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CONTENTS

2 May 2003

This Issue in the Journal

Editorials

Original Articles

Case Notes

100 Years Ago in the NZMJ

Medical Image

Methuselah

Selected excerpts from Methuselah

Letter

Experiences with recreational drugs amongst first-year students at Auckland University
Gregory O'Grady, Tristan Pettit, Jennifer Ng, Richard Frith

Medicolegal

Cosmetic surgeon - discipline

Obituary

Kevin John O'Connor

Notice

Applications for the Integrated Training Program in Obstetrics and Gynaecology

Book Reviews

Birth, death, and points in between: 50 patient years, Richard Stone
Barry Colls

Antioxidants - a health revolution, Carolyn Lister
Mark Hampton

THE NEW ZEALAND MEDICAL JOURNAL
Vol 116 No 1173 ISSN 1175 8716

This Issue in the Journal

Factors that influence changes in smoking behaviour during pregnancy
D McLeod, S Pullon, T Cookson

A cohort of 1283 pregnant women was surveyed to explore the characteristics of women who continue to smoke beyond the first trimester of pregnancy. Socioeconomically disadvantaged women, Maori women and women whose partners smoked were significantly more likely to continue smoking in pregnancy. Pregnant women were more likely to stop smoking if they were employed, in their first pregnancy, or they experienced nausea. The characteristics of women who continue to smoke needs to be taken into account in the provision of smoking cessation support.

Improving the effectiveness of smoking cessation in primary care: lessons learned
D Richards, L Toop, K Brockway, S Graham, B McSweeney, D MacLean, M Sutherland, A Parsons

The ‘Smokescreen’ smoking cessation programme was introduced into general practice in New Zealand in 1995 and had an initial success rate of 10%. Pegasus Health IPA has modified the programme (the PEGS programme) and encouraged increased practice nurse involvement. This study shows the programme is being widely used and helps one third of enrolled patients to remain non-smokers six months after quitting. This result compares well with international statistics and indicates the important role of the general practice sector in smoking cessation in New Zealand.

The cost to the New Zealand Government of providing ‘free’ primary medical care: an estimate based upon the Rand Health Insurance Experiment
T Robinson

New Zealand is moving towards the provision of free general practice consultations to the public. There is substantial uncertainty about the cost of such a policy. Uncertain factors include the likely increase in demand for GP consultations and the downstream effects in terms of medicine, laboratory and hospital use. This article attempts to estimate the effects of these factors and suggests that the provision of free general practice might cost the Government $435 to $592 million dollars a year.

Is the PRIME (Primary Response In Medical Emergencies) scheme acceptable to rural general practitioners in New Zealand?

T Hore, G Coster, J Bills

The health reforms of the mid 1990s included an initiative to improve emergency medical care to those in remote areas of New Zealand. The PRIME (Primary Response In Medical Emergencies) scheme incorporates a coordinated response between rural general practitioners, advanced nurses and local emergency services to provide appropriate management of trauma and medical emergencies in rural locations. This paper aims to ascertain the acceptability of the PRIME scheme to rural general practitioners in New Zealand and therefore identify areas for improvement for all parties concerned.

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Supporting smoking cessation in pregnancy – action is urgently needed

Nick Wilson, George Thomson and Philippa Howden-Chapman

Smoking in pregnancy is a crucial health issue, with both immediate and downstream health and social effects. Smoking has serious adverse impacts on fetal, infant and child health as well as ongoing effects on the health of the mother and other people in the household. It is also an important issue for those wanting to reduce health sector costs, given the evidence for short-term economic savings following reductions in smoking among pregnant women.[1] In New Zealand, smoking rates continue to be high in the principal child-bearing years – 33% amongst women aged 25 to 34 years – and particularly high for Maori and Pacific women – 48% and 53% respectively in the same age group.[2]

In this issue of the Journal, McLeod et al publish a valuable study on factors associated with smoking at conception and during pregnancy.[3] Even allowing for the lower response rate from women of lower socioeconomic status who smoked, they found associations of higher smoking prevalence and lower quit rates with low socioeconomic status, Maori ethnicity and not being employed. These results are entirely consistent with a large body of evidence from New Zealand and around the world relating to smoking. The particularly high rate of smoking among Maori women at the time of conception (55%) highlights the critical need to provide more smoking cessation support for these women and their partners. The finding that three quarters of the pregnant women smokers in this population continued to smoke (after the first trimester) is of substantial concern.

There have been some recent positive developments in smoking cessation support for pregnant women, with the Ministry of Health funding several interventions. These include training programmes to improve smoking cessation counselling and support by lead maternity carers as well as other health professionals. The Ministry has also funded 37 Aukati Kaipaipa programmes that focus in particular on providing culturally appropriate smoking cessation support for Maori women who are hapu (pregnant). The programmes appear to have proved popular with participants, but evaluation data have yet to be published.

A recent mass media campaign run by the Quit Group has included a television advertisement promoting smoke-free pregnancy (part of the ‘It’s about whanau’ campaign). The preliminary evaluation data on this campaign suggest a favourable impact for Maori,[4] but the impact for pregnant women has yet to be reported. Evaluation data on an earlier mass media campaign indicated some favourable attitudinal shift towards quitting among pregnant Maori women, but the campaign was of such low intensity that most were not even aware of it.[5]

One programme for smoking cessation in pregnancy for which data have been published is the ‘SmokeChange Programme’. The study suggested a number of

beneficial outcomes,[6] but the evaluation was limited by the lack of a comparison group receiving standard care.

The collective impact of these various interventions at the national level is not known. Among pregnant women in Christchurch there have been statistically significant absolute reductions in smoking rates since 1994: 4.7%, 6.6% and 3.8% for the first, second and third trimesters respectively.[7] Yet the finding by McLeod et al, that none of the women surveyed who stopped smoking in the first trimester had reported participating in a structured smoking cessation programme, is of major concern (especially since these women have been in contact with a maternity care provider).

No national estimate for the rate of smoking in pregnancy appears to have been published since 1998 (based on data from Plunket for 1995–96)[8]. Given the importance of the issue, and the investment in new interventions by the health sector, it would seem that there is a need for nationally representative surveillance data that are both accurate and timely. A system of sentinel reporting by a randomly selected sample of lead maternity carers is one possible option. Further research is also needed to assess the impact of current interventions and to better define related hazards (eg, the proportion of pregnant women who are exposed to second-hand smoke). All such studies should ideally include biochemical validation of smoke exposure and smoking status, given the past New Zealand experience of under-reporting.[9] Any such data collection needs to be carefully implemented to allow for the sensitivity of the women's status and the need not to 'blame the victim' for nicotine dependency.

The study by McLeod et al appropriately argues for smoking cessation programmes that are tailored to the needs of pregnant women (and take into account their educational level and ethnic group). In particular, there is a critical requirement for programmes to meet the needs of Maori women. This could be achieved in part by appropriate provider training and incentives. Expanding the Aukati Kaipaipa programmes (in terms of programme intensity and coverage) would also be fruitful.

The findings of this study also suggest that programmes may need to consider such factors as the particular relevance of first pregnancy, alcohol use, the occurrence of morning sickness and partner smoking status. McLeod et al argue for the integration of structured smoking cessation programmes with antenatal care. Such integration could make better use of the often close relationship between lead maternity carers and pregnant women.

The suggestion concerning financial incentives for providers delivering smoking cessation support is important. New Zealand already uses specific financial incentives for delivering other interventions, for example, the immunisation benefit. Given the successful use of both monetary and non-monetary incentives in the promotion of immunisation,[10] it would seem appropriate to trial the use of direct financial incentives to encourage pregnant women to quit. New Zealand has had some favourable experience with smoking cessation contests[11] and these could be specifically adapted for pregnant women and their partners.

Enhancing the national Quitline may reduce smoking by young women in general. One randomized controlled trial of telephone support for pregnant women in Christchurch found no significant effect on smoking rates but did report various psychosocial benefits.[12]

Treatment initiatives need to be accompanied by far more effective prevention campaigns that utilise the gamut of tobacco control policy instruments (eg, expanding smoke-free environments) as well as including more intensive, nationwide, mass media campaigns designed for pregnant women smokers (eg, as undertaken in California) or for young women generally.

The interventions detailed above would be substantially better resourced if even a small fraction of government revenue from tobacco taxation was specifically allocated for smoking cessation and tobacco control (as argued elsewhere)[13]. Raising tobacco taxes may have a direct beneficial impact, as evidence indicates that pregnant women are particularly sensitive to cigarette prices.[14]

Preventing smoking uptake and increasing cessation may also be more effective if smoking in pregnancy is seen within a societal context that can include social and economic stress. More successful government policies to address the determinants of social and economic inequalities, such as ethnic disparities in socioeconomic status and employment, could contribute to tobacco control efforts.

In summary, there is a need for improvements in surveillance, research and policies. If the health of women and their children is to be protected from tobacco use, the Government must support the health sector by commitment to ambitious targets and substantially higher levels of funding.

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THE NEW ZEALAND MEDICAL JOURNAL
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New Zealand's Primary Health Care Strategy: what are the costs and how likely are the benefits?

Antony Raymont and Jacqueline Cumming

Major changes are occurring in primary healthcare organisation in New Zealand. The Government is implementing a Primary Health Care Strategy, which foresees that:

> 'People will be part of local primary health care services that improve their health, keep them well, are easy to get to and co-ordinate their ongoing care. Primary health care services will focus on better health for the population, and actively work to reduce health inequalities between different groups.'[1]

Primary Health Organisations (PHOs) will be the vehicle used to implement these changes; they will have access to management funding and will be rewarded for achieving budgets via a new system of performance management now under development.[2] The first PHOs were established in July 2002 and by April 2003 thirty four PHOs were in operation.[3]

User charges for primary care in New Zealand are among the highest in OECD countries and create a significant barrier to access, particularly for those on lower incomes or with higher healthcare needs. Under the Strategy, additional funding is being made available by the Government to enable a reduction in these charges. This funding is currently being targeted towards high-need populations through the use of the 'Access' formula and around 700 000 New Zealanders can now access care with lower user charges.[3] In practice, all those enrolled in Access-formula-funded PHOs are eligible for lower charges and within the next ten years the Government aims to make primary care cheaper for all New Zealanders.

In addition to reduced economic barriers to primary care, key components of the Strategy are: community participation in primary care, with the potential to improve acceptability, effectiveness, efficiency, coverage and equity of resource allocation, as well as greater self-reliance;[4] a population-based approach, with an increasing focus on prevention, screening and health promotion;[5,6] better targeting of resources using a needs-based funding formula;[7] better coordination of services; a multi-disciplinary work force; and better information coupled with a stronger performance management framework to improve quality of care.

The paper by Robinson in this issue of the NZMJ estimates the likely cost to the New Zealand Government of providing universally free primary medical care.[8] Robinson makes his estimates using results from the Rand Health Insurance Experiment (Rand HIE) undertaken in the United States during the late 1970s, coupled with New Zealand health expenditure data. Robinson includes in his calculation:

- Rand HIE estimates of differences in utilisation of services related to the proportion of the primary care fee paid by the user;
- estimates of the GP consultation fee currently charged in New Zealand;

- estimates of the additional costs related to referred services (medicines, diagnostic tests and additional hospital admissions).

He estimates the costs of free care to be between $349 million and $922 million, with a 'best' estimate of between $435 million and $592 million.

There are reasons to suggest that the increase in primary care service utilisation in New Zealand (and the costs to the Government) will not be at the high end of Robinson's estimates. It seems likely that, for many, some user fee will continue to be charged and that the increase in visits will not be as high as estimated using the Rand HIE free care data. There is also the possibility that limited capacity will constrain the increase in primary care visits; Robinson points to supply, morale and workload issues for doctors in primary care. On the other hand, the Strategy envisages an increase in the use of other healthcare professional skills that may reduce such constraints.

In the Rand HIE, individual providers were paid on a fee-for-service basis; thus, there were economic incentives to deliver as much care as possible. There is evidence that providers do react to financial incentives, with a higher number of visits received when they are paid on a fee-for-service basis.[9] Robinson notes that providers' incentives to control the number of visits may increase where they are paid on a capitation basis. New Zealand's Primary Health Care Strategy does involve a shift to capitation, but at the PHO level. Thus, PHOs will have financial incentives to control utilisation, but as long as providers continue to be paid on a pure fee-for-service basis their own incentives will be to maximise the number of patients they see.

Beyond estimates of the likely increase in primary care visits, it is unclear what effect cheaper primary care will have on rates and costs of hospital admissions. In the Rand HIE study, there were higher rates of utilisation of hospital services for those paying lower user charges. But the New Zealand policy will hope to reduce hospital admissions, in particular ambulatory sensitive admissions that might be avoided through improved primary care. Capitation does encourage referrals outside the capitated budget, and this may lead to cost-shifting and increased costs for medicines, laboratory tests and Accident Compensation Corporation (ACC) payments, as well as hospital budgets.

Robinson's estimates of the costs to the Government of implementing cheaper primary care do not include the cost of implementing the Primary Health Care Strategy as a whole, with additional expenditure required for management costs, new health promotion expenditure and PHO performance monitoring costs. Similarly, Robinson does not account for the decrease in payment by individuals, which will reduce the cost to society as a whole for primary care.

The best guess at the cost for the New Zealand Government in reducing user charges – around $600 million per annum – shows that the full implementation of cheaper primary care is expensive. This represents 7.9% of the current $7.584 billion public expenditure on healthcare.[10] The key issue is the extent of the benefit that will result.

Economic theory suggests that the new economic incentives associated with the development of PHOs may deliver the outcomes desired by the Government, ie, a population health focus, a shift in the mix of skills used in primary care delivery, improved access to care for disadvantaged populations and improved incentives to

keep expenditure within limits.[7,9] International research shows that nurse practitioner services provide benefits to consumers and the health sector, and improve health outcomes in a cost-effective way,[11,12] but beyond this there is very little research that categorically shows that the changes envisaged will lead to improved health status.[9] Further, the extent to which we can predict what might happen in New Zealand on the basis of international research is complicated by the different policy, organisational and service delivery contexts that exist here.

Given the dearth of evidence, evaluation of the Strategy as proposed by the Health Research Council, the Ministry of Health and the ACC[13] is of particular importance. A number of evaluations of primary care groups and trusts (PCG/Ts) have been undertaken in the UK and are relevant here. Two separate evaluations have commented on the significant development time required to establish organisations, the lack of management resources (money and skills), and slow progress towards involving users and the community in service development. GPs have tended to dominate decision making and, while nursing viewpoints are valued, nurses have not felt fully included in decision making. Relationships with health authorities have at times been tense.[14,15] It is likely that the evaluation of the Strategy in New Zealand will uncover similar issues.

The evaluation tender documentation focuses on the process of implementation of the Strategy (the changes in structure). Of equal importance is the evaluation of changes in: the experience of healthcare users; utilisation rates by service type; the distribution of funding related to different population groups; the cost of different services; and population health status, including avoidable hospital care. Finally, the long-term outcome of the changes in primary healthcare are likely to depend on adequate monitoring with timely feedback where desired changes are slow to develop.

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Improving the effectiveness of smoking cessation in primary care: lessons learned

Dee Richards, Les Toop, Keith Brockway, Sue Graham, Bill McSweeney, Donna MacLean, Margaret Sutherland and Alison Parsons

Abstract

Aims The 'Smokescreen' smoking cessation programme was introduced in Christchurch in 1995, with an initial study showing six-month, self-reported quit rates of 10% and 17% (with a validated deception rate) in primary and secondary care settings. Substantial modifications were made to try to improve this rate in the primary care setting and the programme has been implemented widely. Our primary aim was to estimate programme utilisation and six-month quit rates for enrolled patients in this general primary care setting. We also aimed to use a wide range of patient, practice and environmental variables to estimate any predictive effect on outcome.

Methods Prospective longitudinal cohort study. The nicotine replacement therapy (NRT) -based programme was implemented by Pegasus Health, an independent practitioner association (IPA) situated in the Christchurch urban area, to which the majority of Christchurch-based GPs belong. A cohort of 516 patients enrolling in the programme over a two-month period were contacted six months after their nominated quit date. The main outcome measure was the six-month, self-reported quit rate.

Results Of the 516 participants, 334 (65%) were contacted by mail or telephone. The overall six-month quit rate was 36% (95% Confidence Interval (CI) 31–41). Univariate analysis initially showed duration of NRT ($p = 0.03$) and age band ($p = 0.004$) were significant predictors of quitting, while living with a smoker ($p = 0.02$), having made no previous quit attempts ($p = 0.02$) and having heart disease ($p = 0.01$) were all significant predictors of continued smoking at six months. Factors that did not predict whether respondents were smoking at six months included previous use of NRT, sex, ethnicity, who delivered the intervention, years of smoking, cigarette dose, and NZDep96 score. However, there was interaction between these factors as after multivariate analysis the only significant predictors of outcome were having others living in the house who smoked (odds ratio (OR) 0.55, 95% CI 0.33—0.93, $p = 0.03$) and having made no previous quit attempts (OR 0.29, 95% CI 0.12–0.71, $p = 0.02$). Both these factors were significantly associated with continuing to smoke.

Conclusions This programme compares favourably with six-month quit rates for NRT-based programmes reported in the international literature of 14–22%. The effectiveness of an NRT-based smoking cessation programme in a general primary care setting appears to have been significantly enhanced by local adaptation, the flexibility of a primary-care-team approach and subsidisation of NRT, together with facilitation responsive to individual practice needs. The success of this programme in helping individual patients quit, as well as its successful implementation in a wide primary care setting, suggests General Practice can play an important role in smoking

cessation in a country with a high burden of disease from smoking-related illnesses. The programme is congruent with the current, national, smoking cessation guidelines endorsed by the RNZCGP. Widespread adoption of this kind of model in IPA/primary health organisation (PHO) settings throughout New Zealand should be encouraged and supported.

The serious health effects of smoking are indisputable. Smoking is responsible for 20% of the deaths in most Western countries, shortens the life expectancy of addicts by an average of eight years and adds a huge and preventable burden of disease to over-stretched health systems.[1] Despite this, progress both in primary prevention of addiction, using legislative and fiscal restrictions, and secondary prevention, using smoking cessation programmes and population-based interventions, has been slow.

Brief, opportunistic advice on stopping smoking and non-tailored smoking cessation letters both increase cessation rates by 2–3%.[2] There are a number of randomized controlled trials supporting the effectiveness of nicotine replacement therapy (NRT). A systematic review in 1994 found an overall, one-year quit rate of 15%.[3] A meta-analysis in the same year found an overall quit rate of 22% at six months. A recent Cochrane review of NRT efficacy included studies with endpoints six months and beyond. An overall 14% quit rate was calculated.[4]

A number of other interesting points were highlighted in this review, including the fact that a key determinant of programme success is the setting in which it is offered, with studies set in primary care showing smaller effect than those in specialised clinics or studies using volunteers. Suggested reasons for this were training differences, as well as the often-encountered problems of translating research evidence into 'real world' general practice – it was felt that differential rates reflected the selection of motivated volunteers compared with the more heterogeneous general practice population. This differential rate of success is of some concern as the general practice sector would regard smoking cessation to be one of its core functions, and delivery of smoking cessation programmes in primary care has been shown to be cost effective.[5]

There is a great deal of interest in addressing cardiovascular risk factors in the primary care setting, and in the utility and funding of smoking cessation and NRT in community settings. Despite evidence that in New Zealand general practitioners (GPs) provide smoking cessation to many patients, a recent study showed that New Zealand smokers are not well informed about smoking cessation strategies and their efficacy.[6] A recent paper found differences between actual and recommended practice in primary care in New Zealand and identified a number of potential barriers to smoking cessation in primary care, including time pressure and the fee-for-service system.[7] It was suggested that increased practice nurse (PN) input could be useful.

It is important to assess the performance of a well-supported, multifaceted, NRT programme when implemented in a general primary care setting. Pegasus Health (PH) is an independent practitioner association (IPA) situated in the Christchurch urban area that services a primarily European population. It was formed in 1992, operates a collective approach to GP budget holding and currently has over 225 GP and 240 associated PN members. Pegasus Health has been running a smoking cessation programme for some years (the PEGS programme: Preparation, Education, Giving up and Staying smoke free). The programme was initially introduced as the

'Smokescreen Programme' in both primary and secondary care. This was devised for use in primary care in Australia[8] and is based on the 'readiness to change' model[9] (precontemplative/contemplative/ready), incorporating a nominated quit date and NRT, and accompanied by supportive counselling and literature. An initial study was performed after its introduction in 1995 using self-reported, six-month quit rates and once again showed differential quit rates in primary and secondary care, with rates of 17% in secondary care and 10% in primary care,[10] and a biochemically validated deception rate using exhaled carbon monoxide of 14.4%. The primary care programme has been substantially modified to make the programme more locally relevant and to try to improve quit rates (the programme has been renamed the PEGS programme).

The primary aim of this study was to estimate programme uptake and six-month quit rates for patients enrolled in a New Zealand, general-practice-based, smoking cessation programme. The programme combines NRT with supportive counselling and has been implemented broadly in a primary care setting in Christchurch, New Zealand.

The secondary aim was to use a wide range of patient, practice and environmental variables to estimate any predictive effect on outcome.

Methods

Current intervention A half-time programme coordinator provided training, materials and a readily accessible support service. Training and resources were provided by the coordinator to practices on an individual basis that allowed the programme to be tailored to each practice's working style and patient population. The training incorporated aspects of the model of behavioural change, motivational interviewing, quitting strategies, NRT use, and relapse prevention. The coordinator also provided ongoing updates, support and advice. The IPA encouraged frequent (weekly to two-weekly) practice contact and PN involvement was encouraged after the first consultation. One of the key philosophies underpinning the implementation was to allow flexibility in delivery between practices. Practices used the programme in a variety of ways, from nurse-run clinics/groups to a GP/PN team approach. Each practice chose how they wished to run the programme, usually based on the skill mix and interests of GPs and PNs within the team.

While the criteria for patient enrolment remained the same as the original model,[9] material for GPs and patients was rewritten and draws on the US Preventive Services Task Force's *Guide to clinical preventive services*.[11] Booklets were made shorter with less text, simple language, a 'positive benefits of quitting' perspective, and less emphasis on the health risks of smoking. There is less emphasis on the smoking cessation 'battle' and more on encouragement and support using a matter-of-fact tone. NRT is emphasised as central to the programme rather than just one option, with subsidisation of the NRT by Pegasus Health underpinning this. The 'Quitters' booklet is very patient interactive and used as a brief 'workbook' with emphasis on individualising the book to each smoker (eg, supports, reasons for and benefits from quitting, identification of likely relapse moods and events, nomination of rewards for quitting).

Consultations covered, in no particular order, assessment of motivation to quit, nominated quit date, discussion of usage of NRT, use of motivational techniques, and discussion of behaviour changes. Patients contributed NZ$15 a week towards the cost of NRT as well as the initial consultation cost. Pegasus Health met the remaining costs of NRT supply. PN involvement was encouraged with flexible roles – either the GP or the PN may implement the programme depending on the availability and skill mix of the individual practice team. This is consistent with effective teamwork principles and was thought to offer added benefits for patient access by reducing costs, as the majority of practices in which PNs implement the programme can reduce or waive charges to the patient for follow-up visits.

Data collection All patients enrolling in the programme provide information, which is recorded on an enrolment form, about their smoking history, previous quit attempts, and smoking-related diseases. A cohort of 516 patients enrolling in the programme over a two-month period (March and April 2000) were selected for study. The cohort were contacted by mail six months after their nominated quit date

and asked to fill in a simple questionnaire. To maximise the response rate, those who did not respond were sent repeat questionnaires at least twice and then telephoned at least three times before being classified as non-contactable. Attempts were made to determine the new addresses of those who had moved since participating in the programme. The questionnaire gathered information about age, sex and ethnicity (using the New Zealand Census format). Address at enrolment was geo-coded and a New Zealand Index of Deprivation (NZDep96) score assigned as an indicator of socioeconomic status.[12] At six months, patients were asked about their motivation for enrolling in the programme, where they had heard about the programme, whether they were currently smoking and, if they were, why they felt they had continued to smoke. Patients were also asked how long they had used NRT, whether they lived with other smokers, and who they had seen at the practice (primarily PN, GP or a combination). Responses to the questions about demographics, smoking and disease history were all categorical and pre-coded prior to study commencement. Responses to the questions about motivation for quitting, reasons for restarting, and suggestions for improvements were also categorical, with the categories developed from free-text answers during the first interviews, which were conducted by telephone to allow this. A free-text 'other' category allowed extra categories to be built in if necessary.

Analysis Simple descriptive statistics were calculated in Excel. SAS (Version 8.02) and Confidence Interval Analysis (CIA)[13] were used for the more detailed statistical analyses.

Results

A total of 3670 patients enrolled in the programme in 2000 in 94 member practices (227 GPs). Of the 516 participants enrolled in a consecutive two-month period, 334 (65%) were contacted by mail or telephone. Over one third of participants had changed address in the six months since participating in the programme so, as previously discussed, considerable effort was required to achieve this response rate. The majority of non-contactable participants had moved and no forwarding addresses were available.

Table 1. Demographic characteristics of participants (age, sex, ethnicity, NZDep96 score)

	Enrolled patients	Respondents
Age band (years)*		
15–25	50	26
26–35	130	68
36–45	130	77
46–55	104	74
56–65	56	51
66–75	26	26
>75	13	12
Sex (F:M)	294:222 (57:43%)	211:123 (63:37%)
Ethnicity		
NZ European	Not available	88% (86%)†
NZ Maori		4 % (7%)†
Other European		4%
Other		2%
No response		1%
NZDep96 mean score	5.8	5.6
Years of smoking		
>5	92%	92%
≥15	65%	71%
Smoking-related disease	24%	29%
Previous quit attempts (mean)	2.07	2.07
Previous use of NRT	23%	23%

*there was a statistically significant difference in response rates across different age bands: 51.89 degrees of freedom 6, $p < 0.00001$; †equivalent percentage of Christchurch population

The majority of enrolled patients (57%) and respondents (63%) were female. Almost all (92%) enrolled and respondent patients had smoked for greater than five years and around two thirds had smoked for 15 years or more. One quarter had a documented, smoking-related disease, and enrolled patients and respondents had made on average two previous quit attempts. Eighty eight per cent of respondents were European, 4% Maori, 4% other European, and 4% 'other'. These small numbers did not allow any sub-analysis within specific ethnic groups. (Demographic and socioeconomic data are shown in Tables 1 and 2).

Table 2. Socioeconomic distribution of programme participants

NZDep96 Category*	Proportion of respondents (%)	Proportion of enrolled patient group (%)
1	9	9
2	9	7
3	9	10
4	9	5
5	5	12
6	12	10
7	9	12
8	10	13
9	13	7
10	7	7

*1 = least deprived, 10 = most deprived

Primary delivery role was split between PN (54%), GP (25%), and combined delivery (16%). Patients heard about the programme mostly from their GP (49%) or by word of mouth (34%). One fifth of respondents had used NRT in previous quit attempts. Reasons for wishing to quit were varied – 38% said they just did not want to be smokers any more, 19% said they enrolled in the programme because of recent health deterioration, and 10% enrolled under pressure from family and friends.

The overall six-month quit rate was 36% (95% CI 31–41). Assuming all non-contactable respondents are still smoking, a 'worst-case-scenario', six-month quit rate was calculated at 23% (95% CI 20–27). This is likely to underestimate the true quit rate, as most missing data were from untraceable patients who had moved rather than non-responders. Using the deception rate of 14% established in the initial study using exhaled carbon monoxide measurement[10] this figure remains above 20%.

Univariate analysis initially showed duration of NRT ($p = 0.03$) and duration of NRT therapy ($p = 0.03$) were significant predictors of quitting. Five to six weeks of NRT therapy was significantly better than one to two weeks (OR 0.38, 95% CI 0.19–0.95), three to four weeks (OR 0.25, 95% CI 0.06–0.98) or 11 to 12 weeks (OR 0.35, 95% CI 0.16–0.78). Age group 45–55 years had a significantly better quit rate (50%) than 26–35 years, 36–45 years and 66–75 years. Conversely, living with a smoker ($p = 0.02$), having made no previous quit attempts ($p = 0.02$) and having heart disease ($p = 0.01$) were all significant predictors of continued smoking at six months (Table 3). Factors that did not significantly predict whether respondents were smoking at six months included: previous use of NRT ($p = 0.77$); sex ($p = 0.08$, male:female, OR

1.49, 95% CI 0.92–2.42); ethnicity (p = 0.12); who delivered the intervention (p = 0.51); years of smoking (p = 0.50); cigarette dose (p = 0.49); NZDep96 score (p = 0.08); reason for quitting (range of p values 0.21–0.98); history of asthma or chronic obstructive pulmonary disorder (p = 0.46); vascular disease (p = 0.31); and other smoking-related disease (p = 0.46). The NZDep96 scores were collapsed into three categories to test for any evidence of a trend: 'low' (NZDep96 score 1–3), 'medium' (NZDep96 score 4–7) and 'high' (NZDep96 score 8–10). There was no significant linear trend (OR: low 1.00 (reference), medium 0.69, high 1.38; $?^2 = 1.14$; p = 0.29).

Table 3. Univariate analysis

	Odds ratios (95% CIs)	p value
Predictors of quitting		
Duration of NRT 5–6 weeks: odds ratio vs 1–2 weeks odds ratio vs 3–4 weeks odds ratio vs 11–12 weeks	 2.63 (5.26, 1.05) 4.00 (16.67, 1.02) 2.86 (6.25,1.28)	 0.03
Age band (46–55 significantly better than 26–35, 36–45 and 66–75: odds ratios compared to 46–55 age band between 0.33 and 0.48)	Chi-square 17.10 5 DoF	0.004
Barriers to quitting		
Pre-existing heart disease	0.23 (0.04, 0.81)	0.01
Living with a smoker	0.55 (0.32, 0.93)	0.02
No previous quit attempts (no linear trend with number of quit attempts)	0.28 (0.11, 0.71)	0.02

As seen in Table 4, subsequent multivariate analysis using a logistic regression model showed there was interaction between variables that seemed to predict outcome using univariate analysis. When applying the multivariate model, the only independently significant predictors of smoking status at six months were two with a negative influence on outcome. Having others living in the house who smoked (OR 0.55, 95% CI 0.33–0.93, p = 0.03) and having made no previous quit attempts (OR 0.29, 95% CI 0.12–0.71, p = 0.02) were factors significantly associated with continuing to smoke. Where respondents had made previous quit attempts, outcomes did not significantly differ between different numbers of quit attempts.

Table 4. Multivariate analysis

Barriers to quitting	Odds ratios (95% CIs)	p value
Living with a smoker: Others in the house who smoke compared with no others in house who smoke	0.55 (0.33, 0.94)	0.03
Number of previous quit attempts: No previous quit attempts compared with previous quit attempts	0.29 (0.12, 0.71)	0.02

The reason for restarting smoking most commonly reported was stress (36%), followed by addiction to or satisfaction from nicotine/smoking (20%), weight concerns (10%), and loss of motivation (10%). Withdrawal symptoms were given as a reason for restarting by 6% of respondents.

When asked for suggestions for other support the IPA or practice could provide that might make quitting easier, the most common response was ‘none’ (35%), with 13% suggesting further follow-up appointments, 9% suggesting more counselling, and 12% suggesting support groups might be helpful. These responses were similar for both smokers and non-smokers, except for the suggestion of support groups: nearly 90% of respondents who made this suggestion were smokers.

Discussion

Preventive care is regarded as a core feature of primary care and this study indicates that smoking cessation can be very effectively delivered in the primary care context. The programme had a good uptake, with enrolment of an average of 16 patients for every GP per year (full or part time).

Figure 1. Socioeconomic distribution of programme participants

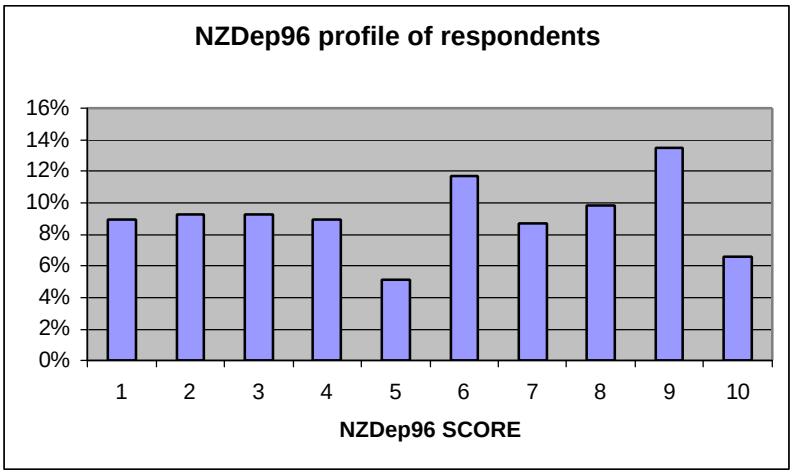
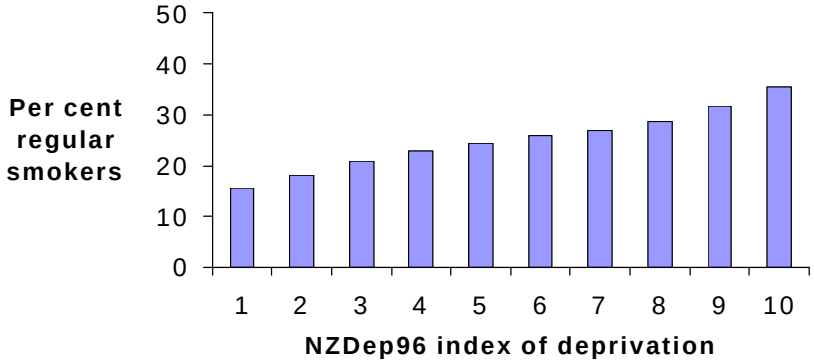


Figure 1 shows the socioeconomic spread of those enrolled in the programme. It is reassuring to see that the programme is reaching the lower socioeconomic group as it is not uncommon for middle and higher socioeconomic groups to have a greater rate of uptake of preventive programmes. There is still room for improvement, however, as proportions in this study sample still do not match the nationwide proportions of smokers in the more deprived groups (Figure 2). The penetration of the programme into non-European ethnic groups is not so good. Numbers in non-European ethnic groups were too small to allow sub-analysis. In particular, Maori and Pacific Island enrolment rates were lower than population proportions and Asian participants were notable by their absence. This is of concern as Census data indicate that Maori have higher rates of smoking in the New Zealand population than Europeans. The reasons for this low uptake need further exploration.

Figure 2. Percentage of regular smokers in New Zealand by NZ index of deprivation (source: Dr P Crampton, Health Services Research Centre, Victoria University, Wellington)



In this study, the population of participants was highly mobile. Whilst this is not an unexpected finding it is important in planning service delivery and programme follow up. It is interesting to note that while deprivation is a predictor of starting smoking it did not appear to influence programme outcome using NZDep96 as an indicator.

This programme compares favourably with six-month quit rates for NRT-based programmes reported in the international literature of 14–22%. Rates in primary care settings are often at the lower end of the range. Deception rates in self-report were tested in the previous study with carbon monoxide assessments[10] and were found to be 14%, which is consistent with rates in the literature[3] and does not substantially affect this judgement of effectiveness.

The reasons for the apparent success of the PEGS programme cannot be inferred directly from this study, but some features of the programme would seem likely to increase its potential for effect. The programme was introduced as a modification of a well-established programme (the Smokescreen Programme) after evaluation in a local context.[10] Key features of the modified programme were: the flexible team approach, NRT subsidisation, and an effective programme coordinator.

Use of the Di Clemente and Prochaska states of change model ensures the programme is delivered to those who are more likely to be ready to quit.[9] A team approach gives flexibility of role in delivery, ensuring that the most suitable person in the practice team is able to deliver the programme. Increased PN involvement also reduces access barriers by reducing costs and increasing potential contact time for the patient. It would appear that programme delivery by PNs could be more cost effective; however, care is needed in interpreting the comparative outcome result. Practices in the study were given the flexibility to implement the programme as it best suited their teams' strengths and weaknesses and prescribed roles would reduce this flexibility and could affect outcomes.

The context within which the programme was developed was also favourable; at the time, the 'smoke free' theme had a high profile in NZ, with gradually increasing public acceptance of and demands for more smoke-free areas, and with political

support in legislation for smoke-free environments. There had also been a significant increase in tobacco prices in May 2000. The programme was branded as a locally modified product, and arrived at a time when enthusiasm for the Pegasus Health IPA was high and there was good practice-level acceptance. The application of an evidence-based approach to practice was already well established and of proven effectiveness within the organisation's Clinical Practice Education Groups (CPEGs) to which all GPs and most PNs belong. The programme coordinator provided training and resources to practices and facilitated the implementation of the programme in a way that was tailored to each particular practice's working style and patient population.

A response rate of 70% or greater is usually considered ideal and, as with all studies, no conclusions can be drawn about outcomes for those who were not contactable. As described, strenuous efforts were made to contact all enrolled patients in the cohort, and it is clear that this is a highly mobile patient group. Almost all the remaining non-responders had moved and had no identifiable, current contact address.

Smoking cessation is very cost effective when compared with other preventive interventions.[14] This study shows it can be effectively implemented in a primary care setting. The effectiveness of an NRT-based smoking cessation programme in a general primary care setting appears to have been significantly enhanced by local adaptation, NRT subsidisation, use of the strengths of a flexible primary-care-team approach, and effective coordination and facilitation responsive to individual practice needs. The programme could be improved by testing the effectiveness of the addition of the most common patient suggestions (longer follow up and support groups).

A description of practices in primary care smoking cessation in 2000 indicated a gap between reported and recommended practice in primary care in this area.[7] The success of this programme in helping individual patients quit as well as its successful implementation in a wide primary care setting suggests General Practice has an important role to play in a country with a high burden of disease from smoking-related illnesses. The PEGS programme is congruent with the 2002 Guidelines for Smoking Cessation endorsed by the Royal New Zealand College of General Practitioners.[15] Widespread adoption of this kind of model in IPA/PHO settings throughout New Zealand should be encouraged and, more importantly, supported. Pegasus Health is a large IPA that has a well-developed infrastructure and resources that allowed it to develop and facilitate the implementation of the PEGS programme. IPAs with different levels of infrastructure development should be supported in providing the required evidence-based education, coordination and practice communication necessary to implement this type of programme.

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Factors that influence changes in smoking behaviour during pregnancy

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Abstract

Aims This study explored characteristics of women who continue to smoke beyond the first trimester of pregnancy.

Methods A cohort of 1283 pregnant women were surveyed at the time they registered with a maternity care provider, using a postal questionnaire. Women who reported they were ex-smokers were asked when they had stopped smoking. Data were analysed using logistic regression to identify socio-demographic variables associated with smoking and with stopping smoking.

Results 829 (69.2%) women responded to the questionnaire. 183 (22.2%) reported smoking when they became pregnant. Forty nine (26.8%) of the women smoking at conception reported giving up in the first trimester. Factors significantly associated with stopping smoking in the first trimester were current employment (OR 2.37, 95% CI 1.16–4.85), first pregnancy (OR 2.18, 95% CI 1.11–4.28), and experiencing nausea during the pregnancy (OR 2.59, 95% CI 1.11–6.04). Women who held a community services card (OR 0.41, 95% CI 0.19–0.86), Maori women (OR 0.38, 95% CI 0.15–0.98) and women whose partners smoked (OR 0.35, 95% CI 0.17–0.70) were significantly less likely to have stopped smoking.

Conclusions Socioeconomically deprived women were more likely to continue to smoke beyond the first trimester of pregnancy and this needs to be taken into account in the provision of smoking cessation support.

Peri-pregnancy health can be improved by a reduction in smoking rates during pregnancy. Maternal smoking is strongly associated with higher rates of spontaneous abortion, prematurity, stillbirth,[1] and lower birth weight.[2,3] Children of parents who smoke have higher rates of sudden infant death syndrome (SIDS),[4,5] otitis media,[6] respiratory infections and asthma.[7] Smoking is also associated with a decreased duration of breastfeeding.[8,9]

In New Zealand, smoking rates for women of child-bearing age are as high as 33% for 20–24 year olds,[10] and in Christchurch 31% of a sample of pregnant women smoked.[11] A higher proportion of Maori women smoke than non-Maori, and death rates from smoking-related causes are significantly higher in Maori.[12] Although rates of smoking in pregnancy have decreased slightly in the last decade, smoking during pregnancy is still an important and modifiable public health problem.[13]

Pregnancy is a time when many women try to stop smoking. In addition, smoking cessation interventions during pregnancy can result in significant reduction in smoking. A meta-analysis of trials of smoking cessation interventions in pregnancy by the Cochrane Pregnancy and Childbirth Group showed an absolute reduction of 6.4% in the number of women continuing to smoke.[14]

In the Wellington and Kapiti areas of New Zealand, 95% of primary maternity care is provided by the maternity care provider Matpro.[15] Matpro providers include midwives, general practitioners and obstetricians. Matpro providers identified the need to develop a programme to support smoking cessation for women registered with them for maternity care and, as part of the development process, a cohort of women were surveyed to explore factors associated with continuation of smoking in pregnancy.

Methods

Study population Data included in this paper were sourced from responses to the first questionnaire of a prospective study of a cohort of 1283 pregnant women registered with the maternity care provider Matpro for their antenatal care.

Data collection All 1283 women who had registered with Matpro, over a seven-month period, by the time they were 24 weeks pregnant, were sent a questionnaire at registration. A freepost, addressed envelope was included for replies and women were assured of anonymity. Non-responders were sent one reminder letter and a further copy of the questionnaire. The questionnaire elicited information on demographic data, smoking behaviour, frequency of alcohol consumption and intention to breastfeed.

Outcome variable The outcome variable of interest was reported smoking cessation in the first trimester of the current pregnancy. Smoking status data were collected by asking women whether they currently described themselves as tobacco smokers, ex-smokers or non-smokers. Women who described themselves as ex-smokers were asked when they had stopped smoking and why.

Explanatory variables Socio-demographic variables were collected using questions consistent with either the New Zealand Census or the Department of Statistics Household Health Survey. Ethnicity data were collected using the ethnicity question from the 1996 New Zealand Census that asked people to tick as many boxes as necessary to show the ethnic group(s) to which they belonged. In the analysis, Maori were defined as women identifying either as solely Maori or Maori plus any other ethnic group. Other variables included partner's smoking status, tertiary education (defined as any post-secondary-school diploma, degree or other qualification), community services card (CSC) status (a healthcare subsidy for low-income earners), income support benefits, current employment status, whether the pregnancy was planned, whether it was the woman's first pregnancy, whether nausea had been experienced during the pregnancy, and on how many days in the previous seven alcohol had been consumed.

Analysis Data were entered into a Microsoft Access database. Ten per cent of data entered were manually checked against questionnaires. Data were transferred to SAS and odds ratios (OR) and 95% confidence intervals (CI) calculated. Logistic regression was used to estimate the effect of each of the explanatory variables on the outcome measures. Selection of variables to find the model that best predicted the outcome of interest was performed using stepwise regression.

At the 5% level of significance, a difference in rates of cessation of 17% could be detected, with 80% power, for variables with a prevalence of 10%, and a difference of 20% for variables with a prevalence of 50%.

Ethics approval This research was approved by the Wellington Ethics Committee, accredited by the Health Research Council of New Zealand.

Results

Response rate The questionnaire was sent to 1283 women. Eighty five women were ineligible to reply because they were no longer registered with Matpro, either because they had moved from the study localities or miscarried. Completed questionnaires were returned by 829 women, a response rate of 69.2%.

Was the cohort representative? Grouped demographic data about a subset of women who did not respond to the questionnaire were available from the Wellington Hospital Perinatal Information Monitoring System (PIMS). When compared to responders, non-responders included a higher proportion of women who were not married or in a defacto relationship (11% vs 24%; $\chi^2 = 17.8$, $p = 0.001$); women who

smoked (14% vs 26%; χ^2 = 18.9, p = 0.001); had no tertiary education (35% vs 49%; χ^2 = 10.8, p = 0.001); or were receiving a benefit (8% vs 19%; χ^2 = 14.9, p = 0.001). The mean age of non-responding women (29.9 years) was slightly lower than that of responding women (31.9 years) (χ^2 = 18.6, p = 0.001). It is possible that some of these differences reflect the characteristics of the subgroup of women delivering at Wellington Hospital for whom PIMS data were available. Data were not available for women delivering at other hospitals in the region and these hospitals, although smaller, served localities with a higher proportion of socioeconomically deprived women. There were no differences between responders and non-responders in alcohol consumption data recorded on PIMS, weeks' gestation, obstetric history, baby's birthweight or Apgar score.

Smoking status 183 (22.2%) of the 825 women who responded to the question about current smoking status reported smoking when they became pregnant. Forty nine (26.8%) of the women smoking at conception reported giving up in the first trimester of this pregnancy and 123 (67.2%) continued to smoke beyond the first trimester. Eleven women (6.0%) did not answer this question.

Table 1. Women who reported smoking tobacco at the time their baby was conceived

		Number in cohort	Women who reported smoking		Odds ratios	95% CI
		n	n	%		
Factors associated with increased risk						
Partner smoker at 20–24 weeks	Yes	163	93	57.1	**9.70**	**6.56–14.33**
	No	639	77	12.1		
Maori	Yes	77	42	54.6	**5.17**	**3.18–8.39**
	No	748	35	18.9		
CSC holder*	Yes	153	70	45.8	**4.33**	**2.96–6.33**
	No	656	107	16.3		
Receives income support	Yes	144	63	43.8	**3.95**	**2.68–5.82**
	No	650	107	16.5		
Protective factors						
Planned pregnancy	Yes	589	88	14.9	**0.26**	**0.18–0.36**
	No	229	93	40.6		
Has tertiary education	Yes	464	62	13.4	**0.30**	**0.21–0.42**
	No	315	108	34.3		
Plans to fully breastfeed	Yes	610	120	19.7	**0.60**	**0.42–0.85**
	No	213	62	29.1		
Current employment	Yes	497	92	18.5	**0.65**	**0.46–0.91**
	No	296	77	26.0		
Other factors						
Consumed alcohol in the last seven days	Yes	218	218	18.4	0.73	0.49–1.08
	No	598	598	23.6		
First pregnancy	Yes	328	76	23.2	1.10	0.79–1.54
	No	497	107	21.5		

*community services card held or applied for (income level for a couple with 1 child <$NZ32 000 pa)
NB: figures in bold are significant, p =0.05

Socio-demographic factors associated with smoking at conception are shown in Table 1. Smoking rates were significantly higher for Maori women (OR = 5.17, 95% CI

3.18–8.39). Fifty five per cent of Maori women in the study reported smoking at the time their babies were conceived. When all variables were combined using stepwise regression, the strongest predictors of smoking at conception were having a partner who smoked (OR = 7.68, 95% CI 4.91–12.02) and Maori ethnicity (OR = 2.90, 95% CI 1.51–5.58). Women with tertiary education (OR = 0.40, 95% CI 0.26–0.62) and women with planned pregnancies (OR = 0.42, 95% CI 0.27–0.66) were less likely to have smoked at conception.

Women who smoked were also significantly less likely to report planning to fully breastfeed their babies (OR= 0.60, 95% CI 0.42–0.85). This effect remained significant after controlling for education and first pregnancy (OR = 0.65, 95% CI 0.45–0.96).

Socio-demographic factors associated with giving up smoking are shown in Table 2. When all variables were combined using stepwise regression, the strongest predictors of giving up were first pregnancy (OR = 5.03, 95% CI 1.90–13.27), any alcohol consumption in the previous seven days (OR = 3.41, 95% CI 1.16–10.05), or experiencing nausea during the pregnancy (OR = 5.71, 95% CI 1.73–18.85). Women who held a CSC (OR = 0.31, 95% CI 0.10–0.95) and women whose partners smoked (OR = 0.22, 95% CI 0.09–0.55) were less likely to have stopped smoking.

Table 2. Women who stopped smoking in the first trimester of their pregnancy

		Number smoking at conception n	Women who stopped smoking		Odds ratios	95% CI
			n†	%		
Factors associated with stopping smoking						
Experienced nausea during pregnancy	Yes	122	41	33.6	**2.59**	**1.11–6.04**
	No	49	8	16.3		
Current employment	Yes	86	32	37.2	**2.37**	**1.16–4.85**
	No	75	15	20.0		
First pregnancy	Yes	68	26	38.2	**2.18**	**1.11–4.28**
	No	104	23	22.1		
Factors associated with continuing to smoke						
Partner smoker at 20–24 weeks	Yes	89	18	20.2	**0.35**	**0.17–0.70**
	No	71	30	42.3		
Maori	Yes	39	6	15.4	**0.38**	**0.15–0.98**
	No	133	43	32.3		
CSC holder*	Yes	65	12	18.5	**0.41**	**0.19–0.86**
	No	101	36	35.6		
Other factors						
Receives income support	Yes	59	12	20.3	0.50	0.23–1.05
	No	103	35	34.0		
Planned pregnancy	Yes	82	25	30.5	1.24	0.64–2.42
	No	88	23	26.1		
Has tertiary education	Yes	58	20	34.5	1.64	0.81–3.32
	No	103	25	24.3		
Consumed alcohol in the last seven days	Yes	38	15	39.5	2.04	0.95–4.37
	No	132	32	24.2		

*community services card held or applied for (income level for a couple with 1 child <$NZ32 000 pa)
†not all women provided complete responses to socio-demographic questions
NB: figures in bold are significant, p =0.05

The reasons most frequently given by women for stopping smoking were related to the health of their baby or their pregnancy (Table 3).

Table 3. Reasons given by women for giving up smoking in the first trimester of pregnancy

Reason for giving up smoking	Number*
Baby's health 'Because I want my baby to be healthy and strong.' 'The baby deserves the best possible start in life.' 'I didn't want to harm baby.' 'I didn't want my baby to smell of smoke or inhale smoke.'	21
Focused on pregnancy 'Because I was pregnant.' 'I gave up on the day I found out I was pregnant.'	17
Sickness or aggravation of morning sickness 'I often felt ill at the smell of smoke.'	11
Own (mother's) health	3
General health benefits	3
Didn't feel like smoking	2
Other health reasons 'To eliminate risk factors for miscarriage.'	1
Other reasons 'Only smoked socially between pregnancies.' 'Filthy habit.' 'Husband has quit so no temptation…'	4
Pressure from others 'Other people's nagging made me feel guilty.'	1
No reason provided	2
Total number of responses	**63**
Total number of women*	**49**

*women were able to give more than one reason

None of the women who stopped smoking in the first trimester reported participating in a structured, smoking cessation programme during this pregnancy.

Discussion

This study has explored the socio-demographic characteristics associated with continuing to smoke while pregnant, with the intention of developing a smoking cessation programme to be delivered by primary maternity care providers.

Data were collected by postal questionnaire. While the response rate of 69% was adequate, the information available with which to compare responders and non-responders suggests that socioeconomically deprived women, single women and those who smoked were slightly less likely to respond. Therefore, rates of smoking may be underestimated and rates of stopping smoking slightly overestimated. Smoking data in this study were self-reported and not validated biochemically. However, the questionnaire was an anonymous postal survey and smoking data were being collected with a range of other data. Studies of non-disclosure of smoking in questionnaire surveys have found non-disclosure to be as low as 5% compared to non-

disclosure in other situations.[16] Women who did not want to disclose their smoking status had the option of not responding to the questionnaire.

Smoking at conception in the cohort studied was associated with socioeconomic deprivation, lower educational levels, partners who smoked, unplanned pregnancy and Maori ethnicity, as documented in studies of non-pregnant smokers.[10] Pregnancy motivated approximately one quarter of the women who smoked at conception to stop smoking in the first trimester, but three quarters continued to smoke. Women pregnant for the first time were more likely to stop smoking. Midwives have commented that women pregnant with their first child might be more concerned about their child's health than women who have already smoked through one pregnancy and delivered an apparently healthy baby.

Although pregnancy motivates women to stop smoking, there is a high rate of relapse after the baby is born.[17,18] Data from a qualitative study by Edwards suggested that women who temporarily stop smoking during pregnancy require assistance to shift their reasons for stopping from the baby to themselves.[19] In our study, many women gave reasons for stopping related to the baby's health or their pregnancy. Women who experienced nausea and vomiting during pregnancy were also more likely stop smoking. Edwards stated that the experience of morning sickness reduced the desire or craving for cigarettes thus making it easier to stop.[19] It is likely that this group of women is vulnerable to relapse. It is important that women who have spontaneously quit during their current pregnancy are identified by their maternity carer and included in any programme of smoking cessation education.

The decision to stop smoking was also associated with reported alcohol consumption in the previous seven days. As an earlier analysis of data on alcohol consumption for this cohort found an association between alcohol consumption and socioeconomic advantage,[20] it is likely that the association between stopping smoking and alcohol consumption in the current study reflects the association between alcohol consumption and socioeconomic advantage.

In this study, women who continued to smoke were more likely to be Maori, socioeconomically deprived and to have a partner who smoked. Smoking cessation programmes must be designed to meet the needs of the women for whom they are intended. Educational levels must be taken into account when developing resource material to support smoking cessation. Women whose partners smoked were more likely to have reported smoking at conception and less likely to have stopped smoking by 20–24 weeks. A recent Cochrane review of a small number of studies was unable to show an effect of interventions to enhance partner support for smokers in cessation programmes.[21] In contrast, in qualitative studies women have described the difficulty of stopping smoking or remaining a non-smoker when their partners smoke.[19] Authors of the Cochrane review have highlighted the need for more systematic interventions to involve partners.

Programmes tailored to pregnancy and to particular ethnic groups are more likely to succeed in those groups.[22] Higher rates of smoking and lower rates of quitting amongst Maori women suggest that current smoking cessation interventions are not adequately meeting the needs of Maori women, particularly those who are pregnant.

A New Zealand-wide survey of antenatal care providers suggested that providers need support and training to provide smoking cessation and pregnancy-specific referral

services.[23] Smoking cessation programmes delivered during pregnancy have been demonstrated to be effective, yet in this sample none of the women who did stop, and few women who continued to smoke, had attended programmes. Integration of structured smoking cessation with antenatal care has the advantage that antenatal care providers develop an ongoing, trusting relationship with both women and their partners. Opportunity exists to fully integrate smoking cessation with the established programme of antenatal care in New Zealand. Maternity care providers who provide care for women with low incomes may need additional support and/or resources to provide cessation support and this may require targeted economic incentives. Addressing smoking cessation at population level, with continuation of initiatives such as Quitline and national advertising campaigns aimed at pregnant women, also has the potential to facilitate lower rates of smoking during pregnancy.

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The cost to the New Zealand Government of providing 'free' primary medical care: an estimate based upon the Rand Health Insurance Experiment

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Abstract

Aim To estimate the likely cost to the New Zealand Government of providing universally free primary medical care.

Methods Estimates of current government expenditure on various categories of health were obtained from Ministry of Health sources. Information from the Rand Health Insurance Experiment was used to estimate the changes in demand for general practitioner (GP) visits, pharmaceutical, laboratory and other referred services, and hospital services. The effects of a supplier response and complement (pharmaceutical) prices were also considered.

Results Assuming that GPs act to control their patients' increasing demand for services, providing free primary care to all New Zealanders is likely to cost the Government between $435 million and $592 million (based upon 1998/99 year data).

Conclusions The difficulties and likely inexactness in making estimates of this sort are acknowledged; however, when considering such important changes in health policy, it is important to attempt to define likely costs (and benefits). Consideration of costs must go beyond simply estimating current private expenditure on primary medical care.

Accessible primary care is acknowledged as important for any health system. Access is determined by a number of factors, including the cost to the patient of using primary care services.[1,2] New Zealand has high user charges for general practice services by the standards of many OECD countries. A number of studies suggest that cost is a significant barrier to at least some New Zealanders' access to GPs.[3–7]

The Primary Health Care Strategy makes it clear that the funding of primary healthcare is on the Government's agenda.[8] There are a number of important advocates for free primary care. For example, in 2000 the National Health Committee recommended that 'The Government should preferentially invest in primary health care services with the intention of moving to fully-funded care over the next five years.'[9]

The cost to the Government of following such a policy is unknown. This paper attempts to estimate this cost using available data on the cost of health services and estimates of increased utilisation of health services that are derived from the Rand Health Insurance Experiment (Rand HIE).[10–12] The Rand HIE remains the only randomized controlled trial of the effect of user charges on health services utilisation. Whilst the costs derived can be considered only as tentative estimates, they are based upon the best information available and may lead to useful discussion.

Methods

This section necessarily summarises the methods used to calculate the cost of free care. Those who would like a more detailed account should contact the author.

The costs to Government of fully funding general practice care are considered under three categories:

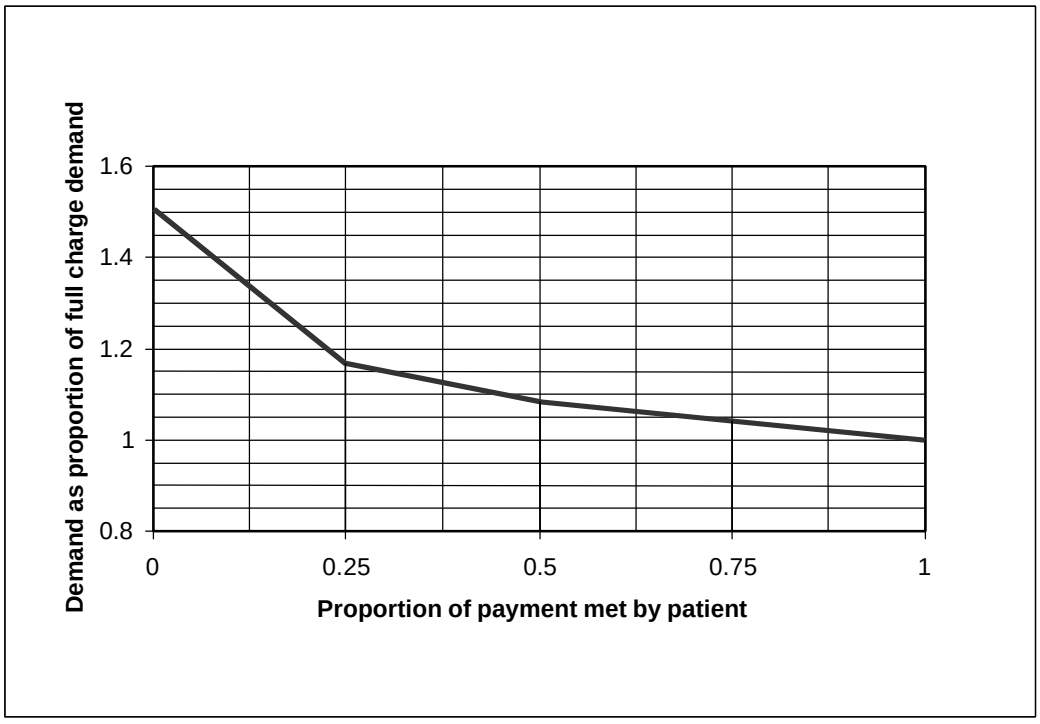
- The costs entailed by the Government taking responsibility for current general practice services that are at present paid for by the private sector.
- The costs of paying for an increase in utilisation of general practice services that occurs because the services are free.
- The costs of paying for any additional health services that result from this increased general practice use (for example, if consumers see GPs more often they are likely to use more medicines).

The costs in this article are calculated using 1998/99 year data. These were the most recent data available to the author. Data on health service expenditure are taken from the Ministry of Health publication *Health expenditure trends in New Zealand 1980–1999.*[13]

Payment for current GP services It is assumed that in moving to free general practice care the Government would agree to pay general practices the same amount that the practices currently claim from patients and other private sources. Unfortunately, this amount is not known directly. Ministry of Health estimates are based upon data extrapolated from the Household Economic Survey.[13]

The cost of paying for new general practice services The cost of extra GP services used under a free system is dependent upon how much demand increases with a fall in price (the price elasticity of demand, or η). The best information that is available comes from the Rand HIE.[10–12] Figure 1 shows the number of doctor visits demanded when care is subsidised as a ratio of the number demanded when patients pay the full cost. People who received free doctor visits utilised services just over 50% more than those who paid for all their care.

Figure 1. Demand for doctor visits with varying user charges (from Rand HIE)



In New Zealand, many people do not pay the full cost of GP visits (for example because they receive GMS or ACC subsidies, disability allowance or have medical insurance). To estimate the increase in demand for these groups should care become free, it is necessary to estimate their current position on the graph, ie, what proportion of the total cost they currently pay and thus what their current level of demand is as a ratio of full-cost demand. By using this as a baseline we can estimate what their likely increase in utilisation would be if they were to receive free care. For example, if a group is currently

paying half of the full-cost fee, their utilisation is estimated to represent 117% of full-cost utilisation. If they were to receive free care, we could expect them to represent 151% of full-cost utilisation. The increase in demand for this group is therefore estimated to be 151/117, or 129% of their current utilisation. In other words, we would expect their demand to increase by 29%.

The Rand HIE also clearly showed that although Figure 1 represents the overall population's responsiveness to price changes, some groups are more or less responsive than this average.[10,12] In particular, children and lower-income earners were more responsive to price changes than adults and higher-income earners. Therefore, in calculating the expected changes in utilisation, appropriate adjustments were made for these groups. Community services card (CSC) status was used as a proxy for income group.

The Ministry of Health provided estimates of current consultation numbers. It was assumed that children under six years old already receive free care and therefore no change in demand is expected. This may not be entirely accurate, but a 2001 survey of 180 GPs by IMS Health showed that 70% of GPs never charge for children under six and only 5% always charge.[15] Costs are otherwise calculated assuming a standard GP consultation charge of $38. This figure was estimated using a number of sources.[16,17]

Doctors' responses to increased demand The Rand HIE determined utilisation changes due to a 'pure demand' effect of changes in user charges. This means it did not take into account doctors' responses to the increases in demand. The patients enrolled in the experiment made up only a very small part of each doctor's practice. Therefore, even if the enrolled patients increased their demand by 50%, their doctor would not notice any appreciable increase in workload and would be unlikely to respond.

If, as predicted, the public's demand for general practice consultations increases by 28% it seems likely that GPs would act to control this increased workload.

Unfortunately, there is limited empirical evidence about this type of situation. Observational studies suggest that where changes in user charges have been introduced to an entire system (in Great Britain in 1948, Saskatchewan in 1968, and Montreal in 1970), changes in utilisation do seem to have been lower than the Rand HIE suggests.[18–20] New Zealand studies of subsidy changes also suggest lower elasticities of demand.[21,22] Because of these uncertainties, estimates are given for costs at two lower estimates of increased overall utilisation (14% and 7%, Scenarios B and C respectively).

The price of complements A further complication of estimating changes in utilisation of general practice care is that demand is likely to be affected by the price of what economists call 'complements' as well as the price of GP consultations. A 'complement' in this context is any service or good that people usually purchase at the same time as the GP consultation. Important complements are medicines and diagnostic tests. The implication of this is that even if GP consultations are free, people will still perceive a cost in seeing a doctor if they expect to pay for a prescription or some other service. For example, if an adult without a CSC now expects to pay $38 for a consultation and $15 for a prescription (total $53), then under free primary care they will still perceive a cost of $15.

If we make the assumption that patients base their demand on the price of the GP consultation and the cost of one prescription, we can recalculate the increase in demand for different groups using the same techniques as previously (Scenarios D and E).

The cost of other health service utilisation changes The Rand HIE suggested that changes in demand for medicines and diagnostic tests were in direct proportion to changes in demand for doctor visits.[12,14] It was therefore assumed that a 10% increase in the utilisation of GP consultations will lead to a 10% increase in the use of medicines and other referred services.

The Rand HIE also found that decreasing user charges for doctors' visits led to an increase in hospital admissions, although this increase was only about one fifth of the rise in visit utilisation (when hospital services were free throughout).[10,11]

No attempt was made to calculate what changes would occur in the use of mental health or disability support services as there is no information available on how the utilisation of these services alter with changing primary care utilisation.

Results

Payment for current GP services In the year ending June 1999, $262 million was spent by private sources on GP services ($197 million out-of-pocket and $65 million by insurance companies).[13]

The cost of paying for new general practice services Based upon the Rand HIE, Table 1 shows that if all user charges for general practice consultations were removed we could expect an increase in the demand for consultations of between 19% and 47% depending upon the group involved, and 28% overall. The cost of paying for these extra consultations is calculated at $202 million.

Table 1. Calculation of increased number of consultations and costs associated with free general practice

Group	Demand increase (%)	Current consults (n)	New consults (n)	New costs ($)
Non-ACC				
Child Y		2 884 020	0	
Child J				
Card holder	47	974 789	456 419	17 343 917
Non-card holder	32	938 347	297 630	11 309 935
Adult				
Card holder	39	5 644 789	2 215 069	84 172 640
Non-card holder	28	6 095 011	1 716 388	65 222 751
Total	28	16 536 956	4 685 506	178 049 242
ACC				
Child Y		16 335		
Child J				
Card holder	39	133 060	51 312	1 949 875
Non-card holder	29	264 062	65 018	2 470 695
Adult				
Card holder	30	764 539	229 955	8 738 280
Non-card holder	19	1 526 371	283 889	10 787 777
Total	23	2 704 367	630 174	23 946 627
TOTAL Non-ACC +ACC				
Child Y				
Child J				
Card holder				19 293 791
Non-card holder				13 780 630
Adult				
Card holder				92 910 920
Non-card holder				76 010 528
TOTAL				**201 995 869**

The cost of other health service utilisation changes Table 2 shows costs for various referred services for 1998/99 and calculated new costs given increased demand due to free general practice care in the base scenario. Twenty eight per cent increase in demand is used for public and private expenditure and 23% for ACC expenditure.

Table 3 shows the equivalent costs for increased use of medical and surgical hospital services. The cost of providing for the increased utilisation of hospital services is calculated at $136 million.

Table 2. Referred service costs for free general practice care, 1999 ($ millions)[13]

	Public		ACC		Total new cost
	Existing	New	Existing	New	
Medicines	763.4	215.7	1.5	0.3	216.0
Specialist	21.9	6.2	19.8	4.6	10.8
Laboratory	205.6	58.1	0.3	0.1	58.2
Physiotherapy	0	0.0	57.9	13.3	13.3
Diagnostic	29.7	8.3	44.8	10.3	28.6
Other	17.1	4.8	7.6	1.7	6.5
Total		**293.0**		**30.3**	**323.3**

Table 3. Existing and new costs for institutional medical and surgical care, 1999 ($ millions)[13]

	Public		ACC		Total new cost
	Existing	New	Existing	New	
Public institutions	1956.9	121.6	103.5	6.5	128.1
Private institutions	110.1	6.8	8.8	0.6	7.4
Total	**2067.0**	**128.5**	**112.3**	**7.0**	**135.5**

Overall cost of free general practice care The total cost of free general practice care to the Government according to these calculations is in the order of $922 million (Scenario A, Table 4).

Table 4. Total new costs to the government of free general practice care ('pure demand' effect)

Category of costs	Scenario A ($ million)
General practice	
Transfer of current user charges to government	262
Costs of extra consultations	202
Other	
Referred service costs	323
Hospital costs	136
Total	**922**

Doctors' responses to increased demand The above costs do not take into account doctors' responses to increased demand. As discussed above, it is assumed that GPs do act effectively to reduce this increase in utilisation by 50% or 75%. Therefore, there is a 14% or 7% increase in use of GP services rather than 28%. The total cost to the government with this scenario is therefore $592 or $428 million (Scenarios B and C, Table 5).

Table 5. Total new costs to the government of free primary care (with GP response)

Category of costs	Scenario B 50% of 'pure demand' utilisation increase ($ million)	Scenario C 25% of 'pure demand' utilisation increase ($ million)
General practice		
Transfer of current user charges to government	262	262
Costs of extra consultations	101	51
Other		
Referred service costs	161	81
Hospital costs	68	34
Total	**592**	**428**

The price of complements Table 6 is calculated using the additional assumption that patients base their demand on the price of the GP consultation and the cost of one prescription. The overall increase in demand for GP consultations with this assumption is 15% (compared with 28% previously). Again, this increase can be halved to account for doctor's response to this demand increase. Table 6 indicates that the cost to Government with these assumptions is $435 million or $349 million (scenarios D and E).

Table 6. Total new costs to the Government of free primary care (with GP response and accounting for continued prescription costs

Category of costs	Scenario D 50%of 'pure demand' utilisation increase ($ million)	Scenario E 25% of 'pure demand' utilisation increase ($ million)
General practice	262	262
Transfer of current user charges to government	54	27
Costs of extra consultations		
Other	84	42
Referred service costs	35	18
Hospital costs		
Total	**435**	**349**

Discussion

Before any major change in health policy is made, it is important to at least estimate the likely costs and benefits. This study has attempted to estimate the costs of providing free primary care in New Zealand. Perhaps one of the outstanding results of attempting this process is the realisation of the degree of uncertainty there must be around these estimates. They are based upon limited data, estimates of price elasticity that may not be valid in the New Zealand situation, and several important assumptions.

Accounting for current user charges might seem to be the simplest part of this exercise. Yet user charges for GP consultations are not currently recorded on a national basis. The estimate used here is taken from the Ministry of Health publication *Health Expenditure Trends in New Zealand 1980–1999* and this in turn is extrapolated from the Household Economic Survey.[13] An alternative approach is to multiply the estimated annual number of GP consultations by an estimate of user charges in each group. User charges can be estimated by deducting the GMS subsidy from the estimated average charge of $38. This approach, however, gives a much greater figure of $433 million as the total cost of GP user charges. The majority of the $171 million difference can probably be explained by the fact that GPs often do not charge for consultations, or charge substantially less than their normal fee. Tilyard and Dovey showed that in one region in 1993 GPs charged their normal or advertised fee in only 37% of cases.[23]

Estimates of increased GP use and referred service and hospital use are based upon the Rand HIE. This was a randomized controlled trial that compared health service utilisation among groups of people who were subject to different co-payments. This paper assumes that the differences in utilisation by groups facing different co-payments can reasonably be equated to changes in demand that would occur if people faced equivalent co-payment changes. The Rand HIE was carried out in several centres in the USA in the late 1970s. The elderly and many people with disabilities were excluded from the study because they were already covered by public health insurance. Using a 25-year-old study, performed in the USA, which excluded important groups of the population is clearly less than ideal. However, it is the only experimental study of this sort ever performed and the only study that has looked at utilisation over a range of user charges.

It is not surprising that decreasing the cost of general practice consultations will lead to an increase in demand and utilisation of these services. However, the shape of the curve in Figure 1 is perhaps less predictable than one would think and has important implications. It shows that the majority of patients' response to user charges occurs with small charges. The size of demand increases when shifting from full user charges to 25% user charges were much smaller than those that occurred when shifting from 25% user charges to free care. If this were to be repeated in New Zealand it would have two important implications. First, even though many patient groups in New Zealand already receive substantial subsidies for general practice care, if their care became free we should expect large demand increases. Second, if the Government did wish to limit demand increases, whilst reducing the financial burden of primary medical care on households, this could be achieved by maintaining modest user charges.

Whilst the Rand HIE provides the best available information on increased demand for doctors' consultations with decreasing user charges, it tells us nothing about how doctors might respond to this increased demand. It seems clear that doctors have some degree of control over utilisation of their services, even when they have no control over price.[24–26] If changes in user charges are introduced to an entire health system the size of utilisation changes may well be smaller than expected.

When free care was introduced to Great Britain in 1948 it was estimated that utilisation of physician visits, for those groups not previously covered by National Health Insurance, increased between 10.7% and 16.2%.[18] The introduction of free

care in Montreal in 1970 led to a 21.8% increase in utilisation of office or home visits, balanced by a reduction in phone consultations and hospital-based care (which was already free).[19] The introduction of a 33% co-payment for office visits in Saskatchewan in 1968 saw a fall in utilisation that was estimated to be between 5.6% and 7.2%.[20]

In New Zealand, an opportunity to study the effect of moving from subsidised GP consultations to free care for children under six years occurred with the introduction of the Free Child Health Care Scheme (FCHCS) in 1997. An evaluation compared GP utilisation for the year prior to the scheme's introduction with the year following introduction.[21] Depending upon the database analysed, the increase in utilisation was estimated at between 6% and 23%. Another New Zealand study examined utilisation changes that occurred with changes in GP consultation subsidies in 1992 and again suggested a lower price elasticity of demand than the Rand HIE (about 18%).[22] The degree to which doctors may wish to exercise this control with the introduction of free care will depend upon the circumstances in which it is introduced. If doctors are paid under a capitation arrangement they will have a greater incentive to control demand than if they are paid by fee-for-service. The supply, morale and workload of doctors will have a strong impact upon the increased provision of services. The number of doctors in primary care is currently declining, and if this were to continue it would limit any increase in utilisation. Nurse and other primary care professional consultations may be substituted for GP consultations and the ability and willingness of these healthcare professionals to meet increased demand will also be important factors.

One of the alleged shortcomings of user charges for primary care is that they raise overall costs by causing people to delay seeking care, leading to worsening of conditions and the subsequent need for more intensive and expensive care (especially hospitalisation). Certainly, there would seem to be considerable scope for primary care to prevent hospitalisations. Nineteen per cent of hospitalisations in New Zealand in 1996 and 1997 were classified as ambulatory sensitive hospitalisations meaning that they were potentially avoidable by utilisation of good primary care.[27] The rate of ambulatory sensitive hospitalisations has been increasing over the last decade.

However, the Rand HIE clearly showed that, for adults at least, decreased user charges for primary care led to an increased utilisation of hospitals.[10,11] It is certainly not clear that this should be regarded as a negative effect. It may be that increased utilisation of primary care allowed the recognition of disease that had been previously under-treated. It should also be noted again that the Rand HIE excluded many who might have benefited most from the primary care management of chronic disease, ie, the elderly and those eligible for Medicaid. Further, the experiment followed enrolled patients for three or five years only.

A further issue is that the provision of free primary medical care in New Zealand might encourage a change in style of practice as well as an improvement in access. Free care would assist the primary care sector in taking a population and preventive focus. This, in turn, may lead to an improvement in health and reduced hospitalisation.

In summary, the costs to the Government of providing 'free' general practice care are very difficult to estimate with any accuracy. What is clear is that when trying to

estimate these costs it is important to move beyond simple estimates of how much is currently privately paid for general practice services. If the primary reason for making general practice free is to improve access we must expect some increase in utilisation of these services. Compensation for this increase in utilisation is essential. In addition, any increase in utilisation will have implications in downstream costs that are likely to be large. Pharmaceutical, laboratory and other referred service costs will increase, and it is quite possible that hospital costs will also increase. Certainly, it would seem to be naive to assume they will decrease.

Estimates based upon the Rand HIE made in this article vary widely from $349 million to $922 million depending upon assumptions. A best estimate would include some degree of limitation on increased utilisation due to doctors' responses and a further reduction due to the continued costs of medicines and other complements. This would imply a total expense to the government of between $435 and $592 million (scenarios D and B). These costs need to be balanced against potential benefits, which are not discussed here.

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Is the PRIME (Primary Response In Medical Emergencies) scheme acceptable to rural general practitioners in New Zealand?

Todd Hore, Gregor Coster and Janne Bills

Abstract

Aim To ascertain the level of acceptance of the PRIME (Primary Response In Medical Emergencies) scheme by rural general practitioners (GPs) in New Zealand.

Methods A nationwide, anonymous, postal/email questionnaire was sent to 536 rural/semi-rural GPs, inquiring as to their involvement in and opinions of emergency care, and the acceptability of the PRIME scheme.

Results The overall response rate was 42%. PRIME training courses and PRIME equipment were regarded as excellent. However, concerns were raised by both PRIME and non-PRIME groups regarding the quality of triaging information given during emergencies and levels of remuneration for call-outs (especially medical call-outs). Additional concerns included lack of flexibility with the PRIME contract in some areas. Some GPs were also concerned that their involvement was less about providing a higher skill level in resuscitation than about filling the gaps in the already-stretched rural ambulance services, which was not the intention of the PRIME scheme.

Conclusions The inclusion of rural GPs in emergency care teams needs to be recognised and adequately remunerated, and these issues should be reflected in the ongoing development of pre-hospital emergency service contracts.

Before the development of a nationally consistent plan to manage medical emergencies in the pre-hospital setting, the provision of emergency services in rural New Zealand was often dependent on finding the best local solutions through the knowledge and goodwill of concerned rural community members and local health professionals. In many areas, a strong collegial relationship developed between the emergency services, in particular volunteers and the rural general practice team, who provided advanced resuscitation skills. However, this produced inconsistencies in standards and practices between different regions.[1]

The 1993 health reforms introduced competitive contracting that began to undermine the cohesiveness and goodwill of the rural emergency team. The contracting process did not take into consideration the important role played by rural GPs and, in some areas, advanced rural nurses. Centralised emergency communication centres, familiar with the urban model, using paramedics for advanced skills, generally did not see a role for GPs. They also did not see a need to notify rural GPs of an emergency in their local community, despite the absence of paramedics in rural areas. Dedicated rural GPs were isolated from the new communication systems, which perpetuated poor communication between the local emergency services and rural GPs, although this was often not the wish of the local ambulance services. Inconsistency of training,

knowledge and skills in the emergency situation played some part in the reluctance of the ambulance services to acknowledge the GP role.

The PRIME (Primary Response In Medical Emergencies) scheme was developed in 1995, the objectives being to provide both a coordinated response and consistent, appropriate management of trauma and medical emergencies in rural locations. The Southern Regional Health Authority (SRHA) funded the creation and development of the scheme as Stage One of their regional Trauma Service Plan. The scheme embraced the pre-hospital emergency care recommendations of the Royal Australasian College of Surgeons Trauma Committee.[2] This scheme would incorporate the rural GP (and, in some areas, advanced rural nurses) with standardized training into the pre-hospital emergency team. The scheme was trialled in 1998 in the SRHA region, funded jointly by the Accident Compensation Corporation (ACC) and SRHA with the support of Hon. Bill English (then Minister of Health); it was extended to the rest of the nation in 1999.

The PRIME scheme was incorporated into the Ministry of Health 'Roadside to bedside' strategy published in 1999. This document highlighted a concern regarding the integration of health services, stating:

> 'It is also important that integration does not inhibit flexibility in the approach and mode of service delivery, especially in rural areas where there are special challenges caused by distance, geography and population size.'[3]

The PRIME service provider is required to have undertaken a PRIME training course (approved by ACC), within a maximum of two years after signing up with the scheme, followed by a two-day refresher training course for trauma and medical emergencies (approved by ACC) at least once every two years. The PRIME service provider is also required to have access to the PRIME medical kit and a form of communication (eg, pager, cellular phone or ambulance radio). The PRIME scheme requires the service provider to respond within a local roster system that provides cover 24 hours a day, 365 days of the year. The key objectives of PRIME are primary assessment, essential resuscitation, and the rapid and safe delivery of patients to the appropriate place of definitive care.

The PRIME scheme utilises the skills of rural GPs and/or rural nurses (RNs) in areas where an ambulance crew (two ambulance officers, where one is a paramedic) is more than 20 minutes away (40 minutes in the South Island). There are currently 266 PRIME service providers in New Zealand (including both rural GPs and RNs). The PRIME network is activated via a pager, in most cases, by the regional communications centre (RCC) following a 111 call, where the nearest paramedic response is more than 20 minutes away. Remuneration for call-outs is dependent upon whether the call results from trauma or a medical condition. PRIME providers receive a monthly retainer for medical call-outs, while trauma call-outs are covered by an ACC claim.

This paper presents the findings of our research, which aims to ascertain the level of acceptance of the PRIME scheme by rural GPs in New Zealand.

Methods

An anonymous postal questionnaire was sent to New Zealand rural GPs inquiring as to their level of involvement in and opinions of emergency care. Questionnaire design and content were the result of

consensus among a panel comprising rural GPs, executive members of the Institute of Rural Health and the NZ Rural GP Network Inc. The questionnaire contained a mixture of tick boxes, Likert scales and open-ended questions, designed using Microsoft Forms™. Likert scales ranged from 1 to 5. A ranking of 1 was equivalent to a ranking of 'excellent' or 'strong agreement' with the statement, while a ranking of 5 was equivalent to a ranking of 'poor' or 'strong disagreement' with the statement. The resulting averages were then compared between groups for statistical significance where possible.
Ethical approval was obtained from the University of Auckland Ethics Committee. Rural and semi-rural GPs were identified using a database provided by the Department of General Practice and Public Health, Christchurch School of Medicine and Health Sciences, University of Otago. Questionnaires were sent to 536 rural/semi-rural GPs; 105 GPs received the electronic questionnaire via email and the remaining 431 GPs received the questionnaire via normal post. Questionnaires were sent out during mid to late December 2001 and a reminder notice was sent out to non-respondents in mid January 2002.
In compensation for the time taken to complete the questionnaire, a letter of acknowledgement for Maintenance of Professional Standards (MOPS) accreditation was sent to those GPs who responded. This letter allowed the respondents to claim one MOPS point from the Royal New Zealand College of General Practitioners (RNZCGP). To maintain anonymity, the GPs were asked to confirm/provide return address details on a slip with the completed questionnaire. A third party (not involved with the research) then separated the completed questionnaire from the return address slip. Questionnaires returned via email were stored separately from their email addresses so that no association could be made between the questionnaire and the respondent.
The questionnaire sought demographic information, previous experience in emergency medicine, opinions regarding emergency resources/services, and level of involvement in emergency healthcare in the respondents' respective regions. PRIME GPs' opinions were canvassed as to their experience and satisfaction with various aspects of the PRIME scheme. Non-PRIME GPs were asked to clarify their reason(s) for not signing a contract to be involved in PRIME.

Results

A summary of the results is presented in Figure 1.

Figure 1. Summary of results from questionnaire

- PRIME GPs are extremely satisfied with the quality of training and equipment provided by the PRIME scheme
- Many rural GPs regard the PRIME scheme as being inflexible regarding availability of the scheme and on-call commitments
- PRIME GPs are concerned with the quality of triage information
- Some rural GPs are concerned they may replace the need for ambulance services in their area. This, however, is not the intention of the PRIME scheme
- PRIME and non-PRIME GPs are concerned about remuneration for call-outs, especially non-trauma call-outs

Overall, 290 replies were received. Completed questionnaires were received from 224 rural/semi-rural GPs (24 via email, 200 via normal post), providing an overall response rate of 42%. Eight were late/incomplete questionnaires, and 58 were returned stating relocation or retirement (9 via email, 49 via normal post). Of the completed questionnaires, 91 (41%) were from PRIME GPs (P group) and 133 (59%) from non-PRIME GPs (NP group). Currently, there are 266 registered PRIME providers (196 GPs and 70 Registered Practice Nurses); therefore, we were able to sample 46% of PRIME GPs.[4] The majority of rural GPs were male (74.6%) with no gender difference between the two groups. Mean age of rural GPs was 45.6 years, with P group significantly younger than NP group. The overwhelming majority of

rural GPs were NZ European for both groups. The average Rural Ranking Scale (RRS) was 47.3 points, with a higher RRS for P group.

Table 1. Demographic profile of rural/semi-rural GPs who completed the questionnaire

	PRIME GPs (n=90)*	**Non-PRIME GPs** (n=134)*	**1999 NZ Rural GP Survey[1]** (n=338)
Gender (%)			
Male	74.4	74.6	72.2
Female	25.6	25.4	27.8
Age in years	43.2† SD [6.9]	51.4† SD [8.6]	44.1
Ethnicity (%) (may choose multiple)			
NZ European	91.2	88.1	93.0
Maori	2.2	3.0	2.4
Pacific Islander	1.1	0	0.6
Indian	0	0.7	N/A
Other	5.5	7.4	5.8
Career length as rural GP (%)			
<5 years	18.7	15.8	
5–9 years	23.1	21.8	<10 years = 13.9
10–19 years	41.8	30.8	45.1
20–29 years	15.4	24.1	29.4
>30 years	1.1	6.8	11.6
Rural Ranking Score	54.2† SD [16.0]	42.4† SD [16.2]	N/A

*number of respondents varies due to non-response to some questions.
†statistically significant, p = <0.001

A significantly greater proportion of NP group (22%) are reliant on work experience as their only source of emergency medical training compared with P group (2%). Other sources of emergency medical training included the Rural Trauma and Emergency Care Roadshow, RNZCGP courses, Goodfellow Unit courses and training courses in anaesthesia. NP group contained 4% who had trained as PRIME GPs and since left the scheme. The PRIME training courses were distributed throughout New Zealand and were regarded as outstanding by the majority of P group (1.7 on five-point Likert scale). P group (1.7) also regarded PRIME retraining as highly desirable. Almost all rural GPs carried some form of basic medical emergency equipment, such as a stethoscope, sphygmomanometer, gloves, bandages, analgesia and inotropes. However, there were some marked differences between both groups regarding the carriage of advanced medical emergency equipment. For instance, a significantly greater proportion of P group (82.3%) carried a chest drain than NP group (19.5%). The majority of P group (93.7%) carried a laryngoscope; fewer carried one in NP group (60.2%). Therefore, a greater proportion of P group are able to provide advanced airway support. Regarding advanced life support, a greater proportion of P group (45.6%) carried a defibrillator than NP group (22.0%). Also, a greater proportion of P group (79.7%) carried cervical collars than NP group (41.5%). In light of these differences, P group (2.0) were slightly more confident than NP group (2.8)

regarding adequacy of medical equipment for attendance at any emergency call-out. P group carried more equipment than NP group, as identified from a selected list of emergency medical equipment.

The PRIME scheme is still in its infancy and some GPs are inadequately informed to consider joining. Some are ineligible for the PRIME scheme. Many among NP group declared they were too busy within their practice, local rural hospital and with commitments outside of work to join. Some GPs within NP group are willing to join but cannot do so because other doctors in the area are not willing to be part of the PRIME scheme roster. Difficulties in attending PRIME training courses were also quoted as being a problem. Additional reasons included lack of communication between PRIME coordinators and GPs; living too far away from the practice at which they would be on call; lack of willing among other practices to share after-hours emergency cover; and reluctance to encroach on the role of the St Johns ambulance service.

Table 2. Reasons given by non-PRIME GPs for not joining PRIME scheme

Reason	**%** (n=125)*
Remuneration for time on call in the PRIME scheme is inadequate.	36.8
The demands at my practice are already too great to consider participating in PRIME	33.6
Remuneration for a medical emergency call-out in the PRIME scheme is inadequate	33.6
The PRIME scheme does not apply to my region	28.8
Remuneration for an accident emergency call-out in the PRIME scheme is inadequate	27.2
I don't know enough about the PRIME scheme	26.4
I am too busy outside of work to have looked into the option of participating in PRIME	14.4
I am unable to attend PRIME training courses	14.4
I am interested, but other doctors I work with are not willing to participate in the PRIME scheme	12.8
I am on call for my rural hospital.	12.0
I was involved in the PRIME scheme in the past [all for less than 1 year], but have since withdrawn	11.2
Other	8.8

*number of respondents varies due to non-response to some questions

On average, both groups thought there was a good level of communication with other emergency services. However, there was some concern by P group (2.5) regarding the level of communication with the regional communications centre (RCC) in the notification of the emergency. Both P group (3.1) and NP group (2.9) were concerned by the quality of triage information supplied to them in the event of a medical emergency. Due to poor triage information, many GPs believed they were being called out inappropriately. GPs in both groups regard the level of triage information to be a major concern within the PRIME scheme. Of the NP group, 11% had been involved with the PRIME scheme in the past, all participants having been affiliated with the scheme for less than one year. Reasons for leaving included poor triage information and increased workload. On average, both groups believed they had usually been of some benefit at the last 10 emergencies they attended. P group (3.3)

shared mixed views as to the level of feedback from PRIME coordinators after a PRIME call-out.

Remuneration was thought to be insufficient overall, however P group believed that remuneration for equipment used and trauma call-outs is considerably better than remuneration for time on call and medical call-outs. This reflects a positive funding aspect of the PRIME scheme. For many of NP group, inadequacies in remuneration for time on call, medical call-outs and trauma call-outs are acknowledged as the reason(s) for not joining the PRIME scheme.

Table 3. Remuneration under the PRIME scheme

Level of remuneration is sufficient for the following:*	**PRIME GPs** (n=91)†	**Non-PRIME GPs** (n=132)†
Equipment used	2.9‡	4.4‡
Time on call	4.0‡	4.6‡
Medical call-out	4.4	4.4
Trauma call-out	2.8‡	4.5‡

*Likert scale: 1=strongly agree; 5=strongly disagree
†number of respondents varies due to non-response to some questions
‡statistically significant, p = <0.001

The majority of P group (80.9%) have been PRIME service providers for less than two years, with approximately one third being providers for less than one year. GPs from P group had indifferent opinions regarding their ability to manage both rural general practice and the PRIME scheme effectively (2.4). The overall satisfaction with the PRIME scheme amongst P group was mixed (2.6).

Discussion

The involvement of rural GPs in emergency healthcare has been proven to be crucial in improving outcome, especially in severe emergencies in which resuscitation and stabilization are often required before patient transfer. Less severe emergencies may also be managed by the rural GP, therefore saving costs.[5] From the results of this study, it has been possible to identify aspects of the PRIME scheme that are outstanding and others that need improvement. The questionnaire response rate (42%) was lower than expected. Several factors may have been responsible. The timing of the questionnaire over the Christmas and New-Year period was not ideal. Also, the demanding workload and stressful conditions placed on rural GPs today may have contributed to the low response rate.

Demographic data are consistent with those of a recent survey of New Zealand rural GPs.[6] The groups differed in age and rural ranking scale (RRS). The difference between the average ages of the groups may lie in the appeal of the PRIME scheme to the younger GP. The difference in RRS may reflect the appeal of the PRIME scheme to the more-remote rural GP. Distance from the base hospital and/or other colleagues may mean that the remotely situated GP has no choice but to be involved.

The PRIME scheme provides the advantage of a high-quality training course, which was well received by all who attended. Regular refresher courses (ie, at least once

every two years) are also welcomed by P group, although some were unaware of when these courses would take place. Some have found it difficult to attend the week-long training course or refresher courses due to work commitments. Reasons given included staffing inadequacies and the difficulty and/or expense of obtaining locum cover for the week. One suggestion offered by a participant was to run the full training course over several weekends. This has already been tried in the South Island, at Queenstown and Motueka.

P group also carry more emergency medical equipment than their NP-group colleagues, which illustrates another advantage of the scheme. In some areas, PRIME service providers are asked to share the PRIME kit. There has been a request that each service provider have their own PRIME kit, which they may then carry at all times. Some amongst P group have recently been supplied with a green emergency light for their vehicles by the ambulance service as part of their contract. A small number of NP group have already taken the initiative to equip themselves with a green emergency light for their own vehicle. Both groups support the addition of an emergency light for their vehicle, as it allows other motorists to give way to the doctor/rural nurse in the event of an emergency.

Many GPs view the PRIME scheme as being too inflexible. Some GPs would like to be on call from home due to family commitments; others cannot commit to 24-hour, 365-day cover. This excludes them from joining the scheme. Some GPs wish to join the PRIME scheme but cannot due to a lack of support from peers. This may be partially alleviated by training rural nurses, although this raises medicolegal issues (eg, drug administration/prescribing rights). Strict protocols and audit procedures were a disincentive to some, whilst others were discouraged when asked to share PRIME contracts between practices.

The PRIME contract states clearly that the PRIME GP is required to be on call according to a roster system that provides emergency medical cover 24 hours a day, 365 days of the year. However, this may cause significant disruption if call-outs occur during the working hours of the surgery. Patients waiting in the rural GP's surgery either need to be rescheduled or seen by another GP (if present).

P group expressed disappointment over the lack of information supplied by the RCC during an emergency call-out. Some GPs from P group were frustrated by inappropriate call-outs by the RCC. GPs who had left the PRIME scheme reiterated this frustration. In contrast, P group GPs in North Canterbury report that they can wait for further information if the distance involved is great and/or the triage information is vague or apparently non-urgent, especially if the GP is busy at that time. Rural GPs report that they are extremely busy with their current workload and requests have been made for emergency call-outs to be more focused on situations that require immediate care.

The majority of GPs in both groups agreed that they received acceptable levels of communication from local ambulance services. Some consider it satisfying to support local ambulance services. However, some GPs (in both groups) do not share this view and complained of poor coordination/cooperation between the GP/RN and ambulance services. Regular joint exercises plus work/social meetings may help alleviate this problem.

Some GPs believed that by being trained and employed in emergency care through the PRIME scheme, they would remove the need for specialist ambulance staff in their area: 'The PRIME scheme is using GPs to cover for reduced commitment to local St Johns.' This could be a view reflected by ambulance staff and may lead to poor communication within a rural locality. However, this was never the aim for GP involvement in the PRIME scheme. The scheme is designed to provide a coordinated response to medical emergencies in rural locations and utilise the advanced resuscitation skills of the GP team to complement the volunteer ambulance staff in the absence of rural paramedics.

All trauma call-outs are funded by ACC; however, P group are offered increased remuneration compared with NP group. In addition, P group also receive a retainer for making themselves available for emergency medical call-outs, which is **not** available to NP group. A strong message from rural GPs is that neither is enough, although P group regarded remuneration for trauma call-outs as somewhat improved. It is important to note that on average there is no difference in the time taken to attend a medical call-out versus a trauma call-out. P group suggested that remuneration for medical call-outs should mirror that for trauma call-outs. P group expressed significant dissatisfaction with the inadequate on-call remuneration, with one GP (P group) stating that remuneration for time on call was 'merely a token gesture'. Generally, P group did not regard the payment for time on call as adequate and believed that it should be increased to a more realistic amount.

In summary, the PRIME scheme has significant potential to improve the outcome for individual patients who suffer from trauma/medical emergencies in rural communities. The improved outcome is expected to result from the seamless integration of a quality ambulance service and a well-prepared rural general practice team, who can contribute advanced resuscitation skills in the emergency situation. There is no doubt that rural GPs/nurses make a major contribution to both the quality and quantity of emergency medical services, but they cannot replace the specialist ambulance staff. Inclusion of rural GPs in the emergency care team needs to be recognised and adequately remunerated. The continued development of pre-hospital emergency service contracts should reflect this. We must ensure that we do not overwork our rural GPs/nurses, as they are rare and precious to New Zealand.

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Acute extensor hallucis longus tenosynovitis caused by gonococcal infection

Shihab Faraj and Derek Stanley-Clarke

We report here an unusual case of acute septic extensor hallucis tendon tenosynovitis caused by *Neisseria gonorrhoeae*, not associated with arthropathy, septic arthritis or other manifestation of disseminated gonococcal infection. To our knowledge there has been no such case reported before.

Case report

A thirty-eight-year-old female was admitted with a swollen, painful, right foot.

She gave a history of gradual deterioration of pain and discomfort in the right foot one week after arrival from a trip to a Pacific Island, eventually becoming unable to bear weight on it. There was no history of trauma, gout or systemic arthritis.

The patient had vaginal and cervical swabs undertaken by her general practitioner for gonorrhoea six months prior to her presentation and these were repeated one week before her presentation; both sets of results came back negative.

Examination findings revealed that she was afebrile with no skin rash and the pertinent findings were restricted to her right foot.

The dorsum of the right foot was red, warm and swollen. The swelling extended to the ankle joint area. The patient experienced marked tenderness along the extensor tendon sheath, particularly the extensor hallucis longus (EHL) tendon. Pain was induced mainly by passive plantar flexion of the big toe. The ankle joint movement was relatively restricted.

Blood tests showed a white blood count of 12.2 E9/l, an ESR of 70 mm/hr and normal serum uric acid.

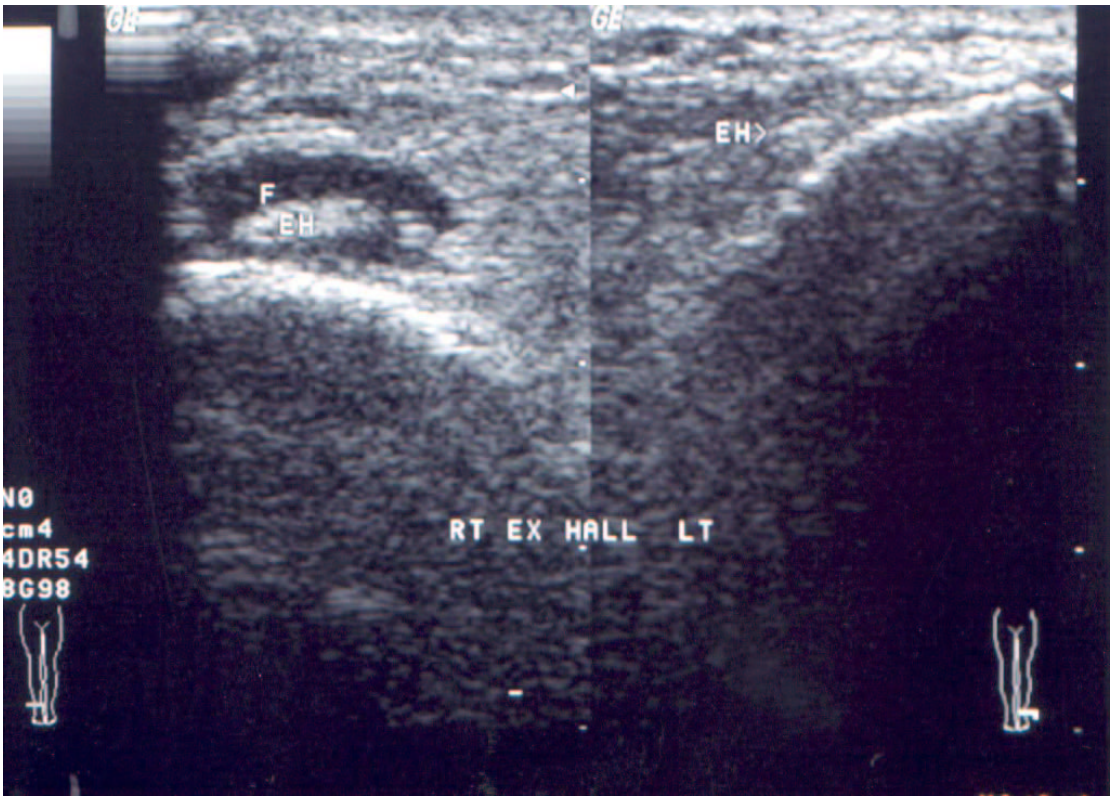
A radiograph of the foot revealed moderate soft-tissue swelling around the ankle and dorsal aspect of the foot. There was no bone or joint involvement.

Ultrasound examination of the right foot demonstrated subcutaneous oedema of the dorsal aspect of the foot and a moderate amount of fluid around the EHL tendon, but the tendon itself appeared normal in size and moved freely. No ankle joint effusion was seen on the scan (Figure 1).

A provisional diagnosis of acute EHL tenosynovitis was made. To confirm the diagnosis and the nature of the tenosynovitis, a needle aspiration was performed under ultrasound guidance. A small amount of fluid was aspirated and sent for culture and sensitivity. This came back with heavy growth of *Neisseria gonorrhoeae* sensitive to ciprofloxacin.

The patient was treated successfully with oral ciprofloxacin then referred to the sexually transmitted diseases clinic for further management.

Figure 1. Coronal section of ultrasound examination of extensor hallucis longus of both sides showing the fluid inside the right tendon sheath



Discussion

Disseminated gonococcal infection can produce an inflammatory reaction in the joints and synovial membranes. It is usually associated with polyarthropathy, affecting the wrist and the knee joints.[1,2] The ankle, shoulder, elbow and small joints of the fingers and toes can also be involved.[3]

Keiseler,[3] Harris,[4] and Colin and Weissman[5] described inflammation of the extensor tendon of the hand, but in all these cases joints were involved.

Schaefer et al reported a case of acute flexor gonococcal tenosynovitis of the middle finger with symptomatic gonococcal pharyngitis in a 15-year-old boy.[6]

Ultrasound is a quick and effective way to differentiate between joint infection and infected tendon in the ankle or wrist areas where fluid accumulation is the clue to the infected site.

Intervention ultrasound yields accurate placement of the needle tip and subsequent aspiration of the tendon sheaths or joint spaces.[7,8]

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An unusual cause of gastrointestinal obstruction: bezoar

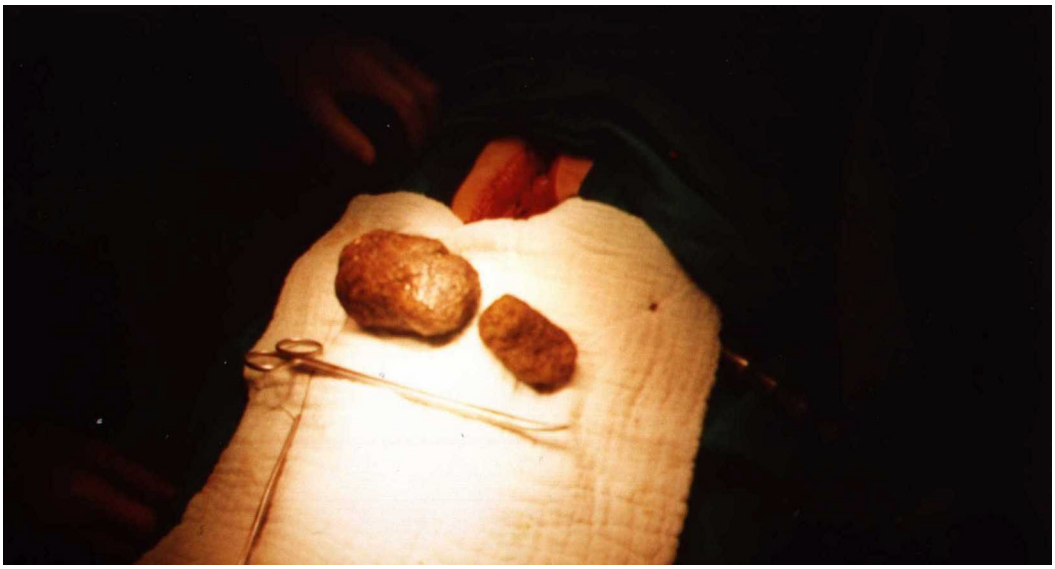
Tanju Acar, Salih Tuncal and Raci Aydin

Bezoars are conglomerates of undigested material in the stomach that appear as a late complication of gastric surgery and have become increasingly recognised as a cause of intestinal obstruction. The pathogenesis of bezoar after gastric surgery is not clear and hypotheses are speculative. Most reported cases come from Mediterranean countries where persimmons, oranges and vegetables are commonly ingested.[1] Gastric bezoars have also been reported in patients with diabetes mellitus, with no antecedent gastric surgery, who have neuropathy or myotonic dystrophy.[2]. In some countries where persimmon ingestion is common, intestinal obstruction due to phytobezoar formation has been reported in epidemic numbers.[3] The current report describes acute intestinal obstruction due to phytobezoar following truncal vagotomy and gastrojejunostomy operation in a 58-year-old woman.

Case report

A 58-year-old female underwent a truncal vagotomy and gastrojejunostomy operation seven years ago for a duodenal ulcer refractory to medical treatment. She had been well until four weeks before presentation, when epigastric discomfort, abdominal pain and vomiting occurred. On gastroscopic examination, a foreign body causing obstruction had been detected. The patient underwent operation due to continuous vomiting despite intravenous fluid administration and cessation of oral feeding.

Figure 1. Two synchronous bezoars removed through gastrotomy and enterotomy. The larger one was removed from the stomach and the small one from the distal loop of the jejunum.



Exploration of the upper gastrointestinal tract revealed a mobile, hard mass causing complete obstruction in the jejunum and one additional hard body located in the stomach. Gastrotomy and enterotomy were performed and two masses were removed from the lumen weighing about 92 g and 48 g (Figure 1). They had a rough, greenish-black outer surface.When cut open, the interior of the masses was yellowish brown and had a citrus-like smell. The histopathologic examination of the masses showed multiple, enlarged, partially-digested vegetable fibres.

On questioning after surgery, the patient recounted the ingestion of oranges and tangerines often in her daily life as she works as a greengrocer. The post-operative period was uneventful and the patient was discharged on Day 12 post-operatively.

Discussion

Bezoar is a rare complication of gastric procedures and constitutes another manifestation of post-gastrectomy syndrome. The incidence of post-gastrectomy bezoar formation is not known, although it has ranged between 5% and 12% in one report.[4] It is generally accepted that orange pith and/or pulp constitute the most common cause of bezoar formation in patients with previous gastric surgery (50–90%).[4] The mechanism is probably through alteration in gastric emptying. After gastric resection with intact vagus, the majority of bezoars are found in the small intestine with increased particle size of food. However, when vagotomy is performed, the bezoar is most frequently located in the stomach.[5] In cases without previous ulcer surgery, the most common cause is persimmon (73–90%).[5] Any kind of indigestible material (eg, potato skin) also has the chance to form a compact mass. Other precipitating factors are incomplete mastication because of rapid deglutition, poor dentition, edentulism, and dehydration.

Clinical manifestations depend on the location of the bezoars. Gastric bezoars cause mostly non-specific symptoms (eg, epigastric pain, dyspepsia, occasional vomiting, and postprandial fullness).The most common clinical manifestations of an intestinal bezoar are complete or partial mechanical intestinal obstruction. In these patients, temporary relief with recurrence is named intestinal ‘lucid interval ’ by some authors.[6] Once the obstruction occurs, surgery is the only way to solve the problem. Frequently, synchronous bezoars are found in the stomach or other areas of the gastrointestinal tract. Therefore, it is mandatory to explore the whole gastrointestinal tract in order to avoid recurrence of intestinal obstruction due to retained bezoar.

We conclude that, because of its potential to cause mortality and associated morbidity, patients with previous gastric surgery should be warned about this preventable complication and be given dietary advice. Also, doctors should be aware of this possibility in the differential diagnosis of all patients presenting with mechanical small bowel obstruction.

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The public are our employers, and it is only just that the question should be discussed from their point of view. The laity have a keen interest—sometimes morbid, sometimes otherwise—in all that pertains to things medical and surgical. And it is essential from a humanitarian standpoint that the public should be instructed and enlightened on many of the various methods which are adopted in the fight against disease. For instance, the Public Health Department would lose much power without the Press, which has, with few exceptions, throughout the colony given such energetic and spontaneous assistance. And, from time to time, this Association may wish to put themselves in touch with the public through the same medium. In such cases the reading matter should be intelligible to the average intellect, and thereby insuring that no wrong impressions are conveyed. In such circumstances I trust that the relation of the profession to the lay Press will always be that of two powers engaged in a common fight against a powerful enemy. But with technical discussions it is another story; let us be content with publishing our opinions and resolutions in our much neglected journal. To sum up, let us give the public only what is good for them and what they can easily digest.

From the professional point of view I strongly feel that, unless some vigorous stand is taken against the practice of puffing paragraphs and reporting of medical discussions, a day will come when the few men who have remained true to the noble traditions of their universities will find their position untenable, and will perforce have to join or starve, or adopt similar tactics to their advertising competitors.

It has been easy to briefly bring before you an evil state of things which you are all aware of, but it is difficult indeed to think of appropriate remedies. Why we have departed from the excellent standard so strictly enforced in the United Kingdom I shall expect some senior practitioner to explain; but I shall appeal to you all to say whether it is not possible to recover ourselves in time, and to make that standard our ideal for the future. I suggest, as a first step in that direction, that our Association should adopt a rule something to this effect, viz.: That no Press reporters be admitted to any meeting of the Association; but that the President's address, if of a non-technical nature, may be published if the members present so direct, and that other resolutions may from time to time be similarly dealt with. With such a rule carried and enforced, and our own house thereby put in order, it would then be possible for us collectively and individually to endeavour to discourage the puffing paragraphs to which I have alluded.

THE NEW ZEALAND MEDICAL JOURNAL
Vol 116 No 1173 ISSN 1175 8716

The pseudohumerus

Figure 1

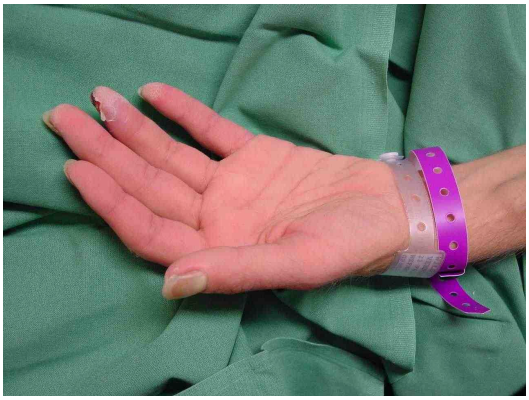


Figure 2

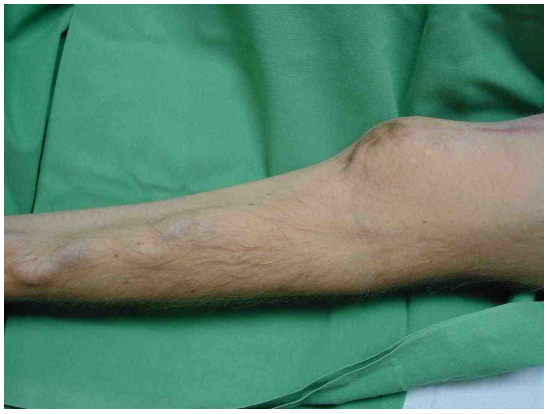
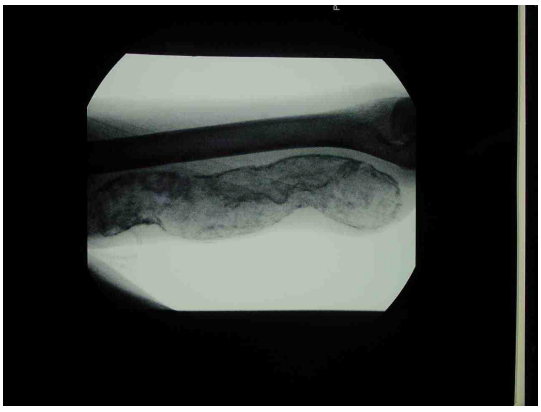


Figure 3



Figures 1 and 2 demonstrate the hand and left upper limb of a 30-year-old patient who has been on long-term renal dialysis. He currently has a functioning renal transplant but presented with digital ischaemia (Figure 1) and an antecubital fossa mass (Figure 2).

Figure 3 is a plain radiograph of the mass.

The diagnosis can be found on the following page.

Diagnosis

The patient has aneurysmal dilatation of his axillary and brachial arteries secondary to a long-standing radiocephalic fistula. The calcification in the aneurysm as seen on the radiograph is a result of hyperparathyroidism secondary to his chronic renal failure. The digital ischaemia is secondary to brachial artery occlusion and steal from the iatrogenic radiocephalic fistula.

THE NEW ZEALAND MEDICAL JOURNAL
Vol 116 No 1173 ISSN 1175 8716

Mobile phones in hospitals

Mobile phones (cell phones) are a source of irritation for some but undeniably useful for many, and over 50% of the population of the United Kingdom possess one. Their use in hospitals, however, is mostly banned as they are considered potentially hazardous in medical environments. But the evidence for serious harm is flimsy, and the hysteria that surrounds the use of mobile phones in hospitals is unjustified.

So how dangerous are they? The evidence for harm is limited. Anecdotal reports exist of interference with medical electrical equipment, which led to a study by the Medical Devices Agency in the United Kingdom. In this study, 4% of medical devices suffered from electromagnetic interference from digital mobile phones at a distance of 1 metre. This compared with 41% from emergency services' handsets and 35% from porters' handsets. Most of the interference related to disturbance of the signal on monitors, such as electrocardiographs, confirmed by data from the United States.

Other effects were on pacemakers, with inappropriate inhibition or atrial oversensing – or misinterpretation of the mobile phone signal as atrial activity with synchronous fast pacing of the ventricle – which has been documented elsewhere in both permanent and temporary systems. The effect on both devices is, however, transitory and can be avoided completely by taking the mobile phone away from the monitor or pacemaker. Moreover, the interference with the pacemaker occurred only with the mobile phone at a distance of up to 10 cm.

BMJ 2003;326:460–1

Bananas in the fertility clinic

Having shunned sex for thousands of years, bananas are in trouble. Those grown commercially are sterile mutants, propagated by replanting the suckers that sprout from existing trees. Lacking the genetic shuffling of sex, the single variety that dominates the export market is susceptible to any pest that evolves to evade its defences against disease.

In the late 1990s, the emergence in Southeast Asia of a new strain of Panama disease, a wilt caused by the fungus *Fusarium oxysporum*, devastated commercial plantations. It has since spread to Australia and Africa, and if it lands in Latin America, where most export bananas are grown, farmers will need a new resistant variety.

Genetic manipulation seems the obvious answer – and researchers at the Catholic University of Leuven in Belgium have already produced several transgenic varieties that carry genes for antifungal proteins. These will be field-tested for resistance to Panama disease over the next few years.

But even if they pass these tests, there is no guarantee that Europe's suspicious consumers will warm to the idea of transgenic bananas. So a conventional breeding effort it also under way. Breeders at the Honduran Agricultural Research Foundation in San Pedro Sula have found that it is just about possible to breed bananas, through

careful hand pollination and sieving hundreds of tonnes of banana pulp to collect the few resulting seeds.

Nature 2003;421:569

Moulding the surgical mind

William Hunter, 18th-century obstetrician and medical educator once described surgeons as ‘savages with knives’. Ironically, one of these savages, his brother John, became one of surgery’s icons. In their time, patients were pinned down, screaming and squirming, by burly assistants, and the surgeon’s fame rested on his dexterity, precision and speed. Then, surgeons were feared, surgery was limited in frequency and scope, and plagued by deadly sepsis.

The arrivals of anaesthesia, antisepsis, and asepsis changed all that. Now, surgeons are revered, surgery’s scope is virtually unlimited, and waiting list numbers swell.

But what is the image of the modern surgeon? Surgery continues to be a male-dominated fraternity of adherents of resolute action, aggression, technology and defensive detachment in practice. Their expertise is bound up in experience, and entry into their ranks is influenced by sex and an ‘intolerance of ambiguity, excessive reliance on high technology, a negative orientation towards psychological problems and a Machiavellianism...expressed as ‘the means justifies the end’ or ‘whatever it takes’.’

Something is missing in the moulding of surgical minds – an emphasis on analysis, problem-solving, evaluation, discrimination and judgement. In short, surgeons’ training is short on thinking, reasoning and understanding.

Eminent US surgeon William J Mayo once observed that ‘Surgery is more a matter of mental grasp than it is of handicraftsmanship.’

Stressing this mental grasp requires a seismic shift in surgery’s culture.

MJA 2003;178:249

Influenza vaccination and reduction in hospitalisation

Serious complications of influenza among the elderly include pneumonia and exacerbations of coexisting conditions that can result in hospitalisation or death. Vaccination against influenza has consistently been associated with reductions in hospitalisations for pneumonia and death from all causes in the elderly.

During influenza epidemics, hospitalisations for cerebrovascular and cardiovascular causes increase, and acute infections, including upper respiratory tract infections, may increase the risk of acute cardiovascular and cerebrovascular events.

In this report, the authors studied two large cohorts during the 1998–1999 and 1999–2000 influenza seasons to assess whether influenza vaccination of community-dwelling elderly persons is associated with reduced rates of hospitalisation for cardiac and cerebrovascular disease.

Observational studies from the United States, Manitoba, and the United Kingdom have reported that influenza vaccination is associated with reductions in the risk of

death from any cause of 30 to 50 per cent. In this study, vaccination was associated with a reduction in risk of death from all causes of 48 to 50 per cent. This reduction may be greater than might typically be expected. Hospitalisation for pneumonia and exacerbations of underlying medical conditions are well-recognised complications of influenza. The finding that vaccination is associated with reductions in the risk of hospitalisation for cardiac and cerebrovascular disease suggests additional effects of influenza that contribute to the overall disease burden and may help to explain the reduction in the risk of death associated with vaccination.

N Engl J Med 2003;348:1322–32

THE NEW ZEALAND MEDICAL JOURNAL
Vol 116 No 1173 ISSN 1175 8716

Experiences with recreational drugs amongst first-year students at Auckland University

The NZMJ recently published data from the National Drugs Survey on the rise of amphetamine and ecstasy use amongst young adult New Zealanders.[1,2] As part of a study into the recreational use of nitrous oxide recently published in the Lancet,[3] we interviewed 1782 first-year law, engineering and health science students at Auckland University on recreational drug use. The full methodology is published elsewhere,[3] though these results have not been previously reported.

Surveys took the form of simple 'check-the-box' questionnaires. One of the questions asked 'Have you ever used other recreational drugs?' and check-boxes were provided for 'marijuana', 'stimulants (including ecstasy, speed)', 'hallucinogens (eg, LSD)', 'cocaine', and 'heroin'.

1360 questionnaires were completed and consistent (76%) and the results are shown in Table 1.

Table 1. Use of recreational drugs by first-year students at Auckland University

Drug	No. students	% (95%CI)
Marijuana	415	30.9 (28.4–33.4)
Stimulants	164	12.2 (10.5–14.0)
Hallucinogens	92	6.9 (5.6–8.3)
Cocaine	48	3.6 (2.6–4.7)
Heroin	27	2.0 (1.3–2.9)

The correlations between use of the different drugs were highly significant ($p < 0.001$) and ranged from 0.17 to 0.60. The use of marijuana, the most popular drug, was analysed for associations with sex, age and ethnicity. Users were more likely to be older (mean age 20.3 years compared with 18.9 years for non-users, $p = 0.0001$), and there was a trend towards less use amongst females (odds ratio (OR) 0.79; 0.58–1.02, $p = 0.07$). There were higher rates of use in NZ European students than Pacific students (OR 0.35; 0.20–0.64), or Asian students (OR 0.08; 0.05–0.12), but not Maori students (OR 0.77; 0.39–1.52).

Although this survey may not be representative of the wider community, these results add evidence to the high incidence of stimulant and ecstasy (an amphetamine with hallucinogenic properties) use reported amongst young adult New Zealanders.[1,2] European males are again demonstrated to be amongst the principle users. The results also demonstrate the continuing high incidence of marijuana use.

Of interest are data, published in the NZMJ 26 years ago, from a comparable though slightly older and more male-weighted sample.[4] While use of most drugs by university students has changed only modestly between 1977 and today, stimulant use has more than doubled: from 4.9% to 12.2%.

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THE NEW ZEALAND MEDICAL JOURNAL
Vol 116 No 1173 ISSN 1175 8716

Cosmetic surgeon – discipline

Charges

A Complaints Assessment Committee (CAC) laid eight charges based on individual complaints against Dr Chan. The charges were laid at the level of disgraceful conduct in a professional respect (Lisa Clement, Ms A, Ms B, Ms C and Mr D), professional misconduct (Ms E) and conduct unbecoming a medical practitioner and that conduct reflects adversely on the practitioner's fitness to practise medicine (Miss F and Ms G). The CAC laid a ninth charge against Dr Chan which was a composite charge. The particulars of the composite charge related to individual complaints by Lisa Clement, Ms A, Ms B, Ms C, Ms E, Miss F and Ms G. This charge was laid at the level of disgraceful conduct in a professional respect.

Finding – eight individual charges

In all eight charges Dr Chan was charged with failing to convey the fact that he was not vocationally registered as a plastic surgeon in New Zealand. The Tribunal considered, in relation to all eight complainants, while it was clear that Dr Chan did not convey that he was not vocationally registered as a plastic surgeon in New Zealand, this was not a disciplinary matter. It was clear that Dr Chan pointed out particular certificates that he had received in respect of cosmetic surgery, but he did not appear at any stage to have indicated that he had qualifications which he did not hold. It was also noted that in a number of instances, the complainants contacted Dr Chan's practice as a result of perusing the Yellow Pages. Dr Chan's practice was listed under cosmetic surgeons and it may well be that a number of the complainants did not distinguish between a cosmetic surgeon and a plastic surgeon.

Lisa Clement

Charge: The particulars were as follows:

1. Dr Chan failed to carry out an adequate pre-operative patient assessment and clinical examination.
2. Dr Chan failed to adequately inform Lisa Clement of the anaesthesia process, and surgical procedure and the risks and complications associated with that procedure and the operation thereby he failed to:
   (a) obtain Ms Clement's informed consent of the proposed anaesthesia process and surgical procedure; and/or
   (b) obtain Ms Clement's informed consent to the procedure at the time of surgery.
3. There were serious deficiencies in Dr Chan's anaesthetic practice, namely:
   (a) He failed to provide adequate information to Ms Clement about the nature or effects of the anaesthetic that she was to receive; and/or

(b) He failed to obtain an adequate pre-operative medical history from Ms Clement and to ascertain the correct name of the medication she was taking, hence could not have been aware of potential drug interactions; and/or

(c) He failed to notate or document the amount of local anaesthetic used in this procedure thus compromising patient safety.

(d) He failed to adequately monitor Ms Clement's condition during the surgical procedure; and/or

(e) He failed to monitor Ms Clement's condition adequately post-operatively; and/or

(f) He failed to ensure that the normal discharge criteria had been met prior to Ms Clement's discharge after surgery, thereby potentially compromising patient safety.

4. Dr Chan failed to convey to Ms Clement that he was not vocationally registered as a plastic surgeon in New Zealand.

Background: Lisa Clement had a breast augmentation carried out by Dr Chan in October 2000. Ms Clement was assessed by a nurse and she did not meet Dr Chan until the morning of the proposed surgery. She had sent photos to Dr Chan to assist with choosing the implant.
Finding: The Tribunal found Dr Chan guilty of conduct unbecoming a medical practitioner which reflects adversely on his fitness to practise medicine.

The Tribunal was satisfied Particular 1 was established and it was concerned by the inadequacy of pre-operative assessment and clinical examination of Ms Clement.

When considering the issue of informed consent (Particulars 2, 3(a) and 3(b)) the Tribunal found that as there was such a short period of interaction between Ms Clement and Dr Chan it was unlikely that Ms Clement received the information necessary for her to be able to give informed consent to the process and procedures.

The Tribunal was satisfied Particular 3(c) was not established. Dr Chan did keep notes for the amount of local anaesthetic although the infiltration rates were not noted. The Tribunal considered that the keeping of infiltration rates is good practice, but on this occasion the failure to do so was not a safety issue.

The Tribunal was satisfied on the facts that 3(d) and 3 (f) were not established. However, it was satisfied that Particular 3(e) was established as the records showed only one recording taken 20 minutes after the operation.

The Tribunal was satisfied that Particular 4 was not a disciplinary matter.

Ms A

Charge: The particulars were as follows:

1. Dr Chan neglected to carry out an adequate pre-operative patient assessment and clinical examination.

2. Dr Chan failed to inform Ms A fully of the risks and benefits of the procedure and further failed to advise her whether liposculpture was likely to produce the results

Ms A wanted and failed to make her aware that liposculpture is not a treatment for obesity.

3. Dr Chan failed to provide Ms A with the opportunity to meet with him prior to the day of surgery and failed to adequately inform her of the anaesthesia process, the surgical procedure and the risks associated with that procedure and possible side effects of surgery and the post-operative care that was required, thereby failing to:
   (a) obtain Ms A's informed consent to his proposed treatment, including the anaesthesia and surgical procedure; and/or
   (b) obtain Ms A's informed consent to the procedure at the time of surgery.
4. Dr Chan failed to inform the patient that he was not a vocationally registered plastic surgeon in New Zealand.
5. There were serious deficiencies in Dr Chan's anaesthetic practice, namely:
   (a) He failed to provide adequate information to Ms A about the nature or effects of the anaesthetic that she was to receive; and/or
   (b) He failed to carry out an adequate or proper anaesthetic assessment of Ms A prior to surgery including taking a satisfactory history of her asthma; and/or
   (c) He failed to record the amount of local anaesthetic used thus compromising patient safety; and/or
   (d) Dr Chan failed to monitor Ms A's condition adequately during the surgical procedure; and/or
6. Dr Chan failed to monitor Ms A adequately post-operatively, including:
   (a) monitoring her fluid balance;
   (b) responding appropriately to her concerns about her condition after the operation;
   (c) being aware of the possibility that Ms A's post-operative symptoms may be due to the large amount of fluid removed in the operation and thus very serious.
   (d) refusing to see her (to assess her condition) when she asked him to do so, thus compromising her safety.
7. Dr Chan discharged Ms A without any of the usual discharge criteria being met, thereby compromising patient safety.

Background: Ms A had liposuction carried out by Dr Chan on 13 June 2000. On the day of the procedure Ms A signed the consent for the operation in front of the receptionist. Ms A said she filled in her medical check list at the time including the fact that she was asthmatic and that she had had a previous bad reaction to Hypnovel. Photos were then taken of Ms A and she was given a sedative pill. Ms A then saw Dr Chan for the first time when he drew circles on her body.

Ms A recalled waking during the procedure to find another doctor working on her thigh. She stated that she woke because she had sharp stabbing pains that increased as the liposuction probe was advanced. She recalls crying and did not see Dr Chan but tried to gain the attention of the other doctor.

Ms A left the Australasia Cosmetic Surgery Clinic without a follow-up appointment despite the fact that there was a clear leakage of blood. Ms A was feeling very unwell and returned to a friend's place where she continued to bleed. Her friend rang the Australasia Clinic and was told that that was normal and when asked to see Dr Chan the following day, was told that everything was okay. Ms A's friend rang a plastic surgeon in Auckland who spoke to her friend over the telephone and arranged antibiotics for Ms A, but was unable to see her before Ms A left Auckland. Ms A said that she was very uncomfortable for a further two and a half weeks on her return home.

Finding: The Tribunal found Dr Chan guilty of professional misconduct. The Tribunal was concerned at the inadequacy of the pre-operative patient assessment and clinical examination of Ms A and was satisfied Particular 1 was established. Ms A was an asthmatic and had advised of a previous allergic reaction to Hypnovel. There was no reference or indication that there was any concern regarding this reaction.

The Tribunal was satisfied that Ms A did not give her informed consent to the procedure and therefore it considered that the first part of Particular 2 and all of Particular 3 were established. While Ms A received a pamphlet put out by Dr Chan concerning liposuction, that pamphlet did not inform fully of the risks and benefits of the procedure. The pamphlet essentially was an advertisement for liposculpture. The Tribunal did not consider that the second half of Particular 2 was established. One of the few matters that the pamphlet did specifically address was that liposculpture is not a treatment for obesity.

The Tribunal considered Particular 4 was not a disciplinary matter.

The Tribunal was satisfied Particular 5(b) was established. However, it did not consider 5(a), (c) and (d) were established as Ms A had received the information about the anaesthesia process and it was clear that from the patient records that notes of the amount of local anaesthetic were kept.

When considering Particular 6 the Tribunal was very concerned at the post-operative care Ms A received. In terms of monitoring her fluid balance, this fell short of accepted standards. A bleeding problem was identified. Ms A, through her friend, raised this issue and nothing appeared to have been done. There was no appropriate response to Ms A's concerns about her condition after the operation. The lack of adequate monitoring of her fluid balance post-operatively put Ms A's renal function at significant risk.

Particular 6(d) was not established as Ms A was unsure as to whether Dr Chan knew she was there when she returned to the clinic the following day.

The Tribunal found Particular 7 was established. The Tribunal considered Dr Chan was responsible for all the staff he employed at his clinic and in this instance Ms A was bleeding and was discharged with no further instructions as to what to do if the bleeding continued.

Ms B

Charge: The particulars were as follows:

1. There were serious deficiencies in Dr Chan's anaesthetic practice, namely:

(a) He failed to provide information to Ms B about the nature or effects of the anaesthetic that she was to receive; and/or

(b) He failed to carry out an adequate or proper anaesthetic assessment of Ms B prior to surgery; and/or

(c) He failed to carry out a proper pre-operative history and assessment particularly with respect to her stated history of smoking and asthma; and/or

(d) He failed to record in the patient records the details of the amount of local anaesthetic used, thus compromising patient safety; and/or

(e) A drug (Maxolon) was administered despite documentation of Maxolon allergy, thereby placing Ms B at serious risk; and/or

(f) He failed to monitor Ms B's condition adequately during the operation and post-operatively;

2. Dr Chan failed to adequately inform Ms B of the anaesthesia process, the surgical procedure and the risks and complications associated with that procedure and the post-operative care that was required, thereby failing to obtain Ms B's informed consent to his proposed treatment, including the anaesthesia and surgical procedure.

3. Dr Chan failed to inform the patient he was not vocationally registered as a plastic surgeon in New Zealand. The literature provided to the patient was misleading in this regard.

4. Dr Chan discharged Ms B without any of the usual discharge criteria being met, thereby potentially compromising her safety.

Background: Ms B had a mastoplexy carried out by Dr Chan on 5 March 2001. She understood that she would have dissolvable stitches. Ms B told the nurse that she was allergic to Maxolon. Ms B also suffered from asthma and was a smoker. It would appear that initially her operation sheet stated that she had no allergies and that had been changed, most likely on the day of the operation. The references on the operation sheet to allergies and current medications appeared to be in Ms B's handwriting. It was not clear whether the decision to use Maxolon on this occasion was made with any awareness of her previous reaction or any idea of preventing a recurrence.

Finding: The Tribunal found Dr Chan guilty of professional misconduct.

When considering Particular 1(a), (b) and (c), the Tribunal was satisfied some information was given to Ms B and she had signed the form saying that she understood the issues relating to the anaesthetic. However, it considered Dr Chan failed to carry out an adequate or proper anaesthetic assessment prior to surgery. Dr Chan did not listen to Ms B's chest or ask any questions at all about her asthma which in the Tribunal's view fell well short of a proper anaesthetic assessment.

When considering Particular 1(d) the Tribunal was satisfied that although the amount of local anaesthetic was not recorded, it was not a matter that warranted disciplinary action.

The Tribunal found Particular 1(e) was established. There was a failure to document the recognition of the allergy, the reasons for using the drug and the methods for combating the allergy. In the absence of any such reference, it appeared that further

information was not obtained in respect of the allergy and that it was merely fortuitous that Ms B did not experience an adverse reaction. The Tribunal considered it notable that Ms B was not asked at all about the type of reaction she had had to Maxolon.

Ms B suffered a severe post-operative infection. However, the post-operative infection was not an infrequent complication and changes were made to her antibiotics in an attempt to deal with the infection. Therefore Particular 1(f) was not established.

The Tribunal did not consider Particular 3 was a disciplinary matter.

Ms C

Charge: The particulars were as follows:

1. Dr Chan failed to inform the patient he was not registered as a plastic surgeon in New Zealand.
2. Dr Chan failed to carry out an adequate pre-operative assessment and clinical examination of Ms C prior to surgery.
3. Dr Chan failed to adequately inform Ms C of the risks and possible side effects of the surgery, nor was she made aware that the outcome of the procedure may not meet her expectations and therefore Dr Chan failed to obtain Ms C's informed consent to the procedure.
4. There were serious deficiencies in Dr Chan's anaesthetic practice, namely:
   (a) Dr Chan misled and/or failed to provide adequate information to Ms C about his anaesthetic management.
   (b) Dr Chan failed to provide adequate anaesthesia during the procedure, resulting in Ms C suffering severe pain during surgery.
   (c) Dr Chan operated without an anaesthetist present during the procedure and drugs were administered by him contrary to the accepted guidelines laid down by the Australian and New Zealand College of Anaesthetists.
5. Dr Chan discharged Ms C without any of the usual discharge criteria being met, thereby compromising her safety.

Background: Ms C had liposuction performed by Dr Chan in March 1998. During the operation Ms C experienced intense pain and asked Dr Chan to stop the process. Her arms were held down and she was told to lie back down and to calm down. She visited another plastic surgeon four months later and had further surgery done under general anaesthetic as she was dissatisfied with the results from the surgery by Dr Chan.

Finding: The Tribunal found Dr Chan guilty of conduct unbecoming a medical practitioner and that conduct reflected adversely on his fitness to practise medicine.

The Tribunal considered Particular 1 was not a disciplinary matter.

The Tribunal was satisfied Particulars 2, 3 and 4(a) were established. The Tribunal considered that Dr Chan did fail to carry out an adequate pre-operative assessment and clinical examination prior to surgery. He had one brief appointment prior to the

surgery with the patient who did not seem to have any further contact with Dr Chan until just before the operation. Ms C confirmed that Dr Chan did not listen to her chest or listen with a stethoscope or take blood pressure. The Tribunal was satisfied Dr Chan failed to inform Ms C about the risks and possible side effects and outcomes, therefore affecting her ability to give informed consent.

The Tribunal was satisfied Particular 4(b) was established. Ms C had awoken during the surgery. The Tribunal considered adequate anaesthesia was not provided.

The Tribunal was not satisfied that Particular 5 was established.

Mr D

Charge: The particulars were as follows:

1. Dr Chan performed a rhinoplasty procedure on Mr D while suspended from practising medicine.
2. Dr Chan failed to ensure that the patient was aware of the risks and side effects of rhinoplasty, and of the anaesthetic and the operation, and thus failed to get informed consent to the procedure.
3. Dr Chan failed to inform the patient that he was not vocationally registered as a plastic surgeon in New Zealand.
4. Dr Chan failed to provide the patient with a satisfactory result from the rhinoplasty procedure.

Background: Mr D had a rhinoplasty procedure carried out on the 3 July 2001 at a time when Dr Chan was suspended from practising. At the first consultation Dr Chan had explained the procedure and on the day of the surgery, Mr D was seen by a nurse and was taken into a room and given pre-operative medication. Mr D saw Dr Chan one week later and the plaster was taken off his nose. Mr D was clearly unhappy with the results of the surgery.

Finding: The Tribunal dismissed the charge against Dr Chan in respect of the treatment of Mr D.

The Tribunal was satisfied at the time of Mr D's operation, Dr Chan was suspended from practice as a result of an order of the Tribunal. The CAC asked the Tribunal to determine that the fact that Dr Chan should not have been practising medicine at this stage was in itself disgraceful conduct in a professional respect. The Tribunal was satisfied that such an argument may have gained some support if section 109(1)(g) relating to the breach of an order of the Tribunal did not exist. The Tribunal considered this was a matter that could have been the subject of a charge under section 109(1)(g) of the Act or section 9 of the Act. A charge under section 109(1)(g) or prosecution with regard to section 9 of the Act were not brought in respect of Dr Chan practising while suspended, and therefore the Tribunal was unable to deal further with the matter. It was this Tribunal's view that practising while suspended does not amount to disgraceful conduct in terms of section 109(1)(a) as a matter of law, and therefore Particular 1 was not established.

The Tribunal was satisfied Particular 2 was not established. Mr D had the benefit of being accompanied by a partner with a nursing background. She acknowledged in her

evidence that she had asked Dr Chan about the complications and there had been discussion of them.

The Tribunal was satisfied Particular 3 was not a disciplinary issue. It considered Particular 4 related to a subjective cosmetic issue and did not warrant a disciplinary finding.

Ms E

Charge: The particulars were as follows:

1. Dr Chan failed to ensure that the patient was aware of the risks, side effects and possible poor outcome of the rhinoplasty surgery, and thus failed to obtain informed consent.
2. Dr Chan failed to inform the patient he was not a vocationally trained plastic surgeon.
3. The surgical procedure carried out by Dr Chan was not carried out with the due skill and care expected of a competent medical practitioner working in the area of rhinoplasty procedure.
4. Dr Chan failed to obtain informed consent to the procedure by:
   (a) giving the consent form for surgery to the patient to sign after Ms E had been given her pre-operative sedation.
   (b) using foreign implants in the procedure despite his assurance prior to surgery that no foreign implants would be used.
5. There were serious deficiencies in Dr Chan's anaesthetic practice namely the immediate post-operative care was unacceptable and unsafe. The guidelines from ANZCA state that even with 'conscious sedation' the patient must be chaperoned afterwards.

Background: Ms E had a rhinoplasty procedure done during 1995, Dr Chan was to operate by using cartilage from behind Ms E's ear. Ms E had stated she did not want a silicon implant and she was told that the operation would be done with cartilage from behind her ear. Five years after the operation, Ms E had a boil on her nose and it was found that it had been caused by a silicon implant protruding through the skin which had to be removed.

Finding: The Tribunal found Dr Chan guilty of professional misconduct.

The Tribunal was satisfied Particular 4(b) was established. The Tribunal considered it a matter of grave concern that Dr Chan felt he was able to undertake a procedure so clearly against the wishes of the patient. The Tribunal found in all other respects the remaining particulars were either not relevant or not proven.

Miss F

Charge: The particulars were as follows:

1. Dr Chan failed to adequately inform Miss F of the anaesthesia process, the surgical procedure and the risks associated with that procedure including the possibility of a less than satisfactory outcome for her, thereby failing to obtain

Miss F's informed consent to the proposed anaesthesia process and surgical procedure.

2. There were serious deficiencies in Dr Chan's anaesthetic practice, namely:
   (a) He failed to provide adequate information to Miss F about the nature or effects of the anaesthetic that she was to receive; and/or
   (b) He failed to undertake a pre-operative clinical examination of Miss F; and/or
   (c) He failed to obtain an adequate pre-operative medical history from Miss F;
   (d) The method of sedation he used was inappropriate for the procedure, resulting in more pain than necessary for Miss F and in any event the method of local anaesthetic used was administered contrary to the accepted guidelines laid down by the Australian and New Zealand College of Anaesthetists.
3. He failed to perform the operation to a reasonable competent standard in that the breast reduction did not lead to any real reduction in her breast size.
4. He failed to inform her that he was not a vocationally registered plastic surgeon.

Background: Miss F had a breast reduction performed by Dr Chan on 15 June 2000. She had the surgery undertaken under local anaesthetic and was told that she would feel no pain but she awoke several times during the surgery due to the pain she felt. She was not satisfied with the results which were supposed to move her to a C cup sized bra. She is still wearing E cup sized bras.

Finding: The Tribunal found Dr Chan guilty of conduct unbecoming a medical practitioner which reflected adversely on his fitness to practise medicine.

The Tribunal was satisfied Particular 1 was established as although Miss F had at least two consultation visits with Dr Chan it was clear that some risks and complications were not explained.

The Tribunal was satisfied Particular 2 was established. Miss F suffered from asthma and there was no reference of discussion relating to the asthma and no examination of the chest in terms of the asthma.

The Tribunal was concerned that the method of sedation was inappropriate for the surgery. It was clear from the expert evidence submitted to the Tribunal that those undertaking that surgery consider that it is a matter best done under general anaesthetic. The Tribunal found there has been a failure to perform this surgery to a reasonably competent standard, and therefore Particular 3 was established.

The Tribunal did not consider Particular 4 was a disciplinary matter.

Ms G

Charge: The particulars were as follows:

1. Dr Chan failed to adequately inform Ms G of the anaesthesia process, the surgical procedure and the risks associated with that procedure including the possibility of a poor outcome for the patient thereby failing to:
   (a) obtain Ms G's informed consent for the proposed anaesthesia process and surgical procedure.

(b) obtain Ms G's informed consent to the procedure at the time of surgery.

2. There were serious deficiencies in Dr Chan's anaesthetic practice, in that he failed to provide adequate information to Ms G about the nature or affects of the anaesthetic that she was to receive.
3. He failed to record in the patient records the amount of local anaesthetic used thus compromising patient safety.
4. Dr Chan failed to appropriately manage Ms G's condition post-operatively.
5. Dr Chan failed to advise Ms G that he was not a vocationally registered plastic surgeon.

Background: Ms G had liposculpture performed by Dr Chan in August 1994. Ms G had a very brief consultation with Dr Chan and was reassured that she would feel no pain. The pain that she suffered both during and following the surgery was intense and was not her expectation in respect of the surgery. Following the surgery, Ms G contacted the Australasia Cosmetic Surgery Clinic and was told to take Panadol. She then approached her general practitioner and was given a prescription for a stronger pain killer. Ms G was bedridden for about three weeks and was off work for about six weeks.

Finding: The Tribunal found Dr Chan guilty of conduct unbecoming a medical practitioner which reflected adversely on his fitness to practise medicine.

The Tribunal was satisfied Particular 1 was not established as this was a matter prior to the Medical Practitioners Act 1995 and prior to the Health and Disability Commissioners Act 1994. It considered the issues about informed consent were within a different context.

The Tribunal was satisfied Particulars 2 and 4 were established. There were serious deficiencies in his anaesthetic practice given the pain experienced by Ms G. It was also concerned at the poor post-operative care given to Ms G.

As the patient notes were not available the Tribunal could not find Particular 3 proven and it considered Particular 5 was not a disciplinary matter.

Composite Charge

Charge: The particulars were as follows:

1. He advertised his surgical services to the complainants in a way that did not make it clear that he was not vocationally registered as a plastic surgeon and provided promotional material that was misleading in this respect.
2. He failed to adequately explain fully the benefits and risks of the surgical procedure that was to be undertaken, and to advise patients as to whether the procedure sought was appropriate for them, thus failing to obtain informed consent to the procedures.
3. He failed to adequately assess the complainants before the operation in order to assess their physical and mental wellbeing, the suitability of the person for the operation and to ensure that they were fully and adequately informed of the procedure that they wished to undertake, and the nature of the anaesthetic to be

used, its benefits and risks, including the possibility that there may be some pain and discomfort experienced under local anaesthetic.

4. He failed to adequately record in the patients' notes (or at all) the amount of local anaesthetic used thus compromising patient safety.
5. He carried out the operations with lack of due skill and care.
6. Following the completion of the operation, he discharged the complainants without proper assessment of their post-operative wellbeing.
7. Following the completion of the operation, he failed to respond to the post-operative concerns of the complainants including failing to see the patients when requested, and failing to act promptly to concerns expressed by them, thus compromising patient safety.
8. The particulars of the composite charge relate to the individual complaints by F, B, Lisa Clement, A, E, G and C.

Finding: The Tribunal dismissed the charge.

This charge was laid as an additional charge not an alternative charge. The Tribunal was concerned that what was proposed by the CAC was essentially charging Dr Chan twice in respect of the same incident. The Tribunal considered that Duncan v MPDC [1996] NZLR 513 did not provide that charges can be assessed on an individual basis and then again on a cumulative basis.

Penalty: The Tribunal ordered:

- Dr Chan be censured in relation to each of the seven guilty charges, fined $15,000 and suspended for a total of 36 months being 12 months on each of the three professional misconduct charges. Each 12-month period to be served consecutively;
- following the 36-month suspension, Dr Chan practise medicine for the following three years only in accordance with the conditions below;
- that Dr Chan has a fully qualified anaesthetist present when he undertakes any surgical procedure;
- that Dr Chan is required to attend medical education courses on consent and patient and practice management at the direction of the Medical Council;
- Dr Chan pay 45% of the costs of investigation, prosecution and hearing of the charges;
- a report of the Tribunal's decisions on the charges be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal web site at www.mpdt.org.nz Reference No: 01/88C.

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Kevin John O'Connor

Kevin John O'Connor died on 28 December 2002 at the age 80 and after a prolonged period of bad health.

Kevin was brought up in Kurow and attended St Kevin's College where he was Head Boy and gained a National Scholarship (in French). At Otago, Kevin soon became prominent as a rugby player of great ability. He played on the back of the scrum for Otago in the days when they owned the Ranfurly Shield. He subsequently played for the South Island, NZ University, and was regarded by most sports commentators as very unlucky not to be an All Black. He had the 'star' quality that would have suited the modern game. He played for the Harlequins with his old friend Ron Elvidge.

After qualifying, he worked in Dunedin Hospital before going to the UK where serious attempts were made to seduce him to Rugby League.

Kevin returned to New Zealand and in 1955 set up practice in the centre of Christchurch, initially with the late Ken Wilson. Although he changed premises, Kevin stayed within a short distance of that site until he retired.

He had an early association with the Brothers of St John of God at Marylands and the Hogben School for Boys. Later he was associated with the Hospice at that site.

Kevin was a police surgeon for 27 years and was a prime mover both in the establishment of the Association of Police Surgeons in NZ and with the International Association of Forensic Surgeons. He attended many international meetings of the latter.

Kevin had an interest in harness racing and was medical officer for many local clubs. He and his wife, Pamela, were also successful standardbred breeders and owners.

Kevin was a large man with a deep voice but under this lay a kindly, almost soft, caring doctor.

Kevin was a cultured man with a deep interest in music. He had an ATCL in piano and a deep love for and knowledge of opera and poetry.

Kevin will be greatly missed. He is survived by his wife and companion, Pamela, and six adult children from an earlier marriage.

Roy Holmes wrote this obituary with valued assistance from Dr John Valentine, Dr Ron Elvidge and Mr Hugh Stevens and the full cooperation of Pamela.

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Applications for the Integrated Training Program in Obstetrics and Gynaecology

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) has a four-year Integrated Training Program (ITP) leading to membership of the College. Trainees will undertake a planned rotation through several training hospitals, including a provincial hospital, over the four-year period.

All prospective trainees must apply to RANZCOG for placement on the program and, upon acceptance, are eligible to take up a training position in an accredited regional training program.

Those seeking entrance to the ITP must have:

1. full medical registration in New Zealand or be eligible for Class 7c Probationary Registration;
2. permanent New Zealand residency or be eligible for permanent residency through the 'Work to Residency' policy of the NZ Immigration Service and must demonstrate a commitment to live and work in New Zealand in the long term;
3. completed two years' practice after graduation (ie 9th year or beyond);
4. obtained a minimum of six months' work experience in obstetrics and gynaecology;
5. attend a pre-entry interview.

Any medical practitioner who is interested in commencing vocational training in obstetrics and gynaecology should contact:

The Executive Officer
RANZCOG
PO Box 10611
Wellington
email: ranzcog@ranzcog.org.nz

Applications close 24 May 2003.

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Birth, death, and points in between: 50 patient years

Richard Stone. Published by Steele Roberts Ltd 2003. ISBN 1-877228-93-1. Contains 164 pages. $29.95

Richard Stone, after half a century of distinguished medical practice as a physician (mainly in Wanganui), has committed his medical memoirs to paper. Clearly, he intended that his book should be read (and understood) by the medically unqualified as well as his medical colleagues as he has taken pains to explain medical terminology, where appropriate. This makes some sections a little tedious for the medically informed. However, in this slim volume there is much of interest.

A paragraph on his experiences as a resident medical officer activated my own memories:

> 'Work was a roller coaster of panic and reward, the awareness of unspoken approval or disapproval of senior colleagues, experienced nurses and patients. Awareness of gaps in knowledge, the hollow ache of fatigue, the relief of an unbroken night's sleep, the delight of a clinical puzzle coming suddenly into focus. The dejection following an unexpected death, the hopeful or anxious expectant faces of relatives. The vivid experience of seeing severe pain or distress with the possibility for rapid relief in our hands; injecting morphine for pain or acute heart failure, or adrenaline for acute asthma, and seeing the heaving chest relax and the rictus of distress fade.'

Those who have known Richard Stone professionally, as a colleague or as a patient will enjoy reading his reminiscences, as did I.

Recommended.

Barry M Colls
Department of General Medicine
Christchurch Hospital

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Antioxidants – a health revolution

Carolyn Lister. Published by New Zealand Institute for Crop and Food Research, Ltd 2003. ISBN 0-478-10832-X. Contains 96 pages. $19.95

At the same time as our bodies are being battered by free radicals, our minds are being bombarded with information espousing the health benefits of antioxidants. Damaging free radicals are implicated in many diseases, but definitive proof of protection by antioxidants is sparse. While scientists battle with the complexities of the field, the simplistic concepts of the ‘bad’ free radical and the ‘good’ antioxidant have been adopted by various alternative health and cosmetic industries. These disciples, with a gospel that promises to cure or protect against all ills, should make an intelligent person wary. However, it would also be unwise to ignore a promising field of research because of over-enthusiastic proponents.

For those seeking enlightenment, Dr Lister’s book is an excellent place to start. It is clearly written and very well presented. The layout and style will appeal to a broad audience, and the boxes, tables and bullet-point recommendations all convey information quickly and in an easily digestible form. Dr Lister is particularly good at describing the different classes of antioxidants and their primary dietary sources. She also sensibly promotes the value of a balanced and varied diet, as opposed to supplementation. The majority of studies showing protective effects are associated with increased fruit and vegetable consumption, while clinical trials with individual antioxidants have been consistently negative.

While Dr Lister’s approach is generally balanced, the evidence of health benefits is overstated in some parts. The use of the word ‘revolution’ in the title is a case in point. I hope the proponents are right – after reading the book I went and bought a salad for lunch. If it triggers others to think about and modify their diet, then great. However, the evidence for antioxidants as the cure for or protector from all ills remains unconvincing. Overall, I would strongly recommend this book as a general resource for those with an interest in nutrition.

Mark Hampton
Department of Pathology and Molecular Medicine
Christchurch School of Medicine and Health Sciences