follow up ultrasound post EVLT. Of these 313 (96%) had ultrasound confirmed occlusion of their saphenous vein. Of the 14 completed but unsuccessful procedures 6 were in fact partially successful, i.e. there was partial occlusion of the saphenous vein but not within 5 cm of the saphenofemoral junction so they were classified as non-occlusion. These 6 patients all had resolution of their symptoms so are all being managed expectantly.

Of the remaining 7 unsuccessful procedures 2 patients are being managed conservatively, 1 patient has been successfully re-treated with EVLT, 2 patients who each had two unsuccessful EVLT procedures on the same leg have undergone successful surgery and 1 patient who also had two unsuccessful EVLT procedures is being managed conservatively. One patient fully recanalized his GSV associated with recurrent symptoms 5 years after the original procedure. He has subsequently been successfully treated with surgical stripping.

No patient is known to have had a post-procedural deep vein thrombosis or pulmonary embolus. Two patients were treated with brief periods of low molecular weight heparin for thrombus in the GSV protruding slightly into the common femoral vein. No patients were readmitted to the vascular service with wound infections or skin burns.

The authors are not aware of any cases of saphenous neuralgia complicating the EVLT procedure in this series. One patient did develop a sural nerve neuralgia with parasthaesia and numbness along the lateral border of her foot after EVLT of the short saphenous vein. This resolved spontaneously after 3 months.

Discussion

Treatment of symptomatic varicose veins results in a significant improvement in patients quality of life and in certain patients can avoid morbid complications such as skin ulceration.^{1,3} However traditionally in New Zealand varicose vein treatment have been afforded a low priority in the public health care system with only a fraction of patients who may benefit from treatment of their varicose veins receiving treatment. This is well demonstrated by the low number of varicose vein surgeries performed at Auckland City Hospital between 2006 and 2008 as shown in Figure 1.

There was one spike in the number of surgical treatments performed in 2009 when a locum general surgeon was contracted to perform day case varicose vein surgery in an attempt to rectify this situation. Subsequent to this EVLT was adopted as primary treatment modality for varicose veins. Initially, due to staffing and equipment availability issues the number of EVLT cases performed was low, but since these were rectified in around 2011 there has been a large and sustained increase in the number of EVLT cases at Auckland City Hospital.

The primary advantage of EVLT from a service delivery perspective is that an operating room environment is not required. EVLT is performed in a procedure room purely under local anaesthetic with no sedation with one operator and a nurse assistant as a day case procedure. It overcomes the primary limiting factor for public hospital patients accessing varicose vein treatments—access to the operating theatre and its attached resources; anaesthesia, anaesthetic tech support, theatre nurses, surgical assistants, recovery nurses, preoperative nurses and postoperative ward beds. A shortage of any one of which can result in cancellation of surgical cases.

Although a cost-effectiveness study has not demonstrated superiority EVLT over surgery—primarily due to the initial capital costs of buying a laser machine, ultrasound machine and the ongoing costs disposables with each laser case (laser fibre, wires and sheaths etc) there is no doubt that in the Auckland City Hospital environment it provides improved access to treatment.⁹

This improved access to treatment does not come at the cost of decreased quality of treatment. Numerous randomised controlled trials (RCTs) have demonstrated similar treatment effectiveness between surgery and EVLT with most demonstrating EVLT (and RFA) have less postoperative pain and a faster return to normal activities.⁵⁻⁸

Our results, although limited by a short duration of follow up, indicate the procedure is effective and safe. Our occlusion rates of 96% are comparable to other studies such as the 99% by Myers¹⁰ and 92% by Darwood.⁶

As this study is a retrospective audit rather than a prospective study we have limited information on long-term effectiveness. So far only one patient has developed clinical recurrence requiring re-treatment (with surgical stripping). Undoubtedly more patients will have varicose vein recurrence if long-term ultrasound surveillance is performed but this would be very expensive and probably futile as patients would only receive re-treatment if they have clinical symptoms justifying this.

Our complication rates are very low with no cases of DVT, skin burns, or saphenous neuralgia. However because these complications were collected through a retrospective chart review it is possible we may be under-estimating their incidence.

Our complication rates compares well to Molls' RCT which also had no cases of DVT or skin burns but a 5% (3/60) incidence of saphenous neuralgia.⁹ Carradices' series of 232 patients undergoing EVLT also had a 0% DVT rate and 2.1% incidence of sensory disturbance.

Although not specifically recorded some patients did develop a marked thrombophlebitis causing some prolonged postoperative discomfort and requiring an extended period of anti-inflammatory treatment. This complication was often mistakenly diagnosed as infection by the primary care doctor due to the redness along the course of the saphenous vein.

Despite being performed under local anaesthetic with no sedation EVLT is well tolerated. The median pain score was 3 with only 9 patients (2.5%) rating their pain as 8 or greater. In two patients the procedure was unable to be completed due to discomfort, one of whom was a 17-year-old boy. Both subsequently had surgical stripping under general anaesthesia.

The treatment of calf varicosities during endovenous saphenous vein ablations remains an area of controversy.¹² Surgical saphenous vein stripping is usually accompanied by multiple stab avulsions to remove with branch varicosities. With EVLT the options to deal with these include immediate or delayed foam sclerotherapy or immediate or delayed ambulatory phlebectomies. Only 10% of our patients had post-procedural foam sclerotherapy. This is a much lower rate of secondary intervention than for example in Cheeters RCT comparing immediate to delayed ambulatory phlebectomy where 67% of patients needed secondary intervention for the calf varicosities.¹³

Our experience is that treatment of saphenous vein reflux abolishes most of the venous hypertension in the leg with effective treatment of patients' symptoms, including ulceration and skin changes. We believe that, in most patients, residual branch varicosities are of cosmetic significance only and therefore their treatment cannot usually be justified in the public healthcare system.

The importance of improved access to varicose vein treatment in the public hospital setting provided by EVLT cannot be overstated. Most of our patients were treated for "medically complicated varicose veins (i.e. not just pain symptoms). In fact 27% of our patients had either a current or healed venous ulcer as their indication for EVLT (Table 1). The effects of leg ulceration on patient's quality of life and the cost to the community are well known.¹⁴ In the United States the estimated annual cost for treating venous ulcers is between \$1.9 and \$2.5 billion.¹⁵

It is also important to note that over 30% of our patients treated by EVLT are of Māori or Pacific Island origin. These patient groups make up only 19% of the Auckland District Health Board catchment area.¹⁶ It could be assumed that the rates of private health insurance in these groups are lower than the general population. This emphasises the importance of the public health system in providing access to varicose vein treatments for Māori and Pacific Islanders.

In conclusion, EVLT is a safe and effective way to treat varicose veins at Auckland City Hospital. It has also allowed improved access to treatment for patients with venous disease by moving the treatment location from the operating room. For these reasons we believe all public hospitals in New Zealand should consider adopting

endovenous ablation techniques as their primary treatment modality for varicose veins.

Competing interests: Nil.

Author information: Ruchira S W Fernando, House Surgeon/Resident Medical Officer; Carl Muthu, Consultant Vascular Surgeon. Auckland Regional Vascular Services, Auckland City Hospital, Auckland

Acknowledgements: The authors thank Russell Bouchier (Vascular Surgeon Auckland City Hospital), Brendan Buckley (Interventional Radiologist, Auckland City Hospital), and Kara Hamilton (Vascular Ward Charge Nurse, Auckland City Hospital) for their assistance.

Correspondence: Mr Carl Muthu, Auckland Regional Vascular Services, Auckland City Hospital, Private Bag 92 024, Auckland Mail Centre, Auckland 1142, New Zealand. Email CarlM@adhb.govt.nz

References:

1. Kaplan RM, Criqui MH, Denegerg JO, et al. Quality of life in patients with chronic venous disease: San Diego population study. *J Vasc Surg* 2003;37:1047–53.
2. Evans CJ, Fowkes FGR, Ruckley CV, Lee AJ. Prevalence of varicose veins and chronic venous insufficiency in men and women in the general population: Edinburgh Vein Study. *J Epidemiol Community Health* 1999;53(3):149–153.
3. Michaels JA, Brazier JE, Campbell WB, et al. Randomized clinical trial comparing surgery with conservative treatment for uncomplicated varicose veins. *Br J Surg* 2006;93:175–81.
4. Mackenzie RK, Lee AJ, Paisley A, et al. Patient, operative and surgeon factors influencing the effect of superficial venous surgery on disease specific quality of life. *J Vasc Surg* 2002;36:896–902.
5. Lurie F, Creton D, Eklof B, et al. Prospective randomized study of endovenous radiofrequency obliteration (closure) versus ligation and vein stripping (EVOLVeS): two year follow-up. *Eur J Vasc Endovasc Surg* 2005;29:67–73.
6. Darwood RJ, Theivacumar N, Dellagrammaticas D, et al. Randomized clinical trial comparing endovenous laser ablation with surgery for the treatment of primary great saphenous varicose veins. *Br J Surg* 2008;95:294–30.
7. Vuylsteke M, Van den Bussche D, Audenaert EA, Lissens P. Endovenous laser obliteration for the treatment of primary varicose veins. *Phlebology* 2006;21:80–87.
8. Perla J, Rautio T, Biancaris F, et al. Radiofrequency endovenous obliteration versus stripping of the long saphenous vein in the management of primary varicose veins: 3-year outcome of a randomized study. *Ann Vasc Surg* 2005;19:669–72.
9. Disselhoff BCVM, Buskens E, Kelder JC, et al. Randomised comparison of costs and cost-effectiveness of cryostripping and endovenous laser ablation of varicose veins: 2-year results. *BJS* 2008;95:1232–1238.
10. Myers K, Fris R, Jolley D. Treatment of varicose veins by endovenous laser therapy: assessment of results by ultrasound surveillance. *MJA* 2006;185:199–202.
11. Carradice D, Mazari F, Mekako A, et al. Energy delivery during 810nm endovenous laser ablation of varicose veins and post-procedural morbidity. *Eur J Vasc Endovasc Surg* 2010;40:393–398.
12. Mekako A, Hatfield J, Bryce J, et al. Combined endovenous laser therapy and ambulatory phlebectomy: refinement of a new technique. *Eur J Vasc Endovasc Surg* 2006;32:725–729.
13. Carradice D, Mekako AI, Hatfield J, Chetter IC. Randomized clinical trial of concomitant or sequential phlebectomy after endovenous laser therapy for varicose vein. *Brit J Surg* 2009;96:369–375.

14. Bosanquet N. Costs of venous ulcers: from maintenance therapy to investment programmes. *Phlebology* 1992;7(Suppl 1):44–6.
15. Valencia IC, Falabella A, Krisner RS, et al. Chronic venous insufficiency and leg ulceration. *J Am Acad Dermatol* 2001;44:401–421.
16. ADHB website – Our Population. www.adhb.govt.nz/healthneeds

Acute surgical treatment of cutaneous abscesses: cost savings from prioritisation in theatre

Vincent Chong, Lifeng Zhou, Hardeep Hundal, Jonathan Koea

Abstract

Introduction Treatment of cutaneous abscesses is an important part of the acute surgical workload and most are treated with incision and drainage. Traditionally most are treated after major cases in theatre prioritisation and remain in hospital overnight.

Aim To examine the cost saved in patients after drainage of skin abscesses according to the time of surgery ('am' versus 'pm').

Methods The clinical records of all patients who underwent acute incision and drainage of cutaneous abscesses at North Shore Hospital (Takapuna, Auckland, New Zealand) between 1 June–31 December 2011 were reviewed with respect to the time of day when surgery was performed [am (defined as 0730–12 noon of the day of surgery)] versus pm). Costs were calculated using standard tariffs set by our hospital.

Results 339 patients (median age 34 yr, 164 female) were admitted for acute drainage of cutaneous abscesses with 149 operated in "am". There was no difference in patients undergoing am versus pm drainage in terms of age, sex, race, Charlson comorbidity score or smoking status although diabetic patients were more likely to undergo a pm drainage ($p=0.008$). The median cost per discharge was NZ\$2397.39. The cost of the 'am' group was significantly less compared to the cost of the 'pm' group with NZ\$2236.63 compared to NZ\$2531.70 ($p=0.0034$) and saved a median of NZ\$295.07 per patient. This amounted to the cost of an overnight bed stay.

Conclusion Prioritisation of abscess drainage in acute theatre management is safe and associated with significant cost savings.

Cutaneous abscesses affecting the skin, axillae, groins and perineal area are common conditions and are frequently seen by general surgeons when they present acutely for treatment. While not complex, cutaneous abscesses represent a significant part of the acute surgical load in Australasia and consume a significant amount of surgical resources.¹

Traditional surgical teaching has been that all abscesses require an overnight stay after incision and drainage under general anaesthesia with the first dressing change performed in hospital.² However this policy dates from an earlier era when saline soaked gauze was used to pack the abscess cavity and this has now been replaced by softer, more absorbable dressings that can often be changed by community-based nurses.

Since most abscesses are treated with incision and drainage they are often prioritised for operative intervention after major acute cases such as cholecystectomy, appendicectomy and laparotomy. Consequently many abscesses are operated on by junior staff late in the surgical day.¹

The development of dedicated acute surgical services has resulted in adequate resources being consistently available for the management of acute surgical patients. This includes staffed acute operating theatres and available senior surgical expertise.³ This more consistent and regular acute commitment has facilitated new approaches to management of traditional surgical conditions.

This investigation was undertaken to determine whether prioritising abscess drainage and undertaking the earlier drainage was safe and resulted in same day discharge with consequent financial savings.

Methods

This is a retrospective analysis of all adult patients who underwent emergency drainage of skin abscesses at North Shore Hospital, Waitemata District Health Board (WDHB) between 1 June 2011 and 31 December 2011. The institution ethics board granted approval for the study.

At North Shore Hospital acute surgical patients are booked with the operating theatre supervisor for surgery. Patient details are recorded and then the cases are prioritised by the acute surgeon of the day.

Abscesses were treated in the mornings when there were no more urgent cases such as laparotomies or when urgent cases required preoperative investigations or stabilisation and consequently operating theatre space and staff were available for a limited period of time. The daily logbooks of the acute theatre were reviewed and all abscess cases operated on in the study period were recorded.

Data collection included patient demographics, comorbidities such as diabetes, smoking status, location of abscesses, time of day when surgery was performed ('am' versus 'pm'), length of hospital stay and associated in-hospital costs. The definition of 'am' is 7.30am to 12 noon of the day. The Charlson comorbidity score was used to quantify patient comorbid status.⁴

For cost purposes, standard tariffs set by our hospital independent coding and costing committee were adopted. Cost analysis included operating time per minute, surgeon time per minute, anaesthetist time per minute, operation room supplies, inpatient nursing and catering costs, laboratory testing and overall hospital stay.

Statistical analysis—Data was entered into a Microsoft Excel spreadsheet and analysed using SAS (v9.3) software. Descriptive statistics for continuous are reported as mean and standard deviation (SD) for normally distributed variable and median and inter-quartile range (IQR) for variables not normally distributed. Categorical variables were reported as frequency and proportions in descriptive analysis.

The Wilcoxon rank sum test was used to compare non-parametric continuous variables (e.g. age, cost and length of stay), and Chi-squared test for categorical variables when appropriate. Multivariable analyses were done to control for confounding factors. Statistical significance was defined as $p \leq 0.05$.

Results

A total of 339 patients were admitted to North Shore Hospital in the study period. All had emergency abscess drainage with 149 undergoing surgery between 7.30 am and 12 noon and 190 undergoing surgery after noon.

All abscesses are included with the most common being perianal 119 (35%), pilonidal 40 (11.7%), breast 38 (11.2%), lower limb 38 (11.2%), axillary 37 (10.9%), groin/inguinal 43 (13%), abdominal wall 24 (7%).

The baseline characteristics were summarised in Table 1. There were 164 female (48%) and 175 male (52%) with mostly Europeans (61%), followed by Māori (15%), Pacific Islanders (15%), and Asian (9%). Ten percent of patients had Type 2 Diabetes. There were no significant differences between both the 'am' and 'pm' groups except for patients with diabetes were more likely to undergo abscess drainage in the morning.

The overall median age was 39 years old (Q1 27 years and Q3 51 years). Using Wilcoxon rank sum test, there was no statistically difference in age between the two groups (P=0.665).

Primary outcome—The overall median cost per case was NZ\$2397.39 (Q1 NZ\$1910.34 and Q3 NZ\$3089.74). When the groups were categorised, the cost of the ‘am’ group was NZ\$2236.63 (Q1 NZ\$1878.72 and Q3 NZ\$2728.72) compared to the ‘pm’ group of NZ\$2531.70 (Q1 NZ\$1951.18 and Q3 NZ\$3337.92; p=0.0034 with respect to “am” surgical drainage).

Table 2 showed the relationship between the time of surgery and cost. Patients were divided into four groups according to the quartiles of the cost for the multivariate analysis. Taking into all confounding factors (including age, gender, ethnicity, smoking and Charlson score), the ‘pm’ group is 1.67 times more costly compared to the ‘am’ group (P=0.0104). In addition, Pacific Islanders and type 2 diabetes were associated with a higher cost.

Table 1. Patient characteristics vs timing of operation (‘am’ or ‘pm’)

Variable		AM (n=149)	PM (n=190)	P value
Gender	Female	78	86	0.195
	Male	71	104	
Ethnicity	European	90	118	0.787
	Asian	13	16	
	Māori	21	31	
	Pacific Islander	25	25	
Abscess site	Perianal	61	58	0.880
	Pilonidal	18	22	
	Breast	20	18	
	Lower limb	19	19	
	Axilla	19	18	
	Abdominal	10	14	
	Inguinal	20	23	
Charlson score	0 (ref)	117	139	0.522
	1	17	27	
	2 and more	15	24	
Type 2diabetes mellitus	No	141	163	0.008
	Yes	8	27	
Smoking	No	102	123	0.472
	Yes	47	67	
Discharge day of surgery		147	0	-

Table 2. Multivariate analysis of cost of operation timing ‘am’ vs ‘pm’

Variable	Reference	Odds Ratio	95% Confidence Interval	
Age		1.02	1.00	1.03
Female	Male	0.91	0.61	1.34
Māori	European	0.79	0.45	1.38
Pacific Islander	European	1.90	1.08	3.37
Asian	European	1.43	0.71	2.89
Smoking	No smoking	0.98	0.65	1.49
Charlson score	Score <2	1.47	1.06	2.11
OT – pm	OT – am	1.67	1.13	2.48

Secondary outcome—The overall median length of stay was 2 days (Q1: 1 day; Q3: 2 days) and a mean of 2.2 days (SD 3.19). Comparing both groups resulted in similar median of 2 days but a mean of 1.89 days in the ‘am’ group and 2.48 days in the ‘pm’ group (Wilcoxon rank sum test, P=0.5297)..

For the multivariate analysis, patients were divided according to the distribution of length of stay for ordinal logistic regression. The three groups were less than 2 days, 2 days and more than 2 days. This showed that there were no statistical significant difference in length of stay between the two groups (Table 3, OR=1.08, 95%CI 0.72–1.63 for time of surgery).

The potential savings were calculated by subtracting the median of the ‘am’ and ‘pm’ group, which were NZ\$295.07 per patient. Therefore, if all patients had their surgeries performed in the ‘am’, the potential savings would have totalled NZ\$56063.30 in the 6 months period.

Table 3. Multivariate analysis of length of stay of operation timing ‘am’ vs ‘pm’

Variable	Reference	Odds Ratio	95% Confidence Interval	
Age		1.01	0.99	1.02
Female	Male	0.92	0.61	1.39
Māori	European	1.17	0.65	2.10
Pacific Island	European	1.88	1.05	3.37
Asian	European	0.80	0.37	1.71
Smoking	No smoking	0.76	0.48	1.19
Charlson score	Score=0	1.75	1.02	3.00
OT – pm	OT – am	1.08	0.72	1.63

Discussion

This small study was undertaken in the context of an organisation-wide change in the way acute surgical patients are managed in our hospital.³ Prior to 2011, surgical teams and consultants were rostered on acute take without any change to their concurrent elective commitments such as operating lists or outpatient clinics.

Consequently acute commitments had to be accommodated around elective commitments on the day. A similar situation existed on subsequent days as patients’ condition changed or investigations were completed and the need for operative

intervention became apparent creating further issues for admitting teams with elective commitments to fulfil. In 2011 services were revised and a system instituted whereby the consultant taking weekend acute call would then be available and in house within normal working hours on the following Monday through Thursday inclusive to run a dedicated acute operating theatre and ensure timely management of patients needing acute surgery.

In addition, a surgical registrar was allocated to the acute theatre with the express role of performing acute surgical operations under the supervision of the acute consultant. This left the rostered admitting teams free to assess and investigate acute admissions and senior expertise available on subsequent days to manage acute patients requiring surgical intervention.

This system has been successful in increasing the numbers of patients managed during daylight hours and in reducing bed stay and waiting times in the emergency department. However the development of a dedicated system to manage acute patients has also provided the opportunity to reappraise and update our management protocols for common surgical conditions.

Cutaneous abscesses are commonly seen and a large part of the acute surgical workload of general surgical departments. Historically cutaneous abscesses were managed with surgical incision and drainage and packing of the cavity with ribbon gauze soaked in saline. Mostly this required general anaesthesia and overnight stay was recommended so the first dressing change could be undertaken in a hospital environment if narcotic analgesia was required.

In addition abscesses and other minor cases were generally scheduled late in the surgical day and treated by junior staff when more major cases such as laparotomy, cholecystectomy, and appendicectomy were completed. Partly this reflected the tradition of undertaking “dirty cases” after “clean cases” and also the greater likelihood of senior staff during the day to cover major cases. Based on the sheer numbers of abscesses presenting to surgical departments previous attempts have been made to streamline and improve their management.

The use of local anaesthetic analgesia with incision and drainage in emergency departments has been advocated⁵ but is only suitable in a minority because of the sensitivity of the affected areas, difficulty in surgical access in sites such as the perianal area, difficulties in obtaining deep analgesia for the drainage of deeply placed and complex cavities and reduced effectiveness of local anaesthetic agents in the acidic tissue environment that accompanies acute inflammation. Consequently general anaesthesia is necessary for adequate drainage in the majority of cases.

We hypothesised that abscesses drained in theatre early in the surgical day would be able to be discharged later that day. For most patients this would mean a one night hospital stay (the night of admission). We believed this was possible for a number of reasons.

Air exchange and filtering units are now more effective and the need to schedule “dirty cases” after “clean cases” in an acute general surgical theatre is now no longer necessary and not associated with an increase in infective risk although this may not be the case in theatres dedicated to joint replacement or other similar environments.

General anaesthesia has now improved significantly with many short acting agents available and the need for patients to stay overnight to manage nausea or other post-anaesthetic symptoms is minimal. Finally packing of abscess cavities with saline soaked gauze is now no longer practice and most are managed with softer gelatine or seaweed based dressings in theatre which makes the first dressing change more straight forward and able to be performed by community based nurses in the patients home.

Our investigation has shown that incision and drainage in the “am” was safe with only 4 patients subsequently requiring readmission for further drainage and all were in complex perianal abscesses. This policy did not result in management delay of any major or high acuity cases and it is important to emphasise that the decision to operate on cutaneous abscess first was the decision of the acute surgical consultant of the day and only occurred when there were no more urgent cases to attend to.

In addition no patient complaints related to same day discharged have been received and this was associated with a cost saving of NZ\$295.07 per patient. This saving represents the cost of a night in a general surgical ward. While it is not a large amount of money the frequency with which abscesses are treated means that over NZ\$100,000 would have been saved annually if all cutaneous abscesses were managed in this way.

Analysis of the characteristic of patients managed with “am” drainage showed no obvious factors that made this more likely other than the presence of diabetes. This finding is indicative of standard surgical practice where diabetic are managed early in the morning to make subsequent blood sugar management for straight forward. Significantly there was no relationship between “am’ drainage and patient age, sex or Charlson Comorbidity Status indicating that most patients can be managed in this way.

This small study can be criticised in a number of ways. It is a retrospective review and while it confirmed our hypothesis that earlier operation was associated with reduced hospital stay and potential cost savings, it has not defined the optimum patient group for this approach. In particular chart review was not useful in determining patients social situation which must be important in this approach since early discharge is only possible to patients with a stable and safe home environment and available caregivers.

In addition we did not find any statistical significance in the length of stay analysis although all but two patients (both of whom had significant cellulitis) operated on in the “am” group were discharged on the same day as surgery. This may be related to the observation unit of time as ‘days’ for length of stay. ‘Days’ as analysis unit is not differential in such a setting, with the median of length of stay as 2 days and subsequent investigations in the area will quantify patient hospital stay in hours.

We were also only able to accurately quantify in-hospital costs only but were unable to quantify other potential costs, such as days off work, medications, sick leave, district nursing care and costs associated with General Practitioner driven episodes of care. However this investigation has confirmed that prioritising “am’ drainage of cutaneous abscesses is a safe and cost-effective strategy for acute surgical services.

A prospective trial is being developed to further define patient and abscess characteristics that are best suited to this approach and to acutely measure the associated community costs.

Competing interests: Nil.

Author information: Vincent Chong, Lifeng Zhou, Hardeep Hundal, Jonathan Koea, Hepatobiliary and General Surgeons. The Department of Surgery, North Shore Hospital, Takapuna, Auckland

Acknowledgements: The authors acknowledge the staff of the Acute Surgical Theatre at North Shore Hospital and Delwyn Armstrong from Waitemata District Health Board for undertaking the cost calculations in this investigation.

Correspondence: Jonathan Koea, The Department of Surgery, North Shore Hospital, Private Bag 93503, Takapuna, Auckland, New Zealand. Fax: +64 (0)9 4884621. Email: jonathan.koea@waitematadhb.govt.nz

References:

1. Baker J, Windsor JA. Management of adult superficial acute abscesses in a tertiary hospital: time for incisive action. *N Z Med J* 2009;122(1295):37–46.
<http://journal.nzma.org.nz/journal/122-1295/3608/content.pdf>
2. Stevens DL, Bisno AL, Chambers HF, et al. Practice guidelines for the diagnosis and management of skin and soft-tissue infections. [Erratum appears in *Clin Infect Dis*. 2005 Dec 15;41(12):1830], [Erratum appears in *Clin Infect Dis*. 2006 Apr 15;42(8):1219 Note: Dosage error in article text]. *Clin Infect Dis*. [Practice Guideline]. 2005 Nov 15;41(10):1373–406.
3. Koea JB, Hundal H, Srinivasa S. Provision of Acute General Surgery: A Systematic Review of Models of Care. *Trauma and Acute Care Surgery* 2014;76:219–225.
4. Charlson M, Pompei P, Ales K, Mackenzie C. A new method for classifying co-morbidity in longitudinal studies: development and validation. *J Chronic Disease* 1987;40:373–383.
5. Halvorson GD, Halvorson JE, Iserson KV. Abscess incision and drainage in the emergency department--Part I. *J Emerg Med*. 1985;3(3):227–32.

A review of the Christchurch Hospital Breast Cancer Service in 2012: meeting the new Tumour Standards

Valerie Davey, Gavin Harris, Birgit Dijkstra, Melissa James, Bridget Robinson

Abstract

Aims To determine whether patients diagnosed with breast cancer in 2012 received timely access to services at Christchurch Hospital when audited against Ministry of Health Tumour Standards of Service Provision (TS) (2013) and the Faster Cancer Treatment (FCT) indicators, and to discover factors which impeded patient pathways, and which would need to be addressed in order to meet the standards.

Methods Data on referrals, dates and treatment for patients diagnosed with breast cancer at Christchurch Hospital was extracted from the Christchurch Breast Cancer Patient Register and other hospital databases.

Results In 2012, 288 breast cancer patients were treated at Christchurch Hospital, 60% referred by general practitioners, and 40% via the national screening programme. Some 2013 Tumour Standards were achieved. The FCT indicator 1 (TS 2.4) and 3 (TS 2.5) were met, with 87% ($\geq 80\%$) receiving their first treatment within 62 days of referral, and 89% ($\geq 80\%$) within 31 days of decision-to-treat. However, FCT indicator 2 (TS 2.1), requiring first specialist assessment within 14 days of referral, was met in 61% ($\geq 90\%$ required). Only 64% of women started adjuvant chemotherapy within 42 days of their surgery (TS 2.6, $\geq 90\%$).

Conclusion The management of breast cancer patients by a multidisciplinary team is crucial to ensure patients receive timely and appropriate care. However, waiting for weekly multidisciplinary meetings and adequate anatomical pathology resource, together with other factors, were identified as delaying the patient pathway and solutions to resolve these are discussed.

Breast cancer remains the most common cancer in New Zealand women, affected 2791 women in 2010 (27.5% of all female cancer registrations) and was the second leading cause of female cancer deaths,¹ 641 of 4082 (15.7%).

In Canterbury, 436 patients were recorded on the Christchurch Breast Cancer Patient Register (CBCR) in 2012 comprising 14.5% of all New Zealand breast cancer registrations (n=3003).²

The Faster Cancer Treatment (FCT) indicators,³ developed by the Ministry of Health (MOH), stipulate all patients referred to a hospital with a high suspicion of cancer should have their first specialist assessment (FSA) within 14 days (indicator 2) and receive their first cancer treatment (surgery or oncology therapy) within 62 days (indicator 1).

Once a cancer diagnosis is confirmed, patients should receive their first cancer treatment (or other management) within 31 days of decision-to-treat (indicator 3).⁴

Developed in late 2013 as part of the FCT programme, *Standards of Service Provision for Patients with Breast Cancer in New Zealand*⁵ (*Tumour Standards*) ensure uniformity and timeliness of care for all patients diagnosed with breast cancer from time of referral to the patients' first cancer treatment through to adjuvant therapy (see Figure 1).

Figure 1. Standards of service provision for patients with breast cancer in New Zealand (published December 2013)

<p>Standard 2 - Timely Access to Services</p> <p>Standard 2.1 - Women referred urgently with a high suspicion of breast cancer have their FSA within 14 days (FCT indicator two). Recommended performance level $\geq 90\%$ meet standard.</p> <p>Standard 2.2 – Women referred with a moderate suspicion of breast cancer have their FSA within 30 days.</p> <p>Standard 2.3 – Women referred with a low suspicion of breast cancer have their FSA within 90 days.</p> <p>Standard 2.4 - Women referred urgently with a high clinical suspicion of breast cancer receive their first cancer treatment within 62 days (FCT indicator one). Recommended performance level $\geq 80\%$ meet standard.</p> <p>Standard 2.5 - Women with a confirmed diagnosis of breast cancer receive their first cancer treatment within 31 days of decision to treat (FCT indicator three). Recommended performance level $\geq 80\%$ meet standard.</p> <p>Standard 2.6 - Women recommended adjuvant systemic therapy by a MDT & fit to receive it commence treatment within six weeks (42 days) of surgery for breast cancer. Recommended performance level $\geq 90\%$ meet standard.</p> <p>Good practice point – Referral to non-surgical treatment provider should be made within 14 days of surgery for breast cancer.</p> <p>Good practice point – Women with high risk breast cancers (e.g. where four or more lymph nodes are involved) who are accepted for and fit to receive treatment commence that treatment within two calendar weeks from the decision-to-treat.</p> <p>Standard 2.7 - Women with inflammatory breast cancer have their FSA with a medical oncologist within two weeks of receipt of referral. Recommended performance level $\geq 90\%$ meet standard.</p> <p>Standard 2.8 - Women with breast cancer referred for radiation oncology assessment have their FSA with a radiation oncologist within two weeks of receipt of referral (where chemotherapy is not part of the management).</p> <p>Standard 2.9 - Women consenting to radiation therapy after surgery commence treatment once the surgical site has healed and within six weeks (where chemotherapy is not part of the management).</p> <p>Good practice point – Radiation therapy should commence one month after the last dose of chemotherapy (expert opinion).</p>

The aim of this study is to determine whether standards on Timely Access to Services (Standards 2.1 to 2.9) were attained at Christchurch Hospital in 2012, and to discover factors which impeded patient pathways, and which would need to be addressed in order to meet the standards.

Because services provided by the private sector are not under the jurisdiction of the FCT or Tumour Standards, the management of private patients after diagnosis are not included.

Methods

All patients referred in Christchurch with a new diagnosis of breast cancer between 1 January 2012 and 31 December 2012 were studied.

All cases had been entered onto the Christchurch Breast Cancer Register (CBCR), which since 2009 has recorded comprehensive details about diagnosis, clinical history, pathology, treatment and subsequent outcome. Complete ascertainment of all breast cancer cases is confirmed by cross-referencing with the New Zealand Cancer Registry.

Patients referred to CPH with benign disease are not captured by CBCR. Data for the patients diagnosed in 2012 at Christchurch Hospital was extracted from the CBCR database by the Register data coordinator. Additional data was collated from the CDHB electronic hospital record system, BreastScreen Aotearoa (BSA) and the Oncology Service Mosaik databases.

In this review, all referrals were re-categorised as high suspicion of breast cancer instead of subgroups of low, moderate or high suspicion due to the small numbers of low (n=4) to moderate (n=2) patients, and included patients with in-situ or invasive disease. Consent was required during 2012 for patients to be added to the Register, a condition waived subsequently.

The dates of referral, first specialist assessment (FSA), discussion in multi-disciplinary meeting (MDM), referral and all treatments were supplemented by information from the CDHB patient management system. Time from referral to first specialist assessment (FSA), and then to first treatment, to MDM, to first oncology assessment, and from decision to treat until treatment were calculated in elapsed days (7 day week).

Time points based on FCT indicators and the breast cancer Tumour Standards were used to evaluate the timeliness of all aspects of breast cancer management provided at Christchurch Hospital. These were expressed as medians, range and as percent of applicable standard achieved.

The following definitions are used for this review: The date of receiving referral is the date a patient is waitlisted for FSA. However, the date of waitlist for surgery is used for patients who require further surgery following an excision biopsy proven cancer or BSA patients referred directly for surgery. The date of FSA is the date of the first specialist appointment with any breast clinician (surgeon/oncologist).

The date of decision-to-treat is the clinic date a patient gives consent for treatment (surgery or therapy). The first surgical intervention (FSI) comprises the initial breast or axillary surgery. Final surgery is the last operation whether this is the same as the FSI or additional surgery such as re-excision of margins or completion mastectomy.

In Christchurch, the majority of patients with suspected breast cancer follow a simple pathway whereby a general practitioner (GP) or BSA send a referral to the Department of General Surgery (GNSU) at Christchurch Hospital. Where a GP has deemed a patient at high suspicion of breast cancer, following the Canterbury Health Pathways guidance, and imaging and biopsy have confirmed cancer, referral to GNSU is triggered.

Patients are assessed by a breast surgeon prior or following a breast cancer diagnosis, and proceed to breast surgery. However, patients who require a mastectomy with breast reconstruction and referral to a plastic surgeon, or who require further imaging and/or biopsies as part of their diagnostic workup, follow a complex pathway often with a delay to surgery.

During 2012, all cases at CPH were considered in the weekly MDM attended by breast surgeons, reconstructive surgeons, medical and radiation oncologists, breast nurses, a radiologist and an anatomical pathologist.

The breast nurses helped action decisions made at the MDM. Patients who receive all their care through Canterbury BreastCare (private breast clinic) are included in the CBCR but are not analysed for time to assessment and treatment.

Results

The demographics of 436 patients (including one male) from Canterbury, newly diagnosed with their first breast cancer during 2012, are shown below in Table 1. Overall, a quarter of patients (25.7%, n=112) were aged under 50 and 74.3% (n=324) aged 50 and over.

Ninety percent of patients were of European descent (n=395), 4.6% Maori (n=20), 0.4% Pacific peoples (n=2) and 4.4% from other ethnicity (n=19) such as Asian. Less than half of patients were diagnosed via the screening programme (45.2%, n=197) with 54.8% (n=239) symptomatic patients referred by their GP or other sources.

Breast cancer was early stage I or II in 72.9% patients (n=318), with 11.7% (n=51) Stage III, and 2.8% (n=12) Stage IV. Twelve percent (11.9%, n=52) had ductal carcinoma in-situ without any invasive component and 0.7% (n=3) had Paget's disease of the nipple or lobular carcinoma *in situ*. One-third of patients (33.9%, n=148) were treated in the private sector and the remainder at Christchurch Hospital.

Sixty-one patients were ineligible for CBCR due to the following reasons: 2 patients declined to join the Register; 1 received their breast cancer surgery outside Canterbury; 57 patients had a previous history of breast cancer prior to 2009 (public=36, private= 21), and 1 breast cancer was diagnosed at post-mortem.

Table 1. Demographics of breast cancer patients diagnosed during 2012 who receive treatment in Canterbury

Variable	Private sector	Public sector	Total	Percentage
Number of patients	148	288	436	100%
Age (years)				
Age <50	47	65	112	25.7%
Age ≥50	101	223	324	74.3%
Ethnicity				
European	138	257	395	90.6%
Maori	1	19	20	4.6%
Pacific People	0	2	2	0.4%
Other	9	10	19	4.4%
Presentation				
BreastScreen Aotearoa	84	113	197	45.2%
GP referrals	64	175	239	54.8%
Prognostic staging				
Stage I–II	106	212	318	72.9%
Stage III	16	35	51	11.7%
Stage IV	1	11	12	2.8%
Ductal carcinoma in-situ (DCIS only)	24	28	52	11.9%
Lobular carcinoma in-situ (LCIS)/Paget's	1	2	3	0.7%

A total of 288 breast cancer patients diagnosed in 2012 were treated at CPH. Of these, 171 (59.4%) patients were referred to GNSU by their GP, 113 (39.6%) were referred by BSA and 4 (1.4%) were referred directly to a medical oncologist with metastatic breast cancer at diagnosis.

The 171 patients referred to GNSU by their GP included symptomatic patients with high suspicion of breast cancer (89.5%, n=153); patients with low (2.3%, n=4) to

moderate (1.2%, n=2) suspicion of breast cancer; patients assessed at Canterbury BreastCare before being directed to CPH for treatment (6.4%, n=11) and 1 (0.6%) elderly patient who was unfit for surgery whose GP sought treatment advice (no FSA). The first breast cancer treatment for women referred from their GP or from BSA to Christchurch Hospital is shown in Tables 2 and 3 respectively.

Table 2. First breast cancer treatment for GP referrals to Christchurch Hospital in 2012

Department of initial referral	First breast cancer treatment	Number of patients	Percentage
GNSU (Department of General Surgery)	Surgery	124	70.9%
	Excision biopsy of breast lesions for Low to high suspicion of breast cancer	9	5.1%
	No primary surgery - Endocrine therapy prescribed by surgeon	11	6.3%
	Preoperative Endocrine therapy prescribed followed by delayed surgery	2	1.1%
	Endocrine therapy prescribed by GP as advised by GNSU (no FSA)	1	0.6%
GNSU – Re-direct to Oncology	Neoadjuvant chemotherapy	14	8.0%
GNSU – Re-direct to Oncology	Neoadjuvant therapy prescribed by oncologist (no primary surgery)	7	4.0%
GNSU – Re-direct to Oncology	Palliative oncology therapy* (extensive metastatic disease at presentation)	3	1.7%
Medical Oncology	Endocrine therapy (extensive metastatic disease at presentation)	4	2.3%
Total number of patients		175	100%

* Palliative therapy include radiation (n=2) & chemotherapy (n=1).

Table 3. First breast cancer treatment for referrals to Christchurch Hospital from BreastScreen Aotearoa (national breast screening programme) in 2012

Department of initial referral	First breast cancer treatment	Number of patients	Percentage
GNSU (Department of General Surgery)	Surgery via simple pathway (waitlist for surgery without FSA at GNSU)	39	34.5%
	Surgery via complex pathway (further diagnostic workup & FSA required)	65	57.5%
	Surgery* (additional surgery for incidental malignancy from excision biopsy for suspicious lesion)	7	6.2%
GNSU – Redirect to Oncology	Neoadjuvant chemotherapy	1	0.9%
Radiation Oncology	Postoperative radiation therapy (incidental malignancy from BSA excision biopsy for suspicious lesion)	1	0.9%
Total number of patients		113	100%

* May include re-excision, mastectomy &/or axillary surgery.

First specialist appointment (FSA)—Overall 240 patients were referred and had their FSA at Christchurch Hospital (CPH) at either GNSU (n=236) or Oncology Services (n=4). The remaining 48 patients had their FSA at BSA or Canterbury BreastCare.

Sixty-one percent of patients (60.8%, n=146) had their FSA within 14 days of a referral for high suspicion of breast cancer, compared with $\geq 90\%$ required by Standard 2.1. The median time from waitlist to surgical FSA was 11 days (range 0–224). Overall 18.8% (n=45) required further imaging with or without biopsies prior to FSA. This did not have any significant impact on FSA times despite the need for additional workup as 80% (n=36) of patients were seen within 14 days with a median time from waitlist to FSA of 7 days (range 0–101). Six patients were referred by their GP for low to moderate suspicion of cancer but excision biopsy showed malignancy (range 5–224).

First breast cancer treatment: overall (surgery & neoadjuvant therapy)—The first cancer treatment received by the 288 patients referred to CPH in 2012 was surgery for the majority (84.7%, n=244), radiation therapy for 1 BSA patient following an excision biopsy which showed malignancy, neoadjuvant chemotherapy for 16, endocrine therapy for 24, and radiation therapy for 3.

In accordance with Standard 2.5, 88.5% (n=253) of 286 patients with a confirmed diagnosis of breast cancer received their first cancer treatment at CPH within 31 days of decision-to-treat.

Overall, 87.1% (n=250) of patients referred urgently with a suspicion of breast cancer received their first cancer treatment within 62 days in compliance with Standard 2.4. Table 4 shows the range of days from referral to first cancer treatment.

Table 4. Number of days from referral to first breast cancer treatment at Christchurch Hospital (Standard 2.5/FCT indicator 3)

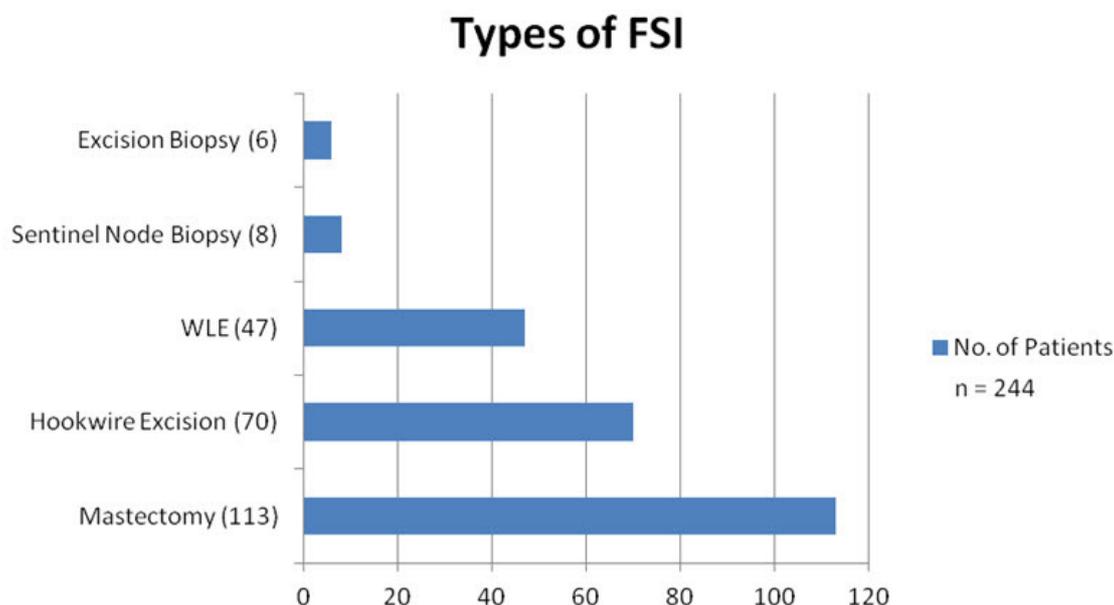
Variable	Referral to first breast cancer treatment (within 62 days)	Decision-to-treat to first breast cancer treatment (31 days)
Number of patients	287 ^a	286 ^{a&b}
Range (days)	3–197	0–118
Median (days)	28	14
Average (days)	35.1	16.8
Number of patients who met Standard	250	253
% met standards	87.1%	88.5%
Met standard $\geq 80\%$	Yes	Yes

^a One patient received her first breast cancer treatment elsewhere (decision-to-treat date unavailable).

^b One patient prescribed hormonal therapy by the GP (decision-to-treat date unavailable).

First cancer treatment: surgery—see Figure 2.

Figure 2. First surgical intervention (FSI)



Overall referrals to GNSU (GP & BSA referrals)—85% (84.7%, n=244) of 288 patients diagnosed with breast cancer underwent surgery as their first cancer treatment.

Of 240 women who were referred urgently (waitlisted) to GNSU, (54.5%, n=133) were GP referrals with the remaining patients referred by BSA. More than 80% of patients received their FSI within 62 days of referral (87.3%, n=213) and within 31 days of decision-to-treat (86.1%, n=210) with median 16 days (range 2-118).

Table 5 shows the timeline from GP or BSA referral to FSI for those who had surgery as their first breast cancer treatment.

Table 5. First cancer treatment (surgery)—time to first surgical intervention (FSI) for GP & BSA referrals

Variable	GP Referrals		BSA Referrals	
	Decision to Treat to FSI	Referral to FSI	Decision to Treat to FSI	Referral to FSI
Number of patients	133	133	111	111
Range (days)	2 - 118	3 - 123	2 - 92	3 - 110
Median (days)	15	32	17	22
Average (days)	17.3	39.1	21.1	27.1
Number of patients who met standards	121	111	89	103
% Met standards	91%	83.5%	80.2%	92.8%
Met standard \geq 80%	Yes (Standard 2.5)	Yes (Standard 2.4)	Yes (Standard 2.5)	Yes (Standard 2.4)

GP referrals—Overall, 83.5% of patients referred by their GP to GNSU received their FSI within 62 days, median 32 days (Table 5). Eighteen percent of patients in both GP referred (n=24) and BSA referred (n=20) groups required further diagnostic workup prior to surgery. A smaller number of patients (6%, n=8) were referred for breast reconstruction with one patient who decided against it. One patient (0.8%) had surgery delayed due to a haematoma post biopsy.

Two patients (1.5%) were diagnosed with other cancer at the same time as their breast cancer diagnosis. Both required chemotherapy for the other cancer before commencing treatment for breast cancer. Ninety-one percent (n=118) of GP referred patients received their FSI within 31 days of decision-to-treat (median 15 days).

BSA referrals—BSA referred 113 patients (39.2% of 288 patients) with screen detected breast cancers to CPH for treatment. Under the BSA programme, patients are usually assessed by a breast surgeon prior to a core biopsy of abnormalities seen on imaging, and then seen again with the histology results (FSA).

The majority of screening patients (98.2%, n=111) received surgery as their first breast cancer treatment. Nearly a third of BSA patients (34.5%, n=39) were on the simple pathway (direct referral for surgery without FSA at CPH) whereas more than half the patients (57.5%, n=65) required further diagnostic workup or FSA at GNSU before definitive decision-to-treat.

One screening patient (0.9%) was referred on for neoadjuvant chemotherapy. Amongst eight patients referred for further treatment following an excision biopsy proven breast cancer diagnosis, seven (6.2%) required further surgery whereas one (0.9%) did not require further surgery and was referred on for radiation therapy.

Eighty percent of BSA-referred patients (n=89) received their FSI within 31 days of decision-to-treat (Table 2), a median of 17 days (range 2–92) while 92.8% (n=103) were treated within 62 days of referral (median 22 days).

In all, 18% (n=20) required further diagnostic workup pre-operatively; 11.7% (n=13) were seen by a Plastic surgeon for consideration of immediate breast reconstruction however two patients declined reconstruction; 3.6% (n=4) developed a haematoma post biopsy which obscured hook wire localisation thus delaying surgery.

Breast reconstruction patients—Overall, 21 patients (8.6%) were referred to a plastic surgeon for consideration of immediate breast reconstruction and/or contralateral breast reduction, of whom 81% (n=17) accepted reconstructive surgery. The median time from referral to FSI for this group (n=20, one patient not waitlisted) was 46 days (range 15–110), and 70% (n=14) were treated within 62 days. The median time from decision-to-treat to FSI for all patients referred for reconstructive surgery was 13 days (range 3–51). Fewer GP-referred patients were referred for immediate breast reconstruction (38.1%, n=8).

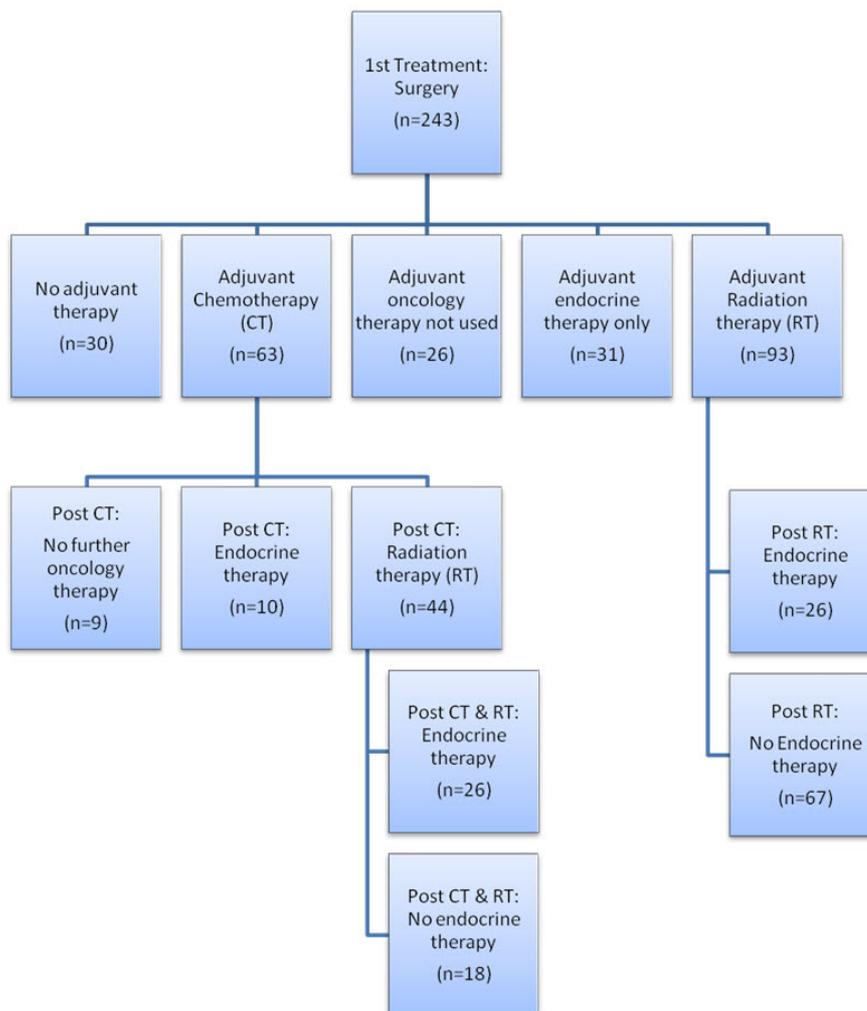
Adjuvant oncology referrals & therapies—Postoperatively, 81.6% (n=199) patients were referred to Oncology Services for consideration of adjuvant therapy, 5.7% (n=14) were commenced on endocrine therapy by their surgeon (no referral to Oncology), 1 patient (0.4%) commenced chemotherapy at a different centre, while the

remaining patients (12.3%, n=30) were not recommended any adjuvant therapy by the MDM team.

Of those referred to Oncology, chemotherapy was not recommended for 13 patients (6.5%) and they were referred on to Radiation Oncology for consideration of radiation therapy. Based on the total number of Oncology referrals (n=212), including patients re-referred for radiation, the median time from being wait-listed in Oncology to FSA was 11 days, (range 2–72 days).

More than two-thirds of patients (n=148, 69.8%) were seen within 14 days which is marginally better than the performance level for GNSU (62%) however this is well short of the required Standard of $\geq 90\%$. Overall 86.9% (n=174) of referred patients accepted adjuvant oncology therapy. Figure 3 gives an overview of adjuvant oncology therapies while Table 6 shows the various pathways patients undergo with calculated days between events.

Figure 3. Flow chart of adjuvant oncology therapies



***Note:** One patient commenced adjuvant chemotherapy elsewhere & is excluded; 13 patients, for whom chemotherapy was not used, were referred to Radiation Oncology.

Table 6. Pathways for patients' first adjuvant therapy for patients referred to Oncology Services

Events	1st Adjuvant Therapy: Overall (n=173)		1st Adjuvant Therapy: Chemotherapy (n=63)		1st Adjuvant Therapy: Radiation (n=93)		1st Adjuvant Therapy: Endocrine Therapy (n=17)	
	Median (days)	Range (days)	Median (days)	Range (days)	Median (days)	Range (days)	Median (days)	Range (days)
Surgery to MDM	13	-21 to 31	13	-21 to 31	13	-18 to 30	13	-16 to 20
MDM to Oncology waitlist	1	-27 to 103	1	-27 to 28	1	-11 to 103	4	-7 to 95
Oncology waitlist to Oncology FSA within 14 days (Standard 2.1/FCT indicator 2)	11	2 - 30	9	2 - 24	14	3 - 30	9	2 - 22
Performance level ($\geq 90\%$ recommended)	68.2% (n=118)		82.5% (n=52)		57% (n=53)		76.5% (n=13)	
Oncology FSA to first Oncology therapy	20	0 - 177	14	3 - 107	22	14 - 177	8	0 - 80
Decision-to-treat to 1st Oncology therapy within 31 days (Standard 2.5/FCT indicator 3)	20	0 - 70	13	2 - 35	22	14 - 70	0	0 - 23
Performance level ($\geq 80\%$ recommended)	94.2% (n=163)		96.8% (n=61)		91.4% (n=85)		100% (n=17)	
Final surgery to first Oncology therapy within 42 days (Standard 2.6)	47	7 - 205	38	13 - 127	55	25 - 205	37	7 - 118
Performance level ($\geq 90\%$ recommended)	38.7% (n=67)		63.5% (n=40)		15% (n=14) (no performance recommended)		76.5% (n=13)	

Note: Negative days i.e. -21 denote a MDM discussion took place 21 days prior to the event (surgery).

First adjuvant therapy: chemotherapy—Chemotherapy was the first adjuvant therapy in 63 women. One patient returned to her home country for adjuvant therapies and is excluded. Forty patients (63.5%) commenced chemotherapy within 6 weeks (42 days) of final breast cancer surgery ($\geq 90\%$ for Standard 2.6) with a median of 38 days (range 13–127), while 88.9% (n=56) commenced chemotherapy within 42 days of the MDM. The majority of patients (96.8%, n=61) commenced chemotherapy within 31 days of decision-to-treat (median 13 days, range 2–35) in accordance with Standard 2.5.

A quarter of patients (25.4%, n=16) required additional surgery following FSI. This meant that nearly half of patients started chemotherapy within 42 days of their FSI (47.6% n=30) with a median of 44 days (range 21–212).

Types of additional surgery included: re-excision of close margins in five, completion mastectomy in two, axillary clearance in seven (two with further excision), and completion mastectomy with immediate reconstruction in two.

One patient, diagnosed with extensive *in situ* disease, had to lose weight before she was suitable for completion mastectomy with immediate breast reconstruction, but final histology showed invasive carcinoma, prompting referral for adjuvant chemotherapy (FSI to adjuvant chemotherapy = 212 days).

Other reasons for delays in starting adjuvant chemotherapy include CT staging before consideration of therapy (17.5%, n=13); postoperative infection or haematoma (9.5%, n=6); late or missed referral from GNSU (3.2%, n=2) and patient's prearranged trip (1.6%, n=1).

Forty-four (69.8%) of the patients who received chemotherapy went on to have radiation therapy, with 72.7% (n=32) commencing radiation within 42 days of their last chemotherapy dose (median 37.5 days, range 11–198). However only 27.2% (n=12) of patients met the good practice point of starting radiation within a month (31 days) of their last chemotherapy dose.

Two patients waited an extended time before commencing radiation: one who underwent a completion mastectomy because of previous close margins (84 days) and one who stopped chemotherapy earlier than expected.

First adjuvant therapy: radiation—Radiation therapy was the first adjuvant therapy for 93 patients, of whom 57% (n=53) had their Radiation Oncology FSA within 14 days of referral (Standard 2.8) with a median of 14 days (range 3–30). Ninety-one percent of patients (n=85) commenced radiotherapy within 31 days of decision-to-treat (FCT indicator 3) with a median of 22 days (range 14–70).

The median time from final surgery to a patient's treatment plan being discussed at the MDM was 13 days (range -18 to 30), from MDM to Radiation Oncology referral one day (range -11 to 103), including 13 patients referred prior to the MDM. Fewer than half of patients (46.2%, n=43) commenced radiotherapy within 6 weeks of MDM with a median of 43 days (range 24–192).

The median number of days from final surgery to first radiation treatment was 55 (range 25–205). Sixteen women (17.2%) had required additional surgery. Using the FSI, the median number of days from FSI to first radiation treatment was 59 (range 35–205).

In 2012, patients were required to commence radiation therapy within 8 weeks (56 days) postoperatively. At the time of review in July 2013, this Standard had been amended to 6 weeks (42 days).

Based on the previous standard, 53 (57%) of patients had radiation therapy within 8 weeks of their final surgery. However only 15% (n=14) of patients met the 2013 standards requirement of 6 weeks. More than a quarter of patients commenced endocrine therapy upon completion of radiation therapy (28%, n=26), at a median 24 days (range 0–70) from last radiation.

Reasons for delays starting radiation therapy varied. Thirteen patients (14%) had seen a medical oncologist to consider chemotherapy which was decided against, nine (9.7%) had delays with the surgery team, three had postoperative wound infection or haematoma, three patients (3.2%) went on pre-arranged trips and one needed treatment for a synchronous non-breast cancer (delay of 205 days).

There are no required performance levels for radiation therapy Standards 2.8 and 2.9. Since the cumulative median was 28 days from final surgery to MDM, MDM to referral and referral to FSA, this left 2 weeks from FSA to first radiation treatment date. Furthermore, patients need CT planning following their FSA or decision-to-treat, before treatment can start. The times from FSA to CT planning to start of radiation therapy were not audited.

First adjuvant therapy: endocrine—Endocrine therapy was the first adjuvant therapy for 31 patients, who fell into two groups. The first group of patients were prescribed endocrine therapy by an oncologist (n=17), and 76.5% of them (n=13) had endocrine therapy prescribed within 42 days following final surgery (median 37 days, range 7–118).

The other group of 14 women were not referred to an oncologist and were prescribed endocrine therapy by their surgeon with 64.3% (n=9) starting therapy within 42 days of final surgery (median 23 days, range 10–71). The two extended delays were due to staff error (107 days) and oncology treatment for another cancer (118 days). The date of starting endocrine therapy was determined from the review of clinical records.

First cancer treatment: neoadjuvant chemotherapy—5% (n=15) of all breast cancer referrals to Christchurch Hospital were referred on directly for neoadjuvant chemotherapy with 46.7% (n=7) presenting with inflammatory breast cancer. Overall, 87.5% (n=14) received their first breast cancer treatment within 62 days of referral and 66.7% (n=10) had their FSA within 14 days of referral. One patient had her Oncology FSA and first few cycles of neoadjuvant chemotherapy at another hospital.

The patient with the longest delay to chemotherapy of 92 days, had extensive metastatic disease, described in the following section on inflammatory breast cancer. The majority of patients (93.3%, n=14) underwent CT scan staging prior to therapy, except for one with early breast cancer who elected to have neoadjuvant chemotherapy. Upon completion of neoadjuvant chemotherapy, all 15 patients had surgery, 86.7% (n=13) of them within 31 days of decision-to-treat.

Following surgery, all patients went on to have radiation therapy at a median of 58 days after surgery (range 33–109), with delays for chemotherapy (n=1); late referral (n=1, 76 days); postoperative wound infections (n=3, range 84–95 days) and personal

reasons (n=1). Fewer than half of patients (46.7%, n=7) were prescribed endocrine therapy within a median of 5 days (range 0-33) following the completion of radiation therapy.

Inflammatory breast cancer—All 7 patients (100%) with inflammatory breast cancer had their FSA with a medical oncologist within 14 days of referral from GNSU meeting $\geq 90\%$ for Standard 2.7 (median 7 days, range 1–10).

The median time from initial GP referral to neoadjuvant chemotherapy was 27 days (range 21–92), with 6 patients starting chemotherapy within 62 days of initial GP referral. The remaining patient had metastatic disease, and underwent palliative radiation as her first treatment 56 days after referral. Although 1 patient underwent egg harvesting before start of chemotherapy, she commenced treatment less than 4 weeks following her GP referral (27 days). It is unclear if the referral source for Standard 2.7 refers to one from a GP or from the surgeon.

Other referrals to oncology services—Overall, 39 patients were referred to the Oncology Service, but did not receive the treatment requested to be considered. A third of patients were referred to a medical oncologist, and chemotherapy was not started and they were then referred on for radiation therapy (33.3%, n=13). The remaining 26 did not commence any oncology therapy. Two patients had extended delays from final surgery to their oncology FSA (146 and 91 days) because appropriate referrals were not made following the recommendations from the MDM, whereas two patients were delayed while their surgical specimens were sent for an overseas opinion.

Discussion

The aim of this study is to determine whether standards on Timely Access to Services (Standards 2.1 to 2.9) were attained at CPH in 2012, and to discover factors which impeded patient pathways, and which would need to be addressed in order to meet the standards. The overall performance levels against the Standards have been brought together in Table 7.

Only some of the 2013 Tumour Standards were achieved as demonstrated by this review. Overall, breast cancer patients treated at Christchurch Hospital received their first breast cancer treatment within a timely manner thus meeting Standards 2.4 and 2.5 (Table 7).

Furthermore, patients with inflammatory breast cancer were assessed within 14 days (Standard 2.7). However a third of patients did not receive their first specialist assessment within 14 days (Standard 2.1) nor was adjuvant systemic therapy commenced within 42 days of surgery (Standard 2.6).

Table 7. Overall performance levels & standards

Standard	Description	Recommended performance level	% Met standard	Standard met
2.1 (FCT indicator 2)	FSA within 14 days of referral	≥ 90%	60.8%	No
2.4 (FCT indicator 1)	First breast cancer treatment within 62 days of referral	≥ 80%	87.1%	Yes
2.5 (FCT indicator 3)	First breast cancer treatment within 31 days of decision-to-treat	≥ 80%	88.5%	Yes
2.6	Adjuvant systemic treatment within 42 days of surgery	≥ 90%	63.5%	No
2.7	Medical Oncology FSA within 14 days of referral for patients with inflammatory breast cancer	≥ 90%	100%	Yes
2.8	Radiation Oncology FSA within 14 days of referral (no chemo)	None	57%	N.A.
2.9	Radiation therapy started within 42 days of referral	None	15%	N.A.

Note: FCT = Faster Cancer Treatment; FSA = First specialist assessment.

In March 2014, after this audit was commenced, MOH updated the FCT indicators and their associated data definitions⁸ for retrospective reporting to MOH by district health boards. The 14 day indicator (FCT 2) was no longer used due to inconsistencies in FSA reporting, whilst the two remaining FCT indicators (1 and 3) were renamed the 62-day and 31-day indicators respectively,⁹ both of which were met in 2012. In addition, screening patients are to be excluded from the 62-day indicator (FCT 1) as they are asymptomatic and BSA have existing monitoring mechanisms.

Using the CBCR database was both a strength and limitation for this audit, since benign breast diseases are not included. Although private treatment is not required to meet the same standards, it would have provided a more complete picture to have been able to include performance for all patients. Several changes have already occurred since 2012.

Canterbury HealthPathways now mandate that GPs do not perform a FNA on a suspicious lump prior to imaging as this causes unnecessary delay of breast cancer treatment, and a new triage system was introduced at GNSU to reduce the time from referral to FSA. In May 2014, CDHB added new codes (such as screened referrals and reasons for delay of FSA or treatment) to their patient management system for more accurate reporting for FCT indicators.

The multidisciplinary care in Standard 5.1 recommends that the care of every patient with breast cancer is discussed at the MDM⁵ and clearly documented. The Breast MDM is held on Mondays, which in 2012 coincided with five public holidays. When final histology was not available, discussion is delayed 1 week or 2 weeks if a holiday, delaying referrals to Oncology Services.

Treatment and FSAs may also be delayed by staff leave, particularly over Christmas or New Year. Holding the MDM twice in the week could be considered. The details of the pathology report are fundamental for planning any further surgery, such as re-

excision, and also referrals for adjuvant therapy. Staffing resources for Anatomical Pathology therefore must be sufficient for timely reporting of breast cancer samples.

Fifty-seven percent of patients started radiation therapy within 8 weeks of final breast cancer surgery, which was the Standard in 2012, while 15% would have met the 2013 Tumour Standards. Barriers to timely treatment were multifactorial, including late referrals, re-directed referrals from Medical Oncology after the decision was not to use chemotherapy, and the need for CT planning following decision-to-treat before starting radiation therapy.

One solution is for patients to be referred to Oncology Services following their Surgical FSA once their breast cancer diagnosis is confirmed, especially if clinical staging suggests they are likely to require adjuvant therapies.

Discussion could then start about adjuvant treatment and it can be expedited once histology is available. This practice is common in the private sector. However this may lead to an additional or wasted appointment since the decision-to-treat depends on the final histology, and extend the time between referral to oncology and first treatment.

Additional breast cancer surgery, which was needed in 25% of patients starting adjuvant chemotherapy, also delayed its commencement. Here, the clinical evidence that delay in starting adjuvant chemotherapy beyond 61 days from surgery is detrimental,¹⁰ and that delaying radiotherapy (when chemotherapy is not given) by more than 6 weeks from surgery is associated with an increased risk of local recurrence,¹¹ provides further support to meeting the guidelines.

The breast nurses and the newly appointed cancer care coordinators have been given the data collated for this review so they can work to streamline breast cancer patient pathways, both through the earlier diagnostic and surgical steps and onto adjuvant therapies.

This paper provides baseline data for breast cancer treatment indicators at Christchurch Public Hospital, showing areas of greatest delay to which interventions can be directed, and against which future performance can be compared. It also highlights the critical role of the regional breast cancer registers in auditing service delivery and the implementation of the Ministry of Health's National Tumour Standards.

Competing interests: Nil.

Author information: Valerie C L Davey, Data Coordinator, Christchurch Breast Cancer Patient Register, Christchurch; Birgit Dijkstra, Consultant Breast & Endocrine Surgeon, Dept of Surgery, Christchurch Hospital, Christchurch; Gavin C Harris, Consultant Anatomical Pathologist, Canterbury Health Laboratories, Christchurch; Melissa L James, Radiation Oncologist, Oncology Service, Christchurch Hospital, Christchurch; Bridget A Robinson, Mackenzie Chair of Cancer Medicine, Dept of Medicine, University of Otago, Christchurch

Acknowledgements: The authors thank the following organisations and people:

- New Zealand Breast Cancer Foundation (premier sponsor)
- Canterbury District Health Board
- Timi Boddington, Decision Support, Canterbury District Health Board
- Alice Turner, Medical Student, University of Otago (Christchurch Campus)

Correspondence: Valerie Davey, Christchurch Breast Cancer Patient Register, c/o Dept of General Surgery, Christchurch Hospital, Private Bag 4710, Christchurch 8140, New Zealand. Fax: +64 (0)3 3640352; email: valerie.davey@cdhb.health.nz

References:

1. Ministry of Health. Cancer: New registrations and deaths 2010. Wellington: Ministry of Health; 2013.
2. Ministry of Health. Cancer: Selected Sites 2010, 2011, 2012 (provisional). Wellington: Ministry of Health; 2013. Retrieved online on 1 Oct 2013 from: <http://www.health.govt.nz/publication/cancer-selected-sites-2010-2011-2012>
3. Ministry of Health. 2013. Faster Cancer Treatment Programme. Retrieved online on 8 Oct 2013 from: <http://www.health.govt.nz/our-work/diseases-and-conditions/cancer-programme/faster-cancer-treatment-programme>
4. Ministry of Health. Faster Cancer Treatment Indicators. Wellington: Ministry of Health; 2013. Retrieved online on 8 Oct 2013 from: <http://www.health.govt.nz/our-work/diseases-and-conditions/cancer-programme/faster-cancer-treatment-programme/faster-cancer-treatment-indicators>
5. National Breast Cancer Tumour Standards Working Group. Standards of Service Provision for Breast Cancer Patients in New Zealand – Provisional. Wellington: Ministry of Health; 2013. Retrieved online on 26 Feb 2014 from: <http://www.health.govt.nz/our-work/diseases-and-conditions/cancer-programme/faster-cancer-treatment-programme/tumour-standards>
6. Canterbury District Health Board. 2013. Canterbury HealthPathways website link: <http://healthpathways.org.nz/>
7. New Zealand Guidelines Group. Management of early breast cancer. Wellington: New Zealand Guidelines Group. 2009.
8. Ministry of Health. 2014. Faster Cancer Treatment Indicators: Business Rules and Data Definitions (version 3, March 2014). Wellington: Ministry of Health. Retrieved online on 17 Mar 2014 from: <http://www.midlandcancernetwork.org.nz/file/fileid/48628>
9. Ministry of Health. FCT Indicators Data Definitions and Business Rules – What’s changed? (Support document to district health boards, final version, March 2014). Wellington: Ministry of Health; 2014.
10. Gagliato D, Gonzalez-Angulo A, Xiudong L, et al. Clinical impact of delaying initiation of adjuvant chemotherapy in patients with breast cancer. J Clin Oncol 2014, January 27, epub.
11. Punglia R, Saito A, Neville B, et al. Impact of interval from breast conserving surgery to radiotherapy on local recurrence in older women with breast cancer: a retrospective cohort analysis. BMJ 2010;340:c845. doi:10.1136/bmj.c845.

Where does New Zealand stand on permitting research on human embryos?

D Gareth Jones

Abstract

In many respects New Zealand has responded to the assisted reproductive technologies (ARTs) as positively as many comparable societies, such as Australia and the UK. Consequently, *in vitro* fertilisation (IVF) and pre-implantation genetic diagnosis (PGD) are widely available, as is non-commercial surrogacy utilising IVF. These developments have been made possible by the Human Assisted Reproductive Technology (HART) Act 2004, overseen by its two committees, the Advisory Committee on Assisted Reproductive Technology (ACART) and the Ethics Committee (ECART). However, New Zealand stands apart from many of these other societies by the lack of permission for scientists to conduct research using human embryos. There is no doubt this reflects strongly held viewpoints on the part of some that embryos should be protected and not exploited. Legitimate as this stance is, the resulting situation is problematic when IVF is already designated as an established procedure. This is because the development of IVF involved embryo research, and continuing improvements in procedures depend upon ongoing embryo research.

While prohibition of research on human embryos gives the impression of protecting embryos, it fails to do this and also fails to enhance the health and wellbeing of children born using IVF. This situation will not be rectified until research is allowed on human embryos.

Since the late 1960s *in vitro* fertilisation (IVF) has been developed to combat infertility, a process dependent upon research using human embryos.¹ Currently, the production of embryos surplus to the requirements of those undergoing IVF treatment leads to the storage of these embryos, of which there are over 11,000 in New Zealand.² Many of these will not be required for subsequent attempts to produce a child and will be discarded for legal reasons.³ PGD is made possible by IVF, and is a procedure that involves discarding embryos that will develop into individuals who would suffer from an unwanted genetic condition.

While IVF has been widely available for 30 years, and has been in the mainstream of medicine for most of those years, the research involved in this has brought the moral status of the embryo into stark relief. While this presents few problems for many people longing for their own child, the spectre of conducting research on human embryos presents imponderable ethical hurdles for others.

Consequently, one very occasionally encounters a situation such as that in New Zealand, which permits IVF and PGD (in both of which embryos are discarded), but prohibits research on any of these shortly to be discarded embryos. At face value there appears to be an ethical inconsistency here, with destruction being deemed

permissible in the former but not in the latter. No case has been made for this judgement.

The prohibition of research on surplus embryos has repercussions for the scientific community and hence for ongoing research into infertility and an understanding of developmental processes in early human development. It also means that embryos cannot be used as a source of human embryonic stem cells (hESCs) in this country. This in turn limits medical research opportunities likely to lead to innovative treatments for diseases. Important as these areas are, both they and the production of research embryos, are only referred to in passing in this paper.

Policy and regulatory frameworks governing embryo research

Regulations governing embryo research are considered in relation to the ability or otherwise to extract hESCs from embryos. They fall into four dominant positions designated A to D by Jones and Towns.⁴

Position A encompasses countries that prohibit all embryo research and therefore the extraction of hESCs. Position B confines the use of embryonic stem cells to those currently in existence, in that they were extracted prior to a specified date, thereby prohibiting the extraction of hESCs and utilisation of hESCs derived in the future. Position C allows for the use and ongoing isolation of hESCs from surplus IVF embryos from IVF programs. Position D allows the creation of human embryos specifically for research via both fertilisation and somatic cell nuclear transfer (SCNT).

The Hinxton Group (An International Consortium on Stem Cells, Ethics and Law)⁵ again identified four groups: Prohibitive (equivalent to A), Restrictive Compromise (B), Permissive Compromise (C), and Permissive (D). The classification adopted by the European Science Foundation⁶ is similar, but omits a position B equivalent.

The groups are Very Restrictive (corresponding to A), Permissive (C), and Very Permissive (D), with further categories of Restrictions by Default (where legislation is not explicit but national practices are quite restrictive in practice), and Unlegislated (where there is no legislation on human ESCs).

The current situation is exemplified by the following examples:

A (Prohibition): Italy, Slovakia, Tunisia.

B (Restrictive Compromise): USA – use of federal funds under President Bush.

C (Permissive [Compromise]): numerous countries including Australia, Canada, China (Hong Kong), Denmark, France, Iran, Netherlands, Norway, Switzerland, Taiwan, USA – use of federal funds under President Obama.

D ([Very] Permissive): Belgium, Israel, Japan, UK, Singapore, South Korea, Sweden, certain states in USA using private funds.

Restrictive by Default: *New Zealand*, Romania, Turkey.

Unlegislated: Austria, Ireland, Luxembourg, Poland.

Of the three countries in the Restrictive by Default category, Romania allows stem cell research under official approvals, but there is no regulation on IVF, research on embryos, or embryonic stem cells. In the case of Turkey, hESC research is prohibited, although non-embryonic hematopoietic stem cell research is allowed by law, under informed consent, and if officially approved.⁶

New Zealand has been placed in the ‘restrictive by default’ category on the basis of the 2012/2013 annual report of ACART.⁷ In the section on advice to the Minister of Health on human reproductive research, it states:

“Section 37 of the HART Act requires ACART to provide the Minister of Health with information, advice and, if it thinks fit, recommendations on certain matters in relation to the use of gametes and embryos in human reproductive research.

In June 2007 ACART provided the then Minister of Health with advice on human reproductive research following extensive public consultation in the 2006/07 financial year. At the request of the Minister, ACART has not undertaken any work to develop guidelines or further advice.

The current *Guidelines for Research on Gametes and Non-Viable Embryos*, developed by the former National Ethics Committee on Assisted Human Reproduction, remain in force”. (These allow research on sperm and eggs, and also on embryos lacking the potential to develop into a fetus due to arrested growth, defects of their cells, or other abnormalities.)

ACART is required to monitor developments in human reproductive research by Section 35(2) of the HART Act 2004, and so is fully aware of the human reproductive research currently approved in Australia and the UK. It also emerges from the above that in 2007 ACART recommended to the Minister that embryo research of some description should be permitted in New Zealand. This is because ACART requires the Minister’s go-ahead to develop guidelines for ECART. In the absence of these embryo research cannot be undertaken.

Approaching the HART Act

The HART Act regulates the assisted reproductive technologies (ARTs) in New Zealand, with the aim of protecting the wellbeing of those affected by IVF and related procedures, namely, the health and well-being of children born using ARTs, the health, safety, and dignity of present and future generations, and the health and well-being of women.

Informed choice on the part of all involved is crucial, while donor offspring are to be made aware of their genetic origins and are to be able to access information about those origins. Additionally, the needs, values, and beliefs of Māori are to be considered and treated with respect, as are the range of ethical, spiritual, and cultural perspectives within society.⁸

Finding a place for embryos—While many important ethical values are encompassed by these principles, there is no direct reference to the moral worth to be ascribed to human embryos in the HART Act. This becomes particularly important when the nature of ART research affecting embryos is under consideration. However,

there are indirect allusions to embryos elsewhere in the Act, that raise the possibility that developing humans, particularly early embryos, may not have the same rights and protections as children or adult humans.⁹ For instance, the HART Act makes it an offence to allow an *in vitro* embryo to develop beyond 14 days gestation. Prior to this point in development, embryos may in principle be used in human reproductive research (subject to prior approval by ECART),¹⁰ imported and exported, and developed outside the womb, subject in all cases to guidelines and comprehensive ethical oversight, and approval by the Minister of Health. The HART Act also restricts the maximum time of storage. As it is extremely unlikely that all stored embryos will be implanted and thereby given a chance to become future individuals, this provision of the HART Act implicitly requires the destruction of human embryos.¹¹

However, embryos may be seen as having a special status warranting protection. One indication of this is found in the Human Tissue Act 2008, with its note that: “A human embryo or human gamete is not human tissue for the purposes of any provision of this Act,”¹² pointing to a protected status. Nevertheless, this does not amount to human rights as afforded to those who have been born, or the legal protections afforded to the fetus.

Established procedures and prohibitions—The HART Act stipulates that some activities can be designated as ‘established procedures’ that may be carried out as routine clinical procedures without requiring ethical approval. These include artificial insemination, collection of eggs or sperm for purposes of donation; egg; sperm and embryo cryopreservation; IVF; intracytoplasmic sperm injection (ICSI); and PGD.¹³

Prohibited actions include the artificial formation for reproductive purposes or implantation of a cloned or hybrid embryo; the implantation of an animal gamete or embryo into a human and *vice versa*; and the implantation of genetically modified gametes/embryos, or gametes/embryos derived from a foetus.¹⁴ Also prohibited are the development of an *in vitro* embryo beyond 14 days,¹⁵ and the commercial supply of human embryos or human gametes.¹⁶ Also restricted is the selection of embryos for implantation on the basis of sex unless it was performed to prevent or treat a genetic disorder.¹⁷

Research on human embryos does not fit into a prohibited category, neither is it an established procedure nor one requiring ECART approval. Currently, research on viable human embryos (as opposed to non-viable ones) is in limbo depending upon agreement of the Minister of Health to the positive recommendation from ACART to proceed. It has similarities to the European Science Foundation⁶ category of ‘restrictive by default.’

This position satisfies no one. For those who would like to see a very restrictive regime in place, there is no assurance that this is the case. This was evident in submissions made to the ACART discussion document, *Use of gametes and embryos in human reproductive research*,¹⁸ where there was widespread “opposition to the use of embryos in research on the grounds that they are human life and any manipulation, including *in vitro* fertilisation (IVF) and pre-implantation genetic diagnosis (PGD) is akin to harming or killing a person”.¹⁹

Additionally, there was “opposition to the use of gametes in research on the grounds that they are human life.” These responses clearly enunciate the view that some of those opposed to research on human embryos are also opposed to IVF and indeed any research of embryos (and in some cases even gametes). For those expressing these viewpoints it is the availability of IVF that should be queried and reviewed. Perhaps inadvertently, this stance uncovers inconsistency between policies, since these submitters are correct in realising that embryos are not protected in IVF or PGD.

Those in favour of at least some uses of embryos in research did so “on the grounds that they have a lesser moral status than persons who have been born, provided that such research has scientific merit and potential to benefit human health.”¹⁹ Users of fertility services expressed the view that they wanted the choice to donate their surplus embryos for research purposes, in addition to current choices of donating them to another couple or discarding them (“allowing them to thaw and perish”).²⁰

Embryos, IVF and infertility

The HART Act accepts the permissibility of IVF and its associated procedures. This, in turn, accepts the validity of embryo research (albeit undertaken in other countries), even if some discussants either fail to recognise this or disagree with it. It is within this context that the debate on embryo research is situated, since ongoing research on human embryos is required to support IVF and associated procedures, as well as having been implicit within its development. Neither destructive embryo research nor clinical trials of IVF procedures are to be regarded as optional add-ons.

The ethical literature from the 1980s onwards falls into two clearly delineated responses to IVF: the *negative*, with its suspicion of IVF and in some cases rejection of it; and the *positive* with its stress on the needs of the infertile and openness to acceptance of IVF.²¹ The arguments of those who are negative towards IVF pay particular attention to protection of the embryo, in contrast to those who are positive, where the emphasis is on the needs of the infertile.

Within a pluralist society, balance has to be found between these two positions, since each represents different and in this case incompatible conceptions of the good. Public policy should not reflect either extreme to the exclusion of the other. There is no escape from the competing interests of those intent on protecting embryos, those with infertility problems, and those wishing to address genetic- and chromosomally-based illnesses.

A society like that of New Zealand is not starting with a clean slate in its response to human embryos. Designating IVF as an established procedure may have been based on inadequate appreciation of its implications, as demonstrated by the subsequent negativity towards embryo research as a step too far. However, the existence of IVF and associated procedures continues to depend upon research on human embryos, albeit conducted in other countries,²² including the UK, USA and Australia.

Against this background, consider four possible models of embryo protection:

Model 1: Consistent protection of embryos. Rejection of embryo research; rejection of IVF and PGD due to the destruction of embryos inherent in these processes, including the production of surplus embryos.

Model 2: Acceptance of existing policies. Rejection of embryo research; acceptance of IVF and PGD, since governing policies and procedures are currently in existence. Reject any experimental procedures in New Zealand that would place further embryos at unnecessary risk.

Model 3: Acceptance of embryo research outside New Zealand. Rejection of embryo research in New Zealand but accept that it may be conducted in other countries; accept IVF and PGD and modifications utilising research data based on research in other countries.

Model 4: Acceptance of embryo research. Accept IVF and PGD employing only surplus embryos, or these plus embryos produced for research; to support ARTs, and/or hESCs and other biological issues.

Of these models, 1 and 4 are consistent in their stances, prohibition in model 1 and permission (within whatever experimental limits are in place) in model 4. The two intervening models (2 and 3) are less consistent in that they accept to differing degrees the results of research on embryos, either in the past and/or on a continuing basis. While they aim to protect embryos in the future, they are prepared to benefit from data and procedures obtained from embryo destruction in the past (and possibly in the present in other countries).

The ethical inconsistency inherent within both Models 2 and 3 requires justification. On what grounds can it be acceptable to destroy (or allow to perish) embryos surplus to the requirements of a clinical fertility program, but refuse to allow the use of these about-to-be-destroyed embryos for research which is aimed at contributing to an understanding of the causes of infertility? Holm²³ describes this as 'performative inconsistency.' This stems from allowing surplus embryos to die, while prohibiting the destruction of other embryos in research (or accepting that they are destroyed in other countries).

These responses tend to reiterate well-rehearsed positions on the status of the embryo. For instance, the stance is upheld by arguing that (i) surplus embryos should be allowed to perish naturally; or (ii) surplus embryos have the potential to give rise to new individuals and hence are equivalent in status to *in utero* embryos; or (iii) it is important ethically to protect all embryos regardless of their fate.

The problem with answers like these is that they ignore the context provided by IVF. Research using embryos is intimately woven through every aspect of IVF. If it is argued that the moral worth of surplus embryos resides in their potential for further development, any wrong exists in ending this potential, not in how it is ended.²⁴

The destruction will occur regardless of whether any research will be carried out on the embryos. This is an unavoidable situation of loss, including potential benefits for human health from research on early embryological development. These are unwanted embryos that have no valuable future.²⁵ This is because their parents have consented to their use in research, no longer requiring them to produce a child and not

wishing to donate them to another couple. Hence, their existence *in vitro* means they have no future as human beings.

A counter argument to this is that a benefit should not be rejected because it depends on a preceding evil,²⁴ namely, research on embryos. Hence, accepting IVF today may be better than rejecting it, even if its origins, with their dependence upon embryo research, are considered unethical. Since none of that work was carried out in New Zealand, there is no moral complicity involved. This argument should be rejected because ongoing research on infertility is required, and any results from this are accepted and utilised clinically even though they may have been generated in other countries.

But is this research required? There is a moral imperative to protect children and families who use IVF. Green²⁶ argues that “we have a duty to minimise the health risks to which we expose future children.” This is of considerable relevance to the HART Act with its principle of protecting children.

It can be argued that a society that allows IVF, also has a duty to be involved in ongoing research that will increase the efficacy and safety of the procedures being used. Without this one is entirely dependent upon research carried out in other societies. This precludes practitioners in this country from improving the safety and protocols of their practice, with its input into the health of resulting children. In these terms alone research can be justified (compare Holm’s²⁷ argument with relation to embryonic stem cells).

On the other hand, if these stipulations do not apply, and if IVF as currently undertaken is completely safe and totally effective, no further research should be undertaken, and one might be able to defend the New Zealand position of approving IVF and prohibiting embryo research. This is a scientific and clinical argument rather than a moral one. However, current evidence suggests that ongoing research is vital, if IVF is to continue to be regarded as an established procedure.²²

The relationship between embryos and future children is an intimate one whenever the existence of the latter depends upon a technological procedure like IVF. Without IVF they would not exist; with it not only do they exist but many aspects of their health and well-being depend upon the protocols employed in the clinic.

The present situation in New Zealand means that it is not possible to conduct clinical trials on the efficacy of different IVF procedures, such as the cumulative pregnancy rates following transfer of embryos at day 3 (cleavage stage) compared with day 5 (blastocyst stage). Both are routinely used in clinical practice, without good evidence as to which is the better of the two.

Unfortunately, a study comparing the two procedures falls under the rubric of research using embryos, even though the aim is to compare the best outcomes in terms of healthy live births. Such a study would potentially be of benefit to the embryos involved in the clinical trial. Since it does not place these embryos at additional risk, it lies outside the four models of embryo protection referred to above.

Conclusion

The argument of this paper is that IVF is intimately linked to embryo research, both in the past and present. This poses problems for a society that does not permit research to be conducted on human embryos.

The intimate link between a technological procedure like IVF based on the utilisation of embryos, and ongoing research, has repercussions for both ethics and public policy. Any carelessness or neglect in IVF will wrong the child-to-be, and a research underpinning is essential to minimise any such wrongdoing. While political compromise is inevitable in any pluralist society, this should not ignore the need for ongoing scientific research into technological procedures that are approved by society.

Until there is clarification of these issues in New Zealand, fertility specialists (and the public) will continue to rely on research conducted by others in overseas jurisdictions.

Competing interests: Nil.

Author information: D Gareth Jones, Emeritus Professor, Department of Anatomy and Bioethics Centre, University of Otago, Dunedin (member of ACART 2005–2011).

Acknowledgements: I thank Associate Professor Andrew Shelling, Professor Cindy Farquhar, Dr Mike King, Maja Whitaker and Willow Macdonald for providing helpful input into the manuscript.

Correspondence: Gareth Jones, Department of Anatomy, University of Otago, PO Box 913, Dunedin 9054, New Zealand. gareth.jones@otago.ac.nz

References and endnotes:

1. Edwards R, Steptoe P. A Matter of Life, London: Hutchinson; 1980; Edwards R. Life Before Birth: Reflections on the Embryo Debate, London: Hutchinson; 1989.
2. Akoorie N. Deadline forces tough IVF choice, The New Zealand Herald, 20 January, 2014 <http://www.nzherald.co.nz/news/print.cfm?objectid=11188978> (accessed 6 June 2014) Dr John Peek is reported as stating that Fertility Associates have 10,600 frozen embryos in storage in their four clinics.
3. ACART, Advisory Committee on Assisted Reproductive Technology. Guidelines on Extending the Storage Period of Gametes and Embryos. Wellington: ACART, 2012. The current 10-year storage period under the HART Act expires on 22 November 2014, and can only be extended with approval from ECART.
4. Towns CR, Jones DG. 2006 Stem cells: Public policy and ethics, In: Ruse M, Pynes CA., editors, The Stem Cell Controversy: Debating the Issues. Amherst, New York: Prometheus Books; 2006. pp 329–341.
5. Hinxton Group: An International Consortium on Stem Cells, Ethics and Law. World stem cell policies (accessed 28 May 2014). 2006. http://www.hinxtongroup.org/wp_ao_map.html
6. European Science Foundation, Human Stem Cell Research and Regenerative Medicine: Focus on European policy and scientific contributions. Strasbourg, France: European Science Foundation; 2013.
7. ACART. Advisory Committee on Assisted Reproductive Technology Annual Report 2012/13. Wellington: Advisory Committee on Assisted Reproductive Technology. November 2013.
8. HART Act. Human Assisted Reproductive Technology Act 2004, Wellington: New Zealand Government; 2004.

9. Jones DG, Whitaker MI. Ethical framework for ACART; 2012.
<http://acart.health.govt.nz/publications-and-resources/acart-publications/ethical-framework-acart> (accessed 7 May 2014)
10. s16, s19(b)
11. Other relevant legislation includes the Contraception, Sterilisation and Abortion Act 1977 and the Crimes Act 1961.
12. Human Tissue Act 2008, s 7(2)
13. Part 1 of the Schedule to the Human Assisted Reproductive Technology Order 2005
14. Schedule 1
15. s 9
16. s 13
17. s 11
18. ACART. Use of Gametes and Embryos in Human Reproductive Research: Determining Policy for New Zealand, A Discussion Paper; 2007. Advisory Committee on Assisted Reproductive Technology PO Box 5013, Wellington 6145.
19. ACART. Use of Gametes and Embryos in Human Reproductive Research: Summary of Submissions; 2007. Advisory Committee on Assisted Reproductive Technology PO Box 5013, Wellington 6145, p2.
20. ACART. Use of Gametes and Embryos in Human Reproductive Research: Summary of Submissions, p3.
21. Jones DG. Christian responses to challenging developments in biomedical science: The case of in vitro fertilization (IVF). *Science and Christian Belief* 2014;26:137–158
22. HFEA. Research Projects Licensed by the HFEA between 1 April 2012 and 31 March 2013. <http://www.hfea.gov.uk/166.html> (accessed 21 March 2014)
23. Holm S. Policy-making in pluralistic societies. In: Steinbock B. editor, *The Oxford Handbook of Bioethics*. Oxford: Oxford University Press; 2007. pp 153–174.
24. Green RM. *The Human Embryo Research Debates: Bioethics in the Vortex of Controversy*. Oxford: Oxford University Press; 2001. p 152.
25. Douglas T, Savulescu J. Destroying unwanted embryos in research. *EMBO Reports* 2009;10:307–312.
26. Green, op cit. (ref 24), p74.
27. Holm S. Going to the roots of the stem cell controversy. *Bioethics* 2002;16:493–507.

When enough is not enough: folic acid fortification in New Zealand

11 September 1992 remains a seminal, but often forgotten, date in the history of public health. It was on this day that the Centers for Disease Control and Prevention in the USA recommended: ‘All women of childbearing age in the United States who are capable of becoming pregnant should consume 0.4 mg of folic acid per day.’

The recommendation was made on the basis of categorical evidence from two clinical trials, the most robust of study designs available in epidemiology. An occurrence trial conducted in Hungary,¹ and a multi-centre recurrence trial,² conclusively showed that increasing a women’s intake of synthetic folic acid markedly reduced the risk of having a baby with the neural tube defects (NTDs), anencephalus and spina bifida.

On 5 March 1996, the US Food and Drug Administration required that all manufacturers fortify enriched cereal grain products (e.g. flour, bread, pasta, rice) with 140 mcg of folic acid per 100 g cereal-grain by 1 January 1998.³

By 2014, more than 70 countries, including Australia, had implemented mandatory folic acid fortification programmes.⁴

Despite strenuous and impassioned efforts by many individuals and organisations since 1992, New Zealand remains a notable laggard in implementing this simple, but highly effective public health intervention. In the interim, babies continue to be born with, and die from, major birth defects which can be prevented.

New Zealand history will show that governments, political parties and industry have unequivocally agreed with the evidence that increasing a women’s folic acid intake reduces the risk of NTDs. The unresolved and highly contentious issue is the method of delivery. Options range from the status quo, encouraging the increased use of folic acid supplements, enhancing voluntary fortification to implementing mandatory fortification.

There are pros and cons for each option.⁵ At various stages, all political parties and some industry members have agreed to support mandatory fortification, only to later renege, for a variety of reasons, on the commitment. Opponents of mandatory fortification argue that it is ‘mass medication’ for the benefit of a selected population group (women of reproductive age), restricts consumer choice, and only a comparatively ‘small’ number of NTD births will be prevented. Debate has also centred on determining the exact number of births and fetuses that would be saved.

New Zealand has pursued a voluntary fortification initiative by working with and encouraging the industry to increase the number of products fortified with folic acid. At best, voluntary fortification should be viewed as complementary to a mandatory programme, and at worst, as a programme which has minimal impact of reducing the risk of folic acid preventable NTDs.

In 2014, members of the baking industry signed a code of practice⁶ which had an ‘aspirational goal’ to work towards ‘fortifying with folic acid a minimum of 25% and

up to 50% by volume, reported as production volume numbers, of packaged sliced loaf breads (including private label products) marketed and distributed in New Zealand, by NZAB members. A minimum of 25% of volume will be fortified by the end of 2014’.

The industry recently released its first audit report to the Ministry for Primary Industries.⁷ In 2012 and 2013, about 14% of packaged sliced breads were fortified with folic acid, with plans for 25–35% by the end of 2014. The report concludes that the aspirational target of 50% is achievable. However commendable and hopeful that is, the simple fact is that at least 50% of all sliced bread in New Zealand will remain unfortified and it does not include unsliced bread products

The inertia and hand-wringing over implementing mandatory fortification as a simply preventive measure can no longer be justified. To reduce the risk of NTDs requires New Zealand to change the current ‘compromise’ situation, whereby the majority of bread products are not fortified with folic acid.

The science is conclusive, unequivocal, and evident, the commitment is not.

Barry Borman, Maria Poynter

Centre for Public Health Research
Massey University – Wellington
Wellington, New Zealand

References:

1. MRC Vitamin Study Research Group. Prevention of neural tube defects: Results of the Medical Research Council Vitamin Study. *Lancet* 1991;338:131–7.
2. Czeizel AE, Dudas I. Prevention of the first occurrence of neural-tube defects by periconceptional vitamin supplementation. *N Engl J Med* 1992;327:1832–5.
3. US Food and Drug Administration. Food standards: amendments of standards of identity for enriched grain products to require addition of folic acid. *Federal Register*. 1996;61:8781–97.
4. Food Fortification Initiative (http://www.ffinetwork.org/global_progress/index.php).
5. Ministry for Primary Industries. Fortification of Bread with Folic Acid. Regulatory Impact Statement. 2012.
6. Baking Industry Research Trust. New Zealand Association of Bakers (NZAB) and Private Label Partners’ Code of Practice for Voluntary Folic Acid Fortification of Bread. 2014 (<http://www.bakeinfo.co.nz/Facts/Bread-making/Folic-Acid-Fortification-of-Bread/Code-of-Practice>).
7. Watson TG. Voluntary fortification of bread with folic acid. Annual Report 2013. A report to the Ministry for Primary Industries. 2014. (<http://www.bakeinfo.co.nz/Facts/Bread-making/Folic-Acid-Fortification-of-Bread/Annual-Report-2013>).

Possible impact of the Tick Programme in New Zealand on selected nutrient intakes: tentative estimates and methodological complexities

Various countries allow health-related endorsements in the form of symbols or logos on packaged foods.¹⁻³ This is also the case for the Heart Foundation in Australia and New Zealand with Tick Programmes.⁴ There is some evidence in favour of such endorsement programmes from experiments,⁵ changes in food composition,^{6,7} and in terms of cost-effectiveness.⁸ However, the likely impact in the New Zealand setting is largely unquantified, with just one study published in 2002 on sodium reductions.⁴

To inform modelling work on the cost-effectiveness of cardiovascular disease prevention strategies, we aimed to estimate the difference in selected nutrients in the diet between: (i) New Zealand with the Tick Programme; and (ii) the counterfactual of no Tick Programme having existed in the country.

Methods—The average New Zealand adult intake of sodium, saturated fat and energy by food category (including separately for the Tick Programme and non-Tick programme foods) was estimated. This involved using “NutriTrack” data which were collected from the packages of all food and beverage products available for sale at two major supermarket chains (one store representing each) in Auckland between February and May 2012. This is a data source which has been used in previous nutrition studies.^{9,10}

Brand-specific food composition data from this source were then considered in light of previous food intake (national nutrition survey) data. We then identified the nutritional differences between Tick products and non-Tick products, and from this estimated what the New Zealand diet might have looked like, had there been no Tick products available. For additional details on *Methods* and associated references – see an online Report.¹¹

Results—There were 448 of the 8440 (5.3%) packaged food items in NutriTrack that displayed the Tick. Compared to a counterfactual of no Tick Programme, we tentatively estimated that saturated fat intake would be around 1.0 g/day less (3.2% [1.0 g/31.2 g] of daily intake of saturated fat for the average New Zealand adult), sodium around 38 mg/d less (1.1% less) and dietary energy around 72 kJ/d less (0.8% less).

Comments—We generated these results to facilitate health economic modelling work, particularly for sodium and saturated fat reduction. However, they are subject to many uncertainties which could mean that they either under or over-estimate the impact of the Tick Programme in New Zealand.

While we have discussed these limitations in more detail in an online Report,¹¹ we summarise these here. The first three points below would suggest that our analysis *overestimated* the benefits of the Tick Programme, and the subsequent four points, that it has *underestimated* it.

- *Limitations with the counterfactual used*—We assumed that if there was no Tick Programme, the nutrient composition of current processed foods would be as it is currently for non-Tick products. However, in the absence of the Tick Programme there could have been greater use of labelling for “reduced salt” and “reduced fat” foods (and some associated reformulation) by food companies.
- *Nature of the product comparisons*—Our analysis was often highly stratified in that we compared very low fat milks with the Tick, to very low fat milks without the Tick (and similarly within the other three types of fresh milk by fat level). However, in other cases we just, for example, compared all margarines with the Tick to with those without the Tick. Yet in the latter it could be that the more appropriate comparison would have been between: (i) the top quartile of “healthiest looking” non-Ticked margarines; and (ii) margarines with the Tick.
- *Compensatory consumer behaviour*—We have little information on how Tick foods are actually consumed. For example, it is possible that some people who are habituated to a high salt and saturated fat intake might partially compensate by adding additional salt or sauces to Tick foods (in cooking or at the table), if they do not taste salty or fatty enough. One experiment indicates that with a salt-reduced soup (both with and without the Tick) subjects tended to add salt.¹² Indeed, some respondents actually over-compensated with this salt addition relative to the sodium in the baseline soup. On the other hand, there is some evidence that once people are on lower salt diets they seem to actually prefer them, according to work that has measured the hedonic value of dietary salt.¹³
- *Limitations with the category comparisons*—Our analysis involved within-category comparisons of varying degrees of specificity (i.e., as detailed above regarding very low fat milks and margarines). But this meant that we did not capture the potential benefit of between-category shifts by consumers due to the Tick. For example, as no “whole milk” products had the Tick, we did not capture any potential benefits of people replacing whole milk with any types of lower fat milk with the Tick.
- *Wider product changes*—Our analysis also ignored potential wider pro-health product changes that food companies might undertake to achieve Tick certification. That is, they may reformulate a whole product range – while only actually getting the Tick logo certified for just some of these products (a pattern described previously for Australia⁶).
- *Competition effects*—It is possible that manufacturers who do not produce any Tick certified products may change the composition of some of their products to better compete with the Tick products of their competitors. Indeed, some non-Tick products in New Zealand supermarkets occasionally have such

labels as “reduced salt”. Nevertheless, some of this labelling may involve only very minor shifts in nutrient composition.

- *Legacy effects*—Our analysis only considered current products with the Tick. That is, it did not consider legacy benefits from the historical impact of the Tick Programme on sodium levels in bread in the past decade or longer.^{4,14} That is breads previously commonly had the Tick in New Zealand, but this is now rare.

In summary, we have produced tentative estimates for the impact of the Tick Programme in New Zealand on selected nutrient intakes. But as detailed above, there are many plausible reasons why these could ultimately be either underestimates or overestimates.

Perhaps the best way forward to evaluate the effectiveness of such food endorsement systems might be for randomised trials in virtual supermarket environments.¹⁵ In addition, before and after natural experiments could be done (on both food composition and food sales) in countries that widely adopted or legislated for food labelling or endorsement systems.

**Nick Wilson¹; Nhung Nghiem¹; Helen Eyles²; Cliona Ni Mhurchu²;
Linda J Cobiac^{1,3}; Amber L Pearson¹; Cristina Cleghorn¹; Tony Blakely¹**

¹ BODE³ Programme, University of Otago, Wellington, New Zealand

² National Institute for Health Innovation, University of Auckland, Auckland, New Zealand

³ Centre for Burden of Disease and Cost-Effectiveness, School of Population Health, The University of Queensland, Herston, Queensland, Australia

Competing interests: NW has benefited from a travel grant and previous short-term work contracts with the Heart Foundation of New Zealand (the non-profit non-governmental organisation which runs the Tick Programme in New Zealand). HE is supported by a Heart Foundation of New Zealand Fellowship (#1463) and sits on the Heart Foundation Tick Criteria Working Group. CNM held the National Heart Foundation Senior Fellowship (2010-2013) and is a member of the Heart Foundation Food and Nutrition Working Group.

References:

1. Lahti-Koski M, Helakorpi S, Olli M, et al. Awareness and use of the Heart Symbol by Finnish consumers. *Public Health Nutr* 2012;15:476–82.
2. Larsson I, Lissner L, Wilhelmsen L. The 'Green Keyhole' revisited: nutritional knowledge may influence food selection. *Eur J Clin Nutr* 1999;53:776–80.
3. Vyth EL, Steenhuis IH, Vlot JA, et al. Actual use of a front-of-pack nutrition logo in the supermarket: consumers' motives in food choice. *Public Health Nutr* 2010;13:1882–9.
4. Young L, Swinburn B. Impact of the Pick the Tick food information programme on the salt content of food in New Zealand. *Health Promot Int* 2002;17:13–9.
5. Borgmeier I, Westenhoefer J. Impact of different food label formats on healthiness evaluation and food choice of consumers: a randomized-controlled study. *BMC Public Health* 2009;9:184.
6. Williams P, McMahon A, Boustead R. A case study of sodium reduction in breakfast cereals and the impact of the Pick the Tick food information program in Australia. *Health Promot Int* 2003;18:51–6.

7. Vyth EL, Steenhuis IH, Roodenburg AJ, et al. Front-of-pack nutrition label stimulates healthier product development: a quantitative analysis. *Int J Behav Nutr Phys Act* 2010;7:65.
8. Cobiac LJ, Vos T, Veerman JL. Cost-effectiveness of interventions to reduce dietary salt intake. *Heart* 2010;96:1920–5.
9. Rosentreter SC, Eyles H, Ni Mhurchu C. Traffic lights and health claims: a comparative analysis of the nutrient profile of packaged foods available for sale in New Zealand supermarkets. *Aust N Z J Public Health* 2013;37:278–83.
10. Woodward E, Eyles H, Ni Mhurchu C. Key opportunities for sodium reduction in New Zealand processed foods. *Aust N Z J Public Health* 2012;36:84–9.
11. Wilson N, Nghiem N. Background Report for BODE3 Modelling on Estimating the Impact of the Tick Programme in New Zealand (a Heart Health Food Endorsement Programme). Wellington: University of Otago, Wellington, 2014.
<http://www.otago.ac.nz/wellington/otago071961.pdf>
12. Liem DG, Miremadi F, Zandstra EH, et al. Health labelling can influence taste perception and use of table salt for reduced-sodium products. *Public Health Nutr* 2012;15:2340–7.
13. Blais CA, Pangborn RM, Borhani NO, et al. Effect of dietary sodium restriction on taste responses to sodium chloride: a longitudinal study. *The Am J Clin Nutr* 1986;44:232–43.
14. Dunford EK, Eyles H, Ni Mhurchu C, et al. Changes in the sodium content of bread in Australia and New Zealand between 2007 and 2010: implications for policy. *Med J Aust* 2011;195:346–9.
15. Waterlander WE, Scarpa M, Lentz D, et al. The virtual supermarket: an innovative research tool to study consumer food purchasing behaviour. *BMC Public Health* 2011;11:589.

Psychotherapy

Excerpt of an article by Stuart Moore, B.A., M.D., Dunedin. (Read at the Otago Division, B.M.A., May 28th.). Published in NZMJ September 1913;12(47):514–537.

This subject was far too long left in the hands of the unscientific. Unfortunately, by them it was submerged in a malodorous swamp of superstition, humbug and confusion of thought.

In the earlier attempts made by men imbued with honest scientific purpose to rescue the treasures of knowledge from this precarious position, the smell of the swamp has been apt to prove tenacious. If one reads the earlier and some of the later works on hypnotism—works, I mean, which have done their part in advancing our knowledge—the impression one is apt to gain is that stupendous results are obtained with marvellous facility and certainty. This impression is false. It is significant that in these works we read little of failures. It was only when methods were devised of successfully treating these failures that we heard much about them.

The danger of psychotherapy seems to be that brilliant temporary results are apt to cause an observer to lose his judgement. This subject has been left too long in the hands of the triumphant quack. Although to-day, medical men have established broad scientific foundation for this subject, and have erected a by no means ignoble edifice thereon, yet the medical profession as a whole are not yet in possession of this wealth of knowledge and of power. It is open to anyone of us who will read, and, with labour, investigate, to attain a knowledge and skill in this matter, which will far transcend that of the quacks. But this knowledge, which should permeate and influence our whole work in medicine, surgery, and midwifery, stands woefully neglected and quackery triumphant, spews forth its unscientific statement and superstitions on a credulous public. The overthrow of quackery must be brought about by the systematic attaining and dissemination of knowledge in the, medical profession.

A very little scientific knowledge and contact with the systematic practical application of this therapy, would enable our students to go forth able easily to outdistance the quack in what is regarded too often as the peculiar province of the irregular practitioner. The treatment of many psychical cases, however, must be in the hands of specialists. The great need at the present time in this subject seems to me to be increased accuracy of definition with corresponding increase in precision of thought.

Despite all the nonsense with which this subject is popularly surrounded, I hope by giving a brief account of its modern scientific foundation to show that the line which divides true science from its counterfeit is here, as everywhere, distinct. The best presentation of the subject with which I am acquainted is “Munshenberg's Psychotherapy.” For many of the conceptions and for a good deal of the phraseology in this paper I am indebted to that book.

Religion, morality, mysticism, have nothing to do with our subject. We, as physicians, must abstract the subject from such entanglement, by carefully distinguishing between the causal and purposive view of man.

Dabigatran tolerance

Although warfarin has been, and probably still is, the most commonly used anticoagulant it is well known to be difficult to use. Dabigatran, a direct thrombin inhibitor has been shown to be equal or possibly superior to warfarin in reduction of stroke related to atrial fibrillation. It has the advantage that frequent blood tests are not required for the patient. It has the disadvantage that unlike warfarin there is no antidote if significant bleeding occurs.

This report concerns a prospective study of the use of dabigatran. 92 patients were recruited to the study. At a median of 8 months, 70% were still taking the drug. Upper gastrointestinal adverse effects were by far the commonest reason for discontinuation of the drug. Most who discontinued dabigatran did so within a few days of initiation of their treatment. The addition of a proton pump inhibitor proved useful for some patients.

Internal Medicine Journal 2014;44:261–265.

Diabetes as a risk factor for stroke in women

This research group has previously published findings that the relative risk of diabetes-related coronary heart disease is substantially higher in women than men. This report concerns the relative risk of diabetes and stroke in the two genders.

Data from 64 cohort studies representing more than three-quarters of a million individuals and more than 12,000 fatal and non-fatal strokes were included in the analysis. The relative risk of stroke associated with diabetes was 2.28 in women and 1.83 in men. The pooled ratio of relative risks demonstrated that women had a greater risk than men (1.27). The sex differential was consistent over the studies.

The authors suggest that the excess risk is due to women having a chronically raised cardiovascular risk profile in the prediabetic state, which is more likely to be undetected and therefore untreated than in men.

Lancet 2014;383:1973–80.

Chronic hypertension and pregnancy outcomes

It is well known that hypertensive disorders of pregnancy are responsible for considerable fetal and maternal morbidity and mortality. This meta-analysis considers prenatal hypertension and its effects on fetal and maternal outcomes. 55 studies from 25 different countries have been included. The pregnancy complications of the patients with chronic hypertension are compared with the general pregnancy population the United States.

The researchers report that the relative risk for superimposed pre-eclampsia compared with pre-eclampsia to be 7.7. The relative risk for caesarean section is 1.3. The relative risk for pre-term delivery before 37 weeks is 2.7 and for birth weight below 2500g is also 2.7. The relative risk for neonatal unit admission is 3.2 and 4.2 for perinatal death. These findings emphasise a need for heightened antenatal surveillance of such patients.

BMJ 2014;348:g2301.



Grants Awarded July 2014

At the July meeting of the Scientific Advisory Group of the National Heart Foundation, a total of 31 grants were awarded. The awards included 8 Project Grants, 9 Fellowships/Scholarships, 6 Small Project Grants, 1 Grant-in-Aid and 7 Travel Grants. A total of 4 Summer Studentships were also awarded to the Medical Schools at the University of Otago and the University of Auckland.

PROJECT GRANTS

Associate Professor Steven Gieseg

School of Biological Sciences, University of Canterbury

Activation of death in atherosclerotic plaques.
\$108,337 over 3 years.

Dr Rajesh Katare

Department of Physiology, University of Otago, Dunedin

Genetic engineering of cardiac stem cells for the therapeutic regeneration of the diabetic heart.
\$110,020 over 2 years.

Dr Sandra Mandic

School of Physical Education, Sport & Exercise Sciences, University of Otago, Dunedin

Built environment and active transport to school: BEATS parental survey.
\$23,102 over 3 years.

Dr Peter Jones

Department of Physiology, University of Otago, Dunedin

Novel mechanisms for the regulation of cardiac Ca²⁺-release channel (RyR2) activity in models of cellular stress.
\$147,004 over 2 years.

Dr Denis Loiselle

Auckland Bioengineering Institute, University of Auckland

The energetics of the right heart - in health and failure.
\$97,126 over 3 years.

Dr Barry Palmer

Department of Medicine, University of Otago, Christchurch

s-Flt-1 as a diagnostic and prognostic marker of congestive heart failure.
\$155,014 over 2 years.

Professor Ralph Stewart

Cardiology Department, Auckland City Hospital

Evaluation of frailty and co-morbidity in patients with severe heart disease.

\$150,000 over 18 months.

Dr Stefanie Vandevijvere

Department of Epidemiology and Biostatistics, School of Population Health, University of Auckland

Local action on food environments to reduce obesity and diet-related chronic diseases in NZ

\$149,716 over 2 years

FELLOWSHIPS**Dr Anna Pilbrow**

The Heart Foundation Senior Fellowship (for 3 years) was awarded to Dr Anna Pilbrow. Dr Pilbrow, Christchurch Heart Institute, University of Otago, Christchurch.

Dr Philip Adamson

An Overseas Training & Research Fellowship (for 1 year) was awarded to Dr Philip Adamson. Dr Adamson will work as an Interventional Cardiology Fellow at the Centre of Cardiovascular Science, Royal Infirmary of Edinburgh, Scotland.

Dr Darren Hooks

An Overseas Training & Research Fellowship (for 1 year) was awarded to Dr Darren Hooks. Dr Hooks will work as a Cardiology (Electrophysiology) Fellow at the Haut-Leveque Hospital, Bordeaux, France.

Dr Carol Chelimo

A Research Fellowship (for 3 years) was awarded to Dr Carol Chelimo, Department of Obstetrics and Gynaecology, University of Auckland.

Mr Jui-Lin Fan

A Research Fellowship (for 3 years) was awarded to Mr Jui-Lin Fan, Department of Surgery and Anaesthesia, University of Otago, Wellington.

Dr June-Chiew Han

A Research Fellowship (for 3 years) was awarded to Dr June-Chiew Han, Auckland Bioengineering Institute, University of Auckland.

Dr Jacelyn Loh

A Research Fellowship (for 3 years) was awarded to Dr Jacelyn Loh, Department of Molecular Medicine and Pathology, University of Auckland.

Dr Campbell Sheen

A Research Fellowship (for 3 years) was awarded to Dr Campbell Sheen, Christchurch Heart Institute, University of Otago, Christchurch

Dr Stefanie Vandevijvere

A Research Fellowship (for 3 years) was awarded to Dr Stefanie Vandevijvere, Department of Epidemiology and Biostatistics, School of Population Health, University of Auckland.

SMALL PROJECT GRANTS

Dr Antoni Moore

School of Surveying, University of Otago, Dunedin

Built environment and active transport to school (BEATS) student survey: GIS analysis.

\$13,498 over 1 year.

Mr Maximilian Pinkham

Department of Physiology, University of Auckland

Is the cardiac sympathetic nervous system affected by renal nerves in heart failure?

\$15,000 over 1 year.

Dr Shieak Tzeng

Department of Surgery and Anaesthesia, University of Otago, Wellington

STABLE – Stroke therapy aimed at blood pressure lability reduction.

\$15,000 over 2 years.

Dr Karen Munday

Department of Nursing, Eastern Institute of Nursing

“How do I grow?” A health and wellbeing programme for children at Kindergarten.

\$6,000 over 1 year.

Dr Paula Skidmore

Department of Human Nutrition, University of Otago, Dunedin

Resilient parents – healthier children? Parental wellbeing and resilience and its relationship with parental and child physical activity, diet and body composition.

\$14,890 over 18 months.

Dr Arlo Upton

Labtests, Auckland

Molecular assay vs culture for diagnosis of strep throat in Auckland children.

\$14,090 over 6 months.

GRANT-IN-AID

Dr Ivone Leong

Department of Diagnostic Genetics, LabPlus (Auckland City Hospital)

Purchase of equipment for targeted and whole exome sequencing to identify the genetic causes of long QT syndrome.

\$15,000

TRAVEL GRANTS

Ms Nichola Davies

Heart Healthcare Setting, Heart Foundation of NZ

European Public Health conference, Mind the Gap: Reducing inequalities in health and health care, Glasgow, Scotland.

Miss Kathleen Gilbert

Department of Anatomy with Radiology, University of Auckland

17th International Conference on Medical Image Computing and Computer Assisted Intervention, Boston, USA.

Ms Renee Miller

Department of Anatomy with Radiology, University of Auckland

Medical Imaging Computation and Computer Aided Intervention Workshop: STACOM (Statistical Analyses and Computational Modelling of the Heart), Boston, USA.

Dr Natalie Walker

National Institute for Health Innovation, School of Population Health, University of Auckland

Society for Research on Nicotine and Tobacco (SRNT) Europe 14th Annual Meeting, Santiago de Compostela, Spain.

Miss Nikki Earle

Department of Medicine, University of Auckland

European Society of Cardiology Congress, Barcelona, Spain.

Dr Pau Medrano-Gracia

Department of Anatomy with Radiology, University of Auckland

17th International Conference on Medical Image Computing and Computer Assisted Intervention, Boston, USA.

Dr Anna Pilbrow

Christchurch Heart Institute, University of Otago, Christchurch

American Heart Association Scientific Sessions, Chicago, USA.

Medical Benevolent Fund

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

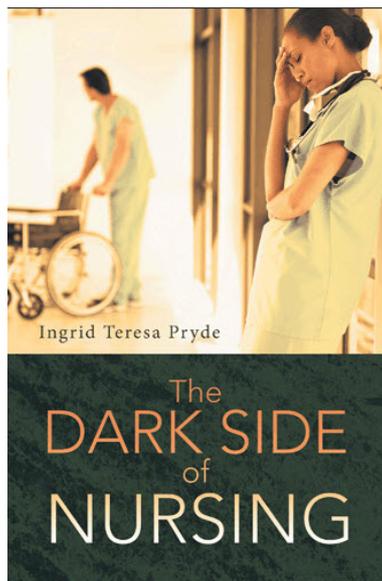
Applications should be directed through the NZMA:

Central Office
P O Box 156
Wellington
Tel: 0800 656161

The Dark Side of Nursing

Ingrid Teresa Pryde. Published by [Balboa Press](#), 2014. ISBN 978-1-45251-239-6.
Contains 304 pages. Price \$19.99 (e-book \$3.99).

The Dark Side of Nursing is a soft-covered book with 12 chapters including a reference section at the back. It is also available as an e-book. This book is written in an easy-to-read black text.



Poems and parts of her personal account of bullying are in italics. The table of contents makes it easy to navigate the book as Pryde has broken each chapter into subsections.

Pryde gained her qualification as a registered nurse in Australia after immigrating with her family from India as a teenager (<http://ingridpryde.wix.com/darksideofnursing>).

While raising a family she obtained a masters degree in cardiac nursing. Pryde has worked in a variety of clinical settings, which has added to her tapestry of experiences. Bullying is a current topic. Whether in the home, at school or in the workplace there is often someone who believes they have the right to bully another person.

This background sets the scene in her book *The Dark Side of Nursing*. Pryde brings to light the fact that nursing is not immune from bullying either. In a profession that specialises in care, Pryde believes these very staff are often the ones guilty of the bullying.

This book is a mix of personal narrative with research and suggested strategies for dealing with bullying along with poems. The narrative is written in the third person and describes in detail how she was bullied and her coping strategies. Pryde's personal experiences bring to light the issue of bullying although it appears to have clouded her view of the nursing profession as a whole.

In addition to the narrative, Pryde has included research on this topic particularly within the nursing arena. There is also discussion regarding legislation in other countries pertinent to this topic. This material intersperses the narrative and at times breaks the flow of reading which is distracting.

There are suggested ways to help cope with bullying and Pryde places an emphasis on role-playing. While this may work well in a training environment it is not something that an individual can utilise easily or independently. If the book had more practical strategies for both the bullied and bully this would be useful.

This is not a book that the reviewer would recommend as part of the workplace reference material or to be used in the educational field. It does, however, provide insight to the lived experience of a woman bullied which no-one can argue with.

This is a book that may be of interest to someone wanting to read a personal account of bullying. The reader does need to be aware that it is one person's account.

Liane Dixon

Clinical Studies Research Nurse
Department of Academic Surgery
University of Otago – Christchurch
Christchurch, New Zealand