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This Issue in the Journal

**Radiology knowledge in new medical graduates in New Zealand**
R Subramaniam, T Hall, T Chou, D Sheehan

This study establishes the radiology knowledge of graduating New Zealand medical students about common radiological investigations and the students’ ability to request the most appropriate and cost-effective radiological investigation for common clinical conditions encountered in our hospitals. It involved approximately 25% of graduating medical students in 2002 and was carried out in Auckland, Hamilton, Rotorua, Christchurch, and Dunedin. Our new medical graduates have ‘just safe’ level of radiology knowledge and skill. More radiology teaching is needed in our medical schools.

**Healthline: do primary care doctors agree with the advice?**
I St George, M Cullen, M Branney

GPs agree with the advice given by Healthline nurses to callers worried about symptoms. About two-thirds of callers to Healthline seek advice about symptoms, and about two-thirds of these call after hours. Many people calling their doctor after hours are now triaged first by Healthline nurses. This article reports close agreement between the advice actually given to people phoning Healthline, and the advice a group of primary care doctors would have given if they were given the same information.

**The Strong Parents-Strong Children Programme: parental support in serious and chronic child illness**
H Jerram, J Raeburn, A Stewart

Serious child illness is a major stressor for parents. This research is a quasi-experimental evaluation of the first attempt in New Zealand and possibly the World to design and implement a course for affected parents with the aim of learning skills and providing support for managing their situation. It runs for 6 weeks and is parent-driven. The results show significant and lasting improvements on an array of measures, and a high degree of satisfaction with the course.
The health status of quota refugees screened by New Zealand’s Auckland Public Health Service between 1995 and 2000
A McLeod, M Reeve

New Zealand is one of about 12 countries in the World which each year accept a quota of refugees from refugee camps and other places. For their first 6 weeks in New Zealand, the refugees stay at the Mangere Refugee Resettlement Centre, where they prepare for their new life. Part of that preparation is a process of medical screening and treatment. This paper summarises the findings of that medical screening, particularly for those refugees arriving between 1995 and 2000, which should be of help to those who provide subsequent medical care for the refugees.

The efficacy of EMG-biofeedback training on quadriceps muscle strength in patients after arthroscopic meniscectomy
M Kirnap, M Calis, A Osman Turgut, M Halici, M Tuncel

In this study, we investigated whether the addition of a EMG-B application (to a postoperative classical home exercise programme after arthroscopic meniscectomy) is effective in improving patients’ quadriceps muscle strength in a postoperative rehabilitation program. Results show that during the postoperative period there is more rapid improvement, and quadriceps muscle strength could be increased greater in patients to which EMG-B is administrated. EMG biofeedback application may be beneficial for postoperative rehabilitation protocols of knee pathologies and conservative programmes.

Computerised screening for hazardous drinking in primary care
K Kypri, S Stephenson, J Langley, M Cashell-Smith, J Saunders, D Russell

Primary healthcare settings appear to offer an excellent opportunity for patients to be screened for hazardous drinking and to be offered brief advice on how to cut down (drinking); however, this effective intervention is rarely utilised. In this study, over 1,000 patients attending a university student health service (Dunedin, New Zealand) were offered computerised alcohol screening in the waiting room and were asked for consent to be followed-up. Over 90% completed screening and only 4% declined consent for later follow-up.
Teaching imaging to undergraduates: strategies and expectations

Tim Buckenham

In this issue of *NZMJ*, Subramanian et al.\(^1\) evaluate the level of radiology knowledge in recent New Zealand graduates. The authors endeavour to establish the level of first-hand experience and understanding of common radiological investigations among those graduates and to assess their ability to request the most appropriate, cost-effective radiological investigation for common clinical scenarios.

The authors are critical of the paucity of organised formal radiology teaching in the last year (trainee intern year) of medical undergraduate education. Their research indicates that the significant majority had observed ultrasound, CT, and angiography (72–80%), but few had observed a barium enema and an intravenous urogram (IVU) (25–28%). The authors conclude by suggesting that a well-structured radiology teaching programme, especially for those in the final year of medical school (trainee interns), is necessary and they quote the burgeoning quantity and role of imaging and the lack of postgraduate radiology education to support this thesis.

There is no question that the modern graduate needs to have a working knowledge of the actual process of an imaging investigation (both from the perspective of the patient and the clinical utility to the referring doctor), and possibly they need to have the ability to interpret the images as well. This knowledge can be obtained in the undergraduate setting by observing scans and discussing the images with radiologists and clinicians. Additional teaching regarding risk (particularly risks related to radiation and contrast media), and an understanding of the optimal imaging investigation for a particular patient in the clinical setting, is also important.

The problem that those teaching imaging face is the rapid expansion of imaging modalities. Many clinicians now have good access to MRI, volume (VCT) or multi-detector CT (MDCT), and SPECT (with PET CT not far off). This dramatic increase in the sophistication of imaging has caused some investigations to become less common with less reliance placed upon them. For example, the IVU in many main centres has been replaced by CT imaging of the kidneys and urinary tracts. Likewise, the barium enema has been largely supplanted by CT colonography, with new post-processing that allows sophisticated luminal visualisation.

Similarly diagnostic arteriography has been replaced by a combination of MRA and CTA. This may account for the small proportion of graduates who had physically witnessed a barium enema and IVU in Subramanian’s paper, but more importantly reflects the growing complexity of imaging and how it is becoming more difficult for clinicians to request appropriate imaging, and to understand the advantages and limitations of these new techniques.

Viewing images in a hospital setting has become problematic for clinicians; many volume CT acquisitions produce 1200 transverse images and multiple sagittal and coronal reformats. These large files may only be reviewed on sophisticated viewers.
which are often located only in the radiology department and are time-consuming to view.

Should the newly graduated clinician be expected to view such large increasingly sophisticated image files or should we be teaching the undergraduate to utilise the radiology department and its staff better? The role of radiology teaching to the undergraduate may have its highest value in introducing the medical student to the radiologists and the radiology department and developing the concept of the radiologist as part of the clinical team and an important part of the diagnostic and therapeutic patient pathway.

Many junior doctors come to the radiology department to ask about an imaging investigation and the question they pose to the radiologist is “what is the answer?” The natural reply to that enquiry, is “what is the question?” Good investigation poses a question for the imaging to answer, but the sophisticated imaging offered now often dilutes the need for good clinical input and offers an easy assessment of the patient which may replace clinical skills.

Subramanian et al are correct when they state teaching undergraduates is underpinned by two basic tenets: familiarisation with the imaging procedures and an understanding of the role of the radiologist as part of the clinical team. Whether this can be achieved by further formal teaching and examination as suggested by the authors is difficult to assess, however.

The trainee intern year is a clinical experience—radiology is learnt by clinical exposure and exists as a thread in all clinical disciplines. By using this traditional system, are we preparing graduates for work in smaller hospitals where the national shortage of radiologists is most acute and the role of the radiologist supporting the clinical team is lost? In these centres, clinical review of images is still important, and adequate teaching of interpretation of plain radiographs is important too as these often have key clinical relevance in the acute setting—but it is impractical to expect more sophisticated interpretation and well-intentioned undergraduate teaching (regarding the use of the radiology resource problematic) without local radiological expertise.

In conclusion, imaging is involved in nearly all patient groups and all clinical scenarios. It is difficult to teach imaging as a discrete entity, and most medical schools have embraced the teaching of radiology as a thread running through each clinical rotation, usually taught by radiologists. This approach may facilitate the understanding of the role of the modern consultant radiologist, the correct use of imaging, and limitations and risks associated with radiological investigation—but imaging is only going to continue in its sophistication and accessibility and maybe the time has come to call a halt on attempting to teach undergraduates interpretation of these sophisticated images and instead focus the teaching on all aspects of the correct utilisation of the radiological resource and try and limit the tendency for imaging to replace good clinical assessment.

As for the need for further formal teaching and evaluation in a crowded undergraduate programme (as Subramanian et al suggest), it is open to debate and will be hotly contested by other expanding fields.
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Reference:
Radiology knowledge in new medical graduates in New Zealand

Rathan Subramaniam, Tim Hall, Tina Chou, Dale Sheehan

Abstract

**Aims** To establish the level of knowledge of new medical graduates in New Zealand about common radiological investigations and to assess their ability to request most appropriate, cost-effective radiological investigations for common clinical scenarios.

**Methods** A test was developed and administered in Waikato, Christchurch, Rotorua, Auckland, and Dunedin hospitals during the first month of new house officer year (November 2002).

**Results** Sixty-two first year house officers participated; 59 were New Zealand medical graduates (Auckland: 24 and Otago: 35) and 3 were from overseas institutions. The mean score for questions that assessed about risks involved in common investigations, including radiation, was 47% (95% CI: 45%–49%). The mean score for selecting the appropriate clinical investigations was 53% (95% CI 52%–54%). Most significantly, only 42% (95% CI 38%–46%) of the respondents thought they had adequate radiology teaching to work as house officers. The following percentage of the respondents never observed the respective examination during their medical school training: barium enema 72% (95% CI: 60%–82%); IVU 75% (95% CI: 63%–87%); US scan 25% (95% CI: 16%–37%); CT scan 20% (95% CI: 11%–32%); angiogram 16% (95% CI: 9%–28%); MRI 42% (95% CI: 30%–54%). The mean score for the practical knowledge about common investigations was 50 (95% CI: 48%–52%).

**Conclusions** Medical students report that they have limited exposure to radiology teaching during their medical school training. The test results suggest that medical school training enabled them to commence their probationary year with a ‘just safe’ level of radiology knowledge and skill.

In the current era of modern organ imaging, radiological investigations play a central role in patient management. However, although radiology has undergone significant changes during the last two or three decades, this has not translated fully into medical school curricula. Despite the enormous change in medical practice, radiology is still only taught as an adjunct subject in the final year (trainee intern year) medical school curricula rather than as one of the core subjects.

Final year medical students (trainee interns) at the University of Auckland have a ‘radiology elective week’ as part of their curricula but there is no other organised formal radiology teaching. It is expected that Auckland students learn radiology from their attachments in medicine, surgery, general practice, psychiatry, and obstetrics & gynaecology during final year. At the University of Otago, there is also no organised radiology teaching during the final year (trainee intern) of medical school. Indeed, students are expected to learn by ‘osmosis’ from their attachments in other specialities.
The purpose of this study was to establish the level of knowledge of first year house officers in New Zealand (as a cohort group) about common radiological investigations as well as to measure their ability to request the most appropriate and cost-effective radiological investigations for common clinical conditions.

Methods

A test was developed and administered anonymously to a sample of first year house officers in 4 of 5 large training centres and at a provincial centre. The goal was to sample about 25% of the 2002 new medical graduate cohort group. The test was administered at Waikato, Christchurch, Rotorua, Auckland, and Dunedin hospitals during the first month of the new house officer year (November 2002) with the assistance of education co-ordinators at each centre.

To ensure national consistency in administering the test, co-ordinators were briefed on the purpose of the test and were asked to administer it during the first month of the new first year house officer intake.

There were four sections in the test (Appendix 1). The purpose of the first section was to determine how many first year house officers actually observed common radiological investigations during their medical school training. The second and third sections tested their practical knowledge and risks of these investigations. The fourth section tested their ability to select the most appropriate and cost-effective investigations for common clinical scenarios.

The content of the test was reviewed (for content and face validity and readability) by a group of academic clinicians: a consultant radiologist, a consultant physician, a consultant surgeon, and a medical education specialist.

The test was validated among a group of graduating medical students at the Waikato Clinical School, University of Auckland in 2001. About 20 graduating students at the Waikato Clinical School took the test. The feedback about the standard of the test, suitability of the topics examined, and readability of the test was incorporated into the final form of the test. A mark scheme was prepared to ensure scoring reliability and fairness across marking answers for all the questions and all the candidates. The principal investigator was the only marker so that the inter-rater reliability was not an issue as there was no second marker.

Participation of the house officers was voluntary, anonymous, and consented and all participants were given 30 minutes to respond to the test without access to any radiological resources. Co-ordinators from each centre returned the completed tests to the principal investigator. Responses from all the centres were marked by the principal investigator and analysed at the Waikato Clinical School, University of Auckland using Microsoft Excel v10 software (Microsoft Corporation, Washington, USA).

Results

Sixty-two first year house officers participated; 59 (22% of total first house officers in 2002) were graduates of New Zealand medical schools (Auckland 24 and Otago 35) and 3 were from overseas institutions. Six of the participants have done radiology selective (a period of 4 weeks for advanced study in a field of choice by students in their fifth year of medical school in the University of Auckland) or elective and three were involved in radiology research.

The following percentages of respondents never observed the respective examination during their medical school training (also see Figure 1):

- Barium enema—72% (95% CI: 60%–82%);
- Intravenous urogram (IVU)—75% (95% CI: 63%–87%);
- Ultrasound (US) scan—25% (95% CI: 16%–37%);
- Computed tomography (CT) scan—20% (95% CI: 11%–32%);
- Angiogram—16% (95% CI: 9%–28%);
Magnetic resonance imaging (MRI)—42% (95% CI: 30%–54%).

The mean score for practical knowledge about common investigations was 50% (95% CI: 48%–52%); for knowledge about risks involved in common investigations including radiation it was 47% (95% CI: 45%–49%); and for selecting the appropriate clinical investigations, the mean score was 53% (95% CI 52%–54%) (Figure 2).

Only 42% (95% CI 38%–46%) of the respondents thought they had adequate radiology teaching in their medical school training to work as house officers.
Discussion

The ultimate aim of medical student radiology teaching is to produce a clinician who would be aware of the indications for, values, and limitations of radiology in the clinical management of patients.

In order to produce a clinician who can critically see the role of radiology in patient care, we need to provide a well-structured radiology teaching programme to our medical students especially to those in the final year (trainee interns) of medical school.

The practice of diagnostic radiology has changed considerably in both technique and application within the last 15 years. With advancement of technology, the practice of radiology includes not only conventional methods but new imaging processes such as multi-detector computed tomography (MDCT), and MRI.

In Australia, while the population has increased by 20% during the last 15 years, the use of diagnostic imaging services has doubled and the services rendered per 1000 population has increased by 80%. The challenge for all medical educators is to educate the future medical profession about cost-effective application of new diagnostic and therapeutic imaging procedures.

The vast majority of today’s medical student population will be physicians of general practice and non-radiology specialities, and will request a wide spectrum of radiology
investigations or procedures in their professional life. But there are no organised radiology teaching programmes for candidates in non-radiology training programmes in New Zealand. This underlies the importance of providing a basic knowledge of radiology to all medical students. Hence, radiology education should be appropriate and effective for a medical student who will soon to be a non-subspecialised junior medical officer.

One of the most important objectives for medical student radiology education is that junior doctors and general practitioners need to understand the value, indications, and limitations of radiological investigations. In general, students need to know what information radiology investigations and procedures can provide with accuracy and what their limitations are. This will allow the future clinicians to have a meaningful discussion about the suitability of an investigation with the radiologists and use them as a resource. In addition, they are expected to obtain informed consent for the investigations explaining the tests and risks to their patients for noninterventional or noninvasive radiological investigations such as CT, US, and MRI. (This is usually done at the time of requesting the investigation rather than at the time of the examination performed in the radiology department.)

Informed consent is becoming increasingly important in the current medicolegal environment. To understand the above issues, ideally the student observes such an investigation or procedure during their educational experience at medical school. It is clear from our study that about 75% of respondents never observed a barium enema or IVU. This may be due to the declining use of these two tests due to their replacement by CT colonography and CT urogram.

Despite being very common imaging investigations, about 25% of the students never observed an ultrasound examination or CT scan. This is reflected in their low mean scores of 50% and 47% about the practical knowledge and risks of common radiological investigations and procedures, respectively. It is important, therefore, that medical schools design curricula that allow all students to have an opportunity to observe these common radiological investigations and to understand the benefit and risks.

To use imaging investigations appropriately and cost effectively, students need to be taught evidence-based imaging. Some of the examples of these evidence based guidelines include:

- Ottawa ankle rules which provide guidance about when it is safe not to request radiographs;\(^4,5\)
- Diagnostic strategy of combining a pretest probability score and D-dimer test to clinically exclude lower limb deep venous thrombosis without an ultrasound examination;\(^6\)
- Clinical criteria to rule out cervical spine injury after a minor trauma without radiographs;\(^7\) and
- Clinical criteria to exclude head injuries after minor trauma without a brain computed tomography.\(^8\)

This will encourage evidence-based practice in the use of established imaging guidelines.
Only 42% of the respondents agreed that they had adequate radiology teaching during their medical school training. This further elaborates the need for organised radiology teaching in our medical schools, especially in the final year (trainee intern). An integrated weekly radiology teaching with other speciality attachments throughout the final year of medical school would contribute enormously to the students’ understanding of radiology and its role in day to day patient management. This along with the ‘radiology elective week’ would provide the practical knowledge adequate to work as house officers.

Assessment forms an integral part of learning processes. One of the oldest and most robust findings of educational research is that the assessment is the major influence on what gets learned. Examination results in practical areas do not always match the work based evaluations of students by those who work with them. Hence both summative and formative assessment methods are necessary.

The summative assessment can take the form of a radiology Objective Structured Clinical Examination (OSCE) at the end of the student period of learning in the trainee intern year. It has been shown that students improved OSCE performance after additional clinical exposure. This suggests that OSCEs would be suited for testing integration of radiological and clinical knowledge learned.

The formative assessment from radiologists and tutors throughout the radiology teaching can provide insight into aspects of professional competence including the ability to work in a team, attitudes, and commitment that escape attention of summative examiners. For a summative radiology examination to be most powerful, it needs to be incorporated into a student’s final year of training (trainee intern year).

One limitation of this study is that only about 25% of the 2002 cohort of graduating final year medical students from New Zealand medical schools took part in this voluntary study, and this sample cohort represents a ‘self selected’ group of house officers—this may have skewed the results more favourably.

Providing a structured teaching programme and appropriate assessment in radiology in our medical schools is important, as radiology threads through patient care in almost every medical speciality.

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**Acknowledgements:** The authors acknowledge the contributions of Drs Barbara Hochstein, Brett Lyons, and Stephen Child in reviewing the content of the test and in co-ordinating the administration of the test at their respective centres. We also thank Bruce Shadbolt who provided statistical analysis.
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References:


Appendix 1

Section One

Objective: We are trying to determine how many of you have actually observed the following radiological examinations/procedures performed.

Have you observed the following radiological procedures being performed during your medical course? Please tick the appropriate box.

<table>
<thead>
<tr>
<th>Examination/Procedure</th>
<th>Never</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Barium enema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IVU/Intravenous urogram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ultrasound scan of pelvis or abdomen (not obstetric ultrasound)</td>
<td></td>
<td></td>
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<tr>
<td>4. CT scan of the head/chest/abdomen or pelvis with IV contrast.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Angiography</td>
<td></td>
<td></td>
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<tr>
<td>6. Endoscopic retrograde cholangiopancreatography (ERCP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. MRI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section Two

Objective: These questions test your practical knowledge of what actually goes on during the procedures commonly requested by clinicians.

Please consider the following statements about radiological investigations. Answer the statements as True or False or I Don’t Know with a tick in the appropriate box.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plain films are the only imaging modality used during barium enema.</td>
<td></td>
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<tr>
<td>2. After barium enema, patients are routinely advised to drink plenty of water to avoid constipation.</td>
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<tr>
<td>3. Hepatobiliary ultrasound is routinely undertaken with the patient lying on their right side.</td>
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<tr>
<td>4. A full bladder is required for transabdominal pelvic ultrasound scan.</td>
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<tr>
<td>5. During CT scanning, the patient is advanced through the scanner on a movable platform, rather than the scanner moving over the patient.</td>
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<td></td>
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<tr>
<td>6. It is typically difficult for a patient to keep still during the time required to perform CT scanning.</td>
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<td></td>
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</tr>
</tbody>
</table>
7. A patient usually requires heavy sedation for ERCP.

8. ERCP usually takes over an hour to perform.

9. MR scanning usually takes longer than CT imaging of the same body area.

10. Patients often complain of muscle aches after MR imaging.

11. During screening mammography compression of the breast is used for all patients.

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**Section Three**

**Objective:** These questions test your knowledge of the risks involved in procedures.

Please tick in the appropriate box.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The risk of bowel perforation is higher with barium enema than with colonoscopy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. All patients undergoing intravenous urogram (IVU) need to be warned that they may feel a hot and burning sensation after injection of IV contrast.</td>
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<tr>
<td>3. A common risk of angiography is puncture site haematoma.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4. Duodenal perforation occurs in 5% of patients undergoing ERCP.</td>
<td></td>
<td></td>
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<tr>
<td>5. Radiation exposure is higher from intravenous urogram examination than from CT scan of the same area.</td>
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<td></td>
<td></td>
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<tr>
<td>6. Radiation exposure for an abdominal plain film is more than for a chest plain film.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. Radiation exposure for a lumbo sacral plain film is less than for a plain chest film.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. There is significant radiation exposure to foetus of a pregnant women who has a chest plain film.</td>
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<td></td>
<td></td>
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<tr>
<td>9. There is some radiation exposure to a patient who has a pelvic ultrasound.</td>
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<td></td>
<td></td>
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<tr>
<td>10. MRI is contraindicated for a patient who has intracranial vascular clips as a result of recent aneurysm repair.</td>
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</tbody>
</table>
Section Four

Objective: To test your ability to request the most appropriate and cost effective investigation for the following clinical scenarios:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Plain abdominal radiograph</td>
<td>G</td>
<td>Intravenous pyelogram</td>
</tr>
<tr>
<td>B</td>
<td>Nuclear Medicine scan</td>
<td>H</td>
<td>Plain chest radiograph</td>
</tr>
<tr>
<td>C</td>
<td>CT scan</td>
<td>I</td>
<td>Plain spinal radiograph</td>
</tr>
<tr>
<td>D</td>
<td>MRI scan</td>
<td>J</td>
<td>ERCP</td>
</tr>
<tr>
<td>E</td>
<td>Ultrasound scan</td>
<td>K</td>
<td>Angiogram</td>
</tr>
<tr>
<td>F</td>
<td>PET scan</td>
<td>L</td>
<td>Mammogram</td>
</tr>
</tbody>
</table>

Scenarios:

1. 10 days after a knock to the head during rugby a 25 yr old male complains of being unable to concentrate during lectures because of drowsiness and headaches. General neurological examination is unremarkable.
2. A 55 yr old woman with a history of left mastectomy for breast carcinoma has presented acutely with a transverse fracture of femur. The injury happened as she got up from a chair. Plain radiograph shows a fracture.
3. 25 yr old female who is 16 weeks pregnant complains of loin pain and tenderness since the previous day.
4. A 35 yr old man is brought to the emergency department after a car crash. His neck is being held in a hard collar and he complains of right arm weakness. A plain radiograph shows a fracture of the left humerus in the subcapital area.
5. A 55 year old hypertensive man presents to the emergency department with excruciating chest pain radiating to the back which started 6 hours previously. The blood pressure in the left arm is 170/110 and in the right arm is 145/95. An ECG and cardiac enzymes are normal.
6. A 40 yr old housewife presents to you complaining of a 6 month history of low back pain. The neurological examination in the lower limbs is normal. Your first radiological examination would be.
7. A 50 yr old man presents with fever and flank pain of 3 days duration. He has a past history of renal colic. He has acutely deteriorating renal function tests.
8. A 25 yr old male patient on steroids and with a past history of Crohn’s disease presents to the ED with a 2 day history of right iliac fossa pain and fever. Your examination reveals tenderness and guarding in the right iliac fossa.
9. A 60 yr old female with a history for sigmoid colon carcinoma and metastatic disease presents with 3 days of pain in the right calf and right calf swelling.
10. A 35 yr old man recently discharged from hospital following pancreatitis due to gallstones presents with epigastric pain and fever.
Please complete this table:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Most appropriate investigation</th>
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</thead>
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</table>
Healthline: do primary care doctors agree with the advice?

Ian St George, Matthew Cullen, Michelle Branney

Abstract

Aims To assess agreement between the advice to symptomatic callers to Healthline, and that advised by primary care doctors given the same clinical information, and thus to assess the safety of Healthline advice.

Methods Ninety records of symptomatic calls to Healthline were examined by three primary care specialists, blinded to the actual advice given. They independently recorded what they would have advised, and their advice was compared with that actually given by the Healthline nurse guided by Care Enhance Call Centre software.

Results Variation among the three doctors was greater than that between the median doctor and Healthline. In 82% of cases, the median doctor triaged to an endpoint close to (or lower than) Healthline. In all but one of the remainder, at least one doctor thought there was no risk to the patient (i.e. in 99% of cases). Review of that case indicated nurse error and the guideline itself was judged to be safe.

Conclusion New Zealand primary care specialists regarded the Care Enhance Call Centre decision support software used by Healthline as clinically safe.

In the 1990s, although telephone advice formed a significant part of the workload of US and UK emergency departments, it was often inaccurate or inadequate.\(^1,2\) In 1995, Aitken and coworkers reported phoning 30 New Zealand public hospital emergency departments and 20 private accident and medical centres, role-playing the parent of a feverish infant. They received a wide range of responses. In 14 centres, the doctor on call was contacted at once; in 5 centres, the doctor gave advice; in 26 centres, the nurse gave advice; and in 5 centres, the advisers did not say who they were.

The authors judged the advice from 16 of the 36 centres to be inadequate.\(^3\) Thus such observations led to a desire to standardise telephone advice for symptomatic callers by using electronic information systems.

In the United States during the 1990s, private insurance schemes began offering nurse-led, software-supported telephone triage and advice; and NHS Direct (a free, 24-hour advice and triage line) began in England.

Meanwhile, in New Zealand in 1994, Tisdale reported a pilot of a nurse-run telephone advice line,\(^4\) and in 1998 Cameron and others reported high levels of satisfaction by those phoning the National Poisons Centre for advice, as well as considerable saving of public money.\(^5\)

Furthermore, the repeated observation that resource-intense primary medical services were being inappropriately used by those whose symptoms could have been managed with lower levels of care,\(^6\) led to a desire for primary care demand management, and again, telephone triage seemed to supply an answer.
The two drivers for freely available telephone triage were thus standardisation of advice, and improved resource use by directing callers to lower levels of care.

The New Zealand Health Ministry funded Healthline pilot began in four regions in 2000. In 2004, it incorporated Plunket Line and in May 2005 it became a national, state-funded, 24x7, primary health service offering health information, well child, and parenting assistance, and symptom triage.

About 70% of Healthline callers seek advice on symptoms, and 70% of the calls are outside normal working hours. Many are triaged to lower levels of care than they had intended before calling Healthline.\(^7\)

The question arises, then: is it safe? An independent study of the Healthline pilot, commissioned by the Ministry, exhaustively traversed the clinical quality activities of the service, and concluded, ‘The Healthline service has operated at least as safely to date as similar overseas telephone services,’\(^8\) but Moriarty and others expressed concern after a study of simulated callers.\(^9\)

Since then, Healthline has changed the software from ‘Personal Health Advisor™’ to a new decision support package called ‘Care Enhance Call Centre™.’

We decided then to examine the degree of concordance between primary medical care specialists with Healthline advice using the Care Enhance Call Centre™ software package.

**Method**

Healthline nurses triage callers seeking advice on current symptoms by using a symptom-specific guideline to one of nine dispositions (‘endpoints’: Table 1). The guideline is computer-based, prompting the nurse to ask a series of questions designed to exclude the most serious potential causes of the symptom. The endpoint is reached when a specific cause cannot be excluded. The nurse makes a full electronic record including demographic data, free text on the presenting symptom, the responses to the guideline questions, the endpoint reached, and the advice and assistance given.

**Table 1. Triage endpoints for symptomatic callers**

| 1.  | Activate 111 |
| 2.  | Go to general practitioner or emergency department immediately |
| 3.  | Call or go to other healthcare provider immediately (e.g. mental health team, poisons centre, dentist, lead maternity carer) |
| 4.  | See doctor or other healthcare provider within 4 hours |
| 5.  | See doctor or other healthcare provider within 8 hours |
| 6.  | See doctor or other healthcare provider within 24 hours |
| 7.  | See doctor or other healthcare provider within 72 hours |
| 8.  | See doctor or other healthcare provider within 2 weeks |
| 9.  | Home self-care |

Beginning from midnight 31 January 2005, we selected the first 10 cases triaged to each endpoint—and printed the call record, obliterating the actual endpoint reached, and the advice given. Three primary care specialists then independently examined the
90 clinical records thus generated and decided what endpoint they would have recommended, given the same information. There were two general practitioners (both women, one urban and one rural) and one accident and medical doctor with a hospital emergency department background: two were selected on the basis of personal acquaintance with the service, and one represented the Wellington after hours medical service.

Thus the ‘gold standard’ with which we compared the nurse decisions, was that of experienced primary care specialists, given the same clinical information.

We defined agreement as an endpoint at or immediately adjacent to that actually recommended by the nurse. We calculated concordance by crude percentage agreement, and by Cohen’s Kappa (K) which provides a number between 0 and 1: a K of 0.7 or more is regarded as showing satisfactory inter-rater reliability.

**Results**

The endpoints advised by the three doctors varied: crude percentage agreement between the highest and lowest was only 51% and Cohen’s K = 0.43.

For that reason we compared the median doctor-advised endpoint for each case with the endpoints reached by the Healthline nurses. For this comparison, crude percentage agreement was 70%, and Cohen’s K = 0.78.

In 10 cases (11.1%), the median doctor triaged to two endpoints or more lower (i.e. to a lower level of care) than the Healthline nurse. In 64 cases (71.1%), the median doctor triaged to within one endpoint of that reached by the Healthline nurse. Thus, for 82.2% of cases, there were no safety concerns.

In the other 16 cases (17.8%), the median doctor triaged to two or more levels of care higher, but the three doctors were unanimous in only seven of these (7.8%). They were asked to review these seven cases, considering specifically whether the Healthline nurse endpoint was unsafe. In only one case (1.1% overall) did all three consider that the lower endpoint posed some risk to the patient. On detailed review of this case, the lower endpoint reached by the Healthline nurse was not a function of the software, but an error by the operator.

In only four cases, the doctors would have triaged to 111 when Healthline did not, and in all of these the Healthline nurse had recommended immediate medical care. The doctors considered there was no risk to the patients in these cases.

**Discussion**

A Kappa of 0.78 between the median doctor and Healthline is reassuring, as is the perception that Healthline endpoints were clinically safe in 99% of cases, and the software clinically safe in all cases. The single case where disagreement was unanimous among the doctors was not a fault of the software, but an error by the nurse.

One doctor spontaneously commented:

> The exhaustiveness of the questioning that the nurses do before reaching a conclusion is probably much more accurate in the end than I would do in the night for example when woken up. The computer prompts them to go into all possible urgent scenarios and thus I think it would be pretty unusual for them to miss anything. Having seen the system ‘up close’ it
appears excellent. The patients will appreciate receiving consistent advice rather than the enormous variety they receive from different individual doctors.

We observed wide variation among the three doctors (Kappa 0.43), wider than that between the median doctor and Healthline (Kappa 0.78). Indeed, one doctor wrote:

   It could be that I am a little cautious or that I am used to dealing with patients who want immediate service/action.

Gribben similarly asked 12 doctors to assess whether they would have managed patients attending a city emergency department themselves, and found a Kappa of 0.34 among them; he remarked:

   There was a surprisingly wide range of views on the proportion of cases that the GPs thought could be completely handled in primary care. We asked for personal views, and so naturally the skills and experience of individual GPs will have contributed to the range. These assessments did not appear to be related to age or gender and the scores of the A&M (accident and medical) doctors and academic GPs were distributed across the range.

The range of medical practice variation is wide, and with Marshall Marinker we offer no criticism of that: “Narrowing the range may give us the illusion of consensus, without telling us anything at all about whether the consensus is better than the diversity.” he wrote. Similarly, we make no judgement as to who is right: triage can be standardised, but without guidelines it is not a precise science.

Note: We acknowledge that three is a small group of doctors, and that a larger group may have provided more reliable data.

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References:


The Strong Parents-Strong Children Programme: 
parental support in serious and chronic child illness

Helen Jerram, John Raeburn, Alistair Stewart

Abstract

Aim To determine the effectiveness of an intervention programme developed to help parents manage serious child illness.

Method Information from previous research about parents’ stress of managing their children’s serious illnesses, plus their wishes for what to do about it, were used to develop a behavioural intervention to be used with groups of parents with seriously ill children. The 6-week programme, called ‘Strong Parents-Strong Children’, was tested using a wait-list control design, and evaluated by standardised and researcher-developed psychological measures.

Results Several significant post-test changes in healthier directions were found for the study group, compared with the control group. Additionally, the group process and session helpfulness received positive appraisals, personal goals were attained at high levels, and most participants said they would recommend the programme to others in similar situations.

Conclusions The programme appears to have a significant and positive impact on the parents of seriously ill children.

In serious child illness, the parent role is an integral part of the treatment process, and is critical in co-ordinating all that is happening for the child. Managing these illnesses adds considerably to the stresses of normal child-rearing. Potential risk to maternal mental health is documented in the literature.\(^1\,2\). In mitigation of these risks, responsive social support (including support provided by professionals)\(^3\) is helpful. When parents feel confident in working alongside professionals, they are better able to collaborate in ensuring their sick child’s quality of life.

This research is the first in New Zealand to investigate the effectiveness of a parent-centred intervention where the focus is support, learning of skills, and stress management for those with children with serious illness and special needs.

The programme described here, entitled ‘Strong Parents-Strong Children’, helps parents manage illness-related stresses and learn advocacy and practical skills within a child development framework. The primacy of the parent role in helping to optimise their sick child’s development (particularly where there are disabling sequelae) formed the rationale for such an intervention.

This paper involves a test of the efficacy of this programme with parents of children referred from the three main hospitals in Auckland.
The intervention programme

The Strong Parents-Strong Children programme consists of six once-weekly sessions. The content focuses on the common stresses faced by parents with seriously chronically ill children, and was obtained from two sources. One was a series of preliminary studies undertaken by the first author. This involved interviewing 40 parents, including those of Maori, Cook Island Maori, and Fiji Indian origin, plus paediatricians and charge nurses, from which a ranking of parental stresses was derived. The second source was from the current psychological literature describing optimal approaches relating to child development and stress management.

Draft versions of the programme were initially trialled over a year with 12 parents, and the version tested here evolved from this process. Each of the six sessions consists of three equal components: input from the facilitator, group discussion, and review of weekly ‘homework’ assignments. Through reiteration of principles and discussion of examples, opportunities are provided for strengthening parent understanding and self-help. In this research, the first author (HJ) was the programme facilitator. Her role was important since she had a similar history as a parent, and hence to some extent was an ‘empathetic peer’.

The session content and process were as follows:

- **Session 1**—This session was introductory, with the facilitator (HJ) beginning by introducing herself and her background as well as her involvement in this area (including what she had learned from other parents in previous research). Pre-course research measures were completed by participants, after which they introduced themselves and shared child illness information; ground rules for this and the following sessions were established. The group processes of learning skills to deal with illness-related stress, personal goal-setting and weekly-reviewed homework were outlined, and the theme of parents taking care of themselves was emphasised. Information about community support was also provided.

- **Session 2**—Strategies for ensuring time to themselves and the importance of learning relaxation skills were discussed. A Mental Health Foundation relaxation CD was provided for home practice. The concept was introduced of the common cognitive tendency to ‘catastrophise’ under stress, including how to deal with this through self-talk (with examples taken from the facilitator’s and other participants’ own experiences).

- **Session 3**—Here the theme was getting desired information from relevant health professionals. Suggestions were made regarding appropriate skills and strategies, and were reinforced with role-plays. The need for parents to have information from professionals properly documented was examined, and their own important role as advocates and providers of information to others was emphasised.

- **Session 4**—This session focussed on the parents’ unique role, and the expertise that they already have in caring for their sick child. The need to have siblings involved and not be overlooked was emphasised. Strategies for child-friendly and consistent behaviour management were covered.

- **Session 5**—Domestic organisation in terms of setting priorities in daily illness and household management was discussed. Other matters included accessing family
and wider agency support outside the household, benefits of shared parenting, and the importance of maintaining normal family activities. The value for the ill children of maintaining their existing friendship links and school contacts was also addressed.

- **Session 6**—This final weekly session looked at the family’s way of operating once the acute phase of the illness process was over. The emphasis was on ‘normalising’ family process and ethos, and on helping the child to manage their own health where feasible. Participants’ future plans were shared, the progress on each person’s course goals set in Session 1 were discussed, and a follow-up session date arranged. Finally, post-course research measures were completed.

- **Follow-up Session**—This took place 6 months after Session 6. Participants reviewed their child’s progress, their own wellbeing, and the usefulness of the strategies they had learned in the course. Parents’ changed perspectives were shared, and longer-term and future goals discussed. Plans for keeping in touch were made. Follow-up measures were completed.

**Note:** All sessions took place in the University of Auckland School of Medicine, Grafton, Auckland.

**The participants (parents)**

Fifty-eight parents whose children had current serious health conditions participated in the study: 41 in a study group and 17 controls. Although no parents had evidence of marked psychosocial pathology, all were experiencing the intense stress that is associated with having a child with serious health impairment. Table 1 shows the characteristics of the parents who participated.

### Table 1. Study group and controls: demographic characteristics of parents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Group (N=41)</th>
<th>Control Group (N=17)</th>
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<tbody>
<tr>
<td></td>
<td>Mothers (N=38)</td>
<td>Fathers (N=3)</td>
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<td>Separate</td>
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<tr>
<td></td>
<td>22</td>
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<td></td>
<td>Pakeha*</td>
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<tr>
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<td></td>
<td>Tertiary</td>
<td>22</td>
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<tr>
<td></td>
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<tr>
<td>Employment</td>
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</tr>
<tr>
<td></td>
<td>Full-time</td>
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</tr>
<tr>
<td></td>
<td>Part-time</td>
<td>17</td>
</tr>
</tbody>
</table>

*New Zealand European.
The children

Table 2 shows that the most common diagnoses among the children were cancers, which included brain tumours, neuroblastomas, leukaemia, osteosarcoma, Burkitt’s lymphoma, and Hodgkinsson’s disease. Other illnesses included cystic fibrosis, haemophilia, diabetes mellitus, severe epilepsy, coronary heart disease, supraventricular tachycardia, restrictive cardiomyopathy, infantile stroke, neurological impairment, cerebral palsy, a liver transplant, Pierre Robin syndrome requiring surgery, the ongoing construction of the missing part of a child’s chest wall, congenital trachea, oesophageal fistula receiving periodic critical care, Down’s syndrome (with diabetes), and chiachondroplasia. Ten children were receiving educational support.

Referrals

Referrals came equally from hospital charge nurses on the advice of paediatricians, and from self-referrals, consequent on parents learning about the groups from support organisations and from other research participants. Criteria for entry to the study were parents who were normal everyday parents, willing to be randomly assigned to either a study or to a control group. Charge Nurses, in discussion with paediatricians, told parents who met these criteria about the research and parents who were interested contacted the researcher. Therefore this was a convenience sample.

Methods

Experimental design—A wait-list design\(^7\) was used. Figure 1 shows the design from initial intervention to the 6 months follow-up. The study and control groups ran for 6 weeks in parallel. The study group had measures taken at weeks 1 and 6, and the control group at weeks 7 and 12. (The control group later received the intervention but their treatment data are not included here.) Follow-up sessions were held for both groups 6 months after their respective last group sessions.

Participants were allocated randomly to study and control groups by drawing names from a container. It was felt there was an ethical requirement to intervene immediately, which meant as many parents as possible were included in the intervention group. Forty-one participants were chosen and distributed between seven study groups, ranging in size from five to seven participants. Eligible parents were informed that they would all receive the programme but that those allocated randomly to a control group would receive the intervention later.

Measures—The principal measure was the Parent Self-Rating Scale (PSRS)\(^8\), developed by the first author (HJ), consisting of a set of 12 analogue scales measuring participants’ knowledge and skills related to coping with their children’s illnesses. In addition, five standard psychological tests were used. These were the Affectometer 2\(^9\) (wellbeing and happiness), the Life Orientation Test\(^10\) (general optimism), the Family Environment Scale\(^11\) (10 dimensions of family life), the COPE\(^12\) (general coping), and the Short Form of the State-Trait Anxiety Scale (STAI)\(^13\) for general anxiety. Overall, the component parts of these 6 measures provided 38 variables for analysis.

Goal-setting was also used as a measure. This involved participants formulating short-term (end-of-course) behavioural objectives (e.g. attend to own health needs, re-discover friends, do short computer course, lessen anxiety, be assertive over child’s needs) and longer-term (six months) behavioural objectives (e.g. ensure successful transition back to school, achieve child self-management of condition, ensure fun times, complete training courses). Achievement on a five point scale (“fully achieved” to “not attempted”) was assessed.

Finally, participants’ ratings were taken using a four-point scale for variables of feeling supported, meeting other parents, cohesiveness of group, and leadership style. Five point ratings were taken for session helpfulness and whether or not they would recommend the programme to other parents. Attendance was also recorded.
Statistical analyses—The observed means and standard deviations are reported for the two groups both before (pre) and after (post) the 6 week intervention period. The scores of the control group and intervention group after the 6-week intervention period were compared using a general linear model which included the score at baseline, treatment (active, maintenance or completed), illness type (cancer or otherwise), months since diagnosis (up to 6 months, 6 or more months), and age group (0–12 years, 12–17 years).

The test statistic and its associated P value for the difference between the two groups are reported. To determine the impact of the three levels of treatment on outcomes, a Tukey-Kramer test was done post hoc across both study and control groups. For the group that underwent the active intervention during the study period, their 6-month scores are also reported.

Figure 1. Timeframe of study and control group

<table>
<thead>
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<th>Timeframe of Study and Control Groups</th>
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<tr>
<td>Phase One</td>
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<td>Weeks</td>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 ... 30 .. 36</td>
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<tr>
<td>Treatment</td>
</tr>
<tr>
<td>(Measurements taken) * * * * * * * * * *</td>
</tr>
<tr>
<td>Controls</td>
</tr>
<tr>
<td>(Measurements taken) * * * * * * * * * *</td>
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<tr>
<td>X Intervention</td>
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<td>-- No intervention</td>
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Table 2. Characteristics of the 54 children and their illnesses

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<tr>
<th>Diagnosis</th>
<th>N</th>
<th>Gender</th>
<th>Age</th>
<th>Time since diagnosis</th>
<th>Treatment status</th>
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<td></td>
<td>Male</td>
<td>Female</td>
<td>Mean (yrs)</td>
<td>Mean (yrs)</td>
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<tr>
<td>Cancers</td>
<td>25</td>
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<td>13</td>
<td>8.1</td>
<td>1.6</td>
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<td>Diabetes mellitus</td>
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<td>5‡</td>
<td>2</td>
<td>8.8</td>
<td>1.9</td>
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<tr>
<td>Severe epilepsy</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>7.8</td>
<td>6.9</td>
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<td>Cystic fibrosis</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>5.4</td>
<td>5.1</td>
</tr>
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<td>Heart disease</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Liver transplant</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Neurological</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>9.1</td>
<td>5.6</td>
</tr>
<tr>
<td>Haemophilia</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Surgical repair</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>5.4</td>
<td>4.7</td>
</tr>
<tr>
<td>Diagnosis awaited</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

*1 child was being considered for a second bone marrow transplant; †Receiving alternative treatment; ‡Including 1 child also diagnosed with Down’s syndrome; §Hospitalised with mother for 1 year; **1 at GP and 1 at Starship Clinic.
Table 3. Variables showing significance on the Parent Self-Rating Scale, Affectometer 2, Family Environment, COPE, and STAI: analyses of covariance of variables post-test (n=41) and paired t-tests from post-test to follow-up (n=33)

<table>
<thead>
<tr>
<th>PARENT SELF-RATING SCALE</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Comparison of change</th>
<th>6-month follow-up</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>F (1,50)</td>
<td>P value</td>
</tr>
<tr>
<td>Optimistic will cope</td>
<td>S 44 (32)</td>
<td>72 (25)</td>
<td>13.5</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 35 (29)</td>
<td>45 (25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling calmer</td>
<td>S 57 (30)</td>
<td>73 (23)</td>
<td>17.5</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 46 (25)</td>
<td>45 (21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stronger as parent</td>
<td>S 61 (31)</td>
<td>81 (18)</td>
<td>14.8</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 44 (29)</td>
<td>53 (27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More accepting illness is random</td>
<td>S 57 (32)</td>
<td>78 (21)</td>
<td>19.5</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 42 (33)</td>
<td>47 (30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More included in clinical decisions</td>
<td>S 62 (28)</td>
<td>82 (18)</td>
<td>21.9</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 54 (26)</td>
<td>57 (24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Able to get needed information</td>
<td>S 61 (28)</td>
<td>83 (16)</td>
<td>24.3</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C 60 (31)</td>
<td>60 (25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advocating for child with professionals</td>
<td>S 65 (26)</td>
<td>85 (15)</td>
<td>11.4</td>
<td>p=0.001</td>
</tr>
<tr>
<td></td>
<td>C 61 (28)</td>
<td>68 (22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better organised</td>
<td>S 52 (32)</td>
<td>75 (23)</td>
<td>7.9</td>
<td>p=0.007</td>
</tr>
<tr>
<td></td>
<td>C 52 (31)</td>
<td>55 (24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better able to manage change in our lives</td>
<td>S 56 (30)</td>
<td>76 (23)</td>
<td>9.3</td>
<td>p=0.004</td>
</tr>
<tr>
<td></td>
<td>C 46 (29)</td>
<td>52 (24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFFECTOMETER 2</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>Comparison of change</td>
<td>6-month follow-up</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellbeing</td>
<td>S 1 (1)</td>
<td>2 (2)</td>
<td>10.9 p=0.002</td>
<td>2 (1)</td>
</tr>
<tr>
<td></td>
<td>C 1 (2)</td>
<td>1 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>S 4 (2)</td>
<td>5 (1)</td>
<td>8.3 p=0.006</td>
<td>6 (1)</td>
</tr>
<tr>
<td></td>
<td>C 4 (1)</td>
<td>4 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>S 7 (2)</td>
<td>8 (1)</td>
<td>6 p=0.018</td>
<td>7 (2)</td>
</tr>
<tr>
<td></td>
<td>C 6 (3)</td>
<td>7 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional support</td>
<td>S 11 (4)</td>
<td>13 (3)</td>
<td>12.1 p&lt;0.001</td>
<td>12 (3)</td>
</tr>
<tr>
<td></td>
<td>C 11 (4)</td>
<td>11 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth / re-interpretation</td>
<td>S 12 (2)</td>
<td>13 (2)</td>
<td>6 p=0.017</td>
<td>13 (2)</td>
</tr>
<tr>
<td></td>
<td>C 10 (3)</td>
<td>10 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td>S 13 (3)</td>
<td>13 (2)</td>
<td>4.6 p=0.038</td>
<td>13 (3)</td>
</tr>
<tr>
<td></td>
<td>C 11 (2)</td>
<td>10 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td>S 11 (3)</td>
<td>12 (3)</td>
<td>7.1 p=0.010</td>
<td>12 (3)</td>
</tr>
<tr>
<td></td>
<td>C 9 (3)</td>
<td>9 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General anxiety</td>
<td>S 14 (5)</td>
<td>12 (4)</td>
<td>4.6 p=0.036</td>
<td>12 (4)</td>
</tr>
<tr>
<td></td>
<td>C 15 (4)</td>
<td>14 (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PSRS=Parent Self-Rating Scale; FES=Family Environment Scale; STAI=State-Trait Anxiety Inventory.
Results

The overall attendance rate was 93%. There were four dropouts, all of whom left for reasons unrelated to the course itself (e.g. left Auckland): three after the first session and one after the second session.

As stated previously, overall, 38 variables spanning the 6 measures were subjected to analyses. Table 3 shows the 17 variables that were statistically significant at the 5% or better level of significance. All the significant results are in a ‘healthy’ direction. As can be seen, these improvements were on 9 variables of the PSRS (reflecting participants’ self-perceived improvements in effectiveness, stress management skills and role as parents), and 8 variables from the standard psychological tests (representing improvements in wellbeing, family cohesion, anxiety levels and overall coping).

The Tukey-Kramer analysis of the 3 categories of child treatment status (active, maintenance, completed) showed that for 10 of the PSRS variables, as well as for ‘Affectometer 2’ and ‘STAI general anxiety’ scores, parents in both the study and control groups with children in active treatment had less healthy mean scores at post-test (p<0.05) than those with children who had completed treatment or were on maintenance treatment.

Many of the children under active treatment had cancer. Similar analyses showed that parents with younger children (0–12 years) did generally better on the PSRS in terms of organisation and coping than parents with children entering adolescence (12–17 years).

Analysis of the study group’s 6-month follow-up data on the PSRS and the standardised measures showed no significant reductions in any mean scores compared with post-test scores, thus indicating overall maintenance of the positive changes made during the course.

With regard to personal goal-setting, a total of 244 goals were set by the 41 participants in the study group. At post-test, 88% of these goals were rated at the top two of the five achievement levels (‘fully achieved or ‘good progress’). At 6-month follow-up (N=33), this figure was only slightly lower at 86%, thus suggesting maintenance of course-related goal attainments.

On judgements of group process, 98% of study group parents rated the groups as ‘very’ or ‘most’ supportive; 95 % of parents rated meeting other parents as ‘very’ or ‘most’ helpful; and 81% of parents rated the groups as being ‘very’ or ‘most’ cohesive. The facilitator’s style was rated by 93% as ‘very’ or ‘most’ empathic, and 89% would ‘definitely’ recommend the programme to other parents in similar situations.

Discussion

The preliminary research that preceded the study reported had shown that children’s serious illnesses were having a major impact on their parents’ daily lives. Family routines had changed and parents had significant concern for their ill children’s future.
After experiencing the Strong Parents-Strong Children programme, participating parents reported significant improvements in several areas: they felt better able to manage several aspects of their child’s illness. They felt empowered to cope with what lay ahead; better able to get information they wanted; stronger as advocates for their children; and affirmed in their own expertise in caring for their children. Their levels of wellbeing and happiness were also significantly higher than when they started the programme, and their anxiety levels decreased. They also perceived their families to be more united; they felt more emotionally supported; and they were better able to plan and deal with stress.

In addition, they were able to achieve most of the individual behavioural goals they set for themselves, which included such matters as increasing their levels of exercise, relaxing, having time for themselves, attending to their own health needs, and meeting their children’s educational needs. At 6-months follow-up, most or all of these gains seem to have been maintained.

Overall, parents appeared very much to enjoy their participation in the programme and how it was run, and would recommend it to others in similar situations. One interesting finding relates to the fact that parents whose children were in active treatment appeared to respond less positively on some measures, compared with those whose children’s treatment was completed or at a maintenance level. This would support the intuitive notion that that parents whose children are actively undergoing treatment may be more concerned with (and vulnerable to) the stresses of what is happening with their children than those who have passed that stage.

Most of the participants in this research were mothers, and the risk to maternal mental health of having a child with a serious illness is well documented in the literature. This study, therefore, can be seen as a contribution to the general area of maternal mental health, as well as to aiding the physical health of the children through their parents’ increased efficacy and confidence. The role of social support, as well as the actual skills learned, should not be underestimated here, since the role of the group and the facilitation by a ‘peer’ were very important aspects.

From a medical research perspective, this research is notable for the fact that it gives the primary voice and attention to those studied—the parents. Professionals clearly have a critical support role to play. However, the key to the success of this programme is seen in the fact that it was largely determined by, and empowering for, the parents concerned.

Overall, this research is a first of its kind in New Zealand, and possibly the World, and shows that a parent-determined programme of this nature can have much to offer in an area as difficult and distressing as serious child illness.

Note: After the completion of this research, a charitable trust was set up by the first author to continue the programme at no cost to parents, which was done in a variety of hospital and community settings around Auckland. The programme is currently in recess.

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Acknowledgements: The nine children who did not survive the research period are remembered with deep respect. We thank the parents who were involved in the study, parent support groups, staff of Starship Children’s Health, Auckland Hospital Neurosurgery Department, and Green Lane Hospital Paediatric Coronary Care Unit.

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References:

The health status of quota refugees screened by New Zealand’s Auckland Public Health Service between 1995 and 2000

Alison McLeod, Martin Reeve

Abstract Each year New Zealand accepts approximately 750 refugees from overseas for resettlement in New Zealand. Known as “Quota Refugees”, these people arrive in groups of 125 six times each year. Since 1979 their first six weeks in New Zealand have been spent at the Mangere Refugee Resettlement Centre in Auckland. This Centre comprises several agencies which prepare the refugees for their life in New Zealand. Among the agencies is a Medical Clinic, which provides health screening, and management of any medical problems found. This paper describes the findings of the health screening, mainly those refugees screened between 1995 and 2000, but also includes some historical data from the opening of the Resettlement Centre.

Each year, New Zealand takes a quota of 750 refugees from overseas; about 10 other countries also take a quota of refugees. These refugees have been mandated by the United Nations High Commission for Refugees (UNHCR), and have often lived in refugee camps for many years. New Zealand also accepts asylum seekers, about whom there is a separate report.1 The invited or ‘quota’ refugees are selected by the New Zealand Immigration Service (NZIS), and come to New Zealand in groups of about 130, and on arrival, stay at the Mangere Refugee Resettlement Centre (MRRC) in Auckland for 6 weeks. MRRC, which started receiving refugees in 1979, is possibly unique in the world because of its collection of agencies on the one site, the agencies being:

- Refugee Branch of NZIS—responsible for the documentation for each refugee.
- Refugee and Migrant Service—a non-government organisation (NGO) responsible for the social aspects of resettlement.
- School of Refugee Studies of the Auckland University of Technology—which runs educational programmes for all ages.
- Refugees as Survivors (RAS)—an autonomous torture/trauma counselling service.
- The Medical Clinic—under the auspices of the Auckland Regional Public Health Service,

During their stay at MRRC, the refugees are prepared for their new life in New Zealand, and among the preparations are medical screening and treatment. Any treatment needed is either started at MRRC, or the refugee is referred to the appropriate clinic. Adverse medical findings do not have any effect on the refugees right to resettlement.

On leaving MRRC, all the refugees are given a copy of their medical records, and part of the resettlement process involves a support worker from RMS helping the refugee to register with a GP.
We report here key findings, mainly from the period of 1995–2000, but also including historical data from the opening of the clinic. Some comparisons are made with asylum seekers.

**Methods**

Medical records have been kept since the clinic first opened in 1979. An annual medical report was written every year from 1979 until 1992. Since July 1995, the records have been computerised, initially shelf general practice patient management system, Medtech-32. The main data is derived from analysis of the Microsoft Access software program from July 1995 until the end of 1999. The screening programme is evolving; so over time, some procedures are introduced and others dispensed with. In addition, some refugees do not receive all the tests. In most cases this occurs in young children in whom for technical reasons not enough blood is obtained to carry out all the tests.

The data includes stated nationality, age, and sex; the screening process includes a chest X-ray for all those 16 years and over; and for all ages, a Mantoux test, full blood count, haemoglobinopathy screening, iron studies, liver function tests; serology for HIV antibodies, Hepatitis B surface antigens, and antibodies, Hepatitis C antibodies, molluscum and rubella IGG; one urine test; and 3 stool tests for Salmonella and Shigella bacterial species, and all other faecal parasites. Women are offered cervical smears and gynaecological bacteriological screening. The clinical medical examination is standardised, and includes a psychosocial assessment.

Historical data before 1995 are taken from the annual reports, and is presented for tuberculosis, HIV, and some faecal pathogens. Where data are missing, it is because it is not available, usually at times of restructuring when lack of continuity of staffing made collection of data difficult.

Laboratory parameters from the testing laboratories as printed with each result were used to determine the normality of blood tests. Data were analysed using Epi Info 2000 software. Relative risks (RR) and 95% confidence intervals (CI) were calculated, with corresponding p values.

**Results**

**Demographics**

2992 refugees received health screening at the MRRC between July 1995 and the end of 1999. Their age and sex demographics are presented in Figure 1; Tables 1 indicates their nationalities. Figure 2 and Table 2 compare the age/sex and nationalities, respectively, of quota refugees compared with asylum seekers. Of the 2992 refugees, 1403 (46.9%) were female and 1589 (53.1%) were male; 34 different nationalities were recorded.

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iraqi</td>
<td>875</td>
<td>29.2</td>
</tr>
<tr>
<td>Ethiopian</td>
<td>691</td>
<td>23.1</td>
</tr>
<tr>
<td>Somali</td>
<td>527</td>
<td>17.6</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>176</td>
<td>5.9</td>
</tr>
<tr>
<td>Iranian</td>
<td>131</td>
<td>4.4</td>
</tr>
<tr>
<td>Sudanese</td>
<td>91</td>
<td>3</td>
</tr>
<tr>
<td>Afghan</td>
<td>68</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>431</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Table 1. Demographic characteristics of quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)
Figure 1. Demographic characteristics of quota refugees screened at the Mangere Refugee Resettlement Centre, Auckland, New Zealand (1995–1999)

Figure 2. Demographic characteristics of screened asylum seekers in Auckland, New Zealand (1999–2000)
Table 2. Demographic characteristics of quota refugees 1995–1999, compared with asylum seekers 1999–2000

| Nationality | Quota refugees | | | Asylum seekers | | |
|-------------|----------------|------------------|----------------|------------------|------------------|
|             | Number         | Percentage (%)   | Number         | Percentage (%)   | Number         | Percentage (%)   |
| Iranian     | 131            | 4.4              | 168            | 18.7             |
| Afghan      | 68             | 2.3              | 146            | 16.2             |
| Sri Lankan  | 47             | 1.6              | 138            | 15.3             |
| Czech       | 0              | 0                | 133            | 14.8             |
| Kuwaiti     | 2              | 0.1              | 65             | 7.2              |
| Somali      | 527            | 17.6             | 46             | 5.1              |
| Iraqi       | 875            | 29.2             | 41             | 4.6              |
| Other       | 1340           | 44.8             | 163            | 18.1             |

Infectious diseases

The four most prevalent infectious diseases in the World (excluding upper respiratory tract infections) are:

- Tuberculosis
- Malaria
- HIV infection
- Schistosomiasis

**Tuberculosis**—Figure 3 shows the outcome of screening from July 1995 until July 1998 (1405 refugees). After that time, the management of Mantoux positive refugees has devolved to the public health units in the areas in which the refugees have settled.

**Figure 3. Outcome of tuberculosis testing in quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)**

CXR=serial chest X-ray; TB=tuberculosis; Prophylaxis=treatment for latent TB infection with Isoniazid; Unresolved=generally those refugees whose Mantoux test is positive, but who are undergoing further investigation at the time they left the Centre—e.g. awaiting sputum culture for tuberculosis, and who were followed up outside the Centre.
For the population under consideration, all 2992 had a mantoux test, of whom 995 (34.3%) had a result of 10mm or more.

**Malaria**—Many refugees come from an area in which malaria is endemic (e.g. Sub-Saharan Africa). There is no test for quiescent malaria, but all refugees are asked if they have had malaria, and if they come from a malaria endemic area; 26% of all the refugees questioned report that they have had malaria in the past.

**HIV infection**—Testing for HIV infection started at the Centre in 1994, but reliable data exists from computerisation of the data in mid-1995. The data has been grouped to avoid the risk of identifying individuals.

**Table 2. Prevalence of positive HIV tests among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Number tested (%)</th>
<th>Number HIV-positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>1349 (98.0)</td>
<td>52 (3.9)</td>
</tr>
<tr>
<td>South East Asia</td>
<td>251 (96.9)</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>Neither of the above</td>
<td>1223 (96.8)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>All quota refugees</td>
<td>2823 (97.3)</td>
<td>57 (2.0)</td>
</tr>
</tbody>
</table>

**Table 3. Serology of infectious diseases other than HIV among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)**

<table>
<thead>
<tr>
<th>Serological test</th>
<th>Number tested (%)</th>
<th>Number positive of those tested (%)</th>
<th>Range by nationality (%)/Mean/SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schistosomal Ab</td>
<td>2825 (94.4)</td>
<td>620 (21.9)</td>
<td>0–100 / 17 / 25.9</td>
</tr>
<tr>
<td>Anti HBs</td>
<td>2964 (90.0)</td>
<td>729 (24.6)</td>
<td></td>
</tr>
<tr>
<td>HBsAg</td>
<td>2923 (97.7)</td>
<td>136 (4.7)</td>
<td>0–100 / 13.8 / 27.5</td>
</tr>
<tr>
<td>Anti HCV†</td>
<td>1926 (88.4)</td>
<td>43 (2.3)</td>
<td>0–10 / 1.5 / 2.7</td>
</tr>
<tr>
<td>HCV RNA present</td>
<td>40 (93) of those positive</td>
<td>19 (47.5) of those with positive antibodies; 0.99% of the 1926 tested</td>
<td></td>
</tr>
<tr>
<td>Treponemal Ab</td>
<td>2847 (95.2)</td>
<td>113 (4.0)</td>
<td>0–100 / 6.5 / 19.4</td>
</tr>
<tr>
<td>Rubella IGG</td>
<td>2681 (89.6)</td>
<td>2240 (83.6)</td>
<td>40–100 / 81 / 17.5</td>
</tr>
<tr>
<td>Morbilli IGG†</td>
<td>2396 (98.1)</td>
<td>1843 (76.9)</td>
<td>0 – 100 / 81.1 / 22.8</td>
</tr>
</tbody>
</table>

†Testing started in 1997.

**Intestinal parasites**—Each refugee is requested to give three stool samples. In the population studied, all 2992 refugees gave at least one sample. If every refugee had given three samples as requested, there would have been 8976 samples. In fact there were 8485 samples examined, (of which 45 were insufficient for analysis). Thus 8440 samples were analysed, 94% of the possible total.

Table 4 lists the number of individuals affected by each intestinal pathogen. Any given individual may be affected by more than one pathogen.
A previous study of the Mangere refugees showed an overall prevalence of 31%\(^2\) of individuals with one or more parasites; of which 7% had two parasites detected, 1% had three, and 0.1% had four.

**Table 4. Prevalence of selected intestinal pathogens/parasites among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)**

<table>
<thead>
<tr>
<th>Pathogen/parasite</th>
<th>Number (%) with pathogen/parasite in stool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaris lumbricoides</td>
<td>89 (3.0)</td>
</tr>
<tr>
<td>Clonorchis sinensis</td>
<td>15 (0.5)</td>
</tr>
<tr>
<td>Giardia lamblia</td>
<td>450 (15)</td>
</tr>
<tr>
<td>Hookworm</td>
<td>125 (4.2)</td>
</tr>
<tr>
<td>Hymenolepis nana</td>
<td>189 (6.3)</td>
</tr>
<tr>
<td>Salmonella spp(^*)</td>
<td>70 (2.3)</td>
</tr>
<tr>
<td>Schistosoma mansoni</td>
<td>80 (2.7)</td>
</tr>
<tr>
<td>Shigella spp</td>
<td>57 (1.9)</td>
</tr>
<tr>
<td>Strongyloides stercoralis</td>
<td>53 (1.8)</td>
</tr>
<tr>
<td>Taenia spp</td>
<td>24 (0.8)</td>
</tr>
<tr>
<td>Trichuris trichuria</td>
<td>232 (7.8)</td>
</tr>
</tbody>
</table>

\(^*\)One recorded case of *S. typhi*; unusual pathogens included 2 individuals with Sarcocystis and 9 with Trichostrongylus.

**Other health parameters**

**Blood-related pathology**—None of the study subjects was affected by a haemoglobinopathy to the extent they had clinical disease. However, the carrier state for various haemoglobinopathies and iron-related disorders were found as recorded in Table 5.


<table>
<thead>
<tr>
<th>Condition</th>
<th>Number (%) tested</th>
<th>Number (%) positive of those tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha thalassaemia</td>
<td>2933 (98)</td>
<td>236 (8.1)</td>
</tr>
<tr>
<td>Beta thalassaemia</td>
<td>2933 (98)</td>
<td>42 (1.4)</td>
</tr>
<tr>
<td>Delta thalassaemia</td>
<td>2933 (98)</td>
<td>6 (0.2)</td>
</tr>
<tr>
<td>HbS (heterozygous)</td>
<td>2933 (98)</td>
<td>10 (0.3)</td>
</tr>
<tr>
<td>HbE (heterozygous)</td>
<td>2933 (98)</td>
<td>21 (0.7)</td>
</tr>
<tr>
<td>Hbf</td>
<td>2933 (98)</td>
<td>136 (4.6)</td>
</tr>
<tr>
<td>Other*</td>
<td>2933 (98)</td>
<td>10 (0.3)</td>
</tr>
<tr>
<td>Type not recorded</td>
<td>2833 (98)</td>
<td>5 (0.15)</td>
</tr>
<tr>
<td>Anaemia</td>
<td>2826 (94.5)</td>
<td>197 (7.0)</td>
</tr>
<tr>
<td>Iron therapy prescribed†</td>
<td>2894 (96.7)</td>
<td>646 (22.3)</td>
</tr>
</tbody>
</table>

\(^*\)Hb Stanleyville II, HbO Arab, HbE+Hbf; †Iron therapy is prescribed for ferritin levels below normal (ferritin levels not recorded).

**Nutrition**—The body mass indices (a measure of relative body fatness) of the adult refugees are presented in Figure 4.
Figure 4. Body Mass Index (BMI in kg/m²) of adult (>17 years) quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)

Table 6. BMI statistics of adult (>17 years) quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (% of all refugees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult quota refugees &gt;17 years</td>
<td>1388 (46.4)</td>
</tr>
<tr>
<td>Mean BMI = 23.0</td>
<td>–</td>
</tr>
<tr>
<td>Standard Deviation = 4.6</td>
<td>–</td>
</tr>
<tr>
<td>Underweight: BMI 18.5 or less</td>
<td>201 (14.5)</td>
</tr>
<tr>
<td>Overweight: BMI &gt;25</td>
<td>390 (28.1)</td>
</tr>
<tr>
<td>Underweight needing iron therapy</td>
<td>472 (15.8)</td>
</tr>
<tr>
<td>Overweight needing iron therapy</td>
<td>948 (31.7)</td>
</tr>
</tbody>
</table>

Chronic illness—ICD-9 coding of significant illnesses was started on 4 September 1997; the population affected by this coding was 1796 individuals, or 60.0% of the study total.

Table 7. ICD-9 coded chronic illnesses/conditions among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)

<table>
<thead>
<tr>
<th>Illness/condition (ICD-9 code)</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes: insulin dependent, controlled (250.1)</td>
<td>5 (0.2)</td>
</tr>
<tr>
<td>Diabetes: non-insulin dependent, controlled (250.0)</td>
<td>13 (0.4)</td>
</tr>
<tr>
<td>Diabetes: non-insulin dependent, uncontrolled (250.2)</td>
<td>7 (0.2)</td>
</tr>
<tr>
<td>Hypertension (401)</td>
<td>49 (1.6)</td>
</tr>
<tr>
<td>Dyspepsia (535)</td>
<td>69 (2.3)</td>
</tr>
<tr>
<td>Haemorrhoids (455.6)</td>
<td>33 (1.1)</td>
</tr>
<tr>
<td>Goitre (240 &amp; 241)</td>
<td>19 (0.6)</td>
</tr>
<tr>
<td>Hearing loss (389)</td>
<td>26 (0.9)</td>
</tr>
<tr>
<td>Heart murmur NOS (785.2)</td>
<td>70 (2.3)</td>
</tr>
<tr>
<td>Back, unspecified disorders (724)</td>
<td>32 (1.1)</td>
</tr>
</tbody>
</table>

NOS=not otherwise specified.
Diseases with low prevalence—Some conditions (particularly those associated with atopy) typically have a low prevalence among refugees. For instance, there were no recorded refugees with eczema or otitis media with effusion (glue ear). Asthma, confirmed or suspected, had a recorded prevalence of only 0.8%.

Tobacco and alcohol intake—All adult refugees are asked if they drink alcohol and/or use tobacco. Prevalence is shown in Table 8.

Table 8. Prevalence (%) of tobacco and alcohol intake among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999), by sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>RR / CI / p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number aged &gt;17 years</td>
<td>1434</td>
<td>778</td>
<td>656</td>
<td>6.03 / 4.34–8.38 / &lt;0.001</td>
</tr>
<tr>
<td>Using tobacco (%)</td>
<td>288 (20.1)</td>
<td>251 (32.3)</td>
<td>37 (5.6)</td>
<td>6.87 / 3.15–14.95: &lt;0.001</td>
</tr>
<tr>
<td>Drinking alcohol (%)</td>
<td>64 (4.5)</td>
<td>57 (7.3)</td>
<td>7 (1.1)</td>
<td></td>
</tr>
</tbody>
</table>

Psychosocial issues—The onsite Torture/Trauma Counselling Service is responsible for the screening and treatment of quota refugees, hence data for psychosocial trauma is confined to a study group in MRRC before the RAS Service opened. This study showed that about 20% had been subjected to some form of significant mistreatment in the form of detention and/or physical mistreatment.

About 14% reported some form of significant psychological symptoms, while about 7% were diagnosed as having suffered post traumatic stress disorder. A greater proportion of females reported psychological symptoms, but a greater proportion of males reported mistreatment. As noted below, referral for counselling and psychological services is one of the more frequent reasons for refugees requiring referral to secondary services.

Referrals to secondary services

On leaving the Refugee Centre, all refugees are given a printed copy of the records, with a covering letter, and requested to register with a general practitioner in the area in which they are settling.

Referrals are made to secondary services, mostly hospital outpatient clinics. The referrals are detailed in Table 9. (Note that any individual may be referred to more than one clinic.) A total of 2189 referrals were made, representing 1423 individuals, being 47.6% of the total population.

Historical issues in refugee health

Is the health of the refugees becoming worse? Apart from the appearance of HIV infection, this appears not to be the case. Historical data for separate conditions are presented below. Missing data points indicate where data is not available, usually at the times of restructuring.
Table 9. Referrals to services other than a GP among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)

<table>
<thead>
<tr>
<th>Service referred to</th>
<th>Number referred (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious Diseases</td>
<td>480 (21)</td>
</tr>
<tr>
<td>Imaging</td>
<td>261 (11.4)</td>
</tr>
<tr>
<td>Mental Health</td>
<td>163 (7.1)</td>
</tr>
<tr>
<td>Respiratory Medicine</td>
<td>146 (6.4)</td>
</tr>
<tr>
<td>ENT</td>
<td>139 (6.1)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>127 (5.6)</td>
</tr>
<tr>
<td>Cardiology</td>
<td>124 (5.4)</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>117 (5.1)</td>
</tr>
<tr>
<td>Sexual Health</td>
<td>114 (5.0)</td>
</tr>
<tr>
<td>General Surgery</td>
<td>96 (4.2)</td>
</tr>
<tr>
<td>General Medicine</td>
<td>72 (3.1)</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>54 (2.4)</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>42 (1.8)</td>
</tr>
<tr>
<td>Urology</td>
<td>47 (2.1)</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>38 (1.6)</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>32 (1.4)</td>
</tr>
<tr>
<td>Diabetic</td>
<td>26 (1.2)</td>
</tr>
<tr>
<td>Other</td>
<td>*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2189 referrals</strong></td>
</tr>
</tbody>
</table>

*Dermatology 21 (0.9%), Family Planning: 21 (0.9%); Plastic Surgery: 18 (0.8%); Neurology 15 (0.7%); Dental 15 (0.7%) plus Audiology, Concussion, Genetics, Geriatrics, Haematology, Nephrology, Neurosurgery, Oncology, Prosthetics, Rheumatology, Vascular Surgery (all less than 0.5%). ENT=Ear Nose Throat.

Figure 5. Tuberculosis (TB) rates among adult quota refugees screened at Mangere Refugee Resettlement Centre (1979–1998)
Figure 6. HIV infection among quota refugees screened at Mangere Refugee Resettlement Centre (1995–1999)

SSA=Sub-Saharan Africa.

Figure 7. Rates of presumptive hepatitis B virus (HBV) carriers among quota refugees screened at Mangere Refugee Resettlement Centre (1979–1999)
Gender issues in refugee health

Women’s health

- **Female genital mutilation (FGM)**—This was found only in women from the Congo, Sudan, Ethiopia, and Somalia (especially the latter). At total of 606 women from these ethnicities were asked and/or examined. A total of 349 were reported to have had FGM. The prevalence of FGM among Ethiopian and Somali refugees was 43.2% and 71.5%, respectively. It is found at all ages, although its prevalence in greater in older age groups, particularly in those older than 10 years.

- **Chlamydia**—The results for this have been recorded since the beginning of 1997, 2177 being affected, of whom 1005 were females of all ages. At total of 236 women were tested for chlamydia, of whom results were available for 234 including 4 (1.7%) individuals with chlamydia infection.

- **Cervical smears**—339 women had cervical smears, of which there were records for 308, and of these 9 (2.9%) had cervical dysplasia.

- **Pregnancy**—The ICD-9 code of ‘normal pregnancy’ was recorded for 45 women being 7.9% of the total number (568 women) over the age of 12 years. The youngest was 15, the oldest 44 (mean age 27; SD 6.7 years).

- **Contraception**—A total of 423 women were assessed for contraceptive and associated status, see Table below

<table>
<thead>
<tr>
<th>Status</th>
<th>No contraception</th>
<th>Oral</th>
<th>DPV</th>
<th>IUD</th>
<th>Condom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%)</td>
<td>211 (50.0)</td>
<td>24 (5.7)</td>
<td>11 (2.6)</td>
<td>29 (6.9)</td>
<td>30 (7.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>Natural</th>
<th>Diaphragm</th>
<th>Operative</th>
<th>Post menopausal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%)</td>
<td>21 (5.0)</td>
<td>0 (0)</td>
<td>15 (3.5)</td>
<td>40 (9.5)</td>
</tr>
</tbody>
</table>

Oral=combined oral or progesterone; DPV=progesterone depot injection; IUD=any form of intrauterine device; Natural=rhythm, or other non-interventional methods; Operative=hysterectomy or tubal ligation.

Gender disparities—The male vs female disparity in the use of alcohol and tobacco has been noted above. As might be expected, there are statistically significant disparities in the prevalence of diseases with a sexually transmitted component, although notably not in the case of HIV infection. In recent intakes of refugees, the prevalence of HIV infection among women has exceeded that of men.

Table 11. Prevalence (%) of selected diseases by gender among quota refugee women screened at Mangere Refugee Resettlement Centre (1995–1999)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Female prevalence</th>
<th>Male prevalence</th>
<th>Ratio M:F</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>4.5</td>
<td>7.7</td>
<td>1.71</td>
<td>0.004</td>
</tr>
<tr>
<td>HBV carriage</td>
<td>4.3</td>
<td>7.1</td>
<td>1.65</td>
<td>0.01</td>
</tr>
<tr>
<td>HIV infection</td>
<td>2.5</td>
<td>3.6</td>
<td>1.44</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Discussion

The results outlined above can be described individually, in relation to asylum seekers screened by the Auckland Health Service, and for refugees in general. The results demonstrate a well-known fact: Refugees and asylum seekers resettled in countries of second asylum have high health needs.

Using referrals to secondary services as an index of health needs, a paper from Ireland compares the rates of referral for refugees with those of a usual general practice population, and found that 16% of refugees were referred, compared to 5% of general practice population. However, refugee health needs may be less than those of certain at-risk groups of the resident population. For example, in a New Zealand study examining the financial health costs of refugees compared with Pacific Island People, Maori, and ‘other’ populations, the health costs per capita are in descending order, with Pacific Island populations incurring the greatest costs. That study found that refugee health costs lay between those of Maori and Pacific Island People.

Perhaps the most obvious difference between refugees and asylum seekers in New Zealand lies in the differing demography of the two groups, in particular the differences in sex and ethnicity.

A commonly repeated statement is that, worldwide, 80% of refugees are women and children, and two-thirds are women and girls. UNHCR figures show that among mandated refugees, worldwide, the proportion of adult males and females is about
equal. Yet the majority of asylum seekers in developed countries are male, as is seen in the asylum seekers screened in Auckland, and also, for example, in the United Kingdom, where, in one study, less than one-fifth of the asylum-seeking population were women. The reasons for this discrepancy between refugees and asylum seekers have been described as being due to ‘lack financial resources, held back by childcare responsibilities and cultural and other restrictions.’ Services for women refugees are described as being ‘gender-blind,’ in spite of the greater obstacles that women face.

The barriers to women refugees being resettled are well known to UNHCR and NZIS. The latter has policies which seek to redress this problem, including a special ‘women at risk’ category for quota refugees. The success of these policies is represented in the more gender-balanced demography of the quota refugees. A notable feature of the quota refugees admitted under the ‘Pacific Solution’ (mainly Afghani boat people attempting to reach Australia) was a reversion to the asylum-seeker pattern of male dominance. In one intake, for example, from a total of 136 refugees, 117 (86%) were male. A predominance of single males brings with it a range of problems, for example housing, family re-unification, well known to the agencies supporting refugees and asylum seekers.

The different mix of nationalities between quota refugees and asylum seekers is also noteworthy. The motives for those seeking asylum in the UK have been recorded, including local knowledge of asylum receiving countries. (Whether these motives are different from mandated refugees, and hence contributes to the different nationality mix is not certain.) Other reasons may relate to the length of time it takes for a quota refugee to leave their country and finally reach New Zealand, compared with the immediacy of the asylum-seeking process. In other words, the nationality of quota refugees represents past conflicts, while that of asylum seekers represents present problems.

The different pathway between quota refugees and asylum seekers also has an impact on the prevalence by nationality of disease, particularly for acquired diseases. By definition, a refugee does not come to New Zealand from his or her country of origin. Many have complex travel histories, and an attempt to relate prevalence to nationality is generally unrewarding or even misleading. However there are some exceptions, particularly the prevalence of HIV infection in those from Sub-Saharan Africa, and also a few notable diseases, for example the prevalence of Clonorchis among the Lao, due to their habit of eating uncooked fish.

Even for non-acquired disease, for example haemoglobinopathies in relatively high prevalence among all nationalities of refugees, makes detailed listing by nationality a hardly worthwhile exercise. Some tailoring of refugee screening by area of origin may be worthwhile, and has been suggested. In the past, some tailoring has been done at MRRC; particularly the refugees from the southern Yugoslav province of Kosovo who were not screened for schistosomiasis (as they came directly from Europe where it is not prevalent) but were instead screened for active hepatitis A. In the main, however, for screening refugees it is better to offer a comprehensive set of tests rather than attempt to modify the tests by ethnicity.

The screening process at Mangere is constantly evolving. A recent change is that asymptomatic refugees no longer have their stools examined for any bacterial pathogen. The only pathogen of importance, Salmonella typhi (or S. paratyphi) was
found only once in over 8000 specimens, hence testing for bacterial pathogens was not considered a worthwhile use of health funds. Other matters at present under review include the cost-benefit analysis of routine Mantoux testing; Vitamin D deficiency; diabetes and hyperlipidaemia screening in older refugees; and tailoring screening for children, particularly those related to vaccination preventable diseases, where routine vaccination might be a better option than testing.

As far as practitioners involved in screening those of a refugee background are concerned, it is suggested that the battery of tests offered at MRRC is a good starting point, and in a large population, the tests will reveal disorders in a worthwhile proportion.

The data also shows that health concerns traditionally found in the population of resettlement countries also occur in refugees, for example diabetes and hypertension, hence the possible need to include appropriate screening among refugees, as well as screening for more unusual diseases. The prevalence of excess weight among quota refugees may also be surprising: The lack of correlation between iron deficiency and low weight shows that quota refugees are generally malnourished rather than undernourished. The high prevalence of smoking, particularly among males, also offers an area where health education should offer significant benefits.

By contrast, some diseases common in the New Zealand population, particularly those associated with asthma and atopy, are uncommon among refugees. The probable reasons for this are not entirely clear, but probably relate to the ‘hygiene hypothesis’.

The data also draw attention the health needs (reproductive and otherwise) of refugee women, although the rates of sexually transmitted infections and cervical smear abnormalities appear to be low compared with the host population. In Auckland, at least, there are now specific services for those whose health is adversely affected by FGM. Practitioners involved with services for refugees should make particular provision for the health needs of refugee women, bearing in mind the greater than usual need for these services to be gender sensitive.

Among the infectious diseases, there are no unexpected findings when comparing refugees in resettled in other parts of the World and asylum seekers screened in Auckland. The cost-benefit utility of routine Mantoux testing has been questioned, and (as noted above) is under review. Interestingly, overseas screening of refugees, or indeed screening on arrival, appear to have little impact on the subsequent incidence of TB among the resettled refugees. Hence the fact that although refugees and asylum seekers have been screened for TB it does not mean that practitioners should relax their vigilance for this disease.

According to published UNHCR data, only 3 countries (Canada, USA, and Australia), among the 12 quota-accepting countries, routinely carry out comprehensive pre-screening of quota refugees. This screening is generally not done for the refugees’ benefit, but, for example, to exclude those with ‘communicable diseases of public health significance, current or past physical or mental disorders that are or have been associated with harmful behaviour, and drug abuse or addiction.’

According to published information, general practitioners in Australia do not know the results of the overseas screening of refugees presenting to them as patients. At the
time of writing, the only overseas screening carried out for quota refugees destined for New Zealand is for active tuberculosis and HIV infection. Tuberculosis must be treated before travel to New Zealand, and the number of quota refugees with HIV infection accepted for resettlement is limited to 20 per year.

Alleviation of psychological upset is an important health need among quota refugees, although it appears to be a greater concern in asylum seekers; this may be due to the uncertain state in which asylum seekers find themselves. Nevertheless, for quota refugees, it still represents one of the most common reasons for referral to secondary services.

Is screening of refugees and asylum seekers worthwhile? The literature refers to the health screening of refugees in different countries as being ‘a confusing blend’\(^22\). Indeed, it has been questioned whether routine screening is needed at all for any immigrants,\(^23\) and it is not carried out for some countries, notably the United Kingdom. The ‘confusing blend’ probably arises because of confused motives for screening.

The reasons for screening may include all or some of the following:

(a) Completion of health documentation needed by immigration services.
(b) The exclusion of certain categories of health problems from resettlement countries.
(c) The assessment of the refugee, physically, emotionally, psychologically, and socially.
(d) The management of any problems found from (b) and (c) above.
(e) The prevention of the spread of infectious diseases from the refugee to the population of the resettlement country.
(f) The prevention of the spread of infectious diseases from the resettlement country to the refugee.
(g) The prevention of future health problems in refugees.
(h) Collection of data.
(i) Assessment of, and planning for, the impact of refugee health on the resettlement country.

A valuable paper by Reid et al examines the relationship between public health risk and personal health benefit in screening refugees.\(^24\) Refugee health screening programmes are generally set up to minimise public health risk, but evolve to serve the personal health of refugees, as exemplified by the formation of torture/trauma counselling services for refugees.

There are well-defined criteria for the effective implementation and management of screening programmes. These criteria refer to screening programmes which look for asymptomatic diseases, disease precursors, or disease surrogates (such as cervical screening), but they can, where relevant, also be applied to mass medical-screening programmes such as refugee health screening.\(^25,26\)

No studies appear to look at the effectiveness of refugee health screening, although certain components of the screening (e.g. intestinal parasites) have been examined.\(^27\)
Given the diverse reasons why refugee health screening is carried out, an assessment of effectiveness is likely to be complex.

Refugee health screening in the sheltered environment of the Mangere Refugee Resettlement Centre is only a small first step in the resettlement of refugees. Of greater importance is the ongoing use that resettled refugees and asylum seekers make of primary and secondary medical services, and finding ways that this use can be enhanced by refugee and medical provider.

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References:


21. Victorian Foundation for the Survivors of Torture Inc. on behalf of the Western Melbourne Division of General Practice. Refugee Health and General Practice.


The efficacy of EMG-biofeedback training on quadriceps muscle strength in patients after arthroscopic meniscectomy

Mehmet Kirnap, Mustafa Calis, Ali Osman Turgut, Mehmet Halici, Mehmet Tuncel

Abstract

Aims In 40 patients, we attempted to investigate the efficacy of electromyography-biofeedback (EMG-B) on quadriceps muscle strength after arthroscopic meniscectomy.

Methods The patients were randomly divided into two groups each consisting of 20 subjects. For the control group, a classical exercise program was given (five sessions of EMG-B application for 2 weeks postoperatively). Range of motions, Lysholm knee score, EMG electrical activity values of vastus medialis obliques (VMO), and vastus lateralis (VL) were measured pre- and postoperatively on the 3rd and 14th day, and at the 6th week.

Results When the ranges of motion values were compared, a significant difference (for average values of knee flexion angle) was found on the 14th day and 6th week in favour of biofeedback group (p<0.05). When Lysholm knee scores on the 14th day and 6th week were compared in the control and biofeedback groups, and maximum contraction and average contraction values of VMO, VL muscles were compared with operated/non-operated %age ratios, there was a statistically significant difference in favour of the biofeedback group (p<0.05).

Conclusions Our results showed that EMG-B was an effective treatment modality in improving quadriceps muscle strength after arthroscopic meniscectomy surgery.

After knee surgery, extensor capacity of the knee decreases considerably. This muscle weakness occurs as a result of reflex inhibition of motor neurones. It is defined as ‘pathogenic muscle weakness’ and is not related to direct muscle injuries.1–3 During the postoperative inactivation process, quadriceps femoris muscle (responsible for the extensor mechanism) weakness is an important problem during the postoperative rehabilitation programme. Despite the advances in knee surgery, postoperative degenerative changes in joint cartilage, and observation of problems such as functional capacity deficit in extensor muscles, all force the investigators to develop rehabilitation protocols to minimise postoperative problems.4

The EMG-B instrument, which is mainly used for muscle re-education and relaxation, is a sensitive volt meter that can record muscle activities (superficially as µV or by rarely used needle electrodes).5,6

EMG-B is generally used to provide muscle re-education, and to regain muscle strength in cases of muscle weakness. It is also applied in the treatment of muscle weaknesses due to postoperative immobilisation in orthopaedic rehabilitation. A patient’s compliance to the exercise program can be improved by addition of EMG-B to the classical rehabilitation programs that are applied in those patients.9–11
In this study, we investigated whether the addition of EMG-B application to postoperative classical home exercise program after arthroscopic meniscectomy patients is effective in improving quadriceps muscle strength in the postoperative rehabilitation program.

Materials and Methods

Design—Forty patients who had undergone arthroscopic meniscectomy were included in the study. The patients were randomly divided into two equal groups: a biofeedback group and a control group. The same exercise programme (conventional home-exercise programme) consisting of three phases was given to the patients in both groups from the postoperative first day. In the first phase of the exercise programme, cold application, quadriceps setting, patellar mobilisation, and straight-leg raising exercises were done; in the second phase, hip adductor strengthening and terminal knee extension exercises were done additionally (and in addition to) the above; while in the third phase, closed kinetic chain exercises and lateral step up exercises were applied. Furthermore, EMG-B training was applied to the patients in EMG-B group from the postoperative third day for 2 weeks. The patients were followed up for 6 weeks. The measurements were performed preoperatively, on the postoperative 3rd and 14th days, and on the 6th week according to the assessment criteria. Assessment criteria:

- Measurements of thigh and knee circumference (cm), and passive joint range of motion (degree);
- Lysholm knee score;
- Maximum contraction and mean contraction values of electrical activities (mV) of operated and non-operated aspects of VMO and VL muscles that are measured by EMG-B instrument. Operated/non-operated %age ratios were calculated. Those values were used as parameters in statistical studies.

Knee circumferences were measured from the middle part of the patella, and thigh circumferences were measured by marking the anterior aspect of the thigh at 15 cm proximal to the patella. Passive joint ranges of motions (ROM) were measured by goniometry.

Biofeedback training was performed with a Myomed 932 myofeedback unit (Enraf-Nonius®, serial no: 11490, Netherlands). During therapy and testing sessions, two active electrodes of the first channel of the instrument were placed 4 cm above the upper edge of patella on the VMO muscle and at 3 cm medial at an angle of 55° by the vertical plane; active electrodes of the second channel were placed 10 cm above the upper edge of patella on the VL muscle and at 6–8 cm lateral at an angle of 15° by vertical plane. The ground electrode was placed 2–3 cm below the patella on the same side of the limb.

For measurements, the instrument were adjusted to give audible stimulation when a contraction above the threshold value with work time of 5 sec, rest time of 10 sec and 20 cycles was performed. The patients were asked to perform isometric quadriceps contraction during the work period. Thus, the patient provided visual feedback by watching the contractions on the screen and provided audible feedback by signal sound when it exceeded the threshold value. The EMG-biofeedback test was performed with the patient sitting. During the test sessions on control days, maximum and average contraction values of VMO and VL muscles (that are defined in both groups of the patients at the end of 20 sets by the biofeedback instrument) were recorded.

For the patients in the EMG-B group, a biofeedback training session starting from the postoperative third day was applied once daily for 5 days per week. The patients had to contract their quadriceps muscle more strongly by increasing the threshold value every day.

Statistical analyses—Repeat measures ANOVA and student t-test were used to determine the differences between the controls and study group, respectively. Chi-squared tests were carried out, for qualitative data. All data were evaluated using the SPSS 9.0 statistical software program. Mean values were considered significantly different if p<0.05.
Results

All of the patients were male and their average age was 34.5±10.3. There was no significant difference in age between the control and biofeedback groups, nor right/left and dominant/non-dominant sides of operated limbs (p>0.05, p>0.05 respectively). There was no difference according to operation scheme between the control and EMG-B groups (p<0.05) (Table 1).

Table 1. Distribution of patients with operated extremity according to right/ left and dominant/nondominant side

<table>
<thead>
<tr>
<th>Variable</th>
<th>EMG-Biofeedback n (%)</th>
<th>Control n (%)</th>
<th>All patients n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM, partial meniscectomy</td>
<td>12 (60)</td>
<td>13 (65)</td>
<td>25 (62.5)</td>
</tr>
<tr>
<td>LM, partial meniscectomy</td>
<td>3 (15)</td>
<td>4 (20)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>MM, bucket-handle tear, partial meniscectomy</td>
<td>4 (20)</td>
<td>2 (10)</td>
<td>6 (15)</td>
</tr>
<tr>
<td>LM, discoid meniscus, partial meniscectomy</td>
<td>1 (5)</td>
<td>1 (5)</td>
<td>2 (5)</td>
</tr>
<tr>
<td>Total n (%)</td>
<td>20 (100)</td>
<td>20 (100)</td>
<td>40 (100)</td>
</tr>
</tbody>
</table>

MM: medial meniscus; LM: lateral meniscus.

No statistically significant difference was detected between the control and biofeedback groups for average values of operated extremity thigh and knee circumferences that were measured pre- and postoperatively, and at the 3rd and 14th day and 6th week (p>0.05, p>0.05 respectively).

When we compared the joint ranges of motions, no statistically significant difference was detected between the control and biofeedback groups for average values of flexion angle in the operated limb preoperatively, and on the postoperative 3rd day, while a significant difference was detected on the 14th day and 6th week in favour of the biofeedback group (p<0.05) (Table 2).

Table 2. Operated extremity knee flexion angle values at baseline, 3rd day, 14th day, and 6th week

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Preop. X±SD</th>
<th>3rd day X±SD</th>
<th>14th day X±SD</th>
<th>6th week X±SD</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG-B group</td>
<td>20</td>
<td>134.3±9.3</td>
<td>99.7±17.8</td>
<td>129±10.2</td>
<td>137.1±6.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Control group</td>
<td>20</td>
<td>130.2±8.8</td>
<td>98.2±13.6</td>
<td>118.2±11.7</td>
<td>129.2±7.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>P values</td>
<td></td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&lt;0.05</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

No statistically significant difference was found between the groups in Lysholm knee score preoperatively and on the postoperative 3rd day; however when Lysholm knee scores on the 14th day and 6th week were compared, it was found that there was statistically significant difference in favour of the biofeedback group (p<0.05) (Table 3).
Table 3. Lysholm knee scores values at baseline, 3rd day, 14th day, and 6th week

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Preop. X±SD</th>
<th>3rd day X±SD</th>
<th>14th day X±SD</th>
<th>6th week X±SD</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG-B group</td>
<td>20</td>
<td>70.3 ± 14.3</td>
<td>57.8 ± 11.6</td>
<td>85 ± 8.4</td>
<td>95.4 ± 3.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Control group</td>
<td>20</td>
<td>69.1 ± 12.9</td>
<td>54.5 ± 9.9</td>
<td>68.1 ± 7.8</td>
<td>79.6 ± 10.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>P values</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the preoperative evaluations, the only parameter that was significantly different between the groups was in operated/non-operated %age ratio of average contraction value of VMO muscle (p<0.05). On the other hand, as in the other parameters, there was no difference in average contraction value of VL muscle, preoperatively.

No statistically differences were found between the groups for maximum contraction and average contraction values of VMO and VL muscles preoperatively and at postoperative 3rd day in operated/non-operated %age ratios (except for preoperative VMO average contraction) while there was a statistically significant difference on the 14th day and 6th week (Figures 1, 2, 3, and 4).

Figure 1. Operated/non-operated % ratio of maximum contraction value of vastus medialis obliques (VMO) muscle

![Graph showing operated/non-operated % ratio of maximum contraction value of VMO muscle](image)
Figure 2. Operated/non-operated % ratio of maximum contraction value of vastus lateralis (VL) muscle

![Graph showing Operated/non-operated % ratio of maximum contraction value of VL muscle.]

Figure 3. Operated/non-operated % ratio of average contraction value of VMO muscle

![Graph showing Operated/non-operated % ratio of average contraction value of VMO muscle.]

Figure 4. Operated/non-operated % ratio of average contraction value of VL muscle
Discussion

A strong correlation exists between quadriceps muscle strength and functional stability of the knee. After knee surgery, a strong quadriceps muscle is required for normal joint kinematics and to return the patient back to normal activities. Additionally, for the normal walking pattern not to be effected negatively, quadriceps muscle strengthening exercises are important in both conservative treatment and postoperative rehabilitation protocols of the knee.

A 20–30% deficit was detected during flexion and extension (especially in patients who had preoperative meniscus lesions), and this deficit in knee function with effusions have been mostly observed in the quadriceps muscles. In our study, we have also seen that preoperative meniscus lesion causes quadriceps muscle inhibition and that affects the VMO muscle more than the VL muscle. Our results suggest that there is a difference in affected ratios between VMO and VL muscles during preoperative period.

Postoperative data has suggested that VMO muscle was also more affected than VL muscle postoperatively. This result supports those studies showing that VMO muscle is more affected during knee injuries.

It has been reported that quadriceps inhibition continues for 6 month following arthroscopic knee surgery, and the inhibition effects are observed not only in the operated extremity but also in the intact extremity. Stam et al detected a 13%
In the early postoperative period, there is a transient decrease in proprioceptive feedback due to several factors such as pain and oedema. Because of this, conventional exercises could not be done effectively during the early postoperative period. This negativity can be dealt with by visual and audible feedbacks from the EMG-B instrument substituting for muscle strength, tendon tension, and joint position feedbacks in a certain ratio.

Croce\textsuperscript{24} has investigated that the effect of EMG-B application on quadriceps muscle strengthening in healthy volunteers, and EMG values of muscle activity and quadriceps muscle strengthening in the EMG-B group were found to be significantly greater than those in the placebo and non-biofeedback groups.

Maitland et al\textsuperscript{25} reported that knee stability could be increased and quadriceps inhibition decreased by EMG-B-assisted quadriceps-hamstring contraction education in the unstable knee. In a study comparing operated/non-operated age ratios of the groups (measuring isokinetic test and peak torque values of patients in that EMG-B application added to a classical rehabilitation programme during postoperative period and in patients with anterior transverse ligament reconstruction), higher peak torque age ratios were recorded in the biofeedback group.\textsuperscript{11}

In a study comparing operated/non-operated ratios of the groups (in which isokinetic test and peak torque values were measured in patients having EMG-B application in addition to a classical rehabilitation programme during postoperative period following anterior transverse ligament reconstruction), higher peak torque ratios were recorded in the biofeedback group.\textsuperscript{11}

In a study of meniscectomy patients, Krebs et al\textsuperscript{9} administrated a classical exercise program to a group, and an additional EMG-B to another group; and after treatment, they detected that the average electrical activity output difference in the biofeedback group was 10 times greater than the group in which only the exercise programme was administrated. Similarly, when electrical stimulation and EMG-B were compared in patients in whom arthroscopic anterior transverse ligament reconstructions were administrated, EMG-B administration was shown to be more effective.\textsuperscript{10}

In the records obtained on postoperative 14\textsuperscript{th} day and 6\textsuperscript{th} week, there was a significant difference between electrical activity levels of VMO and VL muscles and quadriceps muscle strength in favour of biofeedback group. Additionally, knee flexion angle and Lysholm scores in the patients of this group were significantly better on the 14\textsuperscript{th} day and 6\textsuperscript{th} week.

Thus these results show the effectiveness of EMG-B in the functional improvement of the knee, possibly provided by its positive effect on quadriceps muscle strength. Our results are consistent with other results in the literature, in that EMG-B was a very effective modality in increasing muscle strength.\textsuperscript{10,11,24,26}

Furthermore, these results show that during the postoperative period there is more rapid improvement, and quadriceps muscle strength could be increased greater in patients to whom EMG-B is administrated. Indeed, EMG biofeedback application
may be beneficial for postoperative rehabilitation protocols of knee pathologies and conservative programmes.

**Ethics approval:** This study was carried out with the prior approval of the Ethics Committee of Erciyes University.

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**Acknowledgements:** This study was supported by a grant (02-54) from the Directorate of Scientific Research Projects, Erciyes University.

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**References:**


Computerised screening for hazardous drinking in primary care

Kypros Kypri, Shaun Stephenson, John Langley, Martine Cashell-Smith, John Saunders, Dan Russell

Abstract

**Introduction.** Brief interventions undertaken in primary care settings have been shown consistently to reduce hazardous drinking, but they are not commonly offered in practice. The aims were to determine the uptake by young people of an offer of screening in a primary care setting; to identify patients’ drinking risk levels; and to estimate the proportion who would consent to computerised brief intervention and follow-up.

**Methods.** Participants were 1120 patients attending a university student health service that were invited for screening while in the waiting room. Participants were also asked for their consent to be contacted for follow-up assessment 1, 6, and 12 months later.

**Results.** 1,010 patients (90%) accepted the invitation for screening. Of these, 35 (4%) failed to complete screening, thus leaving 975 with complete Alcohol Use Disorders Identification Test (AUDIT) data. Sixty percent of women and 73% of men screened positive. Twenty-three patients (4%) eligible for intervention declined follow-up assessments.

**Discussion.** The study demonstrates that the primary care setting can be used to facilitate access via computer to a large number of individuals whose drinking is hazardous. Limitations of the study include the use of an educated segment of the population who may be more receptive to computerised screening than other groups. Strengths of the study include the high rate of participation and the naturalistic setting in which the data were collected.

Hazardous consumption of alcohol is a leading contributor to the global burden of disease and injury. Aggregate consumption in many countries has stabilised or increased in the last 5 years, after 20 years of steady decline. There is evidence of a change (in the pattern of drinking) toward larger quantities per drinking occasion, particularly among young people (aged 15–24 years). In young people, the intoxicating effects of alcohol account for a greater burden of disease than the chronic effects, given the high incidence of injury and other acute outcomes (e.g. sexually transmitted infections) in this age group.

Primary care services have been identified as settings where screening and intervention for alcohol problems might be effective. The World Health Organization (WHO), therefore, developed the Alcohol Use Disorders Identification Test: a 10-item questionnaire with questions on alcohol consumption, symptoms of dependence, and other alcohol-related problems.

With a cut-off score of 8, the test has a sensitivity of 92% and specificity of 94% for the identification of individuals with hazardous or harmful drinking in primary care settings. It has consistently been found to outperform other questionnaires and blood markers in the identification of individuals with alcohol use disorders. The AUDIT is
cheap to administer and its use provides practitioners with a suitable opportunity to offer advice to patients with hazardous drinking.

A significant advance in the treatment of hazardous alcohol consumption (and thus the prevention of alcohol-related harm) over the last two decades has been the development and evaluation of screening and brief intervention (SBI). SBI typically involves opportunistic administration by a GP or nurse of a brief screening questionnaire such as the AUDIT and (for those who screen positive) provision of 5–10 minutes of brief advice or a short session (<30 minutes) of motivational therapy.

For people identified with severe problems or an established alcohol dependence, a referral may be made for further assessment and specialist treatment. More than 40 randomised controlled trials have been published on SBI, most of which have been in primary care settings.

In 2002, Moyer and colleagues published a pivotal meta-analysis which revealed significant (albeit modest) reductions in hazardous drinking lasting at least 6–12 months among people who were not specifically seeking treatment. Among those actually seeking treatment, the effects of SBI were similar to those of more intensive interventions. On the basis of an extensive review of the effectiveness of SBI in primary care, the US Preventive Services Task Force found that SBI of 15 minutes duration is helpful, and that multi-contact interventions are effective for patients ranging from 17 to 70 years of age.

In New Zealand, around one in six persons visiting their general practitioner meets criteria for hazardous or harmful drinking, defined as a score of 8 or higher on the AUDIT. In the only published New Zealand study in which screening of young people (18–29 years) in primary care has been examined, McMenamin found that 16% of men and 6% of women met criteria for an alcohol-use disorder. He highlighted the importance of screening, noting that ‘without [it], nearly half of those identified would have been missed’ (p.128).

McMenamin also found that screening rates were low for young men (59%) relative to young women (83%). He suggested measures to overcome this barrier included the ‘availability of a patient self-administered computerised lifestyle assessment not requiring supervision by clinical staff’ (p.128).

The potential utility of computerised screening or intervention has been identified in other primary care settings. For example, in a survey of a random sample of university students (n=1,564; response rate 82%), we found that computerised screening and brief intervention was the most acceptable of a range of brief intervention options, including practitioner-delivered interventions. Four out of five hazardous drinkers said they would use such a service if they thought they had a drinking problem.
The aims of this study were to:

- Determine the uptake by young people of an offer of screening in a primary care setting;
- Identify patients’ drinking risk levels; and to
- Estimate the proportion who would consent to computerised brief intervention and follow-up.

**Methods**

**Setting**—The data used for this study were collected during the baseline phase of a randomised controlled trial of a brief intervention for hazardous drinking. Participants were students aged 17–29 years who attended the University of Otago Student Health Service in the period 3–25 March 2003. In 2002, the service conducted 42,000 consultations with over 10,000 individuals, making it the largest provider of primary care for young people in New Zealand (personal communication, Dr Jim Jerram, Director of Student Health Service, 2002).

**Sampling**—True random sampling (i.e. random selection of individuals from a sampling frame of some description) was not practicable for this study given that eligible participants were recruited from patients presenting for care. We opted instead for a selection protocol which would minimise the risk of systematic biases, and allow for measurement of the potential bias resulting from self selection. Each week (Monday–Friday inclusive) of the sampling period was broken into 10 sessions: five morning sessions 9am to 12:30pm and five afternoon sessions 1:30pm to 5pm. Based on the ratio of men to women using the service as measured in a pilot study, and to ensure approximately equal numbers of men and women in the study, we randomly selected 2 of the 10 sessions in each week for recruitment of men only.

**Illustration 1. The University of Otago Student Health Service waiting room**
Research assistants were trained in the application of a study protocol, which stipulated that the assistant should invite the next patient leaving the reception desk (see Illustration 1) to participate in the study, go through the informed consent procedure, log the participant into a computer (see Illustration 2) and return to the reception desk to recruit the next patient. Instances in which a patient appeared too sick or injured or whose English was not sufficient to participate were recorded, as were refusals to participate.

**Illustration 2. Computers used for screening**

Consent—A two-stage recruitment procedure was used, whereby patients were first invited to complete a computerised survey (stage 1: screening). Patients eligible for the study on the basis of screening were asked for consent to be contacted for follow-up surveys (stage 2: assessment and intervention). In accordance with ethical approval, the study was presented to potential participants as a series of surveys on alcohol use, not as a randomised trial. Randomisation was effected by computer upon completion of screening. Participants and researchers were blind to group assignment. This study reports only on data collected during stage 1: screening.

Measures—Participants were asked to indicate their gender, age, and ethnicity, using the questions from the 2001 census. Their drinking risk was assessed with the AUDIT. The consumption questions were based on standard drinks (10g ethanol) which were defined and depicted in graphics presented on the relevant pages of the web questionnaire. The whole questionnaire can be viewed at [http://ipru.otago.ac.nz/eSBI2003Demo/index.html](http://ipru.otago.ac.nz/eSBI2003Demo/index.html) Participants were also asked to indicate how many standard drinks they had consumed in their heaviest drinking episode in the preceding four weeks.
Results

Of 1120 patients invited to complete the screening questionnaire, 1,010 accepted the invitation (90%). Of these, 35 (4%) failed to complete screening due to being called for their consultation, leaving 975 individuals (538 women and 437 men) with complete AUDIT data—i.e., a screening rate of 87%. A summary of the AUDIT data of these patients is presented in Table 1.

Table 1. Distributions of AUDIT item responses by gender (N=975)

<table>
<thead>
<tr>
<th>AUDIT item</th>
<th>Women n=538 (%)</th>
<th>Men n=437 (%)</th>
<th>χ² statistic and p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Drinking frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>9</td>
<td>9</td>
<td>18.43 p=0.001</td>
</tr>
<tr>
<td>Monthly or less</td>
<td>12</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2-4 times a month</td>
<td>39</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>35</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>4 or more times a week</td>
<td>5</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2. Typical occasion quantity (g ethanol)</td>
<td></td>
<td></td>
<td>77.37 p&lt;0.001</td>
</tr>
<tr>
<td>1 or 2 (&lt; 20 g)</td>
<td>22</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>3 or 4 (30-40 g)</td>
<td>20</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>5 or 6 (50-60 g)</td>
<td>23</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>7 to 9 (70-90 g)</td>
<td>19</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>10 or more (&gt;100 g)</td>
<td>17</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>3. Frequency of drinking ≥ 60 g</td>
<td></td>
<td></td>
<td>32.00 p&lt;0.001</td>
</tr>
<tr>
<td>Never</td>
<td>16</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Less than monthly</td>
<td>26</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>20</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>38</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Daily or almost daily</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Experienced the problem monthly or more often</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Unable to stop drinking once you had started</td>
<td>11</td>
<td>17</td>
<td>8.34 p=0.004</td>
</tr>
<tr>
<td>5. Failed to do what was normally expected from you</td>
<td>13</td>
<td>14</td>
<td>0.63 p=0.427</td>
</tr>
<tr>
<td>6. Needed a first drink in the morning to get yourself going after a heavy drinking session</td>
<td>1</td>
<td>2</td>
<td>2.35 p=0.126</td>
</tr>
<tr>
<td>7. Had a feeling of guilt or remorse after drinking</td>
<td>10</td>
<td>14</td>
<td>3.57 p=0.059</td>
</tr>
<tr>
<td>8. Unable to remember what happened the night before because you had been drinking</td>
<td>10</td>
<td>21</td>
<td>22.16 p&lt;0.001</td>
</tr>
<tr>
<td>Experienced the problem in the past year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. You or someone else been injured as a result of your drinking</td>
<td>17</td>
<td>28</td>
<td>15.21 p&lt;0.001</td>
</tr>
<tr>
<td>10. A relative, friend, doctor, or other health worker been concerned about your drinking or suggested that you should cut down</td>
<td>8</td>
<td>14</td>
<td>11.01 p=0.001</td>
</tr>
<tr>
<td>Mean AUDIT score (SD)</td>
<td>9.7 (6.3)</td>
<td>12.2 (7.4)</td>
<td>t=5.81 p&lt;0.001</td>
</tr>
<tr>
<td>Proportion of sample with an AUDIT score of eight or higher (95% CI)</td>
<td>60 (56-64)</td>
<td>73 (69-77)</td>
<td></td>
</tr>
</tbody>
</table>
Two-thirds of patients (66%; 60% of women, and 73% of men) met criteria for hazardous drinking (an AUDIT score of eight or higher). Relative to women, men reported significantly higher drinking frequencies (item 1), typical occasion quantities (item 2), and binge drinking frequencies (item 3). For both men and women, the modal pattern was to consume six or more drinks (>60g ethanol) at least once per week. Men also reported a higher frequency of being unable to stop drinking once started (item 4). Blackouts (item 8) on at least a monthly basis were reported by 1 in 5 men and 1 in 10 women. Alcohol-related injuries (item 9) were reported by 1 in 4 men and 1 in 6 women.

In the 4 weeks preceding their visit to Student Health, 71% of women and 71% of men had exceeded the Alcohol Advisory Council of New Zealand’s recommended upper limits of no more than four drinks per occasion for women and no more than six per occasion for men. Among women, 46% reported at least one episode of more than 8 drinks (>80g ethanol) while 55% of men reported at least one episode of more than 12 drinks (>120 g ethanol).

A frequency distribution of AUDIT scores is presented in Figure 1, with indicators of the standard cut-off score and the more liberal score of 11 recommended by Fleming et al in a study of American college students.

Of 599 service users (311 women, 288 men) who screened positive for hazardous drinking, 23 (4%) did not consent to web-based follow-up assessments as part of the study, leaving 576 individuals (300 women, 276 men) in the intervention trial.

Discussion

These results show that between half and two-thirds of this young population drink at hazardous levels, that most (87%) will complete computerised screening in a primary care setting, and that only 4% of those who screen positive for hazardous drinking decline follow-up contact. The study supports the notion that the primary care setting can facilitate access via computer to a large number of individuals whose drinking is hazardous.

Limitations include the fact that trained research assistants issued the invitations to complete screening. Although the intervention is computerised, when put into routine practice some involvement from receptionists or other staff dedicated to the task would probably be required to promote its use to patients. The program assessed in this study has been delivered as a service (i.e. not as part of a research project) at two student health services at Victoria University Wellington since April 2005. Early reports show that even with minimal promotion by receptionists, large numbers of students have utilised the screening and computerised intervention program, but acceptance rates under these naturalistic conditions have not been measured.

The rates of hazardous drinking identified in this study were remarkably high: 60% of women and 73% of men met the commonly used criterion of >8 on the AUDIT. These prevalence rates can be compared with those attained in 2002 from a large probability sample of students aged 17–29 who completed a web survey (n=1,564, response rate 82%). In that sample, 58% (95% CI: 54%–61%) of women and 70% (66%–73%) of men scored >8 on the AUDIT. While the rates are slightly higher in the present study, the confidence intervals overlap, suggesting that patients using the
student health service are broadly representative of the student population in terms of their drinking behaviour.

We did not diagnose students in the present study, but it is likely, given the AUDIT scores attained, that a far higher prevalence of alcohol use disorders would be found in this tertiary student population than among patients presenting to their general practitioners. Direct comparisons of students and non-students of the same age in the general population reveal very large differences in the prevalence of hazardous drinking. The reasons for this are unclear, but probably relate to the presence in the university environment of ‘…high concentrations of licensed premises, events that have a primary focus on drinking, intense advertising, promotion, and aggressive pricing by the liquor industry, institutional policies that do not adequately discourage drunkenness, and inadequate enforcement of the intoxication provisions of liquor legislation’ (pp. 713-714).

In the last 15 years, New Zealand has drastically altered its laws with respect to alcohol. There has been a shift away from supply-side policies, in which the primary mechanism is to restrict the availability of alcohol to the consumer. Examples include the introduction of wine (1989) and beer (1999) in supermarkets, allowing a wider range of retail outlets to sell alcohol (1989) and the reduction of the minimum purchase age from 20 to 18 years (1999), which increased alcohol-related harm among young people. This move toward increased availability at a time when the burden of disease and injury attributable to alcohol is increasing, highlights the need for greater efforts by public health advocates to influence policy but also for interventions to reduce heavy consumers’ demand for alcohol. To make an impact at a population level, such interventions would have to be inexpensive and deliverable to many. Opportunistic screening for hazardous drinking followed by brief intervention in the primary care setting meets both of these criteria.

Despite evidence from at least 36 randomised controlled trials from several countries, screening and brief intervention is not yet a routine aspect of primary care in any country. One obstacle to its widespread implementation is the lack of time and remuneration available for preventive medicine. Another is the view held by general practitioners that their patients would not accept their advice to drink less if an alcohol-related condition was not the presenting problem.

In recognition of these circumstances, and the reported willingness of students to participate in a computerised intervention, we conducted a pilot randomised controlled trial at the Student Health Service at the University of Otago. Of 112 students who screened positive for hazardous drinking, 104 agreed to be contacted for follow-up assessments, and were randomised to a computerised brief intervention delivered in the reception area (n=51) or a leaflet-only control group (n=53).

Follow-up assessments were conducted 6 weeks and 6 months post-intervention and were completed by 80% and 90% of participants respectively. Results showed reductions of episodic heavy drinking and alcohol-related problems in the intervention group relative to controls of 20–30% over 6 months. It was concluded that the results warranted a larger, more comprehensive trial.

Screening is only of benefit to patients if there is an viable intervention to offer them. The pilot research described above suggests that there is a viable intervention and that early signs regarding its efficacy are positive.
On the basis of the screening described in the present study, we conducted a four-arm randomised controlled trial in which students with hazardous drinking were assigned to one of four conditions:

- Control (information leaflet only);
- Information leaflet with full follow-up;
- Brief intervention; or
- Brief intervention with booster sessions at 4 weeks and 6 months after initial contact.

These interventions represent the least to the most that we judge young people could accept in a primary care setting.

**Figure 1. AUDIT scores of Student Health Service users (N=975)**
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References:


Metastatic thyroid carcinoma

Hakan Kaya, Umut Barbaros, Yeşim Erbil, Alp Bozbora, Yersu Kapran, Ferihan Aral, Selçuk Özarmağan

Abstract

Although metastases to the thyroid gland are common in autopsy studies, clinically significant metastases are rare. A 58-year-old Turkish patient, presenting with thyroid metastasis 2 years after undergoing left nephrectomy for renal cell carcinoma, is reported in this case report. Thyroid metastasis can be the initial presentation of renal cell carcinoma, or it may occur a long time after nephrectomy, which can lead to misdiagnosis of primary thyroid neoplasm. Radiographic features are not useful in making discrimination between the two, however a fine needle aspiration biopsy can be useful. The role of surgical therapy is controversial.

Although thyroid is a common target for metastasis, clinically significant metastases to the thyroid gland are rare.\(^1\)–\(^4\) Fourteen percent of renal cell carcinoma patients have systemic disease, but metastasis to the thyroid is rare.\(^5\),\(^6\) Here we report on a patient operated on 2 years previously for renal cell carcinoma and now presenting with a nodular goitre, which turned out to be metastasis of the primary neoplasm.

Case report

In July 2004, a 58-year-old Turkish man was referred to our department for a nodular goitre. His physical examination revealed a palpable thyroid gland. He had been operated on for renal cell carcinoma (left nephrectomy) 2 years previously and the tumour was now a 7 cm mass. Pericapsular invasion was not seen, but tumour thrombus at the renal vein was detected.

A thyroid ultrasonography (US) showed enlargement of the gland as well as multiple hypoechoic, solid, well-defined mass lesions. Scintigraphy revealed a hypoactive nodule in the left lobe, and a hyperactive nodule in the right lobe.

Thyroid hormone levels were within the normal range of the laboratory’s reference values. US-guided fine needle aspiration biopsy (FNAB) of the gland showed cytological findings suggestive of a follicular tumour. Adenomatous nodule and microinvasive follicular carcinoma discrimination could not be made. Cytological studies were evaluated without knowing the history of the patient.

There were large neoplastic cells with scant cytoplasm misdiagnosed as a follicular tumour. A bilateral total thyroidectomy was performed. Our patient had a multinodular goitre with a suspicious lesion revealed by FNAB. (We prefer near-total thyroidectomy for our patients with multinodular goitres.) This approach is supported by previous reports showing that a near-total thyroidectomy may prevent subsequent recurrent thyroid operations.\(^7\) When we viewed the suspicious lesion via a FNAB, we considered the preferred surgical strategy for this patient to be a near-total thyroidectomy.

The pathological examination of the specimen revealed five nodular lesions. The nodules had similar histopathological features; the renal cell carcinoma and
immunohistochemical examination confirmed the diagnosis of metastasis of renal cell carcinoma (Figures 1 and 2). The tumour had vimentin and pancytokeratin expression, and thyroglobulin immunoreactivity was not observed.

The patient did not have any postoperative complications and was discharged from hospital on the postoperative first day.

Figure 1. Renal cell carcinoma in the left nephrectomy specimen (HE; x200)

Figure 2. Metastasis of renal cell carcinoma to the thyroid gland (HE; x250); inset: negative immunostaining of thyroglobulin antibody (anti-thyroglobulin x200)
Discussion

Metastasis to the thyroid gland are found in about 3–24% of autopsies of patients who died due to malignancies at other primary sites. Metastatic carcinomas are not common in clinical practice but metastasis to the thyroid gland has been reported in renal cell carcinoma, breast cancer, lung cancer, gastrointestinal malignancies, malignant melanoma, sarcoma, haematologic malignancies, and other genitourinary cancers.\(^3,8\)

Renal cell carcinoma is often seen at the sixth decade and with male dominance; it tends to often show a slow progression in its clinical course with a late development of metastasis.\(^1-4\)

Metastases of renal cell carcinoma occurs in the respiratory system, skeletal system, lymph nodes, brain, liver, skin, and other sites such as at the thyroid gland.\(^8-11\) In a study by Chen et al, 10 patients were reported with isolated thyroid metastasis during a 8-year period, of whom 8 had metastasis of renal cell carcinoma.\(^4\) Metastasis may be the initial presentation of the disease-mimicking primary thyroid neoplasm, which can be a diagnostic dilemma for both the surgeon and the pathologist.\(^9\)

Patients with metastasis to the thyroid may present with symptoms related to the mass caused by the tumour, although many effects are asymptomatic. The time interval between the primary malignancy and the metastasis may be long enough to make a misdiagnosis of primary thyroid tumour.\(^3,9\)

If the patient has a history of carcinoma, metastasis of the neoplasm should be kept in mind, although high oxygen tension and iodine makes the thyroid gland resistant to metastasis. Radiographic differences are not useful since both primary tumours and metastatic lesions of the thyroid gland will appear as cold nodules on scintigraphy and as a inhomogenous, hypoechoic mass on ultrasonography. Therefore, fine needle aspiration biopsy can be useful in detecting an unsuspected malignancy.\(^2-5\)

The appearance of metastatic disease in the thyroid gland is a sign of poor survival because it indicates disseminated disease. It has been reported that patients may benefit from surgery, however.\(^6,8\) In the study by Chen et al,\(^4\) mean survival was 34 months with thyroidectomy (with or without adjuvant therapy), which is longer than the 25 months mean survival time of patients treated with modalities other than surgery. Furthermore, after a median follow-up of 5.2 years, 60% percent of patients were alive and two patients were disease-free.

Factors that contribute to a favourable prognosis are a long interval between the occurrence of primary disease and the development of the metastatic focus; a solitary or isolated lesion; spontaneous regression of the metastatic lesions; necrosis in the resected specimen; and slow tumour growth.\(^5\)

In cases of solitary metastasis, the 5-year survival rate from the date of nephrectomy is reported to be 30% to 70%, while it dramatically drops to 5% in cases of disseminated disease.\(^3\) There is no clear consensus on the role of surgical treatment of metastatic thyroid disease. Most authors recommend lobectomy/isthmusectomy when there is a solitary nodule or airway obstruction.\(^4\)
Conclusion

In any patient with a history of malignancy, a new thyroid mass should be considered as a recurrence until proven otherwise. Fine needle aspiration biopsy can help discriminate between primary and metastatic neoplasms. Although metastasis is an indication of disseminated disease, some patients may benefit from aggressive surgery of metastatic solitary lesions.

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References:
TNF inhibitors for inflammatory arthritis in New Zealand

Rebecca Grainger, Andrew Harrison

Abstract

For the vast majority of the estimated 100,000 New Zealanders who suffer from rheumatoid arthritis (RA),
relatively inexpensive disease-modifying antirheumatic drugs (DMARD) regimens are sufficient to control inflammatory disease and maintain long-term function. Some DMARDs have been shown to slow, but not arrest, the progression of erosions. All but a few of those who suffer from ankylosing spondylitis (AS) can manage full social participation with non-steroidal anti-inflammatory drugs (NSAIDs) and an exercise regimen. For the small subset of arthritis sufferers who have disabling pain and progressive damage from uncontrolled inflammatory disease, the advent of the biological era offered great promise. In most of the developed world, this promise is being delivered to patients with an expanding range of diseases including RA, AS, and psoriatic arthritis, but central government (PHARMAC) funding for TNF inhibitors in New Zealand has until recently been limited to etanercept for approximately 40 patients with juvenile inflammatory arthritis.

TNF inhibitors

Increased understanding of the immunopathogenesis of inflammatory joint disease has recognised tumour necrosis factor (TNF) as a central cytokine promoting inflammation. In humans, TNF antagonists have been shown to control disease activity in early and established RA, AS, and psoriatic arthritis. There are currently three TNF antagonists licensed for use in New Zealand (infliximab, etanercept, and adalimumab) available at a cost of NZ$20,000 to NZ$30,000 per patient per annum.

Infliximab

Infliximab (Remicade®) is a chimeric IgG1 anti–TNF antibody containing the antigen-binding region of the mouse antibody and the constant region of the human antibody. Infliximab combined with methotrexate has been shown to improve disease control in over half of patients with RA failing methotrexate monotherapy, and to arrest the progression of erosions over 12 months of treatment regardless of the clinical response.

In AS, infliximab reduced activity of spinal inflammatory disease by at least 50% in 50% of patients with severe active disease, with onset of improvement within 2 weeks. This benefit was sustained over a 2-year treatment period. Infliximab is given by intravenous infusion: initially 3 infusions over 6 weeks, then at 8-week intervals, with a dose of 3 mg/kg in RA and 5 mg/kg in AS.

Etanercept

Etanercept (Enbrel®) is a soluble TNF-receptor fused to the Fc portion of IgG that binds to TNF, preventing interaction with its receptor. Etanercept, at a dose of 25 mg
subcutaneously twice weekly, reduces arthritis activity in patients with early and established RA. In AS, etanercept rapidly reduced both axial and peripheral joint disease; and in psoriatic arthritis, etanercept reduces peripheral arthritis and improves psoriasis.

**Adalimumab**

Adalimumab (Humira®) is a recombinant human IgG1 monoclonal antibody that binds to human TNF impairing cytokine binding to its receptors and lysing cells that express TNF on their surface. In patients with active RA despite therapy with optimum doses of methotrexate, addition of adalimumab rapidly reduces disease activity. Adalimumab is administered subcutaneously every other week.

**Adverse events and contraindications**

In clinical trials, all TNF inhibitors have been well tolerated. Etanercept and adalimumab occasionally cause injection site reactions which decline over time and are uncommon after 2 months of use. Infliximab infusion can cause fever, nausea, and rash in up to 20% of patients, which is usually controlled with premedication. TNF inhibition has been associated with the development of serious infectious diseases, both with common Gram-positive and Gram-negative bacteria and opportunistic organisms such as *Mycobacterium tuberculosis*, *Cryptococcus*, and *Aspergillus*. There is a significant increased risk of reactivation of latent mycobacterial infection (particularly with infliximab), and all patients are screened for latent tuberculosis before treatment. There are rare reports of demyelinating neurological disease, pancytopenia, and drug-induced lupus occurring during use of TNF inhibitors. TNF inhibition worsens congestive heart failure and there use should be avoided in patients with class II, III, or IV congestive heart failure. There have been no studies of safety during pregnancy and therefore adequate contraception should be used.

**TNF inhibitors and PHARMAC**

The Pharmaceutical Therapeutic Advisory Committee (PTAC) first considered funding etanercept in August 2002. It recommended that etanercept be given moderate priority for adult rheumatoid arthritis, which was regarded as a high cost, high benefit situation, and high priority for juvenile inflammatory arthritis, which they regarded as a high cost, very high benefit situation involving many fewer patients.

Etanercept has been funded for juvenile arthritis since February 2004, but up to now PHARMAC has not funded TNF inhibitors for adult inflammatory arthritis. This is out of step with countries such as the United Kingdom, Europe, USA, and Australia where, over the last 7 years, all three TNF inhibitors have become funded for use in RA, AS, and psoriatic arthritis in children and adults.

There is considerably more scientific evidence in to support the use of etanercept in adult RA than in childhood arthritis. The initial PTAC recommendation for adult RA appears to have been based on projected costs rather than science. A complaint to the Human Rights Commission that this policy discriminates on the basis of age has recently been given a favourable hearing.
In February 2005, PHARMAC published a Hospital Pharmaceutical Assessment Summary Discussion Document on infliximab and etanercept for RA. In PHARMAC’s view, these drugs are not cost-effective and fail to achieve an acceptable cost per QALY. Deficiencies in the methodologies used to reach this conclusion have been highlighted by local and international commentators. Quite apart from the fact that the RCT-based QALY calculations are invalidated in clinical practice by entry and exit criteria that define a high-need high-response target group, the long-term benefit of erosion reduction is completely overlooked by basing calculations on the surrogate outcome measure of short-term changes in function. It is particularly inappropriate to use methotrexate as a comparator given that the proposed criteria include failure of methotrexate therapy as a prerequisite. Nevertheless, the document has been circulated to DHBs and, whether intended or not, has served as a barrier to DHB funding of TNF inhibitors.

Cost-benefit analyses based on randomised control trials will inevitably underestimate the social and economic gains provided by successful therapy. It has recently been reported that the cost of arthritis to the New Zealand economy for 2005 will be NZ$2.35 billion, of which only one-quarter are health sector costs. For the patients who meet the proposed criteria for funding of a TNF inhibitor, the non-health sector costs are likely to be proportionately even higher. It seems obvious that targeting this group with therapy that restores function and arrests joint damage will reap economic rewards down the line.

In the last few days, PHARMAC has announced a proposal to list adalimumab on the pharmaceutical schedule. The prospect of TNF inhibitors for adult RA is greatly welcomed by local rheumatologists and arthritis patients, but delays in funding have caused considerable harm, and will continue to do so for New Zealand patients with severe psoriatic arthritis and ankylosing spondylitis for whom the prospect of relief in the next 2 years is unlikely, based on the experience with RA.

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**References:**


More of ‘The relation of the State towards consumption’

This extract is taken from a speech read by Dr J. M. Mason (Chief Health Officer for the Colony of New Zealand) that was published in the New Zealand Medical Journal 1905, Volume 4 (13), p25–29.

The State should assuredly furnish the legal machinery by which adequate air-space, &c., is secured; it should see that no unfair demands are made upon it by reason of the admission of indigent sufferers from the disease from other countries; its duty is to empower local authorities to make suitable by-laws for the prohibition of quitting in public places; the State alone can insist on compulsory notification.

It is a disputable matter as to how far the State as against the municipalities should control the inspection of the foodstuffs capable of transmitting the disease; but it is when we come to the allocation of the cost of carrying out requirement No. 1 that the greatest diversity of opinion is to be found.

In the Old Country many splendid sanatoria have been erected through the generosity of benevolent citizens, and, save with respect to those sufferers who are inmates of a poorhouse, it is never suggested that the State should play the part of banker. Here, by reason of the fact that our ordinary hospitals are in part supported by local rates and part by the central authority, the common answer to an appeal for funds to establish a hospital for such cases is, “It is the duty of the State.”

I suggest that this only expresses half the truth, and if my contention be right it will be seen that in this country, at any rate, the State does more than fulfil its duty. For every pound raised by rate the central authority is by law bound to subsidise it to the extent of one more pound; and for every twenty shillings subscribed by private persons, another twenty-four can be obtained from the Consolidated Fund. In addition to this, the Government has established a splendid sanatorium on the hills near Cambridge for sufferers throughout the colony.

There are a large number of both curable and incurable cases among the absolutely penniless, and I submit that the time has come when appeals such as those made by Dr. Valintine, Nurse Maud, and Nurse Holgate should receive the same satisfactory answer as has been given in Taranaki, Christchurch, Nelson, and Wellington.

One other way in which great help could be given would be to enlist the sympathies of every one by means of the setting-up of a society for the prevention of consumption somewhat on the lines of the association of which our Sovereign King Edward is the patron.

His Excellency Lord Plunket, in ‘the course of a speech at the Cambridge Sanatorium, expressed his willingness to help such a society in any way that seemed best. I ask you, as representing the medical profession of New Zealand, to affirm the desirability of establishing such a society. Under its auspices medical men should deliver lectures, and endeavour to interest the public in this great life-saving propaganda.

Members might become a sort of preventive police, reminding persons who were careless in spitting on pavements and in public places that such practices were not
only illegal, but dangerous. With such united action it would not be a
difficult matter to stop or lessen the yearly sacrifice to this modern juggernaut..

NZMJ Note: For additional text from this speech, see http://www.nzma.org.nz/journal/117-1200/1025/
which was published in the 20 August 2004 issue of the NZMJ. And for some more news from the
Cambridge Sanatorium 100 years ago and some background, see
http://cambridgemuseum.org.nz/Npapers/Inde100s/1904.htm#Dec04 and
http://www.cambridgemuseum.org.nz/Articles/tewaisanart.htm
A corpulent heart

Constantin Marcu, Tjeerd Germans, Aernout Beek, Albert Van Rossum

A 62-year-old man with a prior history of systemic hypertension, diabetes mellitus, and pulmonary emphysema underwent a transthoracic echocardiographic examination (TTE).

The echocardiogram, which was of suboptimal quality, raised the suspicion of a right atrial mass. To better characterise this finding, a cardiac magnetic resonance imaging (MRI) exam was performed (Figure 1 and Figure 2).

Questions—What does the MRI show? What is the diagnosis? (see the next page for the answers)
Answers and Discussion

On a T1 weighted spin-echo sequence (which makes adipose tissue appear bright) 4-chamber view of the heart, a bilobed, homogenous, structure involving the upper and lower parts of the interatrial septum, but sparing the fossa ovalis, was visualised. The structure had signal intensity similar to that of epicardial and subcutaneous fat (Figure 1).

The acquisition was repeated at the same slice location, using a MRI technique which suppresses the signal of adipose tissue. With this technique, the interatrial septal mass, epicardial and subcutaneous fat lost their signal intensity, suggesting that the mass consisted mainly of adipose tissue (Figure 2).

A diagnosis of lipomatous hypertrophy of the interatrial septum (LHIS) was established based on the MRI exam. LHIS represents an accumulation of nonencapsulated, mature, adipose tissue and enlarged cardiac myocytes in the interatrial septum. The reported incidence of LHIS varies from 1% in necropsy studies\(^1\) to 8% in selected populations undergoing TTE.\(^2,3\)

There is no gender predilection but the condition is believed to be associated with advanced age, emphysema (probably due to prior corticosteroid use) and increased epicardial and body fat.\(^1,2\)

LHIS is included in the differential diagnosis of atrial masses, and although a histologically benign growth without clinical consequences in most patients, it has been associated with atrial arrhythmias, and rarely with circulatory obstruction.\(^1–3\) Our patient was reassured about the benign nature of the condition and was advised to follow-up with his local physician.

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References:

Menopausal problems

A recent review points out that many women and doctors have revised their opinions of hormone replacement therapy (HRT) for menopausal symptoms, and a substantial number of individuals have discontinued its use because of concerns about side effects. Not surprising, since the side effects include increased risk of breast cancer, endometrial cancer, cardiovascular disease, thromboembolism and stroke. Numerous alternatives to HRT are promoted but none are nearly as effective in limiting menopausal hot flushes and vaginal dryness as is HRT. The review points out that selective serotonin reuptake inhibitors might be effective in the very short term (less than 12 weeks) and are well tolerated. There is not enough evidence that any of the complementary therapies available are any better than placebo for menopausal vasomotor symptoms. Mention is made of tibolone, a synthetic prohormone with weak oestrogenic, progestagenic, and androgenic actions. Apparently this works as well as HRT, but we would have to be suspicious about its long term effects.

Lancet 2005;366:409–21

Mobile phones increase risk of having a road accident

Because of concerns about risks of potential crashes, use of hand held phones while driving is illegal in most countries in the European Union, all Australian states, and parts of Canada and the United States, but not in New Zealand. A recent study from Australia quantifies this risk. It deals with 456 drivers who had had a road crash that necessitated hospital attendance. And the results—people using a mobile phone up to 10 minutes before a crash were four times more likely to crash. The risk was still raised when hands-free phones were used. Time for legislation here?

BMJ 2005;331:428–30

More about osteoporosis trials

In the NZMJ issue of 24/6/05 we abstracted a BMJ paper reporting a randomised trial which showed that supplementation with calcium 1000 mg and Vitamin D₃ 800 IU daily did not decrease the likelihood that older people will experience a first hip fracture (BMJ 2005;330:1003–60). A similar result was reported in the Lancet (2005;356:1621–8). And to balance those results—a recent meta-analysis of 12 trials involving more than 19000 subjects claims that oral Vitamin D supplementation between 700 to 800 IU/d appears to reduce the risk of hip and any nonvertebral fractures in ambulatory or institutionalised elderly persons. One assumes that neither the BMJ or Lancet reported trials were included in the meta-analysis. Evidence based medicine in conflict? Better use our clinical judgement.

JAMA 2005;293:2257–64
Antibiotics induce bacterial biofilm formation?

Bacterial biofilm is a community of micro-organisms associated with a surface. And biofilm-associated infections are related to biomaterials and implants, such as infection associated with intravascular catheters and prosthetic-valve endocarditis. And they are very difficult to eradicate, presumably because antibiotic penetration is poor. And now another twist in the story. Researchers have recently demonstrated that subinhibitory concentrations of aminoglycoside antibiotics induced biofilm formation in *P. aeruginosa* and *Escherichia coli*. The aminoglycoside in question was tobramycin but presumably this will be a class phenomenon. Ironic, as the aminoglycosides are a major weapon against biofilm related infections.

Nature 2005;436:1171–2

Coronary artery stenting and restenosis

The use of drug-eluting stents that deliver site-specific, controlled release of therapeutic agents has significantly reduced the problem of restenosis inherent to bare-metal stents. Although the therapeutic benefit of sirolimus stents and paclitaxel stents over bare-metal stents is well established, there may be differences between the two devices. Two recent controlled trials, one on all-comers and one on diabetic subjects, addressed this point. And the results? Both favour sirolimus by demonstrating a subsequent significant reduction in the restenosis rate. Thus, the trial data “suggests that the currently available sirolimus-eluting stents provide an angiographic and clinical edge over the currently available paclitaxel-eluting stents”. But, there is always a but, “the currently available paclitaxel-eluting stent holds an edge on availability, deliverability and cost”.

**Blame it on Big Tobacco, but do what you can to help smokers stop**

In their recent paper, Thomson and Wilson suggest that policies that erode the power of the tobacco industry may contribute (along with conventional tobacco control strategies) to the reduction in smoking prevalence.¹

Viewing the industry as the problem (as opposed to smokers) is a critical shift as it recognises the dependence causing nature of tobacco. We have thankfully moved on from the times of viewing smoking as just a bad habit and something that smokers should be simply able to stop. In fact, most smokers want to stop and many try, but spontaneous long-term cessation rates are low (up to 5%).²

New Zealand healthcare professionals are well-placed to advise and assist smokers. Brief advice from a doctor increases long-term cessation rates by 1–3%³ and recommending the use of nicotine replacement therapy (NRT) will further double the chances of quitting.⁴ However it has recently come to our attention that some smokers may not be using NRT appropriately, perhaps through lack of understanding. For example, people quitting with NRT sometimes comment that they are using less of the product than recommended, even though they are struggling at times with urges to smoke, irritability, and other symptoms of tobacco withdrawal.

To receive the greatest benefit from NRT, smokers should be encouraged to use sufficient dosages (e.g. patches need to be used daily) with a new patch applied each morning; and oral products, such as gum, should be used every hour (approximately 15 pieces per day).⁵–⁷

Smokers with higher-level tobacco dependence should use higher-dose products (e.g. 4 mg gum). Dependence can be quickly assessed by asking the time to the first cigarette in the morning (smokers who show greater dependence smoke their first cigarette within the first 30 minutes of waking)⁸ and is generally a better indicator than cigarette consumption.

In addition, a combination of products (e.g. patch and gum) provides a small increase in success rates over one product alone.⁴ Furthermore, they should use NRT for an adequate period (e.g. 8–12 weeks). Understanding how NRT works is vital. It is worth reminding them that using NRT is not the same as smoking, as it typically provides less nicotine and does so less rapidly than smoking.

While not a ‘magic bullet’, NRT helps by relieving symptoms of tobacco withdrawal, making quitting easier and almost twice as likely.⁹ If healthcare professionals were able to communicate the rationale and use of NRT more clearly, then the risk of under-dosing might be minimised and the chances of quitting improved.

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Access to palliative care for people with motor neurone disease in New Zealand: a patient’s perspective

McKenna and MacLeod highlight an important issue in their article Access to palliative care for people with motor neurone disease in New Zealand. However they do not go far enough in their suggestions to provide effective palliative care services for people with motor neurone disease (MND).

As a New Zealand health professional who has been living and working in Sydney for the past two years, I have first-hand experience of the services offered to people with MND “across the ditch”. Having had the misfortune to be diagnosed with MND one year ago, I attend one of the four multidisciplinary MND clinics in NSW that are partially funded by the MND Association NSW. At the clinic I am seen by several health professionals including a neurologist and the palliative care doctor from the local hospice.

Although I will probably return to New Zealand when I have a need for palliative care services, I have been able to build up a good relationship here with the palliative care doctor. She has visited me in my home for a baseline assessment and I can contact her by phone or email if I need to.

Another important issue in the Trans Tasman disparity of services and treatment for people with MND is access to the only drug that has been found to slow the progression of this dreadful incurable disease. At the time of my diagnosis, I was immediately commenced on the Pharmaceutical Benefits Scheme (PBS)-funded, special authority drug, Riluzole. Riluzole is standard treatment for MND in countries including Australia, Canada, USA, United Kingdom, and many European countries. Riluzole is not registered in New Zealand.

If, as McKenna and MacLeod estimate, there are 250–300 people with MND in New Zealand the annual cost of providing Riluzole for those who meet the criteria would be no more than 3 million dollars. A cost which would be offset by people with MND remaining in the workforce longer and paying taxes rather than being a drain on the taxpayer.

Is it ethical to deny MND sufferers access to medication that is standard in countries with similar living standards? Furthermore, is it ethical to deny them (and their families) access to adequate palliative care when their need is greatest?

The progress of MND can be aggressive, particularly in the absence of Riluzole therapy, thus to monitor progress and intervene at the first sign of deterioration referral to palliative care services needs to start soon after diagnosis.

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Regarding ‘Access to palliative care for people with motor neurone disease in New Zealand’

As noted in the “lawyer’s letter” entitled Proposed article for the New Zealand Medical Journal (the letter¹ and article² were published in the 16 September 2005 issue of the NZMJ), a graph was removed from this article pre-publication due to miscalculation of my 2001 data.

I was not permitted to review the text subsequently. It is therefore disappointing to note that the published text still refers to these erroneous figures by stating that percentages of services willing to offer each form of support had increased from 2001 to 2004. In fact, percentages for six forms of support had decreased, two were minimally increased, and one (symptom control) significantly increased.

Furthermore, I am puzzled that the support for decision-making, advice, family/carer support, and bereavement were perceived to have increased from 2001, when they were not surveyed in the 2001 questionnaire.

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References:


Re-evaluating a local public health control measure used in New Zealand for the pandemic influenza of 1918

Aim—Given the heightened global concern around pandemic influenza, we re-examined a particular area control intervention used in one New Zealand county during the 1918 influenza pandemic.

Methods—The data analysis used previously tabulated mortality and 1916 census data1 and the software EpiInfo 2000. Literature searches using Medline and Google Scholar identified other relevant literature on similar local interventions during this pandemic.

Results—The pattern of rapid spread of pandemic influenza in New Zealand during 1918 along coastal shipping and the national rail network routes1 is strongly suggestive of a general failure of pandemic control measures within New Zealand. Nevertheless, one isolated town (Coromandel) instituted the quarantining of passengers on a visiting ferry steamer from Auckland.1 These passengers were routinely held for 24 hours on an island and were subjected to a medical examination prior to being allowed into the town. All roads leading to the town were also barricaded and travellers were required to have medical certificates. The medical officer involved reported no cases in the town of 1000 people and also claimed to have controlled an outbreak in a nearby Maori community by recommending strict isolation of “eight affected houses”.

Our re-analysis of the mortality and 1916 census data suggests that the mortality rate in Coromandel County for Europeans was statistically significantly lower than in the rest of the peninsula (rate ratio [RR] = 0.28, 95% confidence interval (CI) = 0.10–0.77) and when compared with the rest of the District (RR = 0.35, 95% CI = 0.13–0.93; see Table 1). However, the reduction in the Maori mortality rate in the Coromandel County was not at a statistically significant level (Table 1).

Discussion—The apparent success of the public health intervention in Coromandel County in preventing mortality is plausible given the other successful isolation measures within countries during the 1918 influenza pandemic. These included those in some remote Canadian towns5 as well as in the continental United States in some towns, military installations (on islands), and various institutions (e.g. a training school and sanatorium in New York state).3 Isolation completely protected some towns in Alaska and even prevented disease spread between an upper and lower part of the same village.4 The quarantine efforts that delayed disease spread to Fairbanks, Alaska until 1919 may have also provided some public health benefit (since the disease was then less virulent).3
Table 1. Pandemic influenza mortality rates for Coromandel County (site of a public health intervention) relative to surrounding areas (based on published tabulated data and using 1916 census data)

<table>
<thead>
<tr>
<th>Locality</th>
<th>Maori</th>
<th>European</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths (N)</td>
<td>Mortality rate per 1000</td>
</tr>
<tr>
<td>Coromandel County</td>
<td>12</td>
<td>40.3</td>
</tr>
<tr>
<td>Rest of the Coromandel Peninsula*</td>
<td>43</td>
<td>64.7</td>
</tr>
<tr>
<td>Rest of the Thames-Bay of Plenty District†</td>
<td>377</td>
<td>43.9</td>
</tr>
</tbody>
</table>

*“Thames” township and “Thames County”; †That is the whole District of 15 towns and counties but excluding Coromandel County.

We acknowledge that there are possible limitations with the quality of these mortality data and for the 1916 census data that has been used in the analyses (i.e. the census was taken during a World War). Limitations are particularly plausible due to the under-reporting of Maori deaths and limitations with the census data for Maori.5,6 Nevertheless, we consider that this type of re-analysis may provide some (albeit weak) level of reassurance that public health interventions at a local level can potentially be successful.

Recent modelling work from Canada also suggests that travel restrictions within a country may play some role in controlling pandemic influenza.2 Others have also reported on the value of a historical perspective (including the experience from the 1918 pandemic) in informing the contemporary advancement of public health.7 Even so, a future influenza pandemic virus strain may be far more virulent and infectious than those of the past, and it would arrive into a society with much higher levels and speeds of intra-country transport.

Summary—This re-analysis of mortality data for a particular county exposed to a local public health intervention from the 1918 influenza pandemic is suggestive of a beneficial impact. This association is plausible in the context of similar examples of towns in other countries that successfully isolated themselves during this pandemic.

NZMJ Note: Also see NZMJ editorials by Dr Lance Jennings:
- New Zealand’s preparedness for the next influenza pandemic (11 March 2005 issue).

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References:
More on ‘Violence against women in New Zealand’


The evidence is therefore highly suspect and the articles of little value in making a significant contribution to the important problem of domestic violence. There is no attempt to evaluate the verbal abuse and other forms of misbehaviour for which the wives may be responsible.

The other problem is of course a very important one, especially in relation to the children of the home. My awareness of the existence of this work was from an article in the New Zealand Herald giving publicity to the investigation and its results.

It is therefore surprising to learn that Ms Janet Fanslow, who is cited in one of the articles as dealing with correspondence, does not respond directly but only via letters to the Editor of the NZMJ.

Frank H Sims
Retired Pathologist
Auckland
A patient’s diary

A 71-year-old farmer worked a large and successful farm in the South Island without any medical problems apart from a hip replacement, and vague occasional pains around the neck. He retired to the Bay of Plenty at 70 years.

In April 2005 he felt acutely weak, ill, and tired: something he had not experienced before. He kept a diary of his illness which is recorded here:

- For several weeks he noticed tenderness over the right side of his scalp, as if the skin there was sunburnt. At the same time there was constant dull headache above the eyes on the lower forehead; the neck and temples were also painful. The neck was especially painful behind the right ear. When he chewed solid food his jaw muscles became painful, but this stopped when he stopped eating.

- His general practitioner, a locum tenens, suggested a blood test for polymyalgia rheumatica. He referred the patient to a neurologist.

- The neurologist noted that the erythrocyte sedimentation rate (ESR) was normal, and felt that there were no particular features of temporal arteritis. His neurological examination was normal. He commented that the thoracic spine was slightly kyphotic, and there was mild limitation of neck movements. Cervical spine X-rays showed moderate degenerative changes with marked disc-narrowing. He considered that the headache did not emanate from the neck, but as it had lasted for 6 weeks (which was unusual for the patient), he requested a computed tomography (CT) brain scan to exclude meningioma—the scan was normal.

- The GP prescribed synflex and nortryptilline, with no effect. Nurofen Plus (2 tablets 4 hourly) achieved some pain relief.

- His usual GP then explained that he did not have polymyalgia, because the ESR was “too low”, but he would keep this diagnosis at the back of his mind. The patient questioned the level of 7 mm fall in 1 hour, in the context of polymyalgia.

- The patient in late June instigated eye tests and bought new spectacles due to continuing headaches.

- An orthopaedic surgeon, recommended by golf friends, was persuaded to undertake an MRI scan of the patient’s cervical spine, which confirmed degenerative changes at C3/C4, but no nerve compression. There was no pressure or distortion of the spinal cord. He did not recommend surgery.

- In July, August, and September, the patient’s headache symptoms progressively worsened and additional symptoms occurred: sore shoulders, weak arms and thighs, difficulty in standing up, and the first three steps when attempting to walk were tentative. Pain extended to his buttocks and knees. The neck became extremely painful: “…feels like a concrete block—worse at night and in the morning”. An osteopath performed therapeutic massage, with no effect.
• Fortuitously, the patient’s aunt came to stay for a short holiday in September. She said that she had polymyalgia and observed that the symptoms of the patient were exactly the same as hers. What is more, she had immediate relief from prednisone!

• The patient then saw his GP, related this conversation, and asked to be put on prednisone. He pleaded: “In the short term what have I got to lose?” With reluctance, the GP prescribed prednisone 30 mg per day.

• Within 15 hours there was significant pain relief of headaches and scalp pain, neck pain, buttock pain, and knee pain. Within 3 days there was complete cessation of pain in every part of his body. By September 24 he had his first night’s sleep for 5 months. The patient slowly reduced his dose of prednisone, but kept to a small dose. He has had no further pain.

Comment and discussion—The patient’s diary gives a clinically relevant narrative indicating temporal arteritis and polymyalgia rheumatica, described in his own vernacular. Frustration in coping with unrelenting pain prompted his problem-solving that was complementary to his GP’s. Diagnosis and treatment eventually emerged by serendipity (the aunt’s arrival). She even provided a medical reference paper (by Dr JG Jones of Rotorua). The patient got more information from the Internet.

In both conditions, the ESR is usually high, but may be within normal range in about 25% of cases. Undue reliance on a single ESR misleads. Temporal arteritis and polymyalgia are commonly associated conditions in the elderly, but the respective aetiologies may be different.

Temporal arteritis is a systemic vasculitis that targets medium and large arteries. Granulomas in the artery wall are formed by CD4 T cells and macrophages, provoking intimal hyperplasia and vessel occlusion. Clinical manifestations relate to tissue ischaemia (the patient experienced claudication of jaw vessels). Headache may take any form, and may resemble any primary headache. Corticosteroids are the cornerstone of treatment.

Polymyalgia rheumatica is an inflammatory condition of unknown origin, comprising aching and stiffness in the shoulder and pelvic girdles, and in the neck. Arthroscopic, radioisotopic, and magnetic resonance imaging investigations identify synovitis around proximal limb joints and periarticular structures, causing pain. Recent studies have not implicated vasculitis. Normal ESR does not exclude the diagnosis. Corticosteroids are the main treatment.

Ronu R Ghose
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Tokoroa, South Waikato
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References:
PHARMAC responds on long-acting insulin analogues

A Special Series article in August by Dr Jeremy Krebs discussed the timing of funding of long-acting insulin analogues in glycaemic control in diabetes (http://www.nzma.org.nz/journal/118-1221/1641/). We respond to three issues raised by Dr Krebs: process; availability of long-acting insulin analogues internationally; and cost-effectiveness.

Timeframes and PHARMAC’s processes

PHARMAC aims to ensure fair allocation of funding across competing new medicines, and must ensure appropriate targeting of medicines to get best value for money. For this reason, our processes for assessing new pharmaceutical funding applications are necessarily diligent. PHARMAC’s process involves both expert clinical review, negotiation with suppliers, consultation with the health sector, and then decision by PHARMAC’s Board. The process is described in the Attachment to this letter (at the end).

For insulin glargine, the most significant delays have been caused elsewhere. Insulin glargine has been registered for use in New Zealand since June 2001, following first application to Medsafe for registration in May 1999—some two years earlier. Insulin glargine was then registered for three years before the supplier applied to PHARMAC for funding in July 2004.

We have had the application to list insulin glargine for little over a year, during which time:

- The Pharmacology and Therapeutics Advisory Committee (PTAC) or its Diabetes subcommittee (one of eleven expert subcommittees) have reviewed the application four times— as part of obtaining satisfactory expert clinical advice (including information gaps). PTAC originally recommended a low priority for listing insulin glargine for the patient population proposed; hence PTAC referred the application to its Diabetes subcommittee to develop appropriate targeting criteria.

- The application has also undergone further economic evaluation, at PTAC’s request (PTAC had concerns with the original cost utility analysis (CUA) submitted by the supplier).

- In response to an application from another supplier for insulin detemir (another long-acting insulin analogue), PHARMAC’s economic evaluations and the Diabetes subcommittee have also this month looked at long-acting insulin analogues as a whole.

The next steps will be for PHARMAC to negotiate with the suppliers of both insulin glargine and insulin detemir for a commercial arrangement to list one or both long-acting insulin analogues; any agreed proposal(s) would then be consulted on and considered by PHARMAC’s Board. Any proposals for the listing of any long-acting
insulin analogues would be subject to the standard decision criteria that all proposals are weighed against, and prioritised alongside competing new medicines at the time.

Timelines for the applications to PHARMAC for long acting insulin analogues are detailed in the Attachment to this letter (at the end). Available relevant minutes of PTAC and Diabetes subcommittee meetings are also included in the Attachment.

**Long-acting insulin analogues are not funded in Australia nor recommended for funding in Canada**

Neither insulin glargine nor insulin detemir is funded in Australia. The New Zealand application for insulin glargine coincided with an application to the Pharmaceutical Benefits Advisory Committee (PBAC) in Australia. The Pharmaceutical Benefits Advisory Committee (PBAC) has since already rejected insulin glargine and deferred a decision for insulin detemir:


- In July 2005 PBAC also deferred an application to list insulin detemir, given that the supplier had made a precondition that there be a PBAC recommendation to list insulin glargine—a precondition that PBAC rejected ([http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pbacrec-jul05-defer](http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pbacrec-jul05-defer)). According to the PBAC website, insulin detemir’s supplier is considering its position regarding any future course of action.

The Canadian Expert Drug Advisory Committee (CEDAC) ([https://www.ccohta.ca/CDR/cdr_pdf/cdr_submissions/Complete/cdr_complete_Lantus_2005Sept28.pdf](https://www.ccohta.ca/CDR/cdr_pdf/cdr_submissions/Complete/cdr_complete_Lantus_2005Sept28.pdf)) has recently recommended that insulin glargine not be listed, citing *inter alia* no significant differences in 21 open-label RCTs between insulin glargine and NPH (or ultralente) insulin in the incidence of severe symptomatic hypoglycaemia. CEDAC also did not feel that the claimed differences in clinically important outcomes in favour of insulin glargine over NPH insulin justified the three-fold difference in cost.

**Cost-effectiveness**

Long-acting insulin analogues aim to achieve at least as good glycaemic control as insulin isophane (insulin NPH) while reducing the frequency and severity of hypoglycaemic episodes. At PTAC’s request, PHARMAC staff performed a preliminary CUA, based on the supplier’s original submission to PTAC for insulin glargine. Depending largely on the impact of fear of further hypoglycaemic episodes,
PHARMAC estimated a wide range of cost/QALY values for insulin glargine treatment, ranging between $17,000/QALY and $3.1 million/QALY.5

Guidance from the UK National Institute of Clinical Excellence (NICE) on the use of long-acting insulin analogues6 was informed by a comprehensive systematic review and analysis by ScHARR7 (http://www.ncchta.org/fullmono/mon845.pdf). This analysis showed, similarly to PHARMAC’s CUA, a wide range of cost-utility values, again driven by the degree of anxiety/fear of further severe hypoglycaemia and this fear’s effects on quality of life.8 The ScHARR authors commented that the supplier’s submission’s claimed base case was based on the most favourable of a number of analyses. They also concluded that further research was needed that on the quality of life issues associated with the fear of hypoglycaemia, and also the economic impact of balancing HbA1c control and the incidence of hypoglycaemia achieved in practice.

PHARMAC has since estimated a $34,500 to $58,000/QALY range for long acting insulin analogues for the key group recommended by the Diabetes subcommittee – being Type 1 diabetes patients using intensive insulin regimes who had had an unexplained severe hypoglycaemic episode in the previous 12 months.9

The PHARMAC Board will use the above ranges of cost-effectiveness estimates, alongside clinical advice from PTAC and the Diabetes subcommittee and consultation feedback, when deciding whether to fund long-acting insulin analogues and if so under what access arrangements.

Conflict of interest: Scott Metcalfe is externally contracted to work with PHARMAC for public health advice. Jackie Evans and Peter Moodie declare no conflicts.

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Public Health Physician
Wellington

Jackie Evans
Therapeutic Group Manager
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Wellington

Peter Moodie
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Footnotes and references:

1. http://www.pharmac.govt.nz/ptac.asp The volume of applications received by PHARMAC and considered by PTAC is considerable. During 2005 PTAC will have undertaken 51 reviews of new and revised applications etc. PTAC agendas are full and submissions are extensive; agenda papers typically weigh 20 to 25 kg. PTAC recommend moderate to high priority for funding in one quarter of cases, the rest being lower priority, declines, deferrals, or referrals to subcommittees. Further details are in the Attachment to this letter (at the end).

2. While agreeing that there are patients who will potentially benefit from fewer treatment-related hypoglycaemic events with insulin glargine (compared with insulin NPH). PBAC considered that insulin glargine’s absolute reductions in the different types of hypoglycaemic events were small, and that insulin glargine does not totally remove the risk of hypoglycaemic
events. PBAC also rejected claims of cost-effectiveness, stating that the absolute differences in hypoglycaemic event rates used in the economic model submitted were higher than those observed in the clinical trials, and that the model’s utility values were poorly justified.

3. PHARMAC undertakes four levels of economic analysis: very rapid, preliminary, indicative, and detailed. Preliminary analyses typically are rapid assessments using data derived mostly opportunistically, not systematically, typically with 1-2 weeks FTE input. Preliminary analyses are based on the broad principles used by PHARMAC for pharmacoeconomic evaluations as described by the Recommended Methods to Derive Clinical Inputs for Proposals to PHARMAC (http://www.pharmac.govt.nz/pdf/62465.pdf) and PHARMAC’s Prescription for Pharmacoeconomics (http://www.pharmac.govt.nz/pharmo_economic.asp). These principles include: the systematic identification, synthesis and presentation of relevant clinical input data; the use of overall health sector costs and direct patient costs when measuring effects on costs overall; measuring QALY gains; discounting both costs and QALY gains according to PHARMAC’s current discount rate [8% from 1 July 2005, 10% before then]; and the use of univariate and multivariate sensitivity analyses.

4. The supplier’s submission included efficacy data from a meta-analysis of both published and unpublished data for insulin glargine in type 1 and type 2 diabetes, with 0.31 severe hypoglycaemic events per patient year. PHARMAC in turn estimated a 8%-21% risk of hospitalisation for each severe hypoglycaemic episode, hence 0.02-0.07 hospitalisations for severe hypoglycaemic episodes per patient year. PHARMAC used ScHARR’s (http://www.ncchta.org/fullmono/mon845.pdf) value for the loss of quality-of-life due to severe hypoglycaemic episodes themselves (0.15 over 4 days) and a range of values for the associated fear of further severe hypoglycaemic episodes.

5. Under the most cost-effective scenario ($17-18,000/QALY), the fear of further hypoglycaemic episodes was assumed to be both high (loss in quality of life (i.e. disutility) of 17%) and pervasively continual. The 17% disutility derived from the Erasmus disability weight for mild/moderate generalised anxiety disorder. (Stouthard MEA, Essink-Bot M, Bonsel GJ, Barendregt PGN, et al. Disability weights for diseases in the Netherlands. Rotterdam: Department of Public Health, Erasmus University, 1997.) Using a New Zealand-based EQ-5D disutility score for mild/moderate anxiety/depression (11112) of 0.296 would have given lower cost/QALYs. (See Devlin N, Hansen P, Kind P, Williams A. Logical inconsistencies in survey respondents’ health state valuations – a methodological challenge for estimating social tariffs. Health Economics 2003;12(7):529-544.)

Under the least cost-effective scenario ($3.1-3.3 million/QALY), the fear of further hypoglycaemic episodes was assumed to be lower-grade (0.5% disutility) and lasting three months after each episode. The 0.5% disutility derived from a patient-based survey commissioned by Aventis using the EQ-5D, used and cited by the ScHARR analysis (Warren E, Weatherley-Jones E, Chilcott J, Beverley C. Systematic review and economic evaluation of a long-acting insulin analogue, insulin glargine. Health Technol Assess. 2004 Nov;8(45):iii, 1-57.) Assuming a high disutility from fear (but not continual disutility, rather lasting for three months) gave a cost/QALY of $210-220,000.

The cost-effectiveness estimates that assumed the fear of further hypoglycaemia to be both high and continual imply a significant loss in quality of life – with continual anxiety and moderate effects on the ability to perform usual activities (work, recreation, etc). Using such values means that the fear of hypoglycaemia is counted as being worse than the event itself (both day-to-day and as it affects year-long quality of life). It is consistent with the impact of severe hypoglycaemia on some patients and their families – where, for instance, following hospitalisations for severe hypoglycaemia and knowledge of others who have suffered perhaps crippling consequences, patients or parents consistently test frequently during the day and then at night, and diabetes control and the fear of hypoglycaemia in an individual dominate family life.


8. The ScHARR analysis used by NICE examined both HbA1c improvements and reducing the risk of hypoglycaemia, giving a range of £3,500 to £72,000. However, these values understate the cost/QALYs in New Zealand, due to both currency conversion, and then the price of insulin isophane (NPH) in New Zealand being half of that of the UK, yet the insulin glargine price proposed for New Zealand being 34% higher than the UK.

9. In general insulin detemir is expected to have similar effectiveness as insulin glargine. Note however that insulin detemir’s supplier has claimed additional clinical benefit and greater convenience to patients with insulin detemir over insulin isophane (NPH) and insulin glargine, in terms of improved glycaemic control and corresponding reduction in hypoglycaemic events, and an improved delivery system (FlexPen). Prices for the two products differ, hence PHARMAC’s cost/QALY estimates range according to the products’ prices. The $34,500-$58,000/QALY range (for Type 1 diabetes patients using intensive insulin regimes with unexplained severe hypoglycaemic episode in the previous 12 months) uses the high but not continuous fear scenario; this analysis did not attempt to account for the other claimed differences in efficacy and ease of use.

Attachment to ‘PHARMAC responds on long-acting insulin analogues’: further details

1. PHARMAC’s processes

PHARMAC’s process for assessing new pharmaceutical funding applications (http://www.pharmac.govt.nz/funding_applications.asp) is well established and involves both expert clinical review, negotiation with suppliers, consultation with the health sector, and then decision by PHARMAC’s Board:

- Once a new funding application has been received from a supplier, PHARMAC staff seek and collate more information for the application to be considered by the Pharmacology and Therapeutics Advisory Committee (PTAC);

- Following its consideration, PTAC either refers the application back to PHARMAC for further information or analysis, refers it on to one of its eleven expert subcommittees, or recommends whether PHARMAC funds the medicine and at what priority;

- If PTAC makes a recommendation for funding, PHARMAC then negotiates with the supplier to reach a provisional agreement on the terms and conditions of listing, including subsidy;

- PHARMAC then consults with the health sector on the proposal, takes this feedback into account, and submits the proposal (with any revisions) to the PHARMAC Board for a final decision.
2. PTAC

The volume of applications received by PHARMAC and considered by PTAC (http://www.pharmac.govt.nz/ptac.asp) is considerable. PTAC received 27 applications during 2004, and has received 25 this year so far. PTAC often reviews applications more than once (pending further information), usually reviewing at least ten applications each meeting. PTAC has eleven expert subcommittees that provide clinical evaluations in specialist areas.

PTAC meets four times each year, and during 2005 PTAC will have undertaken 51 reviews of new and revised applications etc. These numbers do not include applications sent directly to subcommittees and later ratified by PTAC – particularly many cancer drugs.

PTAC makes recommendations for moderate to high priority for funding in one quarter of cases, the rest being lower priority, declines, deferrals, or referrals to subcommittees.

PTAC agendas are full and submissions are extensive; agenda papers typically weigh 20 to 25 kg.
In turn, PHARMAC’s budget has meant listing or extending access to 25 medicines in 2004/05, and decisions made since July 2005 affect 23 medicines costing an expected $9.9 million this financial year ($36 million by 2007/08).

3. Timelines with applications for long acting insulin analogues

As part of obtaining satisfactory expert clinical advice, the application for insulin glargine was referred by PTAC to its Diabetes subcommittee. This is a normal process that aims to ensure objective decisions.

Timelines are as follows:

- Insulin glargine has been registered for use in New Zealand since June 2001, following first application for registration in May 1999 – some two years earlier.

- The supplier first applied to PHARMAC for funding in July 2004 – three years after registration.

- The application was considered by the PTAC in August 2004, which at that stage recommended a low priority for listing insulin glargine for the wider patient population proposed. PTAC considered that the evidence presented by the supplier demonstrated only modest improvements in HbA1c and hypoglycaemic episodes, and that insulin glargine would best benefit particular patient groups – particularly Type 1 diabetes with frequent hypoglycaemic episodes from existing insulin preparations.

  PTAC requested PHARMAC undertake its own cost utility analysis (CUA) (PTAC had concerns with the CUA submitted by the supplier), and referred the application to its Diabetes subcommittee to develop appropriate targeting criteria; PTAC members considered the low priority recommendation might change if the Diabetes subcommittee could identify an appropriate target population and if there was a satisfactory CUA.

- PTAC’s Diabetes subcommittee considered insulin glargine at its next meeting in May 2005. The subcommittee recommended a high priority for funding for certain patients with severe or nocturnal hypoglycaemia (described in Jeremy Kreb’s article http://www.nzma.org.nz/journal/118-1221/1641/). PHARMAC’s preliminary CUA for insulin glargine was part of the evidence considered by the subcommittee.

- In July 2005 an application from another supplier was received for another long-acting insulin analogue, insulin detemir, to be funded

- PTAC accepted the Diabetes subcommittee’s May 2005 recommendation for insulin glargine when it next met in August 2005. At the same time PTAC considered insulin detemir, including PHARMAC’s CUA for insulin glargine (where it was noted that cost/QALYs for insulin detemir may differ from insulin glargine). PTAC recommended insulin detemir be listed for the same patient groups recommended for high priority for insulin glargine.
Given the application for another long-acting insulin antagonist (insulin detemir), advice was sought from the Diabetes subcommittee comparing the two products. The Diabetes subcommittee met again in October 2005, considering (amongst other material) adaptations to PHARMAC’s CUA for insulin glargine specific to patients with previous severe hypoglycaemia, and a CUA for insulin detemir for those patients.

PHARMAC is now negotiating with the suppliers of both insulin glargine and insulin detemir for a commercial arrangement to list one or both long acting insulin analogues; any agreed proposal(s) would then be considered by PHARMAC’s Board. Any proposals for the listing of any long-acting insulin analogues would then be subject to the standard decision criteria that all proposals are weighed against, alongside competing investment opportunities at the time.

4. Relevant portions of PTAC and Diabetes subcommittee minutes

Record of the Pharmacology and Therapeutics Advisory Committee Meeting held on 19 August 2004

Insulin glargine (Lantus)

The Committee reviewed an application from Aventis to list insulin glargine on the Pharmaceutical Schedule.

The Committee reviewed the studies that had been provided in the submission for the use of this product in patients with type I and type II diabetes. Members noted that the trials were predominantly open-label in design due to the difficulty in blinding participants to the clarity difference between isophane insulin and insulin glargine. They considered that the majority of the trials had adequate sample sizes and treatment duration.

The Committee considered that, to represent a significant advance in insulin treatment, evidence of improved control (measured by HbA1c) and reduced hypoglycaemic episodes (particularly severe hypoglycaemia), as well as simplification in treatment schedules, would be required. Members noted that insulin glargine should provide physiological benefits over existing insulin preparations; however, they considered that the evidence demonstrated only a modest improvement in HbA1c and hypoglycaemic episodes.

The Committee considered that insulin glargine would be of most benefit in particular patient groups, including patients with type-I diabetes who have frequent hypoglycaemic episodes with existing insulin preparations.

The Committee reviewed the cost-effectiveness study provided by the supplier and considered that the modelling used was not appropriate for standard clinical practice. The Committee therefore disagreed with some of the assumptions in the analysis and recommended that PHARMAC conduct its own cost-utility analysis.

Members considered that the Diabetes Sub-committee of PTAC should review the application and that the Sub-committee be asked to recommend appropriate targeting criteria.

The Committee recommended that insulin glargine be listed on the Pharmaceutical Schedule, but should also be referred to the Diabetes Sub-committee of PTAC. In view of the high price and modest clinical benefit of insulin glargine compared with currently available insulins the Committee gave a low priority to listing. However, members considered that this recommendation might change if the Diabetes Sub-committee could identify an appropriate target population and if there were a satisfactory CUA.
The decision criteria relevant to the assessment of this application include: (i) the health needs of all eligible people within New Zealand, as diabetes is a major health problem in New Zealand; (ii) the particular health needs of Maori and Pacific peoples, due to the higher prevalence of diabetes in these populations; (iii) the availability and suitability of existing medicines, therapeutic medical devices and related products and related things, as current insulin regimes are far from ideal; (iv) the clinical benefits and risks of pharmaceuticals, as insulin glargine has some clinical advantages over currently available insulins; (vi) the budgetary impact (in terms of the pharmaceutical budget and the Government’s overall health budget) of any changes to the Pharmaceutical Schedule in view of the high price of insulin glargine; and (viii) the Government’s priorities for health funding, as set out in any objectives notified by the Crown to PHARMAC, or in PHARMAC’s Funding Agreement, or elsewhere, as diabetes is a priority for health funding.

Minutes of the Diabetes subcommittee’s 17 May 2005 and PTAC’s 17-18 August 2005 meetings have yet to undergo full public release. Draft minutes of the Diabetes subcommittee’s 10 October 2005 meeting await ratification by the subcommittee.
Brian Douglas Stringer

One day Brian Stringer was wearing Christ’s College uniform. The next, he was in air force garb. It was 1940 and World War 2 was underway. Stringer had walked out the school gates and almost immediately in the gates of Wigram Air Force base to enlist, says his sister, Barbara Blackie.

The wartime pilot went on to become a surgeon, working for more than 30 years in the United States, although he remained very much a New Zealander.

Stringer died in Medford, Oregon recently He was 83.

Born and raised on a remote Waikato farm, Stringer received his early education from the Correspondence School. He retained an interest in farming, which was to help him in later life. Stringer’s father had been to Christ’s College and sent his son there as a boarder in the mid-1930s.

After flying training, he was posted as a fighter pilot to Malaya, in 1941. His sister remembers a letter he wrote urging the family not to worry about him. The Japanese would never get past Singapore, he assured them.

Soon after, his unit was forced to leave Malaya, as the Japanese captured Singapore and swept onwards. Stringer and his reflow pilots were ordered to fly to Jakarta, where they were evacuated by an Australian warship.

Stringer served the rest of the war in the Pacific. First, he flew Kittyhawk fighter aircraft. Then he shuttled Catalina flying boats from San Francisco to the Solomon Islands and Guadalcanal, where they were used for supply and rescue missions.

After the war, he studied medicine at Otago University, did his house residency at Christchurch Hospital, then established a general practice in Upper Riccarton.

Stringer was awarded a Fulbright Scholarship in 1954 and went to Harvard Medical School in Boston for specialist training in surgery. There he met American Jane Durno, whom he married.

Further surgical training in England and Scotland followed. Stringer became a Fellow of the Royal College of Surgeons in 1956. He returned to the US, working at his father-in-law’s surgical practice in Medford.

He and his wife spent a year in New Zealand, after which Stringer worked briefly as a vascular surgeon in San Francisco. They moved to Medford again in 1958, where he practised for the next 30 years.

On his retirement, he became medical director for the Rogue Valley Physicians’ Service and Blue Cross Shield. He enjoyed his affiliations with many national and international surgical and medical associations.
While living in Oregon, Stringer entered public life with election to local and state boards, dealing mostly with irrigation and water rights. His farming background helped him understand issues. It also helped him manage the eight-hectare farmlet he bought as a retirement activity; he grew mainly pears on it.

He remained deeply interested in aviation, although he did not retain his pilot’s licence after the war. He enjoyed reading and travel. He was most fond of good Scotch whisky and prime-rib dinners.

Barbara Blackie says Stringer was a caring person and placed great importance on education. When his daughters were at university, he paid the fees for two unknown, talented students chosen by their school headmasters as needy causes. More recently, he endowed a scholarship at Christ’s College.

He was affable and made friends easily. He could relate to people at all levels and had amazing ability to remember them. His popularity led to him being a best man and godfather more times than his sister could count.

Stringer always regarded himself as a New Zealander and always spoke like one, his sister says. He had copies of The Press mailed to him regularly and demonstrated a deeper knowledge of New Zealand events than many residents had. He visited home often.

“He was quick to share his homespun moral philosophy, wit and humour with his family and friends,” his sister says. He often reflected on the gift and marvel of life, “and aimed to live it with dignity”.

Brian Douglas Stringer, born Waikato, April 1, 1922; died Oregon, August 29, 2005; survived by his wife Jane, daughters Susan and Judy and five grandchildren.

This obituary entitled War pilot and top surgeon originally appeared in The Press newspaper (Christchurch) on September 10 and was written by Mike Crean. We are also grateful to Bruce Rennie and Carol Ashby of The Press.
Jeremy Dashwood Phelps Hopkins

Jeremy Hopkins was on the beach at Seatoun on April 10, 1968, the day of the Wahine disaster.

Fifty-one people died that day as the interisland ferry foundered and capsized in an atrocious southerly but hundreds more were in urgent need of attention as they came ashore.

Mr Hopkins and a colleague, Dick Aldridge, drove from Wellington Hospital to render assistance on the spot.

Many had broken limbs or were suffering multi-system trauma and urgently needed skilled triage and prompt resuscitation.

It was a crisis where a highly competent and cool-headed surgeon could make the difference between life and death.

Mr Hopkins was an excellent orthopaedic surgeon who commanded the respect of patients, students and medical colleagues.

He had what one colleague described as an effortless superiority—he did things as well as anybody and did it without obviously trying. There was a dexterity about his surgery that improved the outcome for many of his patients.

A good manner went with the competence. In theatre he never needed to raise his voice, an expressive raised eyebrow was usually enough to get his message across and he had a good sense of humour that encouraged everybody in the theatre to work as a team.

His humour was honed at Otago University where he was the tone-deaf soprano in the university capping review, enjoyed “diplomatic club” dinners with fellow students and a mysterious Monsieur X, and he was there the day the old jalopy he shared with other students was ultimately shoved over the edge of a cliff. He had a very full professional life—he had his own practice in addition to his role as visiting surgeon to Wellington and Wairau hospitals, the Home of Compassion Hospital and the Artificial Limb Centre.

He gave up time on his weekends to attend weekly spina bifida clinics at Wellington Hospital and worked at the Puketiro Clinic for Disabled Children.

As honorary surgeon to the New Zealand School of Dance and the Royal New Zealand Ballet, his expertise was called on to identify potential problems in aspiring young dancers. Both he and his wife regularly enjoyed the ballet.
He also had a long involvement in medical politics, serving as president of the Wellington division of the Medical Association and then on the national body, chairing its council, its ethical committee and was ultimately elected to its presidency.

Medical education was another area of expertise. In addition to his teaching duties, he was a member of the New Zealand committee of the Royal Australasian College of Surgeons, an examiner in orthopaedics and became president of the New Zealand Orthopaedics Association in 1992. He was also an orthopaedic consultant to the Fijian Government, served on the World Health Organization working party on road trauma, and on a number of government committees.

Though he retired from active surgery in the late 1990s, he continued doing medicolegal work in Australia and New Zealand as a consultant to lawyers, the ACC and insurance companies. He was past president of the Medico-Legal Society and was New Zealand adviser to the Medical Defence Union.

His opinions were always forthright. Just a couple of months before he died, aged 70, he contributed some robust and apparently telling advice on a draft Medical Association policy on the issue of cultural competency in medicine.

He could be provocative but was always good company.


This obituary entitled Cool head in Wahine crisis originally appeared in The Dominion Post newspaper (Wellington) on September 1 and was written by Hank Schouten. Sources: Wyn Beasley, Judith Hopkins, The Dominion Post Library. We are also grateful to Zena Moran and Mark Round of The Dominion Post.
Raffaela Angela Buonocore

Angela passed away peacefully at home in Nelson on 21 September 2005 aged only 43 years. She moved to Nelson 4 years ago to work as a consultant obstetrician and gynaecologist. Tragically, she was diagnosed with metastatic bowel cancer after just 6 weeks in this appointment.

Angela graduated from Otago University in 1986, and, after her registration year in Nelson, shifted to Wellington.

She then studied for a Bachelor of Music degree at Victoria University, with special emphasis on singing—her talent was such that she was a finalist in the Mobil Song Quest.

After concurrent work at Family Planning, her strong social conscience and special interest in Women’s Health lead her to specialise in Obstetrics and Gynaecology.

She undertook her registrar training in Wellington between 1990 and 1994, and then further postgraduate training in Peterborough and Leicester.

In 1997, Angela obtained her FRANZCOG and returned to Wellington where she worked until 2001 as a consultant obstetrician and gynaecologist at Wellington Hospital, and, in private, at Fertility Associates.

In 1990, Angela married Alistair Darroch, and the couple subsequently had three children, Raffaele, Lisetta and Giovanni—the damning diagnosis was made when Giovanni was just 6 months old. But Angela fitted much in to her life, and, not surprisingly (given her interest in mind-body medicine), stretched the time, although it did mean forsaking medicine to focus on family and music.

All those who have worked with Angela will remember her fine qualities, especially her fun, wit, unselfishness, loyalty and dedication. She was a great team person, who had excellent clinical judgment and a huge dose of common sense. And she did not forget her Neapolitan roots, breaking into wonderful song with just a little prompting.

Just 2 weeks before her death, Angela completed a CD recording of some of her favourite Italian opera and ballads. The poignancy of the initial track from Tosca when he asks the Lord “...why do you repay me like this?” was not lost on Angela—or all those who have been touched by her. Her CD is a vivid reminder of a vivacious and talented young woman.

We are grateful to Professor John Hutton for this obituary.
Operation Vietnam: a New Zealand Surgical First


In this 176-page paperback tome, Michael Shackleton, a respected Dunedin-based general surgeon, relates his experiences (in the early 1960s in Vietnam) providing medical aid as part of an extension of the then existing Colombo Plan.

His story is of a dedicated surgeon eager to establish a useful, credible non-partisan medical presence in Vietnam, frustrated by governmental promises that far exceeded reality. A concurrent theme is the role of his family (present in Vietnam after many delays) in the difficult times whilst Michael tried to establish the surgical service.

The book offers two perspectives: that elucidated by Michael himself, and that elucidated by his wife, Annabel, in her cheerful and optimistic letters which are produced verbatim. These two points of view are juxtaposed in the book to provide an interesting plurality to the narrative. Perhaps the most interesting aspect of the entire book is the time in which the events unfold, a time marked by the inclusion of meetings with such politicians as Robert Muldoon, Roy Jack, and Keith Holyoake.

Michael Shackleton, through his experiences, is able to give an insight into New Zealand’s position with regards to the Vietnam War, particularly the uneasiness the nation felt with its commitment to the war and its relationship to its major ally, the United States.

New Zealand’s struggle with the Mighty US is mirrored in Michael’s own struggles to establish a surgical service that was distinct from the American presence. The author has been able to give us a snapshot of New Zealand and its relationship to the World at that time, reflected in the particular difficult circumstances he and his family found themselves in.

Throughout the sagas of unmet expectations and frustrations, Michael Shackleton and his family maintain a commendable sense of purpose and fortitude, which ultimately makes the tale uplifting. Overall, a worthwhile read for those interested in New Zealand’s involvement in the Vietnam War and in particular those who have had experience working for, or with, international aid organisations.

A commendable, factual, personal tale, well supported with photographs. Read and enjoy.

Tim Buckenham
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Making Sense of the Chest X-ray: a Hands-on Guide


This is a short guide to interpretation of chest radiographs aimed at all those involved in clinical situations where reviewing chest radiographs is an integral part of practice. The author states at the beginning: “I offer a practical approach to chest X-ray interpretation, which may be of use to doctors and other healthcare professionals who need to develop these techniques as part of their assessment, diagnosis, and management of patients.” This is a commendable objective, but is let down in the most fundamental way by the very limited quality of the chest radiographs.

To facilitate observation of abnormalities such as pneumothorax, the images need to be of high quality. Even for a reader with an experienced eye and knowing the diagnosis, many of the abnormalities were imperceptible on the images provided in the book. In addition, inaccuracies in the text, such as on page ix where the author states an example of pulmonary oedema and then lists the reasons for this including cardiomegaly (although the chest radiograph is clearly labelled as supine and as such assessments of cardiac size cannot be made), reduce the credibility of the author and the text.

The author has attempted to lighten the text by offering hints such as reviewing the chest radiograph from the posterior aspect rather than the anterior aspect “as it is often easier to see posterior shadows this way.” There is no evidence that such manoeuvres are helpful and the author does not give any references where these techniques have been validated.

Overall this is a well-meaning pocket book with a number of good cases, but it is badly let down with the quality of the images and its rather old-fashioned approach to the chest radiograph that leads the reader to believe that the chest radiograph is a stand-alone imaging modality—which it is in a few cases—but it fails to put it in context with other more sophisticated methods of investigating the chest, such as volume CT and MRI.

Tim Buckenham
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Mosby’s Medical Drug Reference 2006


Designed as a pocket drug reference for clinicians in the US, this book fills a market niche currently taken in New Zealand by MIMS New Ethicals. It’s worth looking at, if only to see just how good a pocket drug reference can be. For starters, there are no advertisements. This could be a problem for those readers who find titillation in the semi-clad, nubile/virile forms usually used to appeal to the psychological needs of the reader, in order to sell products for obesity or erectile dysfunction.

The book is well referenced; contains good information on clinical pharmacology, pharmacokinetics, dose, and side effects; and also advises on the correct pronunciation of drug names (invaluable for one-upping colleagues on ward rounds). An excellent feature is that drug interactions are also scored on a three-point severity scale, with a description of the nature of the interaction. It even includes some off-label indications as well as the registered indication.

As a pocket guide, the binding should be able to survive the rigours of the ward round and hospital cafeteria. Although the cover does wipe clean, and internal pages suffered minimal staining when exposed to vegemite, the binding did not survive a 10-metre throw down a corridor (at moderate velocity). In the opinion of the reviewer, it is unlikely to survive a year in a registrar’s pocket. However, free hand-held software is provided, so although the book may perish, the information will live on in the hand-held device.

Although cost information is provided, the prices are US prices and information on PHARMAC subsidisation is not provided. The US categorisation of risk in pregnancy is provided, rather than the Australian. Otherwise, I enjoyed ward testing this book and found it to be a useful drug reference.

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Primary Care Ophthalmology (2nd edition)


The preface of this book states that it is a practical guide to eye care and is designed for general practitioners and other medical practitioners who are not ophthalmologists or ophthalmology trainees.

This book does an admirable job of meeting its objectives. It contains 17 chapters and 300 very good colour illustrations. There are numerous other diagrams.

The material is presented predominantly in note form with a brief introduction about each condition and then bullet points under the headings of symptoms, signs, differential diagnosis, and treatment.

In short this is an excellent book. It is designed to be dipped into to remind people what to look for and what to consider. It also gives good overviews, and there are plenty of good quality illustrations that would easily enable you compare the patient in front of you with the given illustrations in order to come to an opinion.

There are a number of books on the market which cover this sort of area, but this would have to be one of the best. It would be my recommendation that if you were to buy a resource book in ophthalmology to have in your general practice rooms, then this would be the one to buy.

It also comes with the added advantage that there is software inside that enables the book to be downloaded on to your personal digital assistant (PDA) and this would be hugely helpful for those who are mobile in their consulting.

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