Feature Articles:
A/Prof. Lybus Hillman, Dr. Nicholas Coatsworth & Dr. Andres de Francisco

salus mundi
(L. welfare of the world)
Contents

Letter from the Editors
Letter from the editors 2

Feature Articles
A Médecins Sans Frontières career
Dr Nicholas Coatsworth 3

My brilliant career (with apologies to Miles Franklin)
A/Prof. Lybus Hillman 5

Medical career choices – a personal reflection
Dr Andres de Francisco 7

Original Research
An audit of investigation and prescribing practices in patients discharged with systolic heart failure in a tertiary referral hospital
Michael J. Bennett 8

Multifactorial causation of stroke in Australia: a comparison between Indigenous and non-Indigenous populations
Daniel D. Dascombe 14

Comparing the frequency of GP mental health diagnoses between rural and urban communities
B Cantwell, K Clifton, D O’Leary Counahan, L Dickson, J Gerlach, H Imamura, D Medek, E Sansoni 19

Law & Ethics
The ethics of preimplantation genetic diagnosis
Cheryl Pui-Yan Au 24

Coercion in psychiatry – is seclusion ethical?
Cheryl Pui-Yan Au 26

In the absence of “ObamaCare” regulation, is ethics sufficient to guide American Allied Health practice?
Sarah L. Latham 28

No longer shut out: The National Disability Insurance Scheme and improved access to care
Samuel M. Harkin 31

The Vipeholm Dental Caries Studies and the Capacity for informed consent
Philip M. Gaughwin 34

Student Life
Can we do it? Yes we can! The juggle: medical school and family
Sharmila Sambandam, Shaun Thayer 37

News & Topics of Interest
Clostridium Difficile: an emerging infectious disease threat
Ines Prasidha 39

Government policy on financial assistance to medical students discourages medical research
Corey B. Moore 42

Global, Rural & Indigenous Health
Q Fever – cut the bull!
Stephanie Hendry 43

Education
The medical student bedside mentoring program: a feasibility study
Emma Tucker, Dr Caroline Luke 46

Life in the developing world as a foreign medical student
Corey B. Moore 52

Electives
Paediatrics in China: hospitals and orphanages
Cheryl Pui-Yan Au 55

Surgeries and safaris in South Africa
Nushin Ahmed 57

Tongan adventures
Kate Brown, Jessica Madden 60
The committee of the Medical Student Journal of Australia (MSJA) proudly presents Volume 4, Issue 2. For this issue we have chosen the theme “salus mundi” which, in its Latin translation means “welfare of the world”. The MSJA has continued to grow over the past four years and for this issue, the committee has aimed to gather more submissions from around Australia particularly from the allied health domains. We have even received international submissions for the first time.

The Editorial Committee strongly upholds the philosophy of the journal, which is to encourage medical and allied health students to be involved with research early on in their careers. The journal also gives many students an opportunity to be involved with the ins and outs of the journal process itself, seeing the full process from editing, to peer reviewing, to proof reading and collating of the final product. It has certainly involved a lot of time and effort for many of the past and present committee members, but the finished accomplishment has made it all worthwhile - not to forget the interesting submissions we have read and the lessons we have learned about the journal process along the way.

The MSJA has been incredibly fortunate to have a fantastic panel of expert peer reviewers to whom we are greatly indebted. The Editorial Committee would like to extend a big thank you to all of the clinicians who took the time and effort to meticulously review these articles. It is because of you that we could put together a high quality journal with manuscripts reviewed by internationally renowned clinicians and researchers. It has been also great to see an enthusiastic response from students around Australia in contributing to the journal.

The MSJA would like to make note of our guest writers - Dr Lybus Hillman, Gastroenterologist and Senior Lecturer, Dr Nicholas Coatsworth, President of Médecins Sans Frontières Australia, and Dr Andres de Francisco, Deputy Director of the Partnership for Maternal Newborn and Child Health at the World Health Organisation. Hopefully their words will inspire you as they did us to stay true to yourself throughout your medical career, and to make use of your skills for the better welfare of people throughout Australia and the world. We hope you enjoy reading the articles and anecdotes of this issue, and that the stories and information you read may help inspire your future success.

Warmest Regards,

The Editorial Committee,
Volume 4 Issue 2, 2012
I had an argument once with a close friend of mine about the semantics of the word ‘career’. It was an odd discussion, mainly because I looked upon her career with some degree of envy, and as something that I wanted to aspire to, yet she seemed to view medicine very differently. She had always been impressive, but not in an aloof or detached way. On the contrary, she was one of the more gregarious people in medical school. She left us after third year to become President of the University of Western Australia student guild. The next time I looked she was off in Boston doing a Masters of Public Health at Harvard Medical School. After a little time ferreting around the surgical subspecialties, including another stint doing Ear, Nose and Throat (ENT) surgery at Harvard, she settled on ophthalmology. I never really understood why smart people ended up doing ophthalmology. The eye being a window to the soul, every ophthalm registrar will tell you about the first time they diagnosed a systemic disease looking at the retina (sarcoid, vasculitis, TB…), though it never seemed to me to be the right path for clinicians who were good with people, who would have been fantastic physicians given their talent for communication and empathy. It’s an odd coincidence that three of my closest friends have become ophthalmologists. And I guess this is where the dispute over the word ‘career’ arose. You see, my friend argued strongly that career, in relation to medicine, simply meant the direction that your medical life took, a single path in a multitude of scientifically interesting pathways, supplemented by but divorced from the other aspects of your life (in her case, politics, learning how to speak Timorese etc etc). I was romantically opposed to the view (as distinct from ‘romantically disposed’ to my friend) in that I felt that medicine was a vocation, far more than a job, not necessarily all-consuming but certainly visceral in the devotion to the patient, the pursuit and acquisition of knowledge, the challenge of the uncertain diagnosis, and the life that the ‘career’ as a doctor offers. For me the word career was too sterile to define all the things that medicine represented. Career was something that you could change (‘shifting jobs mid career’) if not on a whim then certainly with relative ease, but a vocation implied that you’d found the thing you were good at, and meant to be doing. As in many semantic arguments, and all arguments had after Race 8 at Flemington Racecourse on Melbourne Cup Day, it became irrelevant. My friend is a wonderful doctor, a consummate eye-surgeon, and has an extraordinary capacity to take on new opportunities. I think one day she’ll agree that she has found her vocation. For the purposes of this short essay, however, I will acquiesce to my friend, and talk about a career and where mine has gone.

I went to medical school at the University of Western Australia. Everybody in medicine has a latent talent that is eventually snuffed out by the consumptive process of medical education. Mine was language and debating. So I was one of those 17-year-old school-leavers who struggled between putting medicine or law as number one. I watched Rake on ABC last night and I am by no means confident of my decision. My debating coach, several years later, with some degree of perspicacity would say, ‘it’s good you did medicine Nick, you would have been such an ‘xxxx’ if you’d become a lawyer’. Nick Coatsworth. The next Charles Waterstreet, or Cleaver Greene. One by one the people who couldn’t forswear their other talents dropped out – the concert pianist in first year, the interior designer in second year. I watched them and wondered whether they could have married their talents with a medical career, or whether my decision to continue was the right one.

It would be unusual, I think, to go through medical school without contemplating dropping out at least once a year (the feeling was dulled by euphoria and alcohol at post-exam parties and trips to Margaret River). For me, the motivation to continue was a desire to work for the organisation Médecins Sans Frontières (MSF). I thought that this would be the ultimate justification for the missing years of my life that medical training took away (a little dramatic on reflection) and so the first few years of my ‘career’ were largely devoted to making myself a suitable candidate for a mission. That meant a selection of rural placements, kicking off with a medical and Emergency Department (ED) intern placement at Kalgoorlie hospital (‘doctor, would you like to put some local anaesthetic in the eye before you try and remove that foreign body’), and continuing in the ED at Port Macquarie hospital and Taree. By pure luck rather than good management I missed the multi-traumas from the Pacific Highway, or the really sick paediatric cases. I considered thrombolysis to be the limits of my thrill-seeking unlike some of my Kiwi colleagues. With time through the first few post-grad years it became less about MSF and more about which direction I would take amongst the multitude available. Paediatrics was attractive, and a very good pick up line, but died a quick death when a two year-old’s parents yelled at me for missing a cannula and having to ring the paediatrician. My surgical consultant offered hope for a cutting career – ‘you seem to be a guy that doesn’t need to go home at 5’ – way off the mark Mr Levitt. But the deed was done after my second term as a medical intern at Royal Perth Hospital, with Dr Arthur Harris and Dr Steph P’ng as consultant and registrar. Arthur was a
wonderful physician, and a true gentleman, I didn’t see him ever go through a door before someone else, whether that be a medical student, patient or hospital cleaner. At the age of 65 he beat me 6-0, 6-0 in tennis at the end of term. After that I had something to look at beyond MSF, and the reason for having done medicine started to become clearer.

There would be no compromise on going away with MSF though. At the end of my second resident medical officer year I walked into the old MSF office in Glebe to do my interview. Half way through a Masters of Public Health at University of Sydney (a strategic enrolment to improve my chances in the interview), armed with high school French and a couple of rural terms under my belt I sat for 90 minutes in what was, and still is, fundamentally an assessment of how easy you are to get along with. Happily they didn’t ask for referees, happily I had not become a lawyer. A very perfunctory French test meant a first mission in the French Congo, and six tough months closing down a hospital that had stood for a decade in a particularly poor part of a poor country. Rapidly I changed my view on doing overseas work to ‘make a difference’. Despite the hundreds of malaria tablets dispensed, the long hours, the fatigue, frustration, and then work with the MSF Board in Australia (with similar emotions), I have never thought that I’ve given as much back to MSF as I have taken away. There is certainly a philosophy underpinning the organisation that is not quite akin to any other in the humanitarian or medical world and one that continues to generate a certain passion in those lucky enough to work with MSF.

The (not so latent) talent for language, will be troubling the editors, so I will skip over the traumatic but necessary physicians’ examinations, the respiratory and infectious diseases training, and arrive now in Darwin with a young family and a consultant position at Royal Darwin Hospital, which is where I find myself writing. This journey into medicine was very distant to me 10 years ago as an intern, and had I known how ultimately rewarding it would be I suspect I wouldn’t have believed it anyway.

But reflecting back to my friend and her career - people who seem to do a lot of things in medicine, who win scholarships to Harvard, who learn a language at the same time as their ophthalmology exams, who continue into medical politics or whatever ‘extra-curricular’ activities they manage – I’ve realised that it’s not some sort of super-human effort, or being in the right place at the right time that allows them to accomplish this. I think partly it reflects the latent talents that people still have in medicine, which I’m certain can be combined with a medical career, and should be used to overcome some of the frustrations of a challenging profession. The other part is simply taking the opportunities as they arise, putting your hand up when others don’t, and allowing yourself the satisfaction of a vocation whilst maintaining other interests.

It’s never easy, but it’s very possible.

Good luck!
My brilliant career (with apologies to Miles Franklin)

Assoc. Prof. Lybus Hillman MBBS FRACP MD*

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I always wanted to be a doctor. I have no idea why. No one in my family had ever been in a profession, no one had gone to university. I grew up in a tiny town in southwest Western Australia (Figure 1) and I think I was impressed by the local general practitioner’s kindness to a tiny tot. The first anatomy text I ever studied was when I was four and visiting a family friend in Adelaide (this family friend went on to have a great career as a surgeon). But I was definitely hooked by then.

University in WA in the late sixties and early seventies was a dream. We were only 60 students. We all knew the faculty extremely well. We learnt anatomy using a cadaver. After the rite of passage of first year, we knew we would all get through as long as we turned up to everything, studied hard and didn’t do anything stupid. I took a year “off” between pre-clinical and clinical to do research on motor programming in Physiology for a Bachelor of Medical Science, which proved that I loved clinical research but was not an original thinker. It was also a fruitful year as I met my future husband!

As soon as I entered the clinical years I knew that I had made the right choice. I just loved clinical medicine (and still do). Of course it was helped by what we could do back then: suturing all the inebriates’ wounds in Accident and Emergency Friday nights (much more fun than going out!); delivering 25 babies in fifth year including, without gloves, one syphilitic child; running a peripheral hospital’s coronary care unit as a sixth year student after the registrar had done a short morning ward round and then acting as night resident for the entire hospital! These days I would be struck off by the Tribunal.

Reality struck post-graduation. I had stupidly married an Australian diplomat who was immediately posted to Germany. Whilst relishing living in a European country and learning to really speak German, proving that I was capable of being an intern in a German hospital wasn’t easy. After two months of intensive language training I was taken on in an unofficial capacity by the local community hospital. My training was up to the task but my language wasn’t. After crying every night for a year, I was finally able to communicate at a level that resulted in the hospital offering me an official position. The Australian government had other ideas. They did not approve of working diplomatic spouses and wouldn’t let me take a formal position. It took another year of fighting with the government and still not earning any money, despite working full time including nights, before I was allowed to be officially employed. My proudest moment was when I filled out a German tax return!

Upon returning to Canberra, my experience in Germany paid off. I was able to immediately join the Fellow of the Royal Australasian College of Physicians (FRACP) training program which back then was basically run by previously successful registrars. They were determined that we would pass, and pass we did having been grilled by them constantly for two years. I was totally bewitched by gastroenterology (in what other specialty can one have so much fun playing with so many toys?) but the head of department thought that it was an inappropriate career for a woman. I was told “girls don’t do gastro”? One of his peers sorted that out.

Back then it was really important to have a higher degree if you were serious about your specialty. I was lucky as my husband was posted to New Zealand next so I was able to finish my fellowship and carry out research for a MD in a very supportive academic unit in Wellington. Once again I realised that clinical research was enormous fun!

All good things come to an end and suddenly my MD was handed in and I had to decide about my future career. I had always envisaged an academic career but at that time in Canberra it was simply not feasible. Out of nowhere I was offered a brilliant opportunity: to be an associate in a new multidisciplinary private specialist centre which had just opened in Civic. It was perfect and has remained so to this day, evolving over time to a gastroenterological practice near Figure 1. Associate Professor Lybus Hilman growing up in Albany, 1952.
the Woden Valley Hospital as it was then known. One of the joys of this practice has been the ability to carry out clinical research on Barrett’s oesophagus by utilising excellent clinical records and a simple data base. I have been able to have an academic career in a private practice proving that good clinical research can be carried on outside major institutions.

Having sorted out my career options, it was time for children. Naturally my hormones refused to comply. Many tests and hormonal manipulations later, my first daughter was born, to be followed by a son and another daughter. My endocrinologist said despairingly, “Lybbie, having turned you on, how do we turn you off?” By this time I was near terminal exhaustion trying to be a clinical gastroenterologist and a mother of three even with the help of a supportive husband and an indispensable nanny. Enough was enough – no more children. Time to settle.

I haven’t mentioned the farm. But that is another story...
Medical career choices – a personal reflection

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*Deputy Director
Partnership for Maternal Newborn and Child Health (PMNCH)
The Secretariat hosted by WHO

Medicine… what else..? was my first response when I was asked what I wanted to study. Not an astronaut, fireman or Formula 1 driver, but a Medical Doctor. Why? Well, the fact that my father, uncles, and grandfathers for many generations were in the medical field I guess put a bit of subliminal pressure on my ‘free’ choice. I knew, for example, where the first-aid box was at home and what it contained. I also played with fantastic toys provided by pharmaceutical companies to doctors to promote their products.

I studied medicine in one of the best universities in Bogota. I learned a lot of theory there but really mastered more the practical stuff in the hospital wards, naturally leaning towards the human connection – talking with patients or parents was what I always enjoyed. Seeing inside people focuses one’s own seeking for the meaning of life.

It was also fun. Kids in the pediatric ward often shouted ‘Papa’ when I came to do the rounds and my old professors raised an eyebrow (undeservedly so). The real shock came during my first shift as an intern when I jumped to revive with CPR a young woman, while requesting adrenaline and the lot. When she opened her eyes she told me: “Doctor, please let me go. Everybody should have the right to die. Let me do so in peace”. I could not believe it! Doctors are supposed to save people, not let them die. The authoritative voice of the third year resident ordering me to let her go ended that. She had a terminal kidney cancer. That single event shaped me from the moment I managed to stop crying that night.

‘Tropical Medicine?’ asked my father, an eminent and highly regarded cardiologist whose patient list had included the Presidents of Colombia. While my parents were very supportive, they imagined me specialising wearing a swimming costume with a noisy sound system on my shoulder walking down a lost paradise beach. After much interaction, it was obvious that this would be a promising career. I went to London to specialise in Tropical Medicine.

The quantum moment for me happened when I understood that a diagnosis and the clinical, curative or preventive course of action are equally complex for a community as for an individual patient. That realisation, alongside the boredom of future eternal night shifts in hospitals and the possibility of interacting with people on a larger scale, lead to my decision to go into Public Health. I completed a Masters in Public Health and subsequently moved to The Gambia where I ran a field station for the British Medical Research Council in a remote area in Basse. I designed and ran a research programme for four years to understand and reduce childhood mortality using a community-based surveillance system to implement and measure the impact of interventions. I then married, had a child and completed my external PhD in Medicine. Excited about Public Health, I moved to Bangladesh where I ran a large community-based Reproductive, Maternal, Newborn and Child Health Programme at an international centre working in remote areas covering a population of half a million. I stayed there for ten years and had a second child during this time.

Research became, for me, the vehicle to shape policy through the provision of evidence. But the use of such evidence by policy makers did not impact the community as much as I had dreamed. Seeking to transform minds, I moved to an emerging initiative of promoting priority-setting for research into neglected diseases. We coined with colleagues the ‘10/90 gap in health research’ at the Global Forum for Health Research, to explain that less than 10% of funds for research were invested in 90% of the world’s health problems. This concept exposed vast inequities in the allocation of funds for health research and raised the need to support research for neglected diseases. We then established initiatives destined to leverage action and funding for neglected diseases. Keen to promote the use of evidence, I moved to the Partnership for Maternal, Newborn and Child Health at the World Health Organization in Geneva to promote alliances between civil society, governments, health care professionals, academics and the private sector to jointly tackle health problems. This neutral platform of constituencies now encourages partners to pursue joint projects to improve the health of mothers and children.

Dealing with the human aspect of a patient, a community, or that of disparate constituencies is not that different. Bringing elements together to leverage action on a common agenda is the most effective catalyst for positive health outcomes.

It does not matter which field of medicine you choose, as long as you pursue concrete actions to enhance human life. I guess you end up knowing what the right thing is to do.
An audit of investigation and prescribing practices in patients discharged with systolic heart failure in a tertiary referral hospital

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INTRODUCTION AND AIMS

Heart failure affects 1.5-2.0% of the Australian population with around 30,000 new cases diagnosed each year (1). Prevalence of the disease increases greatly with age. A 2006 population study of Canberra residents found the prevalence of symptomatic heart failure was 4.4 times greater among those aged 80-86 than 60-64 years (2). In 2000 approximately 325,000 Australians had symptomatic heart failure requiring treatment, and an additional 214,000 had asymptomatic left ventricular systolic dysfunction (3). This asymptomatic group have a high risk of developing symptomatic disease, however early diagnosis and treatment has been shown to delay symptom onset and reduce the risk of death and hospitalisation (4).

Approximately 50% of patients with heart failure have preserved systolic function (‘diastolic heart failure’) with a left ventricular ejection fraction (LVEF) ≥ 40% (5). This represents a problematic treatment group as limited trial data exists to guide therapy. Conversely, strong evidence exists for the effective treatment of systolic heart failure (LVEF <40%).

While the incidence of heart failure has changed little since the 1950s, survival has improved markedly since the 1980s (6,7). During this time, overwhelming evidence of the positive survival benefits of angiotensin-converting enzyme inhibitors (ACEIs) and beta-blockers emerged, eventually leading to their widespread use in the management of systolic heart failure.

In 1987, the Cooperative North Scandinavian Enalapril Survival Study (CONSENSUS) demonstrated a 40% reduction in mortality at six months amongst those treated with enalapril (8). This was followed by the Studies of Left Ventricular Dysfunction Treatment (SOLVD) in 1991, which found a 16% reduction in mortality and reduced rates of hospital admission among those receiving enalapril (9). Further studies including the Acute Infarction Rampiril Efficacy (AIRE) study and Trandolapril Cardiac Evaluation (TRACE) study contributed to a substantial body of evidence supporting the use of ACEIs for heart failure (10, 11).

The evidence for beta-blockers was provided by the Metoprolol CR/XL Randomised Intervention Trial for Congestive Heart Failure (MERIT-HF) study, which demonstrated a 34% reduction in mortality amongst clinically stable patients with heart failure when metoprolol was added to conventional ACEI and diuretic therapy (12). This was shortly followed by publication of the Carvedilol Prospective Randomised Cumulative Survival (COPERNICUS) study in 2001, which found the use of carvedilol was associated with a 35% reduction in the risk of death amongst those treated for heart

ABSTRACT

Objective: To determine the frequency of inappropriate management of systolic heart failure.

Method: A retrospective clinical audit using hospital electronic medical records was conducted. Investigations and discharge medications of patients admitted with a primary discharge diagnosis of systolic heart failure (left ventricular ejection fraction ≤ 40%) between 1st January 2008 and 31st August 2010 were compared with national guidelines for investigation and pharmacological management.

Results: Medical records of 84 patients were collected; 61 patients (71.8%) were prescribed an angiotensin converting enzyme inhibitor (ACEI) or angiotensin II receptor antagonist (ARA); 59 (69.4%) were prescribed a beta-blocker; 23 (27.1%) were prescribed a loop diuretic without an ACEI or ARA; and 12 (14.1%) were prescribed ≥ 1 contraindicated drug. Almost 1 in 5 patients (18.8%) with atrial fibrillation and heart failure were not prescribed an antithrombotic. All patients had documented evidence of at least one chest x-ray and one echocardiogram during admission or within the last 12 months. Renal function and electrolyte testing was performed in all patients during admission for heart failure.

Conclusion: Diagnostic and monitoring investigations had high concordance with guideline recommendations; however substantial gaps existed between heart failure management guidelines and clinical practice. Indicated drugs known to prolong survival and reduce readmissions (ACEIs, ARAs and beta-blockers) were underprescribed, while drugs known to exacerbate heart failure continued to be prescribed. Among those with heart failure and atrial fibrillation, antithrombotic agents were underprescribed.
failure (13). Overall, the benefits of beta-blockers have been evaluated in more than 20 published clinical trials, involving more than 20,000 patients with heart failure (14).

In 2006, the National Heart Foundation Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia were published, which underwent minor additions in July 2011. Key recommendations of this document included: use of ACEIs or angiotensin II receptor antagonists (ARAs) recommended in combination with use of beta-blockers in all grades of CHF; use of loop diuretics to manage fluid overload; and the avoidance of drugs known to exacerbate heart failure (15). Key investigations recommended for diagnosis and monitoring of heart failure included; echocardiogram (ECHO), electrocardiogram (ECG), chest x-ray (CXR), and measurement of electrolytes, urea, and creatinine (EUC). At the time, the underuse of ACEIs and beta-blockers, and inadvertent co-prescription of potentially contraindicated drugs were identified as gaps in management (15).

Chronic heart failure shares many risk factors with atrial fibrillation (AF), and both conditions frequently coexist (16). Results from the Framingham study found that amongst patients with both conditions, 38% of those with AF had a prior diagnosis of heart failure, and 41% of those with heart failure had a prior diagnosis of AF (16). Both conditions are associated with an increased risk of thromboembolism and stroke (15). To mitigate this risk, national guidelines state that all patients with heart failure who develop AF should receive long-term antithrombotic therapy (15). To predict thromboembolic events in patients with AF, and to help guide clinicians in selecting patients for antithrombotic therapy, numerous risk stratification tools have been developed. The CHADS2 tool is a widely used and validated point-based scheme, in which two points are given for a history of stroke or transient ischaemic attack, and one point is given for the presence of the following risk factors; congestive heart failure, hypertension, age >75 years, and diabetes. A total score of zero denotes low risk (1.2 strokes per 100 patient years), a score of 1 denotes moderate risk (2.8 strokes per 100 patient years), and a score ≥2 denotes a high risk (>3.6 strokes per 100 patient years) (17).

As heart failure is a component risk factor of the CHADS2 tool, all patients with heart failure and concomitant AF will have a CHADS2 score of ≥1. According to guidelines current during the collection period (and at the time of writing), this score corresponds to a moderate risk of

<table>
<thead>
<tr>
<th>Variable</th>
<th>All patients N=85</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex, no. (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>57 (67.1)</td>
</tr>
<tr>
<td>Female</td>
<td>28 (32.9)</td>
</tr>
<tr>
<td><strong>Age at admission, mean (median), years</strong></td>
<td>73.6 (74.0)</td>
</tr>
<tr>
<td><strong>Length of stay, mean (median), days</strong></td>
<td>12.4 (5.0)</td>
</tr>
<tr>
<td><strong>Co-morbidities, no. (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>32 (37.7)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>38 (44.7)</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>30 (35.3)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>46 (54.1)</td>
</tr>
<tr>
<td>Previous CABG</td>
<td>16 (18.8)</td>
</tr>
<tr>
<td>Pacemaker</td>
<td>11 (12.9)</td>
</tr>
<tr>
<td>Defibrillator</td>
<td>5 (5.9)</td>
</tr>
<tr>
<td>COPD</td>
<td>22 (25.9)</td>
</tr>
<tr>
<td>Asthma</td>
<td>8 (9.41)</td>
</tr>
<tr>
<td>Dementia</td>
<td>2 (2.35)</td>
</tr>
<tr>
<td>Stroke/TIA</td>
<td>4 (4.7)</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>22 (25.9)</td>
</tr>
<tr>
<td><strong>Number of co-morbidities, no. (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Zero</td>
<td>5 (5.9)</td>
</tr>
<tr>
<td>= 1</td>
<td>16 (18.8)</td>
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<tr>
<td>&gt; 1</td>
<td>64 (75.3)</td>
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<td>&gt; 2</td>
<td>49 (57.7)</td>
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<td>26 (30.6)</td>
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<td>&gt; 4</td>
<td>13 (15.3)</td>
</tr>
<tr>
<td>&gt; 5</td>
<td>4 (4.7)</td>
</tr>
<tr>
<td><strong>Total co-morbidities, mean (median)</strong></td>
<td>2.8 (3.0)</td>
</tr>
</tbody>
</table>

CABG = Coronary Artery Bypass Graft; COPD = Chronic Obstructive Pulmonary Disease; TIA = Transient Ischaemic Attack

Table 1. Baseline demographic and clinical characteristics of patients admitted from 1 January 2008 to 31 August 2010 with a primary diagnosis of systolic heart failure (LVEF ≤ 40%)
stroke and all such patients should be prescribed aspirin or warfarin for primary prevention (18,19).

In order to quantify the extent of inappropriate management of heart failure, a retrospective clinical audit was conducted, comparing current practice with established guideline recommendations. As a secondary analysis, the use of antithrombotic therapy among heart failure patients with coexistent AF was sought for comparison with current guidelines.

**METHODS**

**Ethics approval**
Approval from ACT Health Human Research and Ethics Committee was sought and granted in 2010 prior to data collection.

**Patient selection**
Hospital electronic medical record databases were searched to select patients admitted to the hospital between 1st January 2008 and 31st August 2010 with a primary diagnosis of heart failure. In those with multiple admissions during the selection period, the first admission with a primary diagnosis of Heart Failure was used. Only residents of the Australian Capital Territory (ACT) were included. To exclude those with diastolic heart failure, only patients with an ECHO report showing evidence of a LVEF ≤ 40% within the previous two years were included.

**Data collection**
Discharge summary reports were searched for patient age, sex, common co-morbidities, and discharge medications (see tables 1, 2). For those who died during an admission for heart failure, inpatient medication charts and progress notes were examined. Length-of-stay data was obtained by calculating the difference in days between discharge and admission dates. For those patients not prescribed an ACEI, ARA, or beta-blocker, discharge summaries and medication charts were searched for documented allergy or intolerance which could explain their underuse.

Discharge summaries and patient files were also searched for evidence of investigative procedures (ECG, CXR, EUC) performed during admission or in the previous 12

<table>
<thead>
<tr>
<th>Variable</th>
<th>All patients N=85</th>
</tr>
</thead>
<tbody>
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<td>Indicated drugs</td>
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</tr>
<tr>
<td>ACEI</td>
<td>51 (60.0)</td>
</tr>
<tr>
<td>ARA</td>
<td>11 (12.9)</td>
</tr>
<tr>
<td>β-blocker</td>
<td>59 (69.4)</td>
</tr>
<tr>
<td>Loop diuretic</td>
<td>81 (95.3)</td>
</tr>
<tr>
<td>Amiloride</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>42 (49.4)</td>
</tr>
<tr>
<td>Thiazide</td>
<td>12 (14.1)</td>
</tr>
<tr>
<td>Digoxin</td>
<td>35 (41.2)</td>
</tr>
<tr>
<td>Contraindicated drugs, no. (%)</td>
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</tr>
<tr>
<td>Dihydropyridines</td>
<td>6 (7.1)</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
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</tr>
<tr>
<td>NSAID (excluding aspirin ≤100mg/day)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>1 (1.2)</td>
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<tr>
<td>Thiazolidinediones</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>3 (3.5)</td>
</tr>
<tr>
<td>≥1 contraindicated</td>
<td>12 (14.1)</td>
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<tr>
<td>Other drugs, no. (%)</td>
<td></td>
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<tr>
<td>Warfarin</td>
<td>40 (47.1)</td>
</tr>
<tr>
<td>Aspirin (&lt;100mg)</td>
<td>35 (41.2)</td>
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<td>Drug combinations, no. (%)</td>
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<td>ACEI or ARA</td>
<td>61 (71.8)</td>
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<tr>
<td>ACEI/ARA plus loop diuretic</td>
<td>58 (68.2)</td>
</tr>
<tr>
<td>ACEI/ARA plus β-blocker</td>
<td>42 (49.4)</td>
</tr>
<tr>
<td>ACEI/ARA plus β-blocker plus loop diuretic</td>
<td>40 (47.1)</td>
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<tr>
<td>No ACEI or ARA</td>
<td>24 (28.2)</td>
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<td>No ACEI/ARB or β-blocker</td>
<td>7 (8.2)</td>
</tr>
<tr>
<td>β-blocker without ACEI/ARA</td>
<td>17 (20.0)</td>
</tr>
<tr>
<td>Loop diuretic without ACEI/ARA</td>
<td>23 (27.1)</td>
</tr>
<tr>
<td>Spironolactone without ACEI/ARA</td>
<td>20 (23.5)</td>
</tr>
</tbody>
</table>

ACEI = Angiotensin Converting Enzyme Inhibitor; ARA = Angiotensin II Receptor Antagonist; NSAID = Non-Steroidal Anti-Inflammatory Drug

Table 2. Number of patients prescribed indicated and contraindicated drugs during admission for systolic heart failure between 1 January 2008 and 31 August 2010
Data was coded and entered into a Microsoft Excel spreadsheet.

Data Interpretation

Descriptive statistics were calculated and prescribing rates compared with the recommendations made in the National Heart Foundation Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia 2006. Two consultant cardiologists confirmed that these guidelines were in use in the hospital during the collection period.

RESULTS

Patient characteristics

Eighty five eligible patients with a primary discharge diagnosis of heart failure and LVEF ≤ 40% were identified between 1st January 2008 and 31st August 2010 (Table 1). The patient sample included 57 men and 28 women, with a mean patient age of 73.6 years (range: 50-91 years).

Most patients had multiple co-morbidities, with the average patient having around three co-morbidities (mean: 2.8, median: 3.0). Hypertension and diabetes were the most prevalent co-morbid conditions, present in 46 (54.1%) and 38 (44.7%) patients, respectively. Atrial fibrillation, coronary artery disease, chronic obstructive pulmonary disease, and chronic kidney disease were also common, affecting more than 25% of patients. Only five patients (5.9%) had no documented co-morbidities (Table 1).

Patterns of drug use

Amongst the drugs indicated for use in systolic heart failure, loop diuretics were the most frequently prescribed – used by 81 patients (95.3%) (see Table 2). The proportion of patients prescribed other indicated drugs was much lower; 59 (69.4%) were prescribed a beta-blocker, 51 (60%) an ACEI, 42 (49.4%) spironolactone, 35 (41.2%) digoxin, 12 (14.1%) a thiazide diuretic, and 11 (12.9%) an ARA. Sixty-one patients (71.8%) were taking either an ACEI or ARA. No patients were prescribed amiloride.

Of the 12 patients (14.1%) taking contraindicated drugs, dihydropyridine calcium channel blockers (DHPs) were the most frequently prescribed – used by six patients (7.1%). Corticosteroids were prescribed to three patients (3.5%), tricyclic antidepressants to one (1.2%), antipsychotics to one (1.2%), and thiazolidinediones to one (1.2%). No patients were prescribed non-steroidal anti-inflammatory drugs (NSAIDs).

Low-dose aspirin (≤100mg) was prescribed to 35 patients (41.2%) and warfarin was prescribed to 40 patients (47.1%).

Combinations of drugs were also examined. Fifty-eight patients (68.2%) were taking an ACEI/ARA and loop diuretic, 42 (49.4%) were prescribed either an ACEI or ARA with a beta-blocker, and 40 (47.1%) were prescribed an ACEI or ARA with both a beta-blocker and loop diuretic (see Table 2). Furthermore, 24 patients (28.2%) were not prescribed an ACEI or ARA, seven (8.2%) were taking neither an ACEI or ARA or beta-blocker, 17 (20.0%) were prescribed a beta-blocker without an ACEI or ARA, and 23 (27.1%) were prescribed a loop diuretic without an ACEI or ARA (see Table 2).

Of the 32 patients with AF, 21 (65.6%) were prescribed warfarin, 8 (25.0%) were prescribed aspirin (≤100mg daily), and three (9.4%) were prescribed aspirin and warfarin (see Table 2). Six patients (18.8%) were not prescribed warfarin or aspirin.

DISCUSSION

The findings of this audit demonstrate the persistence of previously identified gaps in the pharmacological management of patients with systolic heart failure in a tertiary referral hospital. Despite universal recommendations advocating the use of ACEIs in combination with beta-blockers, and the avoidance of drugs known to exacerbate heart failure, prescribing rates remain suboptimal. More than a quarter of patients (28.2%) with left ventricular systolic dysfunction were not receiving an ACEI or ARA, and almost a third of patients (30.6%) were not receiving beta-blocker therapy. In light of the cost saving and mortality benefits of these drugs, under prescribing represents a significant failure of current practice. Furthermore, no documented allergy or intolerance that would explain poor prescription rates could be found in patient discharge summaries. It is unclear whether this reflects inadequate documentation, or a true deviation from the guidelines.

These findings can be compared with figures quoted in similar Australian and international studies. A 2010 retrospective study of 667 patients treated for heart failure in a regional Australian hospital (Wagga Wagga) between January 2003 and December 2007 compared the use of cardiovascular medications with the Australian National Heart Foundation Guidelines (20). The authors reported that 58.2% of patients received an ACEI or ARA and 34.7% received a beta-blocker (20). These rates are considerably lower than those seen in the current study, suggesting greater utilisation of these agents may be occurring in the metropolitan or tertiary hospital setting. A 2001 review of 37 international studies reported rates of ACEI use to be 43% to 90% (mean 71%) among patients who were discharged from hospital with evidence of systolic heart failure (21). This compares well with the rates observed in the ACT, suggesting local and international practices do not differ greatly.

A small number of patients (14.1%) were taking one or more contraindicated drugs, most commonly DHPs. While studies on the mortality effects of DHPs in heart failure are lacking, they are associated with reflex tachycardia and diuretic-refractory peripheral oedema. For these reasons, local and international guidelines oppose their use in the setting of systolic heart failure. Discontinuing DHP use in these patients provides an opportunity to prevent potential adverse outcomes and optimise disease management.

The use of drugs known to worsen heart failure was also noted in a 2008 audit by the National Prescribing Service (NPS). Results of this audit indicated that 20% of patients with systolic heart failure were concomitantly taking one or more contraindicated drugs, most commonly non-steroidal anti-inflammatory drugs (NSAIDs) (22).

Further discrepancy between guidelines
and prescribing practice was evident in the use of loop diuretics. Current guidelines explicitly state that loop diuretics should only be used in combination with an ACEI, and never as monotherapy for fluid overload. Contrary to this, more than a quarter of patients (27.1%) were prescribed a loop diuretic without an ACEI or ARA. While this will reduce peripheral oedema, pulmonary congestion, and increase exercise tolerance, loop diuretics alone fail to alter disease course, prolong survival, or reduce hospital readmissions (15). Urgent efforts to address this gap in current practice will promote improved health outcomes for patients and lessen the burden of heart failure on the health system.

Perceived reasons for diuretic use without combination ACEI or ARA may include potential to worsen renal function and, in the patient with acute heart failure, precipitate hypotension. Almost 25% of study patients had a history of chronic kidney disease, which may have been perceived as a relative contraindication to the use of ACEIs or ARAs. Furthermore, the majority of patients were over 70 years, possibly with numerous risk factors for falls. In these patients the clinical benefits of ACEIs or ARAs may have been balanced against the potential for hypotensive episodes and falls. In some cases these risks may have been deemed too great to warrant the use of these drugs. Likewise patients may have previously experienced kinin-mediated effects to ACEIs and this would justify avoiding these drugs.

A 2002 study into underuse of ACEIs found the most likely cause of under-prescribing was physician fear of worsening underlying hypotension, hyperkalaemia, or renal insufficiency (23). The authors suggested that patients with these perceived contraindications stood to derive greater benefits from ACEIs than those without perceived contraindications, and cautious use, slow dosage titration, and careful monitoring, rather than avoidance, should be recommended (23).

A secondary analysis of the data examined the use of antithrombotic agents in patients with concomitant AF. Almost one in five patients (18.8%) with systolic heart failure and AF were not prescribed aspirin or warfarin. Untreated, these patients will continue to have a moderate-to-high risk of suffering a thromboembolic event, including stroke. Addressing the underuse of antithrombotics in this patient group should be considered a priority.

Diagnostic and investigative procedures had high concordance with guideline recommendations. All patients had documented evidence of at least one CXR and one ECG during admission, or within the last 12 months. Likewise, renal function and electrolyte testing was performed in all patients during admissions for heart failure.

Further research is warranted to explore the factors determining prescribing patterns and to develop ways of improving guideline concordance. While educational initiatives directed towards prescribers are a logical and traditional measure aimed at improving guideline concordance, a multidisciplinary approach is likely to be more effective in achieving desired overall outcomes. The addition of a clinical pharmacist to heart failure management teams has been shown to optimise drug regimens and reduce hospital readmissions (24).

Study limitations
The findings of this audit were limited by several factors, including a relatively small sample size, reliance on the quality of hospital medical records, and absence of definitive outcome measures (such as mortality, or readmission). Due to the retrospective nature of the audit, there was no practical way to validate the accuracy of the documented records. In many cases contraindications and intolerances to drugs, which would have explained underprescribing, may not have been documented in patients’ medical records. Likewise, discharge summaries may not have accurately reflected the medications patients received at discharge.

The study did not consider the dosages or frequency of administration of prescribed drugs. As ACEIs, ARAs, and beta-blockers are routinely commenced at low starting dosages and up-titrated gradually, it was not feasible to investigate when such drugs were commenced or the target dosages prescribers were intending to achieve with individual agents.

Selection bias may have also contributed to the observed results. Only patients with a documented LVEF \( \leq 40\% \) were included, and hospital ECHO reports from the previous two years were used to select patients meeting this criterion. It is likely that patients with systolic heart failure who had not had an ECHO performed, had one performed outside of the hospital setting, or had one performed more than two years ago were excluded. Similarly, only patients with a primary discharge diagnosis of heart failure were included in the study and many patients may have received treatment for heart failure during an admission for another condition. Moreover, for patients with multiple admissions for heart failure, only the initial admission was used for data collection, and treatments at subsequent admissions may have differed.

Patient consent to medical treatment was also not considered. It was assumed that every patient to whom it was offered received treatment. The possibility exists that patients may have simply refused treatment with a particular agent. This would have altered the accuracy of the observed prescribing rates.

CONCLUSION

This audit confirms the substantial gaps between national heart failure guidelines and clinical prescribing practice in a tertiary referral hospital. ACEIs and beta-blockers are underused in patients with systolic heart failure despite widespread availability and unequivocal evidence for their efficacy in this setting. Contraindicated drugs were prescribed to a minority of patients, however given their potential to cause costly and debilitating exacerbations of disease they exemplify an important target for clinical review by both doctors and clinical pharmacists. A large proportion of patients with systolic heart failure had concomitant AF, and consequently a moderate-to-high risk of thromboembolic disease. Currently, antithrombotic agents are underprescribed in these patients.

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**REFERENCES**


Multifactorial causation of stroke in Australia: a comparison between Indigenous and non-Indigenous populations

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INTRODUCTION

Stroke is a significant contributor to the global disease burden; it is second only to coronary heart disease as a cause of death and is a major source of disability (1). In the Australian community, there are an estimated 350,000 people living with the deleterious effects of stroke, with 11,220 deaths attributed to it in 2009 (2). Stroke can be broadly defined as an acute loss of brain function resulting from a disturbance in blood supply (3). There are two distinct disease processes implicated in this definition; ischaemic stroke results from the blockage of a blood vessel supplying the brain whilst haemorrhagic stroke results from the rupture and subsequent bleeding of a blood vessel (3). Ischaemic stroke represents approximately 80% of cases (3,4).

Compounding the burden of stroke mortality, this direct effect on the central nervous system leads to a wide spectrum of disability in stroke survivors, with rehabilitation representing a major cost to the healthcare system (5). Causation of stroke is complex and multifactorial, with independent risk factors largely common to coronary heart disease as well (2,4) adding to the importance of identification and management of these factors.

Pattern of disease

In 2003, according to the Survey of Disability, Ageing and Carers (SDAC), approximately 346,700 Australians had suffered a stroke during their lifetime, corresponding to a prevalence of 1.7% for females and 1.8% for males (2,6). However prevalence increased significantly with age, with a concurrent increase in disparity between sexes: in the 65-74 years age group 8.1% of men and 5.3% of women had experienced a stroke (6). An analysis of data from the NEMESIS study by Thrift et al. (7) reflects these trends, showing the median age of patients having a stroke to be 75 years, with males tending to be affected at slightly younger ages than females.

The age-standardised rate of hospitalisation for stroke declined 12% in the period 1998-99 to 2007-08 to a rate of 176 per 100,000 for males and 131 per 100,000 in females (6). Similarly information from the Australian Institute of Health and Welfare (AIHW) (2,6) shows, in broad terms, a steady decline in age-standardised stroke mortality rates over the last four decades punctuated by an acceleration in the rate of decline over the period 1997-2006, as illustrated in figure 1. These declines have been greatest in ischaemic stroke with an average rate of approximately 8% per year, compared to 2% per year in haemorrhagic stroke (2).

In Australia, stroke disproportionately affects disadvantaged sections of the community, representing a major challenge for health authorities. According to the 2007-08 National Health Survey (NHS), “those in the lowest socioeconomic group are 1.8 times as likely to have had a stroke as those in the highest.” (6). This trend is magnified in Indigenous Australians. The AIHW reports that overall stroke prevalence is almost twice as high in Indigenous Australians compared to their non-Indigenous counterparts (4,6). Furthermore Katzenellenbogen et al., in a study conducted in Western Australia, reported that the incidence rate of stroke was 2.6-fold greater in Indigenous men and 3.0-fold greater in Indigenous women compared to the non-Indigenous population (8).

Burden of disease

According to the AIHW stroke was projected to be the fifth leading cause of burden of disease in 2010, contributing 117,000 disability adjusted life years (DALY’s), 4.1% of the total national burden of disease (4). The findings of Cadilhac et al. (5) expand on this, showing that haemorrhagic stroke was associated with greater loss of health compared to ischaemic, largely due...
to a greater case fatality rate at a younger age. In 2003, 75% of the stroke burden for females and 68% of the male burden was due to years of life lost prematurely (4, 6), therefore it can be inferred that despite being much less common than ischaemic events, haemorrhagic events contribute more to the overall stroke disease burden.

Raw mortality data emphasises this burden. In 2007, stroke claimed 8,623 lives, 6% of all deaths, while the 12 month mortality rate for patients experiencing their first ever stroke was one in three (2). It is projected however that over the next decade the burden of disease attributable to stroke will decline in line with continuing declines in mortality (4). This can be linked to better management of risk factors such as tobacco smoking and blood pressure (4).

In keeping with the previously identified pattern of disease in the Indigenous population, the burden of stroke is similarly more pronounced in this group. According to Katzenellengogen et al. (8), Indigenous age-standardized DALY rates were approximately three times higher for both sexes when compared to non-Indigenous rates. Compounding this, they also found that over 60% of the nonfatal stroke burden in the Indigenous population occurred in the 15-54 year age group, compared to 24% in the same non-Indigenous population (8). This implies that Indigenous people are more likely to experience a stroke at a younger age, highlighting the health gap that currently exists in Australia.

Identification of Risk factors

Causation of stroke is complex; an interaction between risk factors, both modifiable and non-modifiable, across a wide spectrum from individual behavioural and biomedical factors to broader community-based socioeconomic factors (1,3,9). A number of risk factors, such as hypertension and tobacco smoking, have traditionally been considered synonymous with disease of the cardiovascular system however the INTERSTROKE study (1) has sought to identify and quantify the contribution of specific factors across 22 countries. Initial findings of the study suggest that ten modifiable risk factors are associated with 90% of the risk of stroke (1), highlighting the immense potential for targeted stroke prevention measures. These findings are summarised in Table 1.

As can be seen in table 1, hypertension is the greatest contributor to stroke risk whilst the top five risk factors; hypertension, current smoker, abdominal obesity, diet and physical activity, constitute approximately 80% of the global risk for both stroke aetiologies (1). There are small, but significant, differences evident in these findings between ischaemic haemorrhagic events; for example, hypertension is a more potent risk factor for haemorrhagic stroke, with a reported population attributable risk (PAR) of 73.6% and 45.2% respectively, whilst increased alcohol intake showed a much larger correlation with haemorrhagic also (1). Atrial fibrillation (AF) is the predominant cardiac cause of stroke, with various studies estimating the increased risk of stroke in people with AF to be between two-and-seven fold (1,10). Increased psychosocial stress and depression were also associated with an increased stroke risk (1).

As has already been shown in pattern of disease a number of non-modifiable risk factors are clearly implicated in stroke causation. Increased age and male sex are both associated with increased risk (1,6). Further to this there is strong evidence for a genetic basis to stroke in certain members of the population; data from the Framingham study shows that a parental history of stroke before the age of 65 increases the risk of stroke in offspring 2.79-fold (11).

Multifactorial model of stroke causation

Development of any model for stroke causation must consider the aforementioned biomedical and behavioural risk factors in the context of the overarching environmental and social influences applicable to different sections of the community (1,9). Whilst not directly implicated in stroke causation, these more distal factors influence prevalence of proximal risk factors. The AIHW (6) reports that stroke death rates in 2007 were highest for those in the lowest socioeconomic groups. This is supported by Heeley et al. (12) who found a higher prevalence of risk factors such as hypertension and smoking among those in the most deprived socioeconomic group, whilst those in this group were also more likely to be blue collar workers or unemployed, implying an association with level of education. Similarly environmental factors such as community remoteness and living conditions can influence a person’s ongoing access to healthcare (9). Thrift et al. (9) contend that the rate of stroke in Aboriginal people may in fact be underestimated in epidemiological studies because distance may impede hospital attendance in remote communities, potentially resulting in

![Figure 1](image-url). Stroke death rates by sex, 1987-2007. Sourced from AIHW (6, p. 81.)
nonattendance for relatively minor events and thus underreporting of stroke.

The multifactorial model in figure 2 presents a proximal to distal causal pathway, showing schematic links between different factors. Whilst proximal factors such as smoking and hypertension are inextricably linked to stroke pathology, a holistic perspective shows the fundamental path between distal and proximal factors; for example a person with a lower level of education is more inclined to be of a lower socioeconomic status, and thus more likely to smoke tobacco and have hypertension. Additional complexity arises from the multiplicative effect of certain risk factors in combination with others; for example abdominal obesity increases the risk of diabetes (13), and both are significant risk factors for stroke. The global impact of a person’s psychological wellbeing is also considered. This model of causation not only incorporates the stroke risk factors identified, but highlights the multifaceted nature of the stroke causal pathway, and the different levels at which disease prevention measures can be targeted.

Differences between Indigenous and non-Indigenous populations
Disparities in the burden of stroke between Australia’s Indigenous and non-Indigenous populations are predictably paralleled by disparities in risk factor prevalence at all points in the causal pathway. In terms of health behaviours the AIHW in collaboration with the Australian Bureau of Statistics (ABS) (14) reports that 45% of Indigenous people over the age of 15 are current daily smokers compared to 17% in the non-Indigenous population. Furthermore Vos et al. (15) report that tobacco smoking is the largest contributor to the overall Indigenous burden of disease and well documented health gap. Given the proximity of smoking to development of stroke, these statistics are clearly significant in explaining the gap in stroke burden. In terms of biomedical factors, the prevalence of diabetes in Indigenous Australians is approximately three times that in non-Indigenous (14), obviously contributing to increased stroke risk, whilst hypertension is slightly more prevalent also (14).

In seeking to explain the excess risk of stroke in Indigenous Australians Thrift et al. (9) cited more distal factors, including socioeconomic and educational disadvantage, and psychological factors. Education level is central to health literacy and socioeconomic status, and in 2008 the year 12 retention rate for Indigenous students was 47%, well below the national average of 75% (14). Table 2 lists some key risk factors in the context of key socioeconomic indicators in the Indigenous population. This table illustrates the effect of distal factors, employment and educational status, on proximal factors in the Indigenous population, confirming the link established in the multifactorial model.

The downstream effects of low socioeconomic status on stroke causation are clearly varied; however the AIHW (14) also reports a correlation with poor diet and low levels of exercise. Similarly the reported rate for episodes of high or very high levels of psychological distress in Indigenous adults was 32%, twice that of the non-Indigenous population (14). As well as being an independent risk factor for stroke, psychological stress is also linked with other factors, especially smoking and risky alcohol consumption (14). This again emphasises the significance of the interaction between

### Table 1. All stroke risk factors and population attributable risk as identified in phase 1 of the INTERSTROKE study. Adapted from O’Donnell et al. (1).

<table>
<thead>
<tr>
<th></th>
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<td>73.6%</td>
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<td>2. Current Smoker</td>
<td>18.9%</td>
<td>21.4%</td>
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<td>24.1%</td>
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<td>29.4%</td>
<td>27.6%</td>
</tr>
<tr>
<td>6. Diabetes mellitus</td>
<td>5.0%</td>
<td>7.9%</td>
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</tr>
<tr>
<td>7. High Alcohol intake</td>
<td>3.8%</td>
<td>1.0%</td>
<td>14.6%</td>
</tr>
<tr>
<td>8. Psychosocial stress/Depression</td>
<td>4.6%</td>
<td>4.7%</td>
<td>3.5%</td>
</tr>
<tr>
<td>9. Cardiac causes</td>
<td>6.7%</td>
<td>8.5%</td>
<td>-</td>
</tr>
<tr>
<td>10. Ratio of Apolipoprotein B to A1</td>
<td>24.9%</td>
<td>35.2%</td>
<td>-</td>
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</table>
continue to experience considerably worse health, social and economic outcomes than their non-Indigenous counterparts (9,15), a situation that has become entrenched since European colonisation over 220 years ago. In addressing this disparity, and in seeking to reduce the burden across the community, recognition of the multifactorial nature of stroke causation is vital. Targeting of the traditional proximal cardiovascular risk factors, whilst undeniably implicating psychological factors in Indigenous stroke risk. Environmental factors also contribute to the gap; 20% of Indigenous households report that they cannot access emergency services, whilst in remote areas only 69% reported access to medical/health clinics (14). This not only has a severe impact on the capacity to seek acute medical treatment, but presents a barrier to the ongoing management of chronic conditions that contribute to stroke risk.

CONCLUSION

The risk factors for stroke are the same in Australia’s Indigenous and non-Indigenous populations, however the burden of stroke is not shouldered equally. This is symptomatic of a society in which Indigenous people continue to experience considerably worse health, social and economic outcomes than their non-Indigenous counterparts (9,15), a situation that has become entrenched since European colonisation over 220 years ago. In addressing this disparity, and in seeking to reduce the burden across the community, recognition of the multifactorial nature of stroke causation is vital. Targeting of the traditional proximal cardiovascular risk factors, whilst undeniably implicating psychological factors in Indigenous stroke risk. Environmental factors also contribute to the gap; 20% of Indigenous households report that they cannot access emergency services, whilst in remote areas only 69% reported access to medical/health clinics (14). This not only has a severe impact on the capacity to seek acute medical treatment, but presents a barrier to the ongoing management of chronic conditions that contribute to stroke risk.

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Table 2. Health risk factors by selected socioeconomic indicators, Aboriginal and Torres Strait Islander people aged 15 years and over. Sourced from AIHW (14).

<table>
<thead>
<tr>
<th>SES status indicators</th>
<th>Current daily smoker (%)</th>
<th>Chronic risky/high risk alcohol consumption (%)</th>
<th>Acute risky/high risk alcohol consumption (%)</th>
<th>Used illicit substances in previous 12 months (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest year of school completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 12</td>
<td>34.5</td>
<td>16.5</td>
<td>43.6</td>
<td>20.0</td>
</tr>
<tr>
<td>Year 9 or below</td>
<td>54.4</td>
<td>18.4</td>
<td>34.9</td>
<td>20.5</td>
</tr>
<tr>
<td>Currently employed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41.1</td>
<td>19.0</td>
<td>43.9</td>
<td>21.3</td>
</tr>
<tr>
<td>No</td>
<td>58.3</td>
<td>18.4</td>
<td>39.5</td>
<td>29.5</td>
</tr>
</tbody>
</table>
factors must continue to be a priority for health professionals involved in primary care; however there is scope for health and social policy to target the distal community-based factors clearly inherent in stroke causation in Australia. Socioeconomic, environmental and psychological factors are particularly pertinent in rectifying the Indigenous health gap. Additionally, in the context of an aging population a holistic approach to stroke prevention is imperative in continuing the declines in morbidity and mortality achieved over the last 40 years.

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Comparing the frequency of GP mental health diagnoses between rural and urban communities

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*Medical student, The Australian National University

ABSTRACT

Objective: To compare the type and proportion of mental health disorders encountered by general practitioners (GPs) in urban and rural settings.

Design, Setting and Participants: Cross-sectional clinical audit collected over the period of 2005-2012 from patients within the Australian Capital Territory and Greater Southern NSW Health Network. Three thousand five hundred and eighty one patients from this database were selected on the criteria of presenting to a GP and being over the age of 18 at the time of the appointment.

Main Outcome Measure: Percentage of mental health diagnoses in urban and rural general practice.

Results: Of 3581 patients, 1934 (54%) were seen in rural general practice. It was identified that there was no statistically significant difference in the proportion of presentations that were for mental health issues between rural and urban general practice (6.2% vs 6.4%, p = 0.728). Additionally, there was no statistically significant difference between the proportions of presentations for the top three mental health diagnoses in urban and rural areas. Substance use disorders were identified as more commonly diagnosed in urban general practice. There was no statistical significance in the difference between rural and urban settings in the difference of the proportion of mental health diagnoses when adjusted for age and sex, however a larger population sample may be required to identify any discrepancies.

Conclusions: While our results are consistent with previous studies, they raise questions as to the true nature and impact of health-seeking behaviours in both rural and urban populations. Similar studies with larger sample sizes are needed in order to appreciate the impact of location, age and sex on mental health diagnoses.
and Welfare reports up to a 40% increase in risky alcohol consumption and a 28% increase amongst substance abuse disorders in men outside major cities (11), this is not supported by literature including all age and sex demographics, with only small differences in the rate of substance use disorders reported between people living in a rural or urban setting (6). Thus, given that substance abuse disorders decrease steadily with age (10.6% in 18-34yo vs 4.4% in over 55s), and reporting of disorders is greater in women than men (21% vs 12%) despite an increased burden of disease in men (20% vs 15% at 18-24 years; 15% vs 10% at 25-34 years) (6), the similarities in reporting of substance abuse disorders between urban and rural settings could be attributed to age and sex demographics in these areas. Alternatively, it may be that substance use disorders are also under-reported in rural populations due to the perceptions outlined above (4).

This study therefore aimed to explore the use of clinical data to describe trends in mental health diagnoses in rural and urban settings of ACT and rural NSW and to compare the impact of mental illness between rural and urban settings. It aimed to compare the proportions of common mental health diagnoses among rural and urban populations, accounting for age and gender.

METHODS

This study was based on successive cross-sectional clinical audits of GP consultations. Over the period 2005-2012 data were collected by The Australian National University medical students from patients within the Australian Capital Territory (ACT) and rural New South Wales who presented to a health practitioner. For the purposes of the study, rural patients were classified only as those seen within the former Greater Southern New South Wales Local Health District and urban patients were classified as those seen within the ACT. Ethics approval was obtained for this study from the ethics committees of the ANU, NSW Health and ACT Health.

In this study there were 3581 patients who presented to a GP and were over the age of 18 at the time of the appointment. Mental health diagnoses were formally defined using ICPC-2 data codes (23). If multiple mental health diagnoses existed for one patient only the first was accepted for analysis in order to measure the proportions of the most common diagnoses.

Data was analysed using SPSS version 18 software (SPSS Inc, Chicago). Chi-square tests were performed to test for statistical significance in the differences in the proportions between urban and rural patients, and difference by sex and age. A p value of < 0.05 was considered statistically significant, except where adjustments for multiple comparisons were deemed appropriate. In these cases, the Bonferroni method was used to reduce the risk of Type 1 error. An independent samples T test was used to compare the mean age between rural and urban patients. The age groups were defined as: young adults (18 to 35 years old), middle aged (36 to 64 years old), and elderly (65 years or over).

RESULTS

There were a total of 3581 GP consults in the dataset. Of these, 1934 (54.0%) consults occurred rurally. Rural patients were significantly older than urban patients (mean ≤ 58 and 53 years respectively: p <0.001), and there was also a higher proportion of female patients in the rural GP setting (1155/1934, 60%) compared with the urban setting (898/1647,55%) (Table 1). Out of 3581 GP consults, 225

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Full sample (N = 3581)</th>
<th>Rural sample (N = 1934; 54.0%)</th>
<th>Urban sample (N = 1647; 46.0%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>2053 (5703%)</td>
<td>1155 (59.7%)</td>
<td>898 (54.4%)</td>
<td>.002</td>
</tr>
<tr>
<td>Male</td>
<td>1528 (42.7%)</td>
<td>779 (40.3%)</td>
<td>749 (55.5%)</td>
<td></td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>55.9</td>
<td>58.3</td>
<td>53.1</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Age group*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young adult</td>
<td>595 (16.6%)</td>
<td>271 (14.0%)</td>
<td>324 (19.7%)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Middle aged</td>
<td>1709 (47.7%)</td>
<td>851 (44.0%)</td>
<td>858 (52.1%)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Older adult</td>
<td>1277 (35.7%)</td>
<td>812 (42.0%)</td>
<td>465 (28.2%)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Mental health diagno-</td>
<td>225 (6.3 %)</td>
<td>119 (6.2 %)</td>
<td>106 (6.4 %)</td>
<td>.728</td>
</tr>
</tbody>
</table>

± = Standard deviation

* Age in years compared using independent sample T-test, all other demographics compared using chi-square test.
† Overall p value for chi-square test presented at variable heading, significant difference in column proportions for each level of the variable presented as <.05 using Bonferroni correction for multiple comparisons
‡ Expressed as a rate rather than a percentage as can have multiple diagnoses per patient
mental health diagnoses were made at the end of the encounter (mean 6.3 diagnoses per 100 consults) for 207 patients. There was no difference in the rate of mental health diagnoses between rural (6.2%) and urban (6.4%) areas (Table 1).

Out of the 225 mental health diagnoses, the three most common were depression that accounted for 39% of diagnoses (88/225), anxiety at 17% (39/225) and substance use disorders at 16% (35/225). The next most common diagnoses were acute stress (8%), psychotic disorders (4%), dementias (4%) and manias (3%). If a patient had one of the top three diagnoses, any subsequent diagnoses were then removed from the remainder of the analysis. This left only one primary diagnosis for each of 154 patients with depression, anxiety or substance abuse (Table 2). The overall prevalence of these primary diagnoses were 2% for depression (87/3581), 1% for anxiety (35/3581) and 1% (32/3581) for substance use disorders. Depression was the most common in both urban and rural samples but substance use disorders was more common in the urban group and anxiety was more common in the rural group as shown in Table 2 (P<0.05). This analysis was repeated, stratifying the sample by sex (Table 3). In the 63 male patients with one of the “top three” diagnoses, substance abuse was the most common diagnosis (35 patients; 56%), followed by anxiety (16 patients; 25%) and depression (12 patients; 19%). There was no statistically significant difference between rural and urban patients (p=0.27).

In the 91 female patients with one of the “top three” diagnoses, depression was the most common diagnosis (52 patients; 57%) followed by anxiety (23 patients; 25%) and substance abuse (16 patients; 18%). The differences between urban and rural were not statistically significant (p=0.08).

### DISCUSSION

Our results showed no significant overall difference in the overall proportion of mental health diagnoses in GP consultations in rural and urban populations and depression was the most common diagnosis in both rural and urban areas. However, our study did find a significant difference in the proportion of diagnoses for substance use disorders and anxiety disorders, with substance use in urban areas more than double that of rural areas, and anxiety more common in rural areas.

There was a difference in age distribution of GP patients by location. The proportion of those above the age of sixty was greater in rural compared to urban populations (p <0.05), while the opposite was true of those between the age of eighteen and sixty-five. Andrews and colleagues (10) found a lower prevalence of mental health disorders in those aged over sixty-five and the Australian Bureau of Statistics (ABS) reported that young people were much more likely to report a mental health disorder than those in older age categories (18). We might therefore have expected a higher prevalence in the urban group due to confounding by age.

Our study documented a significantly larger proportion of patients visiting a GP who were female in rural compared to urban areas (p = 0.002). It is difficult to ascertain whether this difference may impact upon our mental health diagnostic analysis. Andrews and colleagues (10) and later Komiti and colleagues (14) identified disparities in the type of mental illnesses experienced between genders. Caldwell et al (4) found that males who have mental health disorders are less likely to access help in rural areas than those in the city, and that overall, young women were much more likely to access help than young men. Depression, anxiety and substance use disorders were identified as the most common three mental health diagnoses within each population. Our top three diagnoses are equivalent to those identified in the National Survey of Mental Health and Wellbeing as the most common mental health problems experienced by Australians (18). This suggests that similar mental health issues are common within both populations. However, while the study found no differences in the top three mental health diagnoses between rural and urban populations, it did document variations in the proportions of diagnoses. Depression was the most frequent mental health diagnosis in both rural and urban populations (60% urban, 53% rural; p > 0.05), correlating to the BEACH study, where depression was reported as the most frequently managed mental health problem by Australian GPs (19). The percentage of anxiety disorders was found to be higher in the rural than urban population (27% vs 19%; p>0.05). This is analogous to national data collected by Andrews et al. who also found a slight increase in anxiety disorders in the rural population (10). However, women are more likely than men to report the symptoms of anxiety to their GP (18).

<table>
<thead>
<tr>
<th>Diagnosis*</th>
<th>Full sample (N = 154)</th>
<th>Rural sample (N=75; 48.7%)</th>
<th>Urban sample (N=79; 51.3%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>87 (56.5%)</td>
<td>45 (60.0%)</td>
<td>42 (53.2%)</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Anxiety</td>
<td>35 (22.7%)</td>
<td>20 (26.7%)</td>
<td>15 (19.0%)</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>32 (20.8%)</td>
<td>10 (13.3%)</td>
<td>22 (27.8%)</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

>.05 = not significant  
* Overall p value for chi-square presented at variable heading, significant differences in column proportions for each level of the variable presented as <.05 using Bonferroni correction for multiple comparisons.

Table 2. Comparison of the three most common mental health diagnoses in rural and urban GP consults

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In the 91 female patients with one of the diagnoses, depression was the most common diagnosis (35 patients; 56%). There was no statistically significant difference between rural and urban patients (p=0.27). In the 91 female patients with one of the “top three” diagnoses, depression was the most common diagnosis (52 patients; 57%).
Australia’s Health 2010 (20) it is noted that anxiety disorders are the most prevalent across all age groups. Anxiety is a common mental health comorbidity particularly with depressive and substance use disorders (21). The proportion of substance use disorders also varied between settings, with more than 50% greater prevalence of substance use disorders in the urban population. This also reflects national data which has found a reduction in substance use disorders associated with increasing remoteness (4). As men are two times more likely than women to report substance use disorders particularly in younger age groups, the lower rates reported in this study could be partly attributed to the higher proportion of women and elderly amongst our study population. More research may provide further insights into the nature and cause of this finding.

Our study was limited by an inability to investigate the homogeneity of our rural population. This was due to the questionnaire not specifying a precise location, instead distinguishing only between rural or urban. It has been demonstrated that this ‘catch-all’ rural category can be misleading due to distinct differences between towns which can impact on mental health. For example, while some rural towns are experiencing population growth, others are seeing population decline, and there is also a wide discrepancy in infrastructure such as housing, health services, education and recreation, all of which can impact on mental health (22). Therefore, using ‘rural’ as an overall category without being able to analyse each town separately means we may be missing nuances related to various differences between the areas. It also needs to noted that the data are collected only from areas ANU medical students attend and our data may not be representative of the wider population. A medical student was present during each presentation and due to the reluctance of some patients to discuss mental health issues with a GP, having a student present may have dissuaded them further. This may have resulted in missing those who had intended to present with such issues, but decided against it due to the student presence.

**CONCLUSION**

Our study found a significant difference in the age and gender demographics of rural and urban patients attending for GP consults, and 10% of consults had a mental health diagnosis. Depression was the most common mental health diagnosis. The overall rates of mental health diagnoses managed by GPs in rural and urban populations were found to be similar but varied in the proportions of the three most common mental health diagnoses between rural and urban groups. A statistically significantly greater rate of diagnosis of substance use disorder was identified in the urban setting while a greater rate of anxiety was found in the rural population.

**REFERENCES**

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<table>
<thead>
<tr>
<th>Diagnosis*</th>
<th>Full sample (N = 63)</th>
<th>Rural sample (N = 24; 38.1%)</th>
<th>Urban sample (N = 39; 61.9%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>12 (19.0%)</td>
<td>7 (29.2%)</td>
<td>5 (12.8%)</td>
<td>.27</td>
</tr>
<tr>
<td>Anxiety</td>
<td>16 (25.4%)</td>
<td>5 (20.8%)</td>
<td>11 (28.2%)</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>35 (55.6%)</td>
<td>12 (50.0%)</td>
<td>23 (59.0%)</td>
<td>&gt;.05</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Diagnosis*</th>
<th>Full sample (N = 91)</th>
<th>Rural (N = 51; 56.0%)</th>
<th>Urban (N = 40; 44.0%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>52 (57.1%)</td>
<td>33 (64.7%)</td>
<td>19 (47.5%)</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Anxiety</td>
<td>23 (25.3%)</td>
<td>13 (25.5%)</td>
<td>10 (25.0%)</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>16 (17.6%)</td>
<td>5 (9.8%)</td>
<td>11 (27.5%)</td>
<td>&gt;.05</td>
</tr>
</tbody>
</table>

>.05 = not significant
* Overall p value for chi-square presented at variable heading, significant differences in column proportions for each level of the variable presented as <.05 using Bonferroni correction for multiple comparisons

**Table 3.** Comparison of the three most common mental health diagnoses between rural and urban GP consults in males and females
The ethics of preimplantation genetic diagnosis

Cheryl Pui-Yan Au B Med Sci

*Medical student, The University of Sydney

A couple in their early forties, Mr and Mrs R, came to the fertility clinic for their first consultation regarding In Vitro Fertilisation (IVF) treatment. Mrs R has a strong family history of colorectal, breast and ovarian cancers on her paternal side, with her father confirmed to have the Breast Cancer Type 1 Susceptibility Protein (BRCA1) mutation. She herself has not been tested for the BRCA1 mutation, but has had regular mammograms, all of which have been normal thus far. Because she has a 50% chance of inheriting the BRCA1 mutation, the fertility doctor offered the possibility of prenatal genetic diagnosis (PGD) for the embryos harvested from the IVF cycles, which is available at IVF Australia. This would add another $4000 per cycle to the cost of IVF.

BRCA1 and BRCA2 gene mutations confer significant lifetime risks for both breast and ovarian cancer ranging from 36-90% for breast cancer and 18-56% in BRCA1 mutation carriers and 14-27% in BRCA2 mutation carriers for ovarian cancer (1,2). BRCA1/2 mutation carriers thus have medically and ethically complicated decisions to make, not only regarding their cancer risk and treatment, but also their childbearing plans. Preimplantation genetic diagnosis (PGD) involving in vitro fertilisation (IVF) and embryo biopsy opens the door to preventing pregnancies affected with debilitating and/or lethal genetic diseases, such as cystic fibrosis, Huntington’s disease and Duchenne muscular dystrophy (3,4). In such cases, if the embryos carry the genetic mutation(s), they will definitely get the disease. There has been recent debate about extending use of PGD to encompass lower penetrance, adult-onset diseases such as hereditary breast and ovarian cancer, where there is less certainty that the condition will occur in the offspring (3,4). My paper will briefly describe the main ethical issues in the general use of PGD, and then more specific ethical, legal and professional implications related to PGD among the BRCA1/2 population.

A major ethical objection arises from the need in creating and selecting embryos based on genetic criteria. The deselected embryos are then usually discarded. Those who view the preimplantation embryo or foetus as a person will object to the creation and destruction of embryos, and oppose PGD (3). Others view preimplantation embryos as the first stage of a human being and thus deserve special respect, but lack interests or rights due to their ‘rudimentary’ development (3). With this perspective, PGD may be ethically acceptable in order to prevent serious genetic diseases in offspring. Another set of ethical objections arise from the embryo selection process itself. The deontological perspective is that no matter what the intentions are, it is wrong to choose traits in offspring. The consequentialist objection stems from the view that engineering children according to genetic criteria is a highly instrumental approach to reproduction. There are societal fears that PGD will move us towards a eugenic world in which children are valued more for their genotype than for their inherent worth and dignity (3–5).

In addition to these strong objections to PGD, the new indications of PGD for susceptibility conditions such as hereditary breast and ovarian cancer create additional ethical issues. Here, the question is whether the burdens of carrying susceptibility genes for the child exceed the financial, psychological and ethical burdens of IVF and PGD, to justify these reproductive measures to avoid affected children (4,5).

Critics of PGD for BRCA1/2 carriers argue that a mutation predisposes to but is not 100% predictive of cancer, and that most cancers have an adult onset and are multifactorial. Known carriers may improve their chances of survival through early detection by regular screening, and lifestyle measures such as healthy eating and the cessation of smoking (4). The parental burdens of IVF and PGD should be weighed against the psychological burdens of their offspring as adults, which includes psychological harms – stress, anxiety, depression, grief and feelings of guilt (2,6). In addition, PGD often has an uncertain outcome and is costly, time and labour-intensive. Even with a successful IVF and PGD procedure, there is no guarantee of pregnancy after transfer, and no guarantee of a term or near-term delivery (3,7).

It has been argued that couples who carry cancer susceptibility genes such as BRCA1/2 should have the freedom to choose PGD. Using the principles of reproductive freedom and family autonomy, there is a view that parents have a presumptive right to obtain and use genetic information in making reproductive decisions (4). If they don’t opt for PGD, they have to face the prospect of wondering whether their daughters will develop breast cancers in their 20s and 30s and/or seeing their daughters deciding whether to undergo prophylactic bilateral mastectomies to prevent breast cancer. In addition, for those who survive breast and ovarian cancer, treatment entailing surgery, chemotherapy and/or radiotherapy is distressing and psychologically effects individuals and families. Thus, some view the avoidance of offspring with susceptibility genes to be procreative liberty (2). However, such procreative lib-
ery should be considered in light of duties of care and of justice. This duty of care is specifically on clinicians and healthcare workers to inform patients of reproductive options, within the boundaries of their ethical stance. Equity and justice in society also come into consideration as there should be equitable distribution and access to limited resources that reflects need priority (4). In such cases, there may be legitimate restriction of procreative liberty if scarce resources need to be shifted to other ‘needier’ patients.

In Mr and Mrs R’s case, they are primarily seeking IVF to facilitate reproduction. On the one hand, the most viable embryo for implantation is needed for reproductive success. On the other hand, IVF provides the opportunity to screen for the BRCA1 gene, but those without the mutated gene may have lesser implantation potential (7). Moreover, the long term effects on the embryos selected for IVF (i.e. without mutated genes) are not clear, and due to the multiple genetic and environmental pathways in carcinogenesis, such offspring may develop cancer regardless (5). It is important to remember that PGD does not guarantee a child with a healthy future.

In this case at least, the couple already opted for IVF for infertility due to advanced maternal age. Non-IVF patients, however, would seek PGD only if they did not want an affected pregnancy or did not want to risk abortion later on (3). Harm potential exists for these patients with a shift of cancer burden from offspring to healthy mothers. Ovulation induction is a necessary part of IVF, and this may put women involved at increased risk of developing ovarian cancer, particularly if they are already at higher risk (2).

Generalising PGD for cancer to other late-onset or multifactorial diseases, there needs to be extreme caution in weighing competing professional, ethical and medico-legal values from the doctor, the patient, the family and society. Clinicians who oppose PGD outright may not be comfortable in advising PGD as an option for BRCA mutation carriers who are making reproductive decisions. However, the couple may be referred to reproductive specialists for consultation if they are interested. In this case, the doctor informed Mrs R that she needs to consider testing for BRCA1 carrier status before proceeding further, however did not refer the couple to genetic counselling specifically. As per the NHMRC guidelines, it is critical that those seeking PGD understand the technology, its technical limitations and the ethical implications, in order for them to make informed decisions (8). Genetic counselling should be undertaken by qualified counsellors who have an understanding of family processes and relevant psychosocial, ethical and religious factors, and who do not exert coercive pressure (5).

Potential parents do have significant obligations regarding the foreseeable future of their offspring, but this does not mean that they have a duty to have a child with the best opportunities in life using reproductive methods that are costly and that have significant ethical implications. The boundaries of preventative medicine probably do not encompass the use of PGD to predict risk of developing a late-onset multifactorial disease. PGD for cancer susceptibility should not be introduced just because the technology is available. Implications must be recognised at all levels such that there are measures to ensure acceptable risk-benefit ratios.

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Coercion in psychiatry – is seclusion ethical?

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A CLINICAL SCENARIO

Cooper is a 22 year old male with a three year history of paranoid schizophrenia on a background of chronic cannabis use. He has had a history of trouble with the law for aggression/violence. He is on a community treatment order (CTO) but has been non-compliant with his medication. His sister contacted the acute crisis team when he became verbally and physically aggressive towards her. On presentation to the Acute Psychiatric Unit, Cooper was very agitated and tried to assault staff members. He was then physically restrained by four staff members and secluded in the isolation room.

In my article, I will be exploring whether it is justified to use coercive measures in psychiatry, specifically the involuntary use of seclusion. Seclusion can be defined as “locking a patient alone in a room for protection of the patient and his environment, in order to control problem behaviour, and to enable nursing and treatment” (1).

Is it acceptable if patients are a danger to others or to themselves, and if seclusion creates a therapeutic climate (e.g. patient becomes calm and gains access to repressed memories due to decreased sensory stimulation)? Or is an appeal to respect autonomy and/or human dignity a sufficient reason to reject coercive measures?

ETHICAL ISSUES

Autonomy

In medical ethics, there have been several attacks against a central role for autonomy. Firstly, autonomy is just one of the many moral considerations, and it has been argued that respect for autonomy should not over-ride other moral values such as beneficence and dependency (2). Secondly, the concept of autonomy itself is broader and is relational (3). Complete self-sufficiency and independence, free from controlling factors, does not exist. In addition, autonomy as a moral capacity can only be developed in relation to others, i.e. it cannot be seen in isolation from other people and relationships. From these arguments, seclusion cannot be dismissed simply on the idea of autonomy. Other moral principles as well as the relational context of autonomy need to be considered. Perhaps it can be argued that to prevent destructive behaviour to self and/or others, coercive measures may be necessary to foster or regain autonomy (3). If seclusion is viewed as an intervention for attaining autonomy instead of threatening autonomy, then we have lost one reason for eliminating seclusion completely. However, this does not mean that seclusion does not raise many issues related to autonomy.

Human dignity

Violation of human dignity is often used as an argument against seclusion (4, 5). But what exactly is human dignity? There are at least two conceptions of dignity (6):

1. “Inherent dignity”: a universal and inalienable moral quality of every human being which cannot be earned/taken away
2. “Individualistic dignity”: dignity that is tied to personal goals and social circumstances, which can be enhanced/robbed depending on events outside the control of the persons involved.

Can seclusion be regarded as a violation of inherent dignity? Although this characteristic of humans cannot be taken away from the patient, we can act in a way that is not in accordance with it and thus violate it.

In relation to “individualistic dignity”, Nordenfelt proposes the concept of “the dignity of identity” (7). He states that we can be humiliated by and our autonomy restricted in many ways, but this does not just entail feelings of worthlessness or of humiliation. He argues that intrusion in the private sphere is a violation of a person’s integrity and this encompasses a change in the person’s identity and thereby his dignity. In light of this, it can be argued that seclusion should not be used.

Conversely, a study about patients’ perceptions of the concept of dignity in a psychiatric setting showed that “encountering competent and committed staff”, “being confirmed”, “being looked upon as like anyone else”, “being helped to reduce the shame” and “being understood”, are conditions associated with respect for dignity (8). If seclusion measures were enacted by competent staff, with confirmation and understanding and in a way that reduces the shame, is human dignity violated in this sense?

Effects of seclusion: promoting wellbeing?

The definition of seclusion implies that it is used with good intention – i.e. to protect the patient and his environment and to create a therapeutic situation. This view of seclusion is based on doing good and avoiding harm, or additional harm.
Indications for seclusion (and restraint) are (9):
1. “To prevent imminent harm to the patient and/or others
2. To prevent serious disruption of the treatment program or significant damage to the physical environment
3. To assist in treatment as part of ongoing behaviour therapy
4. To decreased the stimulation the patient receives”

Even though there is observational evidence about the positive effects of seclusion, there is a lack of controlled studies to evaluate the value of seclusion/restraint in patients with serious mental illness (10). Furthermore, negative effects have been published, including substantial deleterious physical and psychological effects on both patient and staff (11).

Thus, if we want to practice evidence-based medicine, it can be argued seclusion should only continue to be used in the context of randomised trials, in which the effects of seclusion in extreme circumstances are explored and compared to other measures such as forced drug treatment (which may be even more harmful) (12). The design of such studies will no doubt be fraught with ethical dilemmas. Even cohort studies investigating methods to control severe and violent behavioural disturbances in psychiatric patients are problematic, since the comparison/control group receiving less or no intervention may pose physical risks to staff and/or other patients. Nevertheless, if there is a lack of evidence of positive effects of seclusion, perhaps it should stimulate us to find alternative methods of dealing with extreme circumstances of aggressive behaviour.

The patient’s perspective
Many studies have explored patients’ experiences of seclusion/restraint. While there are some contradictory findings, the predominant emotions expressed by patients include fear, helplessness, confusion and humiliation (13). Many do not know the reason for their seclusion and view the act as punishment and/or violation of their autonomy (14). A recent study suggested that providing patients with meaningful activities, planning beforehand, documenting the patients’ wishes, and making patient-staff agreements can result in reduced use of seclusion/restraint and thus a more positive patient experience (15). However, this is contingent on patients playing a more active role in their management and clinical staff seeking and eliciting patients’ thoughts, suggestions and preferences “in advance”.

CONCLUSION
In Cooper’s case, the indication for seclusion/restraint was to prevent imminent harm to himself and to staff members. As outlined in my article, coercive measures cannot be dismissed or accepted based on autonomy or human dignity principles alone. More research on whether coercive measures are beneficent is needed to complete the argument, but as long as there is no strong evidence for positive effects of seclusion and the fact that deleterious effects have been described, coercive measures should be used with caution and perhaps reduction encouraged. Certainly from the patient’s perspective, seclusion/restraint is undesirable and measures to reduce the need for restrictions as well as alternatives should be continually evaluated and developed.

REFERENCES
The United States of America’s health care system is both complex and flawed with a convoluted history that has resulted in inflated health care costs without a paralleled ranking in performance or level of overall national health (1). President Barack Obama’s reforms however, have set in motion a significant regulatory overhaul of the US health care system primarily through the Patient Protection and Affordable Care Act (PPACA), informally referred to as “ObamaCare”, which was signed into legislation on March 23, 2010. The act, which makes it mandatory for all citizens to possess health insurance, aims to decrease the number of uninsured Americans and subsequently reduce the overall costs of primary basic healthcare. Whilst previously America’s high health care costs have been primarily supported by private expenditure and minimal public spending (2), the PPACA sets out to ensure the lower socio-economic bracket, the unemployed and chronically ill, now have access to free or partially subsidised health insurance through the expanded government-funded Medicaid program or a novel compulsory “health-insurance exchange” program. Likewise, all other Americans require government-approved health insurance through either an individually-purchased package or an employer-funded scheme, with a penalty of 2.5% of one’s income imposed on those that fail to follow this legislation (3).

This reform has been received with mixed reactions (3). Both the average tax-payer as well as the socio-economically disadvantaged, chronically ill and unemployed undoubtedly benefit from the scheme as do the insurance companies. This is such, because although private insurers are now required to provide indiscriminate cover, even to those with chronic medical conditions, they have also experienced a significant influx of capital from young relatively healthy individuals who are cheap to insure, thereby boosting their profits. Subsequently, it is only the individuals who were fit and healthy and previously not engaged in a health insurance scheme that are now faced with a tough decision – to purchase insurance or pay a health-insurance levy with their tax?

This new compulsory financial encumbrance has, for some, been an unwelcome spoonful of medicine, especially given that in spite of the changes being in the context of a socialist reform, compulsory insurance means these individuals are now financing the insurance company’s profits (3). However, in spite of this, the already-instituted provisions of this reform as well as those still to come have and will continue to have significant positive impacts on the accessibility and affordability of basic health care. The question is however, what is the impact on ancillary health care? Has allied health been affected? Not yet…

**PPACA’S IMPACT ON ALLIED HEALTH**

As a student, I had the chance to witness one facet of America’s health care system in action at an east coast physiotherapy practice. This was prior to the instigation of the PPACA, although practice has not yet changed significantly. The patients at this practice, holders of private health insurance, were recipients of what I perceived to be high quality care. However, it has been suggested that quality can be divided into five components, one being the separation of financial and clinical decisions (4). This was evidently not the case. In America, privately insured patients have their physiotherapy sessions covered by the insurer, possibly with an additional personal co-payment. The funding that is received from the insurer is dependent on what treatment techniques the therapist performs, with each treatment technique classified under a particular billing code and associated with a particular repayment sum. During my time at this practice, I was able to witness that the therapists would take advantage of this system by frequently providing the patients with long physiotherapy sessions in order to deliver multiple different techniques – manual therapy, exercise therapy and electrotherapy, for which they were then able to bill the insurer. It has been recognised by both myself and others (5), that this form of practice presents an ethical issue, in which there are both advantages and disadvantages affecting all parties (therapist, patient and insurer). At this stage the PPACA is yet to make an impact on this mode of practice in allied healthcare. Subsequently, in the absence of legislative regulation, Beauchamp and Childress’ relevant Ethical Principles - Beneficence, Non-Maleficence, Respect for Autonomy and Justice, should be examined in order to guide practice (6). Whilst there is little consensus in the literature as to the best process of ethical reasoning in physiotherapy (7), one comprehensive process, as described by Davis provides a satisfactory framework to apply Beauchamp’s principles and integrates ethical decision making into clinical practice:

- Identification of ethical principles,
- Clarification of professional duties,
- Description of desired outcome, and
- Decision upon a course action (7).

**IDENTIFICATION OF ETHICAL PRINCIPLES**

Beauchamp contends that the general ethical principles include
beneficence, non-maleficence, respect for autonomy and justice (6). Beneficence, defined as the obligation to provide benefit and to balance the benefits against risks is particularly relevant to the case (6). It is the contention of both the American Physical Therapy Association (8) and Australian Physiotherapy Association (9) that physiotherapists are committed to delivering the best possible treatment outcomes, i.e. benefit, through evidence-based practice. In the case of my American experience, the patient is receiving valuable care through the comprehensive provision of multiple evidence-based therapies. This model of practice also has secondary economic gains for the therapist, whereby the provision of multiple therapies, allows the therapist to make numerous claims to the insurance company. However, in line with beneficence’s definition, these benefits must be weighed against potential risks. Whilst the patient, is not at risk of any physical harm, this does not fully satisfy “non-maleficence”. Non-maleficence, meaning to do no harm, not only has physical dimensions, but also economic. This model of practice puts the patient at risk of economic harm if they are required to make substantial co-payments to the physiotherapist. There is also the potential for negative consequences related to the length of time required for all the therapies to be administered – e.g. missed work or reduced time for other commitments. Not least, this practice also theoretically has an aspect of fiscal harm for the insurer who is funding all or much of the therapy. These different perspectives must be considered carefully and balanced against each other when it comes to making an ethical decision and conclusion about this practice.

CLARIFICATION OF PROFESSIONAL DUTIES

Whilst consideration of beneficence and non-maleficence is important as decreed in the Hippocratic Oath (10), the physiotherapist must also consider the other ethical principles. Thus, respect for patient autonomy is perhaps the keystone to exploring this case. Autonomy is defined as the ability to act freely or independently (11). This is an important component of informed consent, which is the obligation of the physiotherapist to obtain, and appears to have been neglected here. In this case, the physiotherapist fails to explain the reasoning behind the treatment plan and discuss whether the patient can afford the time for the long consultations and/or the co-payments, but instead pushes for the multi-therapy treatment approach. It is not surprising that the physiotherapist advocates for this and chooses not to divulge that one reason for the lengthy consultations is to enhance their own reimbursement as it reveals a conflict of interest. However, whilst I find this conflict to be deplorable and such conduct is proscribed by the American College of Physicians (12), in reality it has been tolerated to-date in many areas of American healthcare.

Fortunately, whilst this is current practice, there is hope that the PPACA’s future provisions will force a change in this culture. With all Americans now requiring insurance, there is also a greater pool of potential patients requiring physiotherapy and rehabilitation. As a consequence, there will hopefully be a reduction in the risk of physiotherapists demanding lengthy consultations of relatively few patients, by instead distributing their care to a larger client base and providing consultations of a more appropriate length encompassing only the most necessary therapy techniques. This will hopefully also reduce any financial burden to the patient associated with excessive co-payments. However, until the effect of the larger patient pool takes effect, or further provisions are made under the PPACA, practice should be guided by our ethical principles.

THE DESIRED OUTCOME

Recognition of the aforementioned principles, the associated individual perspectives and the physiotherapist’s professional duties provide the basis for the decision making process described by Davis (13). Ideation of the desired outcome is the third step in the process. The optimal outcome for the patient would ultimately involve receiving first-class physiotherapy within the framework of their personal time constraints and financial limits. For the therapist, it would involve complying with their professional obligations whilst still receiving modest reimbursement sums, and for the insurance companies it would involve only reasonable expenditure. Consequently we are faced with a decision regarding what course to take. This is the point where the fourth principle, justice, may be considered, i.e. the obligation of fairness in the distribution of benefits and risks (6). This idea is consistent with the utilitarian approach to ethical decision making, whereby the rights and wrongs of actions are assessed, and one practises in light of their consequences (10). One avenue in this situation would be for the physiotherapist, following the initial assessment, to discuss with the patient their ideal treatment plan – i.e. one inclusive of multiple evidence-based therapies but also ascertain the patient’s goals and limitations thereby ensuring that the patient is able to autonomously give free and informed consent. This approach reduces the risk of maleficence by allowing and respecting the patient’s autonomy in their treatment decisions. Furthermore it also benefits the patient through facilitating the provision of evidence based therapy, as well as there being the potential for the therapist to benefit financially if the circumstances permit. The only party which does not profit from this approach is the insurance companies. However, when looking at the larger picture of America’s healthcare system, even in the context of Obama’s new health care reforms, in reality this deficit is inconsequential, given the profitable nature of the insurance companies, and it would not be hard to judge that both benefits and risks have been fairly distributed in order to arrive at this outcome.

THE COURSE OF ACTION

In resolving ethical difficulties in the clinical context, one encounters many competing factors which must be evaluated in order to determine a moral course of action. This is complicated by the fact, that in any prospective contemplation, it is extraordinarily difficult to accurately predict all good and bad consequences (14). For this reason, it is essential that thorough ethical analysis is integrated into the clinical decision making process to ensure an ethical outcome. Davis’ process (7) utilised here, whilst not the only existing method, does provide a suitable guideline for ethical decision making (5). We will however continue to be faced with the challenge of appropriately integrating ethical reason-
ing into our clinical decisions, until there is a gold standard for this process. Until then, there will continue to be differences in method and choice of moral theory, influenced by the ethicist’s own personal moral values, with the potential for diverse conclusions for a single issue. Whilst this proposed course of action has benefits for both the patient and physiotherapist, it does not solve any of the fundamental inadequacies of allied health care in the context of the American health care system. This ethical approach however can hopefully operate constructively alongside Barack Obama’s health care reforms. Furthermore, as additional PPACA provisions are introduced, there will hopefully be further legislative contributions made which are able to guide not only basic primary health care practice but also allied health care for the American public (15).

REFERENCES

No longer shut out: The National Disability Insurance Scheme and improved access to care

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“Persons with disability are subject to multiple and aggravated forms of human rights violations, including the neglect of their most basic survival related needs. These human rights violations do not only occur in far off places that lack enlightened legislation and policies, or the resources needed to meet basic needs. They occur every day, in every region, of every state and territory in Australia. Virtually every Australian with disability encounters human rights violations at some points in their lives, and very many experience it every day of their lives. In 2009, in one of the most enlightened and wealthiest nations in the world, it is possible for persons with disability to die of starvation in specialist disability services, and to have life-sustaining medical treatments denied or withdrawn in health services.”

This emotive and disturbing quote comes from the report ‘SHUT OUT: The Experience of People with Disabilities and their Families in Australia’ (1). The report highlights not only the human rights abuses suffered by Australians living with a disability, but also the significant financial challenges faced under the current disability-funding model. The report goes on to assert that the current funding model does little to address the concern that many medical and allied health sector employees have little understanding of the health needs of people living with disability, in part as a result of receiving insufficient appropriate training on how best to address the needs of those with a disability. These revelations beg the question, what is being done to improve the state of health care delivery to members of the Australian community with a disability?

In December 2011 and at the subsequent Council of Australian Governments (COAG) meeting in late July 2012 (2), the Gillard government announced the introduction of a National Disability Insurance Scheme (NDIS) (3). The NDIS is a national system, not dissimilar to Medicare, which would address major issues faced by disability services consumers, such as a lack of long term stability of funding and supports or lack of personally catered support which leads to a wasting of resources, and an inability to move between states due to the fragmented nature of service provision. Further benefits outlined by the report included funding for a research arm of the scheme, with a view to providing high quality, evidence-based training and services which manage lifetime costs of care and optimise delivery (4).

DEVELOPMENT OF THE NDIS

In 2009, the Federal government commissioned PricewaterhouseCoopers (PwC) to prepare an independent review into the long-term implications and feasibility of an NDIS. This report was commissioned by the government in response to what it perceived as the gradually worsening function of the current disability welfare scheme, which absorbs approximately $20 billion per annum (5), without adequately meeting the life-long needs of the members of the Australian community with a disability, (approximately 4 million in 2003). The current system in Australia is fragmented, with funding coming via three main streams with very different characteristics:

- Income support, including the Disability Support Pension, the Carer Payment and the Carer Allowance;
- The “care and support” welfare system, whereby Commonwealth and State Governments allocate recurrent and growth funding to purchase and provide services and to pay benefits directly;
- The insurance system, whereby individuals pay premiums to guard against the risks of sustaining a disability, and the associated physical and financial hardships (5).

Beyond the recognised disability welfare system, people with a disability consume a disproportionate amount of services of other types (5). This, coupled with an ‘ageing population’ and correlation between age and disability means a significant proportion of Australia’s future budget expenditure will be required just to maintain the unsatisfactory human rights standards delivered under the current disability funding model. Evidently, this is not solely a human rights concern, but a financial issue requiring urgent action. Findings from the PwC report highlight developing socio-economic issues such as the loss of income generation, and deterioration of mental health status of ‘informal carers’ - the friends and family of members of the community with a disability (5). The costs of providing care to an aging population and to those with a disability are well recognised by the Federal government and a key area of concern with regard to sustainable funding of the healthcare system. Evidence of this was supported by international examples from Germany, Singapore and New Zealand.

* Of Australia’s $100 billion annual health expenditure, an increasing amount, projected to reach 80% by 2020, is spent on people with a chronic or complex disease – people most likely to also have a disability

† Over the next 40 years there will be a steady increase in the number of people with severe and profound disabilities - projected to rise from 1.4 million to 2.9 million (4)
cited in the PwC report (5). The report identified that some of the major issues with the current disability funding as:

- A lack of central planning, and associated inefficiency due to lack of coordination between the many agencies involved across both Commonwealth and State;
- Little opportunity for acknowledgement of community need;
- A lack of a clear definition on disability, entitlements and eligibility for services, including links to other government services; and
- Poor monitoring of service providers with respect to both service delivery and outcomes.

The issues raised could be overcome with a properly funded NDIS by:

- Generating an appropriate funding model to ensure funds are channelled to do the most good for those in need;
- Introducing a regulatory process for achieving an agreed approach to assessing eligibility and entitlement within a model which recognises individual potential and planning for people with a disability;
- Establishing clear protocols for links with associated government services; and importantly,
- Establishing clear guidelines and expectations of service providers, including evidence based training opportunities and requirements, and requirements of service reporting and accountability (5).

Following the PwC report, the Labor government then commissioned a report by the Productivity Commission, released by the Prime Minister Julia Gillard on 10 August 2011 (4). The report essentially examined the costs and benefits of replacing the current disability services system, and specifics of the implementation of a NDIS.

In response, the government allocated $1 billion in the 2012/13 budget for the implementation of initial test sites in 2013, gradually increasing with a view to rolling out the scheme nationally from mid-2018 (6). The primary intervention approach to care provision for members of the community with a disability, coupled with the anticipated reduction in unemployment, is projected to deliver a 1% increase in Gross Domestic Product by 2050 (5). The scheme has, in theory at least, been greeted with bi-partisan support in Australia with the Federal Opposition committing to going forward with the scheme on the 2018 schedule should they win government (7). Trial sites have been agreed in the Australian Capital Territory, New South Wales, South Australia, Tasmania, and Victoria. Queensland and Western Australia have declined to commit to trialling the scheme to date.

Other stakeholders have been positive in response to the NDIS proposal. Disability groups have been unanimous in their support. Craig Wallace from People with Disability Australia says the NDIS “should be the beginning of the end of a funding lottery many disabled people face”, hoping the new system will help to relieve “the poverty that’s related to disability” under the current “broken and broke” system (8). The ‘Every Australian Counts’ campaign, encompassing the views and support of over 500 advocacy organisations, specialist disability organisations, local governments, and community and corporate groups (9) states “The NDIS will revolutionise the way people with a disability, their families and carers are supported in Australia. It will replace all the current state and territory disability systems, because they don’t work. The NDIS will be a modern, person-centred support system, helping hundreds of thousands of Australians with disability and their families to have the opportunity to participate actively in their communities by providing targeted supports aligned to need.”

The Australian Medical Association has been calling for a Medicare style ‘safety-net’ disability scheme since 2009 with then president Dr Andrew Pesce stating “doctors are fed up with the inadequate early intervention and community assistance for people with disabilities, and many get frustrated at being unable to get assistance, care coordination and support services for their patients with a disability” (10). More recently, current President Dr Steve Hambleton has criticised state governments for the delay in accepting the federal government’s NDIS proposal, urging states to “Put the interests of people with a disability ahead of political squabbling” (11).

The Australian Federation of Disability Organisation’s (AFDO) ‘Human Rights Analysis’ states that the proposed NDIS will allow a “radical rethink” on the delivery of disability support, and how people with a disability “might be empowered to enjoy full inclusion and participation” (12). The report outlines that human rights obligations create a platform for aspirational claims that seek to make a more equal, more inclusive, less violent society, citing several human rights documents that, in its view, are “setting a strong footing for the NDIS within a rights landscape is a certain way to accelerate Australia towards a goal of a more just, equitable and inclusive society” (12). In terms of the legal rights of people with disability, the AFDO cites Article 12 of the CRPD, which “affirms an obligation on States to recognise and support the equal legal capacity of all people with disability” (12).

CONCLUSION

The introduction of an NDIS represents a major health care and human rights reform for people with a disability, ensuring access to and provision of long-term, specific funding for treatment and care for those who require it, not limited by the person’s financial situation. It also provides for increased evidence based training and practice to best facilitate service delivery, in turn increasing the quality of care provided to those accessing the scheme and ultimately contributing to a lessening of the multiple and aggravated forms of human rights violations experienced by those with a disability that were identified in the ‘Shut out’ report.

REFERENCES


The Vipeholm Dental Caries Studies and the capacity for informed consent

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*The term intellectual disability will be used to refer to research participants of the Vipeholm study, although this population likely also housed individuals with severe epilepsy and other disorders. For the purposes of this study, we adopt the World Health Organization (WHO 1992) definition: “a condition of arrested or incomplete development of the mind, which is especially characterised by impairment of skills manifested during the developmental period, which contribute to the overall level of intelligence, i.e. cognitive, language, motor and social abilities.” ICD-10 Classification of Mental and Behavioral Disorders: Clinical descriptions and diagnostic guidelines (World Health Organization, Geneva, 1992), pp. 227-230

The Vipeholm studies illustrate two well-known sayings: (1) the end sometimes justifies the means, and (2) it is easy to be wise after the event.

–Bo Krasse, senior researcher
Vipeholm Dental Caries Experiments 1945-1955
University of Goteborg, 2001 (2)

INTRODUCTION

In Sweden at the beginning of the 20th century, tooth decay had become increasingly prevalent as its population industrialised and shifted from a rural to an urban habitat. By the 1930s, dental caries were prevalent in 83% of children’s deciduous teeth, and in over 99% of army conscripts, a figure comparable to the general population (1, 2). While several animal model and observational studies suggested a link between dietary consumption and caries formation, the cause of this highly prevalent, chronic disease was not known at the time (3, 4).

In order to establish an effective preventative public health strategy, it was necessary to identify the cause of dental caries. To this end, the government commissioned the Folktandvåren (Public Dental Service) and Medical Board to establish an interdisciplinary team of clinicians and scientists at Vipeholm, a state hospital for the “uneducable mentally deficient” in Lund (a small university town in southern Sweden). The resulting ten year study (1945-1955) was one of the first taxpayer-funded scientific investigations ever performed (5). The Vipeholm Dental Caries Study has since been described as “…one of the most important contributions in the entire dental literature” as it: “…definitively established that the more frequently sugar is consumed, the greater the risk, and that sugar consumed between meals has a much greater caries potential than when consumed during a meal” (6).

Vipeholm’s ethical transgressions have been a consistent focus for retrospective analysis in Sweden, but are not well known to the international medical community. Perhaps the most egregious is that all patients involved in the study had not given their informed consent, regardless of their capacity to do so (7). Here, we will briefly describe the Vipeholm experiments, and discuss aspects of the study regarding consent in contemporary medical research.

THE VIPEHOLM STUDIES: RATIONALE, DESIGN, AND OUTCOMES

Why Vipeholm?
The following summary of the Vipeholm experiments summarises extensive work that is presented in greater detail elsewhere (1, 2, 5, 8, 9). Vipeholm was the only state hospital in Sweden for individuals who were intellectually disabled, and housed 800 patients from across Sweden. The Vipeholm patient population was selected by the Folktandvåren for what was considered a highly prestigious, long-term and expensive investment of taxpayer funds for purely scientific reasons. In order to establish a link between dietary consumption and caries formation, it was necessary to perform a controlled investigation in a large, permanently housed, adult patient population for whom exposure (dietary consumption) could be standardised and outcomes (caries formation, saliva composition, etc) quantified in minute detail, over a period of years. Vipeholm was the only state-owned medical facility in Sweden that met these requirements (2).

The Vipeholm sugar experiments: methods and findings
Initial experiments exposed patients to supplements (Vitamin A, B, C, D, and Fluoride) in conjunction with regular meals in order to see if it reduced caries formation. By 1947, the researchers had failed to demonstrate any clear protective effect. The researchers
next investigated another line of evidence suggesting an association between sugar and dental caries formation. In this second series of experiments, sugar was added to the basic (standard) diet of 436 patients in various controlled formats: dissolved in beverages, baked into bread, in plain chocolate, or varying numbers of toffees or caramels over the course of a day. Control patients were given fats instead of fermentable carbohydrates to compensate for calorie consumption. Saliva samples were taken every 15 minutes through the day and analysed for sugar and acid levels (5, 10).

By 1949, the study found that, relative to control patients, those who consumed 24 toffees developed 4.02 new carious tooth surfaces per person per year, relative to control patients (0.30 caries per person per year). In particular, the study established that sticky sweets consumed between meals (rather than within meals) significantly increased carious tooth surface formation (2). Ethical issues were not discussed formally either before or during the study. Prior to 1950, patients received no dental care. By the end of the study, 2,125 new dental caries had been induced in the study period (8).

The Vipeholm experiments: reactions and consequences
When the results emerged in 1953 (11), there was an outcry. Other scientists claimed the evidence had been ‘bought’ by the confectionary and sugar industries. The media argued the studies were inhumane, and provoked national outrage (5). The parliament was stunned, and introduced a bill to halt funding for further experiments, and to prevent the use of patients at Vipeholm as research subjects from July 1955 onwards (10).

Because the experiments had employed a rigorous scientific methodology and controlled for the introduction of bias, the researchers were able to successfully defend their experiments to the government and to the public at large. The results of the Vipeholm experiments were incorporated into a major public health strategy in 1957, and the Folkstandvären became engaged in a successful ongoing campaign of preventative oral health (2).

CAPACITY AND CONSENT IN MEDICAL RESEARCH

Ethical and legal considerations of the Vipeholm experiments
Vipeholm was initiated (1944) prior to the Nuremberg Code (1947) and the Declaration of Helsinki (1964), which codify ethical considerations for human experimentation. The Nuremberg Code emphasised that research participants provide voluntary and informed consent free from coercion (article 1) and that the research should not be conducted where there is a priori reason for inducing disabling injury (article 5) (2). In order for an individual to consent, they must (1) be given accurate and balanced information, (2) have the capacity to consent, and (3) make an autonomous and voluntary choice to participate (article 1). The 1975 revisions of the Declaration of Helsinki (adopted by the World Medical Association) (2) later introduced the requirement for an independent, institutional review board (IRB) oversight (Article 4) and formal, ethical consideration of the research protocol (Article 5) (7). In the United States, the Willowbrook study (where children with intellectual disabilities were injected with hepatitis in order to observe its progression in situ) resulted in federal commissions that outlawed inhumane and exploitative research (12,13). In the context of Australian law, the National Statement on Ethical Conduct of Research Involving Humans (1999, revised 2007) (4) codifies four principles of ethical research: (1) Respect for Persons, (2) Justice, (3) Beneficence and (4) Respect for persons. The ethical ramifications of the Vipeholm studies are described in detail elsewhere (7).

Consent and contemporary medical research for the intellectually disabled: ethical, legal and human rights considerations
The Vipeholm and Willowbrook studies have not discouraged interest in contemporary medical research into intellectually disabled populations. For example, psychiatric disorders are more frequent in the intellectually disabled population. Consequently, psychiatric treatments hold great promise for improving the quality of life for intellectually disabled persons (14). Of increasing importance is the extent to which multiple centre, randomised controlled trials (necessary for the therapeutic evaluation of psychiatric drugs) can be conducted for intellectually disabled persons when legal and ethical requirements, particularly concerning informed consent, differ between countries (15).

Edwards (2000) summarised three arguments for the absolute exclusion of individuals with intellectual disabilities from participation in medical research (16). Firstly, there is the special vulnerability of the research subject. In an institutional setting where a patient is absolutely dependent on others for their wellbeing and social interaction, consent may be given out of desire to be seen to cooperate or ‘help’ their doctors and carers. Secondly, it can be argued that all research is fundamentally non-therapeutic, in that it is not primarily intended to directly benefit the potential participant. Thirdly, while one can choose to be used as means to another’s ends, it is morally illegitimate to use others in this way in the absence of their consent. Alternatively, McDonald and Keys (2009) have argued that blanket prohibitions imposed by IRBs may actually limit the autonomy and self-determination of intellectually disabled individuals and thereby increase their marginalisation in society (17).

The current legal and international human rights framework emphasises the capacity of the intellectually disabled for social, physical, emotional and intellectual development. Autonomy and independence are central features of the United Nations Convention on the Rights of Persons with Disabilities (5). In Australia, the Disability Act (2006 (Vic)) upholds the rights of those with a disability to human worth, to live free from abuse, neglect or exploitation, and the right to exercise control over their own lives (6). Under these principles, an individual who assents to participation in medical research cannot be legally obstructed from doing so. Conversely, any indication by the individual that they refuse to participate must be respected, and participation in the study stopped.
Guardianship and consent by proxy for medical research

Often, it is difficult to ascertain patient preferences in the absence of decisional capacity. It has been common practice for medical researchers to seek the consent of a proxy or guardian in order to enable participation of intellectually disabled individuals in a research project. Here, the common law position is less clear. Guidelines for decisional competency, including the involvement of proxies or guardian decision makers, were established for medical treatment, not research. Consequently, there is a tendency for research participation to be assessed on a per-case basis. A guardian makes the decision to participate based on two principles: patient preferences and wishes, and what is in the best interests of the patient (14). Importantly, the consideration of ‘best interests’ often is widened to include the interests of similarly placed persons (i.e., intellectually disabled individuals similar to the person being asked to participate). Regardless, it remains the responsibility of the researchers, not the guardians or patients, to ensure that the rights of the individual are respected at all stages of the research process and to meet the requirements of consent under the law (13).

CONCLUSIONS

The Vipeholm studies have had a substantial influence on public health policy and fundamental scientific understanding. The study identified the cause and means of prevention of a disease that had been long present in human history, and had markedly increased as a consequence of urbanisation and industrialisation. In other ways, Vipeholm serves as a marker against which progress in ethical research conduct can be measured, from paternalistic to reflective and positive engagement.

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Can we do it? Yes we can! The juggle: medical school and family

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With an increasing number of postgraduate medical schools, the average age of medical students has increased compared to the past (1-2). This increase in average age has lead to more people entering medical school with pre-existing commitments. They might have to juggle other responsibilities in addition to medicine, including work and family. Medical school is hard enough as it is. Some people already have children when they start; others have them during the course of medical school.

One of us (a father) had three children and went for the fourth and final, and ended up having their fourth, fifth and sixth at the same time (triplets!!!!). And the other one is a first time mother who had a baby during medical school and took a year off and returned to study. This is our account of how we survived medical school and family life with children. As fourth year medical students at the cusp of graduation, we would like to share our experience and strategies hoping that this might help others in similar situations.

There are three elements to this situation. There is you; your family and your study.

Let us be egocentric and start with you. You can’t achieve anything if you are not in the right place mentally as well as physically. To achieve this you need adequate sleep, eat well, get some form of physical activity and do something you enjoy. The bottom line is if you do not look after yourself you are in no position to look after anyone else or perform well in your studies. Well that is a statement that everybody would have heard but it comes down to how many of us follow it. It is almost impossible to perfect this art of looking after yourself when there are competing commitments. Sometimes you have no choice but to lose sleep close to exams or when your child is sick. But one must realise that this is not a sustainable state and to be productive down the track, you have to reevaluate and prioritise. At certain times one priority will rise above another; this is not to say that the others are completely neglected. The process of prioritising is a dynamic one.

Now getting on to the family: Before children it was easier to migrate into a cocoon the weeks preceding exams. But young children do not realise it is the most important assignment or exam. They have no idea! You still have to engage them, play with them and take the time to make them feel special even if you have exams the day after. But it is all worth it. Picture this; you get home after a long, hard day where you have been hammered by your consultant, you walk through the door and your two year-old waddles up to you with a big smile, lifts their arms up and gives you a big cuddle. All the difficulties seem to melt away.

There are other great positives to having family with you during medical school. For starters, you have endless volunteers (even if they were coerced into it) to practice your clinical skills on, but don’t get too comfortable crossing the doctor-patient relationship boundaries. Jokes aside, a content family means more understanding and support in general but more importantly close to exams. It does take some effort and thought into preparing the family for hard times. It is very important to be open and communicate well at all times. This helps set expectations for yourself and your family at various points in the course. Some suggestions in keeping the family happy are flowers, untouchable family time (well, almost), one on one time with the children and partner, baking, outings, good food – anything to recognise their contribution and make them feel appreciated. One strategy that has worked for us is to do more than your fair share during the times you can and then close to exams you can hand over everything or almost everything and take the time off when needed.

Now getting down to business: managing your studies. Organisation is not just a good quality to have but an absolute necessity. Some strategies to organise your schedule are to have lists and cross them out as you go. This not only gives you direction and helps you prioritise but also gives a sense of accomplishment. Another strategy is to set specific time for study, this could be early morning or late at night when the family is asleep. As it gets closer to exams weekends have to be encroached upon as well. Some people find it difficult to study at home for one reason or another. For us the only time we get to open our university bags at home is to get our lunch box out. Because of this it becomes a necessity to find a location for study outside home – this could be the library, or the park.

Even with the best laid plans and all the organisation in the world, you still have crises pop up when you least expect them. This could take the form of you, your children or partner getting sick or other family commitments. In all these situations you may have to take time off. This might lead to you feeling behind in your studies (well you are behind). Our solution to the above crisis is to prepare for them by working consistently. Part of that is to look up the requirements for the entire year including assignments, portfolio items etc. On days when you think you can’t be very
productive, get the fluff out of the way.

People, please get a study group. They are valuable. They give you an idea of where you stand and push you to the boundaries, they give you plenty of support and they give you accountability to your study. We are lucky to be in a really good study group. Sometimes there can be some tension, but we always realise people are considering each other’s best interests and we have become close friends. One of our friends in the group says, “This is more of a support group than a study group”. So get in a study group with people you get along with and having a mixed group of people with and without children is a good idea. Make it fun as well. If you are going to spend hours in the same spot, it is good to have food as part of study sessions.

Just a little note on taking a year off and coming back to medical school: There are a few challenges that come with this. You haven’t touched a book in a year and you have been busy learning to be a mother or a father for the first time. It is not easy. You forget medicine. You come back and there are a whole bunch of new people who have already developed friendship circles. Initially you don’t feel like you fit in. You have a lot of self doubt. You have to leave your baby in child care and you are focused more on what your child is doing more than anything else that is going on around you and guilt is a constant state. But in the face of all this, you have to keep focused and you have to remind yourself of why you chose medicine in the first place. Just remember you are setting a great example for your children and don’t feel bad if there are days or even weeks when you can’t perform as well as the others. That will make a difference. As they grow it gets a little easier and you are not worried every time they are sick and rush them to ED. It will get better.

In conclusion, juggling family with medical school is not easy. It takes a great deal of work and energy. It is physically, mentally and emotionally demanding and it is time consuming. Yet the hard work is worth it and in our experience the people who have done it have done it well. Medical school is just the start and you are going to achieve bigger and better things. You need your family by your side to enjoy your achievements and in our view, in the long run, family is of greater importance. Don’t let that which is of greater value be at the mercy of that which is of lesser value. To conquer the world at the expense of family is just not worth it, but with them on your side you just might!

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**INTRODUCTION**

_Clostridium difficile_ is the most common cause of hospital-acquired and antibiotic-associated diarrhoea (1). The infection can range from asymptomatic colonisation to severe pseudomembranous or fulminant colitis (2), resulting in prolonged hospital stays with high morbidity and mortality, and extra cost and pressure to the healthcare system (3).

In 2003, there has been an emergence of a highly virulent strain, _C. difficile_ BI/NAP1/027, in North America and Europe, with a mortality rate of >10% in people aged over 60. Following this outbreak, there were reports of initial cases of this strain in Australia, South Korea, Hong Kong and Costa Rica. Considering the high mortality, the emergence of this highly virulent strain is a worldwide concern (4).

This review aims to increase awareness of the importance of _C. difficile_ infection as a nosocomial infection, and to update knowledge on current epidemiology in Australia.

**MICROBIOLOGY**

_C. difficile_ is an obligate anaerobe (5), Gram-positive bacillus that can exist in a vegetative or spore form. In its spore form, the bacteria can survive harsh environments and common disinfection techniques. The spores are also resistant to antibiotics, thus they can remain in the gastrointestinal tract and potentially contribute to recurrent disease after treatment and eradication of vegetative _C. difficile_ (6).

_C. difficile_ colonises 60-70% of healthy newborns and infants aged 12-18 months (6), however in adults, it is only present in the stools of 5% of healthy individuals (7).

**VIRULENCE FACTORS**

The primary virulence factors are the two toxins, toxin A (TcdA) and toxin B (TcdB). TcdA causes fluid secretion, mucosal damage, and intestinal inflammation, while TcdB is a cytotoxin (2).

The epidemic _C. difficile_ strain (BI/NAP1/027) has an 18 base pair deletion within the TdcC gene (negative regulator for the production of TcdA and TcdB), as well as a deletion at position 117. These deletions result in a truncated TcdC protein. Due to the defective negative regulator, they are able to produce significantly more toxin, which has been associated with increased disease severity (8).

This strain has also been shown to produce a third toxin, _C. difficile_ toxin (CDT), which is a binary toxin. CDT induces microtubule protrusions at the cell surface of intestinal epithelial cells, therefore increasing adherence (8). This hypervirulent strain also shows resistance to newer fluoroquinolone antibiotics, such as moxifloxacin (9).

**PATHOGENESIS**

_C. difficile_ is transmitted by the faecal-oral route (2). There is a preference for the large bowel for colonisation, which is probably due to the anaerobic environment; while colonisation in the small bowel is quite rare (6). Once the spores have reached an appropriate location within the gastrointestinal tract, germination occurs. After germination, _C. difficile_ adheres to the intestinal epithelium. In the hypervirulent BI/NAP1/027 strain, adherence is increased by CDT. After or during colonisation, vegetative _C. difficile_ releases TcdA and/or TcdB into the colon, which leads to clinical manifestations of _C. difficile_ infection. However, the non-toxin producing _C. difficile_ strain will not result in clinical disease (6,10).
RISK FACTORS

The risk for acquiring C. difficile infection is increased by factors that impair the normal resistance mechanisms, including disruption of host flora by antibiotics, gastric acid suppression, immunosuppression, or cytotoxic drugs that may result in C. difficile colonisation in the gastrointestinal tract (9). Many antibiotics have been implicated in C. difficile infection, but the most common ones are broad spectrum agents, such as ampicillin, amoxyclillin, third and fourth generation cephalosporins, and clindamycin (9). C. difficile infection should be suspected in any hospitalised patient or any person in the community who develops diarrhoea after a course of antibiotics or in association with immunosuppressive therapy.

CLINICAL PRESENTATION

The severity of C. difficile infection varies from mild diarrhoea to pseudomembranous colitis, toxic megacolon and death (10). The symptoms usually occur five to ten days after commencing antibiotic therapy (9). Diarrhoea is usually watery, but may occasionally be bloody. Other associated symptoms include fever, anorexia, nausea, and abdominal pain. An elevated white cell count and hypoalbuminaemia also commonly occur (9). Clinical features of severe C. difficile infection include fever (>38.5°C), peritonitis, evidence of bowel perforation, the presence of ileus, and/or toxic megacolon. Laboratory findings associated with severe C. difficile infection include lactic acidosis, elevated white cell count, low albumin level, and acute renal impairment. The presence of pseudomembranous colitis on colonoscopy and radiological evidence of dilatation of the large bowel without involvement of the small bowel, thickening of the bowel wall, perforation, or unexplained ascites, are also strongly suggestive of severe C. difficile infection (9). Risk factors associated with poor prognosis include age over 60 years, significant underlying comorbid conditions or organ dysfunction, and immunocompromised status (9).

DIAGNOSIS

In Australia, laboratory diagnosis of C. difficile infection is most commonly made through detection of C. difficile TcdA and TcdB using Enzyme Immunoassay (EIA) kits. Despite limitation of its sensitivity (75-95%), it remains widely used due to its simplicity and relatively low cost (11). Commercial real-time Polymerase Chain Reaction (PCR) testing for toxin genes, has better sensitivity (93%) and specificity (97%), and is now available in many Australian laboratories (11). Other methods of diagnosis include anaerobic toxigenic culture, screening EIA to detect C. difficile glutamate dehydrogenase (GDH), and cell culture cytotoxicity neutralisation assay (CCNAs) (12). Anaerobic toxigenic culture is extremely sensitive, but is labour intensive and takes at least three days (4). Screening EIA to detect GDH has high sensitivity but is not very specific, while CCNAs takes 24 to 72 hours to complete (12). Some commercially available PCR methods can presumptively identify PCR ribotype 027 based on detection of binary toxin genes and the 18-base-pair deletion in the TdcC (4). An alternative is to screen for moxifloxacin resistance, as most BI/NAP1/027 isolates are resistant to moxifloxacin (9). Repeat testing is not indicated within 30 days of initial detection, as 25-30% of patients have asymptomatic carriage within this period (9).

TREATMENT

The current treatment for C. difficile infection based on Australian Society for Infectious Diseases (ASID) guidelines is metronidazole for mild to moderate disease, and oral vancomycin for severe disease. The oral route is preferred for metronidazole administration as the concentration in the colon is similar after oral and intravenous administration in patients with ileus. A ten day course is usually used, but a longer course may be indicated, although it should not be used for longer than four to six weeks due to the potential for peripheral neuropathy. Vancomycin is more effective in severe C. difficile infection and is associated with lower rates of treatment failure and relapse than metronidazole. Vancomycin achieves a much higher concentration following oral administration than intravenously, as it is not absorbed in the gut. Vancomycin can also be administered as a retention enema, particularly in cases of ileus. Surgery is indicated if there are signs of bowel perforation, toxic megacolon, and/or ongoing severe sepsis despite antibiotic treatment. The most commonly performed surgery is subtotal colectomy, with an end-ileostomy. Recurrent C. difficile infection should be treated with re-administration of metronidazole or vancomycin, as for an initial episode. However, for second or subsequent recurrences, an alternative antibiotic is preferable, due to concerns about the cumulative toxicity of metronidazole. Alternative therapies for this include bacitracin, tigecycline, fusidic acid, and faecal enemas (“stool transplant”).

PREVENTION

The hospital environment, as well as chronic care facilities, can become grossly contaminated with C. difficile spores, which can persist for months to years and be easily transmitted by hands of healthcare workers, unless methods of cleaning and disinfection that remove or kill spores are used (2, 9) in addition to hand hygiene before and after contact with patients and their immediate environment. Alcohol-based hand rub is effective against the vegetative form, but not as effective against spores as hand washing, which physically removes spores (9).

EPIDEMIOLOGY IN AUSTRALIA

Limited data were available from Australia on the incidence of C. difficile infection and the distribution of the various ribotypes before the introduction of ribotype 027 (8). The first case of C. difficile ribotype 027 thought to have been acquired in Australia
was in an 83 year-old man who developed watery diarrhoea and subsequently toxic megacolon post-aortic valve replacement (13). Since then, there have been further clusters of C. difficile ribotype 027 infections centred in residential aged-care facilities.

C. DIFFICILE INFECTION SURVEILLANCE IN AUSTRALIA

C. difficile is not notifiable to public health authorities in any jurisdiction in Australia, and there are no known formal patient-based surveillance systems for notification of severe C. difficile infection cases or outbreaks, nor a reference laboratory for C. difficile infection surveillance were proposed in 2002; however they have not yet been widely adopted (14). Nevertheless, C. difficile infection is one of the markers of healthcare-associated infections, recommended by the Australian Commission on Safety and Quality in Healthcare, and national surveillance will be introduced soon (15).

CONCLUSION

C. difficile infection is the commonest cause of nosocomial infection and antibiotic-associated diarrhoea, with high morbidity and mortality, causing extra costs and pressures on the healthcare system. The emergence and outbreak of highly virulent C. difficile BI/NAP1/027 in North America and Europe, followed by its detection in Australia, highlight the need for increased awareness and a better surveillance of C. difficile infection in Australia.

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Government policy on financial assistance to medical students discourages medical research

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The Social Security Act 1991 section 569(2)(b)(i) makes anyone who has completed a “degree of Doctor” ineligible for Austudy. The intention behind this rule is reasonable in that it limits the time taxpayers support an individual’s study. However for Bachelor of Medicine, Bachelor of Surgery (MBBS) training, it is discriminatory, discourages our country’s international medical research competitiveness, and reduces the quality of care that is delivered to individual patients and the community as a whole.

It is discriminatory because students who obtain their MBBS before their Doctor of Philosophy (PhD) are eligible for government support, while those who obtain their PhD before their MBBS are not. In addition, I would argue that it actually makes more practical sense to encourage our future medical doctors to obtain their PhD first, because someone with an MBBS is less likely to subsequently obtain their PhD due to the greater financial loss that they would incur.

It reduces Australia’s international medical research competitiveness by discouraging those with a PhD from obtaining an MBBS, in an area where an MBBS is highly respected. It is generally accepted that researchers with both an MBBS and PhD are more highly regarded than those with only an MBBS, who are more highly regarded than those with a PhD alone. The qualifications of the international leaders in medical research give strong support for this.

It reduces the quality of medical care delivered to individuals and the community as medical doctors need to know the evidence behind their decisions, understand how that evidence was obtained, do their own research if required, and collate all this information in order to make better decisions for their patients and the general public. That is, our medical doctors are expected to have a great understanding and appreciation of research.

Therefore, individuals who already have a PhD are a logical group to choose from to train for their MBBS. This is recognised by most graduate-entry medical schools in Australia that positively encourage applicants to obtain their PhD prior to their MBBS study by preferentially selecting them over those without one. However, the current legislation discourages those with a strong, proven interest and competency in research from becoming our future medical doctors by denying them social security support during their MBBS study. One technical workaround would be for universities to change their policy to allow students to defer their PhD after they have met the requirements to graduate, and to have medical schools recognise this.

I put this information to the Minister for Tertiary Education, Skills, Science and Research, Leader of the Government, The Hon Chris Evans. His reply, dated 26 April 2012, was:

“... It has been a long-standing Australian Government policy that student income support should be provided to students in financial need to gain qualifications to enable them to enter the labour market. Those students undertaking further study after completing doctoral degrees do not fulfil this criterion, as they have already been awarded qualifications at the highest level...”

This policy is at odds with most medical schools, in that it discourages individuals with a proven track record of medical research from obtaining their MBBS. This is unjust, reduces Australia’s international competitiveness when it comes to medical research, and ultimately affects the quality of medical care delivered to patients.
Q fever – cut the bull!

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INTRODUCTION

In Australia, Q fever is largely an occupation-associated infectious disease. It can result in significant morbidity and time off work. A relatively effective vaccine has been available since 1989, but there are still 300 cases reported annually. After introduction of the National Q Fever Management Program (NQFMP) there was a halving of reported cases, but with cessation of the vaccination program in 2006, a further drastic reduction cannot be expected. The aim of this article is to explore the impact of the NQFMP and review the available trends since its cessation. This helps to identify current gaps in the data on vaccination and Q fever, and therefore suggests further areas of research.

THE ORGANISM

Q fever is an infectious disease caused by the obligate intracellular bacteria Coxiella burnetii. The disease was first recognised in the mid-1930s amongst a group of abattoir workers and farmers in Brisbane. Edward Derrick documented the disease and isolated an unknown organism responsible for causing fevers in this group of workers. Hesitant to name it, he called it “Query Fever” which was shortened to Q fever. Derrick sent infected tissue to Macfarlane Burnet in Melbourne, who identified the organism to be Rickettsiae-like. Herrald Cox in Montana, USA subsequently identified and classified it as a new genus, Coxiella burnetii, in recognition of his and Burnet’s work (1).

Q fever is a zoonotic disease acquired from wild and domestic animals. In Australia it is most commonly acquired from cattle, sheep and goats however other animal reservoirs exist including kangaroos, bandicoots, camels and rabbits (1-4). The bacteria are present within urine, faeces, milk products, or animal birth products. Humans are inoculated directly via aerosol inhalation of these products or indirectly through inhalation of contaminated products such as dust (1). The spore-like properties of Coxiella burnetii explain the high level of physical resistance it displays. It is thought to survive in the environment for months to years (5).

CLINICAL MANIFESTATIONS

The effects of Q fever vary from country to country and host to host. It is estimated that 60% of cases are asymptomatic (2,6,7). Acute Q fever has a variable incubation period of approximately three weeks (1,8) and symptoms last for one to three weeks without treatment (8). In Australia the common clinical manifestation is of a non-specific, flu-like presentation which can lead to misdiagnosis and underestimation of disease rates (1,9). Complications can occur with acute Q fever and include hepatitis, pneumonia, headaches and, in rare cases, meningitis and encephalitis (2,10).

Q fever occurs worldwide with the exception of New Zealand (10). After acquiring acute Q fever some individuals may progress to chronic Q fever. Those that progress often have pre-existing valvular disease, immunosuppression and other co-morbidities (11). The most common forms of chronic Q fever are infective endocarditis (60-70%) and post-Q fever fatigue syndrome (10-20%) (6). Both forms are very difficult to treat, carry significant morbidity, and have a mortality rate of less than 5% (2,12,13).

DIAGNOSIS AND MANAGEMENT

Diagnosis of Q fever is usually made by serological detection of IgM and IgG levels to phase II (acute) and phase I (chronic) antigens (2). Acute Q fever can also be de-
tected by Polymerase Chain Reaction in the first eight to ten days after exposure (1). Treatment for acute Q fever involves two weeks of antibiotics, commonly doxycycline (14). Infective endocarditis management requires a minimum of 18 months of antibiotics (doxycycline and hydroxychloroquine), five years monitoring and in selected cases cardiac surgery (11).

**OCCUPATIONAL EXPOSURE**

The highest reported occupational occurrence is seen in the meat industry (60%), followed by the agricultural industry (30%) (13). Any occupation where employees are exposed to cattle, sheep, goats, camels and kangaroos, or their biological fluids, are at high risk (8). This includes sheep shearers, stockyard workers, animal transporters, veterinarians, agricultural staff and laboratory personnel (8). The occupational data recorded reflects these associations, as does the typical patient demographics (1,4).

**COSTS TO INDUSTRY**

There is a significant financial cost associated with Q fever. Occupation-acquired, laboratory-proven Q fever is largely compensable (15). Work Cover compensation claims are estimated to cost $1.3 million per year (13). Legal payouts can be substantial with a $1.1 million payout from an isolated case of occupation-acquired chronic Q fever recorded (13). Other costs include medical expenses and replaced labour, estimating 1700 weeks of work are lost annually from the disease (1).

**VACCINE EFFICACY**

Since 1989 a whole-cell, formalin-inactivated vaccine has been available for use. The Q-VAX® vaccine can have serious adverse reactions if given to a previously exposed or vaccinated individual (1,8). Therefore, a thorough history of previous infection or vaccination, skin testing and antibody titres are required before vaccination can occur (7). A literature review by Chiu and Durrheim analysed seven studies to determine the efficacy of the vaccine in Australia. Although the vaccine efficacy ranged between 83-100% and none of the studies were conducted under ideal conditions (3), the general consensus was that the vaccine is highly protective (>95%) for individuals with high exposure risk, as long as it is given fifteen days prior to exposure (15).

**THE NATIONAL Q FEVER MANAGEMENT PROGRAM**

In the early 1980s, before the release of the Q-VAX® vaccine, between 600 and 800 new cases were being reported each year (16). Figure 1 shows the disease trend since 1991. Although the vaccine was available from 1989 there was limited uptake until 1994. This was when the vaccine manufacturer, CSL Limited, ran a national campaign to inform and help establish vaccine programs in large abattoirs (12,16). This vaccination uptake was not followed elsewhere and the reported rates reflected this (7,12). During 2001-2002 the Australian Government established the NQFMP which ran in two phases to provide free vaccination to some high risk occupations. Phase I included abattoir workers, contractors and sheep shearers. Phase II included sheep, dairy and beef cattle farmers, employees and unpaid family members working on farms (4,7). Funding was only supplied for three years, and so the program ceased during 2004-2006. Although the full success of the program is hard to estimate, the greater than 50% reduction in notification rates seen from 2002-2010 has been largely attributed to it (7,17). In 2003 an economical analysis was performed to determine the potential cost effectiveness of the NQFMP. This assumed 100% vaccination uptake among meat workers and 20% among agricultural workers, and showed this to be very cost effective (13).

**THE RESPONSE TO THE NQFMP**

The response to the NQFMP varied between states and occupations. The overall uptake of the vaccine was estimated at 50-54% nationally (7), with a higher uptake in Phase I than Phase II. A Southern Queensland study by Palmer et al. (2007) demonstrated the consequences of a low vaccine uptake during 2000-2006. At least 71% of occupation-acquired Q fever cases were unvaccinated despite the majority (92%) being eligible under the NQFMP (12). Massey et al. (2009) displayed similar results in a New South Wales (NSW) study from 1993-2007, with all 38 cases unvaccinated despite the majority being aware of the vaccine. Being naive to risk and access problems were the most common reasons for not being vaccinated (18).

**CHANGE IN OCCUPATIONAL INCIDENCE**

The meat industry appears engaged in Q fever prevention with 95% maintenance of vaccination programs after cessation of the NQFMP (4,13) and continuous employee registration of vaccination status via the National Q Fever Register. This is in significant contrast to the agriculture industry. Monitoring in NSW showed a possible change in the leading occupation from meat workers to agricultural workers dur-
ing 1993-2007 (18). However, monitoring of occupational trends was difficult as occupation was reported in less than 50% of cases and the difference was not statistically significant.

**TRENDS SINCE NQFMP CESSATION**

Previous data shows low vaccination rates occur without a vaccination program. Now that the NQFMP has been established and subsequently ceased, the onus is on the employers to provide staff vaccination. Fear of litigation is a strong incentive for employers to provide vaccination but vaccination is not mandatory (19). In the 2007-2008 the national health budget of $16.6 million was committed to the “National Immunisation Program – Q Fever Vaccine” which solely assists CSL Limited to continue to produce and supply the vaccine until 2016 (20). No other funded vaccination programs exist.

**CONCLUSION**

Following termination of the NQFMP the future epidemiology of Q fever remains unclear. Nearly five years after complete NQFMP cessation there are still 300 cases of Q fever reported annually. The meat industry has shown significant declines in Q fever notification rates and continues to provide vaccination programs for the majority of workers. However, the agriculture industry is behind. Further surveillance is needed to determine the effectiveness of the NQFMP and the association with the agriculture industry. A cost-effective analysis determining the value in a vaccination program among agriculture workers is needed. This could determine if re-introduction of a government-funded or subsided vaccination program is warranted.

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INTRODUCTION

Peer-assisted learning is an integral part of medical student training. It occurs in the informal situation of approaching a peer for assistance, with students more likely to approach peers than faculty (1), in organised study groups, and in formalised Problem Based Learning (PBL) sessions. Peer-assisted learning has been shown to be as effective as the training provided by experienced faculty in learning anatomy (2–4), communication and history taking skills (5,6), laboratory skills (7) and clinical skills (8–11), as well as in the PBL setting (12). These are examples of the cognitive congruence hypothesis that suggests that a teacher with a similar knowledge base to a student is more effective than an expert in the field (13,14). However, research in the area of peer learning in clinical education is poor with no clear gold standard learning model (15).

Peer-assisted learning has been shown to be of benefit not only to those tutored but also to the tutors themselves (5,16). The tutoring experience helps students’ academic development, enhance their expertise and may help in the making of decisions regarding choice of career (16). Moreover, medical training in education principles have been proposed as: current students are the physicians and faculty members of the future and will have teaching roles; students may become more effective communicators; and students with a better understanding of teaching may become better learners (17). Other suggested benefits include alleviating teaching pressure for faculty, creating a comfortable and safe learning environment, providing junior students with role models, offering alternative study methods, enhancing motivation and preparing students to be teachers and leaders (13).

ABSTRACT

Peer-assisted learning has many theoretical benefits both for the student tutor and tutee. During 2010 the Year 4 students at The Australian National University’s Medical School (ANUMS) conducted an informal bedside mentoring program for Year 2 students. All participating students perceived a benefit from the program and enjoyed the experience. No quantitative benefit to Objective Structured Clinical Examination (OSCE) scores could be determined. The majority of non-participating students cited time constraints as their primary reason for not doing so, however, approximately one quarter of students stated they lacked the confidence to participate. Expectations of new students to the program were assessed with 54–80% of future Year 4 students planning to participate. Given the theoretical and perceived benefits to students, continuation of the program is warranted and integration into the professionalism and leadership theme within the curriculum suggested.

Near-peer teaching on the ward has been demonstrated to provide junior medical students with beneficial and valued learning experiences (18,19). In this setting, junior students attend the wards with an experienced student teacher. Students gain insights into the practice of medicine, the process of becoming a doctor, the nature of interaction with patients and clinical skills (18). In addition, students who receive bedside teaching also attain a higher level of self-confidence (19).

During 2010, the Year 4 medical students at the ANUMS conducted an informal bedside mentoring program for the Year 2 cohort. Given the theoretical benefits of such a program, this study was conducted to examine both the successful aspects of the program and opportunity for improvement with the overall goal of formalising this program to ensure its continuation if found to be successful. The aims of this study were:

1. Evaluate the experiences of the Year 2 and Year 4 students (both positive and negative).
2. Identify the reasons for non-participation for both the Year 2 and Year 4 students.
3. Determine the anticipated participation of future students and their expectations.
4. Provide a strategy to ensure the continuation and success of the program if warranted.

This article presents the investigation into the bedside mentoring program at the ANUMS. In Section II the study design is presented, followed by the results of this investigation in Section III. These results are discussed in Section IV and recommendations to the ANUMS are provided.

METHODS

This study was conducted by a series of surveys sent to all students enrolled in the relevant year groups at the ANUMS. The
Table 1. Year 4 student experiences of bedside mentoring

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed bedside mentoring</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring was beneficial to my learning</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I recommend bedside mentoring to future yr 4 students</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring takes up too much time</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>My bedside mentoring was beneficial to yr 2 students</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I would like formal recognition for bedside mentoring</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>I would have liked a teaching training session</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring should be mandatory for yr 4 students</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

The following surveys were conducted:

- A retrospective survey of the nine participating Year 4 students in 2010 which focused on their experiences as teachers.
- A retrospective survey of the 81 non-participating Year 4 students in 2010 which focused on their reasons why they did not participate.
- A retrospective survey of all Year 2 students in 2010 to determine the level of participation, the experiences of those who participated and the reasons for non-participation.
- A prospective survey of all Year 4 students in 2011 to determine their expectations of the bedside mentoring program.
- A prospective survey of all Year 2 students in 2011 to determine their expectations of the bedside mentoring program.

The surveys were advertised by the ANU-UMS online discussion board (MedOnline) and via email, and were conducted using an online polling system. The student responses were anonymous and voluntarily completed. Consent to participate was given implicitly by the submission of the survey.

RESULTS

The student experience
During 2010 nine Year 4 students participated in bedside mentoring, of which six responded to the survey. All six respondents would have liked to have received bedside mentoring themselves when they were in Year 2. The six responders conducted 29 bedside mentoring sessions with approximately 65 Year 2 attendees (some of which would have been the same student attending multiple times). Extraplating from the six respondents, it is estimated that a total of approximately 40 sessions were conducted in 2010 with approximately 100 Year 2 participant attendances. The Likert scale responses by the Year 4 students are listed in Table 1.

The Year 4 participants were also asked to provide comments about their experiences. The majority of comments (four respondents) were in regards to the time pressures in Year 4 making it difficult to schedule bedside mentoring sessions. The other two respondents stressed that the program should remain with optional participation.

The Year 2 students of 2010 were also surveyed to find out the experiences of students who participated in the program. The survey was sent to the 100 students enrolled in the year, of which 28 responded. Of these respondents, 15 participated in bedside mentoring (53%). The average OSCE score at the end of Year 2 for these 15 students was 184.7 (standard error 3.3), and the correlation between the number of bedside mentoring sessions attended and OSCE score received was low (correlation coefficient of 0.3). The Likert scale responses by the Year 2 students are listed in Table 2, which shows the majority of students enjoyed bedside teaching and found it beneficial to their learning.

The Year 2 participants of 2010 were asked to provide comments on their experiences. Several commented that they found the process gave them more confidence to tend the wards without the formality of a supervising consultant. Two students noted that the program needed to be advertised better and the sessions spread more fairly amongst the participants.

Reasons for non-participation
During 2010, 81 Year 4 students did not participate in the bedside mentoring program, of whom 20 responded to our survey. Seventy percent of these students stated that they would have liked to have received bedside mentoring themselves during their Year 2 program despite not providing it during their final year. The students were asked to choose from a list of statements as to why they did not participate, the results of which are listed in Table 3.

Ninety percent of non-participating Year 4 respondents gave ‘other reasons’ which largely fell into two groups, first, those who were too busy with other learning commit-
ments (12 respondents, 60%), and second, those who were not confident enough to mentor Year 2 students (five respondents, 25%). The Year 4 students were also asked if they had any other comments about the program. Comments were made by five students, two of which were about the time constraints in the Year 4 schedule. One student stated that with hindsight they wished they had provided bedside mentoring, another student stated that bedside mentoring should not be compulsory and one other stated that they thought it was an excellent program which should be formally supported.

The Year 2 students of 2010 were surveyed to find out why some students did not participate. The survey was sent to the 100 students enrolled in the year, of whom 28 responded. Out of these respondents, 13 did not participate in bedside mentoring (46%) and were asked to choose from a list of statements about why they were not involved. The majority of Year 2 non-participants stated “they did not get around to it”. These results are listed in Table 4.

Three of the five ‘other reasons’ for non-participation were the same, that is “the program was not well advertised”. Two students commented that there should have been a fairer way to allocate the spaces as they would have liked to attend but were unable to allocate themselves early enough. The average OSCE score of the 13 non-participants was 183.8 (standard error of the mean = 1.6).

### Table 3. Reasons for not participating in bedside mentoring by Year 4 students in 2010

<table>
<thead>
<tr>
<th>Statement</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>18 (90%)</td>
</tr>
<tr>
<td>I was interested initially, but forgot or did not get around to it</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Seemed too time consuming</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Seemed too difficult</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>Did not know what was required</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Was not interested</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>I did not see any benefit to Year 2 students</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Did not know about the program</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>I did not see any benefit to me</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

### Future student participation and expectations

The Year 2 students of 2010 and 2011 as well as the Year 4 of 2011 were surveyed to determine how many students wanted to provide bedside mentoring during their Year 4 schedule. The survey was conducted prior to the Year 4 students commencing bedside mentoring. The anticipated participation rates of future students is high with 54%, 80% and 67% of the Year 2 students of 2010, 2011 and Year 4 students of 2011 respectively indicating that they would like to participate.

The Year 2 students of 2011 were surveyed about their expectations of being tutored in the bedside mentoring program, of which 21 responded. The students were asked to provide comments on their expectations of the program. More than half of the comments (55%) described general positive expectations of the program. Several students suggested that there would not be enough Year 4 students available due to time constraints. The Likert scale results are listed in Table 5.

The Year 4 students of 2011 were surveyed about their expectations of teaching in the bedside mentoring program, of which six responded. All six students stated that they would have liked to receive bedside mentoring themselves when in Year 2. Comments on their expectations of the program revolved around a perceived difficulty due to time constraints. The Likert scale results are listed in Table 6.

### Continuation of the program

All students surveyed were asked to offer suggestions to improve the program and ensure a positive learning experience. The following suggestions were received.

1. Hold a social event to introduce the Year 2 and 4 students to each other and follow up with further social events.
2. Offer bedside mentoring outside of the Year 2 lunch break.
3. Offer an incentive to the Year 4 students (eg not having to do an associated portfolio item such as the PAL review article).
DISCUSSION

Peer-assisted learning has many theoretical benefits to both the senior student tutors (16,17) and the junior student tutees (18,19). All students (both Year 2 and Year 4) who participated in the ANUMS bedside mentoring program in 2010 either agreed or strongly agreed that they enjoyed and benefited from the experience. Interestingly, while all students stated that they benefited from being involved, many students did not see the benefit to the other party (i.e. Year 2 students did not unanimously see benefit to Year 4 students and vice versa). All students either agreed or strongly agreed that they would recommend participation to future students. Not one student stated that the bedside mentoring program took up too much time.

The results show that, for the participating students, it was a useful program. This perceived benefit however, could not be differentiated for the Year 2 students by OSCE scores with participants having an average of 184.7 (standard error in the mean = 3.3) and non-participants having 183.8 (standard error in the mean 1.6) and low correlation between the number of sessions attended and OSCE score (correlation coefficient of 0.3). To investigate this matter further, an increased number of survey participants are required due to the low statistical significance of the results. It should also be noted that OSCEs are only one method of testing a student’s knowledge and do not examine all potential benefits from bedside mentoring (e.g. confidence in interacting with patients).

Recommendations to improve the bedside mentoring program

As future registrars, specialists and potential lecturers in medicine, current medical students will be required to teach others (20), yet the educational skills required are not taught in the curriculum of medical schools. For example, while the ANUMS dedicates approximately 10% of its curriculum to a ‘professionalism and leadership’ theme (21), there are no formal classes on teaching. This professionalism and leadership theme is common to most medical programs and would be ideally suited to include teaching as part of students’ development into future doctors.

Most Year 4 students were not in favour of making bedside mentoring mandatory in the curriculum despite stating that participating was to their benefit. However, it is proposed that participation in the bedside mentoring program could be an attractive and suitable alternative to existing assessment for the professionalism and leadership theme. With a suitable framework (such as minimum number of sessions requirement and a reflection on teaching experiences), the bedside mentoring program could be a valuable addition to the professionalism and leadership theme and to the general

Table 4. Reasons for not participating in bedside mentoring by Year 2 students in 2010

<table>
<thead>
<tr>
<th>Statement</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was interested initially, but forgot or did not get around to it</td>
<td>8 (62%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (38%)</td>
</tr>
<tr>
<td>I wanted to but there was not enough Year 4 mentors</td>
<td>3 (23%)</td>
</tr>
<tr>
<td>Did not know about the program</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>I did not see any benefit to me</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Was not interested</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Seemed too time consuming</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Seemed too difficult</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Did not know what was required</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 5. Year 2 student expectations of bedside mentoring

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will enjoy bedside mentoring</td>
<td>11</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I will have enough time for bedside mentoring</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring will be easy</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring will be beneficial to me</td>
<td>11</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Year 4 students should have a teaching training session</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring should be mandatory for yr 4 students</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>
In addition to providing academic credit to Year 4 students who learn important teaching skills, the following recommendations are made to ensure that the program continues and provides this beneficial experience to future years:

1. Hold a social event to introduce the Year 2 and 4 students to each other. This occasion could be used to highlight the potential benefits to students in both year groups and to inform students of the experiences of previous participants. Such an event could increase confidence of Year 4 students in their own abilities to teach and would ensure that the program is well advertised to students (approximately 35% of Year 4 students and 60% of Year 2 students wanted to participate but forgot about the program).

2. The current scheduling of bedside mentoring at lunch time on Tuesdays is too restrictive. Many students wanted to participate but were too busy with other learning commitments (60% of Year 4 students). Extending the bedside mentoring program to Tuesday afternoons after scheduled Year 2 classes would be an easy solution to this problem.

3. Offer a short training session to Year 4 participants on how to teach students. Attendance could be a requirement if bedside mentoring becomes an option within the professionalism and leadership theme.

**LIMITATIONS OF THIS STUDY**

This study has several limitations. First and foremost, the study had a small number of survey respondents. While two-thirds of the Year 4 participants of 2010 responded, only one quarter of the non-participants replied. Similarly only 28 out of 100 and 21 out of 95 students enrolled in Year 2 in 2010 and 2011 respectively provided survey responses. The worst response was received from the Year 4 students of 2011, with only 6 of the 79 students responding.

The students who responded to the surveys were a self selected group and, hence, may have replied due to a greater interest (and possibly perceived benefit) of the bedside mentoring program. Similarly, for those who participated, they did so voluntarily presumably for the same reason. The study only considered one year group of students’ experiences and examined the expectations of a different but also singular year group. Therefore, these results may have a significant selection and measurement bias. Finally, the study did not consider the potential impact on patients having an increased number of students interviewing and examining them and is an area which requires further research.

It is suggested that the study be repeated for future cohorts of students. Further research would also allow investigation into the effects of implementing the proposed changes and determining if extra changes are required.

**CONCLUSION**

This paper has presented the results of an investigation into a novel near-peer teaching program conducted at the ANUMS. Near-peer teaching in the ward environment has been demonstrated in the literature to provide beneficial learning experiences both for the tutor and tutee. This study investigated the informal bedside mentoring program conducted by the Year 4 students for the Year 2 cohort to examine the successful aspects of the program and look for opportunities for improvement with the overall goal of formalising the program if warranted.

All participating students (Years 2 and 4) enjoyed the experience and perceived a benefit. Moreover, all participants stated that they would recommend the program to future students. The perceived benefit by the students did not translate to a measurable difference in OSCE scores between participants and non-participants.

Most non-participating students were unable to take part due to time constraints. Some Year 4 students stated that they did not have confidence in their own abilities to carry out this task. It is anticipated that

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### Table 6. Year 4 student expectations of bedside mentoring

<table>
<thead>
<tr>
<th>Expectation</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will enjoy bedside mentoring</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I will have enough time for bedside mentoring</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring will be easy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring will be beneficial to me</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring will be beneficial to yr 2 students</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I would like to have a teaching training session</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I would like formal recognition for bedside mentoring</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bedside mentoring should be mandatory for yr 4 students</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
54-80% of future Year 4 students would provide bedside mentoring. All Year 2 students indicated that they would like to receive bedside mentoring.

It is suggested that Year 4 participation is rewarded by receiving academic credit through the professionalism and leadership theme of the curriculum. Students were strongly against mandatory participation and therefore it is proposed that it could be alternative to an existing assessment item. In addition it is suggested that the program include a social event at the beginning of the year to increase the confidence and collegiality of the Year 4 students and ensure the program is well advertised, increase scheduling of bedside mentoring to an afternoon in addition to the current lunch time period, and finally, provide a short training session to Year 4 participants on how to teach students.

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Life in the developing world as a foreign medical student

Corey Benjamin Moore BSc (Hons), PhD*

*Medical student, The University of Sydney

In September 2010 I was dismayed to find out it would be at least 18 months until I could be accepted into and start medical school in Australia. I could be almost half way through my degree in that time. Worse still, what if I was not feeling so well on the day of the GAMSAT or the interview? I would then have to wait another 12 months to try again! What was I supposed to do for the next 18 to 30 months?

I soon discovered the little known secret that the Philippines offers an internationally recognised four year graduate MD degree taught in English at an affordable cost of only $1600 per semester. Add to that student accommodation at under $200 per month and each meal around $2, the total cost of studying and living was well under the cost of rent alone in Australia. Like Australia, the Philippines have a GAMSAT style entrance exam, but unlike Australia, it does not appear that many schools place such a significant emphasis on its weighting in their selection process. I was surprised when I saw offers made to other students despite their scores being in the bottom few percent. One school told me that this was because it was a government regulation that students sit the entrance exam but the schools had some independence about which students they accepted into their programs and on what basis. In general it seemed if you were genuinely interested in medicine and could pay for your tuition up-front you could find a school that would accept you into their program. Whilst it may have been a little less onerous to be accepted into a medical school program in the Philippines than in Australia, the ability to stay in the program was something different. Passing the first year was where the real selection of students happened.

Anyhow, I thought it would be good practice for the GAMSAT, so I set off for Manila on December 11 and sat the exam the next day. I received my results within two weeks and a few months later, after having sat the GAMSAT in Australia, I flew back to the Philippines to check out a number of the schools and have an exotic holiday before my life as a medical student began.

With a population of 95 million, the Philippines have 38 medical schools both private and public. The public schools do not accept foreign students and a number of private schools require foreigners to pay a non-refundable “deposit” of $10,000. I sent off applications to six schools as per the instructions on each school’s website. Many responded by saying to just ‘pop in’ whenever I happened to be in the neighbourhood and they’d arrange an interview at that time. So I went to the airport and flew to the first school on my list and true to their word, they summoned all the senior people from the school and within 30 minutes I was having my first medical school panel interview. Another school was so excited to see me that once I had paid their $40 application fee they gave me an official offer of acceptance – no interview required. This made the process fairly stress free, but was also a little disappointing because I wanted to practice answering the “Tell us about yourself,” and “Why do you want to be a doctor?” kind of questions for my interviews later in the year back in Australia. In hindsight, I can now see the fact I had turned up from a foreign land was evidence enough for them of my desire and willingness to become a doctor. Furthermore, I realised after my interviews in Australia that I really did not need to practice answering these questions. The fact I was prepared to study medicine in the third world proved to be strong evidence that I had many of the qualities they were looking for. As it turned out, my fresh and relevant experiences in the Philippines provided me with plenty of examples to demonstrate my passion for medicine when I was asked the humanistic questions. Without these I’m sure I would have struggled to distinguish myself from the other candidates. So, in many ways, my idea to study in the Philippines as a back-up plan in case I was not accepted into school in Australia helped me secure my place in a school in Australia.

After being accepted into a number of schools in the Philippines, I decided to relax and ponder which school I liked the most. I spent a lot of this time in a small country town, where I was able to stay...
with people who were living close to, or in, poverty. Along with this poverty came suffering and tragedy but also what I thought was a strong sense of community – neither of which is so evident in Australia. I saw men and women taking on ‘traditional’ roles that, while restricted, seemed to bring them some comfort in knowing their role in their community. It was a powerful reminder of how we can get caught up in our own small world and forget how satisfying it can be to be a part of a community and to make a meaningful contribution to it. I was humbled by my experiences there. One experience in particular stands out:

I was playing a game of pool set up on the street by a family to make a little income when, at around 10pm, I heard a strange scream coming from a nearby house. Within a minute, dozens of people had appeared, broken down a security gate and carried a man on to the street and commenced CPR. The man had hanged himself and the screaming woman was his wife who had woken up in the night to find him hanging from the ceiling. The man together with the wife and two young sons were quickly rushed off to a nearby health-care centre, only for the wife and sons to come back 30 minutes later, alone. The wife was escorted into the house by the women from the community, but the kids refused to go back into the house. I went over and talked to them. The youngest said it was his fault that his father hanged himself because it was his birthday. Of course, I told him it wasn’t and that his father had gone to heaven, but he quickly replied saying he knew his dad was now in hell “because people who kill themselves go to hell.” It was shocking to hear that a child so young could have such a strong opinion and sad to think these children would probably carry this burden for the rest of their lives. When I told my Filipino friend that these children should probably have some counselling, she said they would not be able to afford it. I immediately felt a sense of duty to offer to pay – at $40 for a one hour session with a fully qualified psychiatrist I had the means to do so. She quickly added though that they would be reluctant to accept such an offer because of the stigma attached to admitting you have a psychological issue. This made me think about the campaigns on mental illness at home which were aimed at promoting its awareness and treatment and destigmatising it. I realised just how vital it is to do this otherwise other children in need may not get access to the care they need.

Over the coming months I realised this was not such an isolated event as my friends and fellow medical school classmates told me of their own personal accounts of rape, armed assault and murder. This tainted my initial impression of the positive effects of poverty. I began to feel guilty that my country was possibly contributing to this by not sharing its wealth and not providing equal opportunities to people in other parts of the world. I was taught and believed that discrimination was wrong, but here I could see first-hand that these people did not have the same rights that I had as an Australian. But what could I do as an individual? I do not have the resources or influence to make much of a direct impact. So I hope in sharing these experiences that I can make a difference by helping others appreciate the personal benefit and insights that can be gained by stepping out of our comfort zone and starting a journey into the lives of other people. And I hope they can also encourage others to do the same, thereby resulting in a greater awareness of where we, as individuals and Australians, want to fit into this world.

I eventually decided to study at the Cebu Institute of Medicine. It is ranked as the best private school in the country (based on a 100% medical board pass rate by graduates over the past ten years) and is on the “friendly, safe and beautiful” island of Cebu. The island is famous for being the place where Magellan was killed 500 years earlier for trying to bring Catholicism to the area. The warrior who killed him is a national hero, which I found ironic since the vast majority of people in the Philippines are practicing Catholics and many have some Portuguese or Spanish ancestry. Paradoxes liked these seemed to be everywhere in the Philippines and I often found myself asking people how they could reconcile such disparities in their heads. That was until someone asked me about Gallipoli, Ned Kelly and convicts.

June 6 was the first day of school. There were a few Filipino-Americans in the class, but I was the only Caucasian – providing me with another experience of living as the odd one out. School got underway pretty quickly after the first week of orientation (Figure 1). The school I had chosen was almost entirely based on PBL. We were expected to read and understand several chapters on new topics every day and be prepared to present them from memory to other students the following morning. On top of this we were given one to five formal exams each week and would be tested on the most obscure details. My life had gone from an exotic holiday to an 80 hour per week study nightmare! My 98% score on the Filipino “GAMSAT” and a PhD published in the journal, Science, meant nothing! In the first semester, we had memorised a dozen biochemistry pathways; memorised all the bones and muscles of the body with the help of a street person-turned-cadaver that we had dissected using a few photocopied notes as a guide; completed the physiology of the respiratory, cardiology and gastrointestinal systems; written a research proposal; submitted weekly entries from our reflection journal; and had begun clinical training on Saturday mornings. I was reading every spare minute I had. I remember once thinking I should give myself a moment to think about what I was actually doing. I looked around at other people going about their lives and smiled. I felt so glad that I had the courage to be in this place that was different to what I was accustomed and to have been given the opportunity by the people of this land to not just learn medical science, but to learn about the human condition. I had never felt this feeling of purpose before and I would have never imagined I would find it so far from my comfort zone. Soon after this I received an offer to study at ANU and I knew I would return to Australia but not as the same person. I had a new perspective and better understanding on what is required to truly study medicine. It is not just about learning the science but to understand what it is to be human with all its complexities.

I am now in my second year studying medicine at one of the best universities in the world, yet in many ways I learnt so much more from my short eight months in the Philippines. It was an experience that I believe everyone who wants to understand more
about what it means to be human should do. My experiences
from living with people who have been dealt a different set of
cards and observing how they have adapted to them made me
question assumptions that I had never before even thought to
challenge. I went to the Philippines to start my study in medicine
thinking it was about learning how the body works. I came away
understanding that medicine is much more about humanity.

If anyone is interested in finding out more about how to begin
their journey in medicine by going to the Philippines, please feel
free to contact me.

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Paediatrics in China: hospitals and orphanages

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With generous funding from the Australian Chinese Medical Association, I was able to go on a four week medical elective to Xi’an, China, with Shaanxi Agape Community Care Association. This is a Chinese non-profit, non-government organisation that works in partnership with local Chinese people and overseas volunteers to provide medical care within Shaanxi province. This organisation has a strong focus on providing community care to vulnerable populations in western China, especially orphans and children with disabilities. The organisation also provides services such as rehabilitation programs, counselling, community health education, child support as well as medical/nursing training for rural village doctors and community health workers. As an Australian born in Hong Kong, I chose to go to China not only to learn from and contribute to its healthcare but also to experience the rich culture that my home country has to offer.

I did this elective with three other medical students. Our two main supervisors were a general practitioner from Sydney, Australia and a paediatrician from San Francisco, USA. They provided supervision and teaching and I was able to enhance my theoretical knowledge and clinical skills in medicine. We attended ward rounds at the paediatric department at the nearby Shaanxi Provincial Hospital which allowed me to practise examination skills as well as history taking in Chinese Mandarin. It was definitely advantageous to have some Mandarin listening and speaking skills as most patients do not speak English at all, and doctors spoke limited English. At times, we had a translator from the organisation who was very helpful. We also examined patients attending the cerebral palsy rehabilitation clinic and performed health checks at orphanages and foster homes in both urban and rural settings. As well, we helped out at a village healthcare worker training CPR session.

In addition to seeing interesting pathologies, I was able to establish working relationships with local Chinese doctors and to observe the healthcare system in China (Figure 1). From my limited exposure to the Chinese medical system, I think that the development of the healthcare sector is quite far behind economic development in China. There are some fundamental challenges facing the current Chinese healthcare system. Firstly, a significant portion of China’s urban and rural population is without access to affordable healthcare. Rural areas are particularly hard hit with around 40% of the rural population unable to afford professional medical treatment (1). I was able to go to the monthly free clinics run by Agape at various nearby villages, which were very welcomed by the locals (Figure 2). The access issue is not restricted to rural patients, with 36% of the urban population also finding medical treatment prohibitively expensive (1). A high proportion of the population is uninsured in China, and thus they have to pay for medical services out-of-pocket (2). It was fairly standard to see long queues of patients lining up to pay and register at the counters before getting blood taken, tests performed, and before being seen by the doctors at clinics. Additionally, there are economic incentives to over-prescribe drugs or diagnostic services. The typical hospital in China receives less than 10% of its income from the government, and thus hospitals are ‘forced’ to generate the rest of their income from services and drug sales (3, 4). As there are no strict government guidelines in terms of the types and number of drugs to be prescribed for each illness, it was not uncommon for diseases to be over- or inappropriately-treated (3).

Despite this, what impressed me most during my elective was the orphanage at rural Han Zhong, set up by an overseas special education professional to provide training for orphaned teenagers and young adults with special needs, ranging from vision impairment, crippled limbs to mental retardation. I was very impressed by the job training facilities available at the orphanage — a staff canteen, convenience store and bakery which provide on the job training for the students. It highlighted the long journey...
of rehabilitation for children with special needs to reach their potential, which for some, is independent adult life. This would not be possible without the dedication, love and support that the Chinese staff members showed for these children who had been abandoned by their parents due to some disability.

Additionally, Agape runs an advocacy and support program called ELIM for children and families affected by HIV/AIDS. What I wasn’t aware of before going on this elective was that there is an HIV/AIDS pandemic in China (5). In China, the number of people affected by HIV has been estimated at between 430,000 and 1.5 million, with some estimates going much higher (6, 7). During the 1990s, in many rural areas of China including Shaanxi Province, up to millions of farmers and peasants were infected with HIV through participation in state-run blood collection programs in which contaminated equipment was reused (5).

The rapid spread of HIV infection in China is having a devastating impact on the country’s children, and threatens to become an epidemic with significant social and public health repercussions. ELIM is a program for all infected children, not only those orphaned by parental loss but also those affected due to societal impacts (8).

For many children who have been affected by HIV/AIDS, fundamental rights of non-discrimination, survival and development are being compromised. This stems from a fear of HIV/AIDS and a lack of understanding of how HIV is transmitted. We visited a mother and her daughter who were both infected with HIV/AIDS. They had experienced discrimination and exclusion from their community as a result of the widespread and pervasive stigma against HIV/AIDS sufferers. Their neighbours did not allow them to leave their house and sprayed pesticides on their door and window frames. Other parents and teachers refused to allow the daughter into the local school. Through the ELIM program, both mother and daughter were able to relocate their home to a different community and the daughter now attends a nearby school.

In conclusion, I was able to fulfil my learning objectives and I highly recommend this elective to medical students. Having some rudimentary Mandarin is very helpful. Besides developing my knowledge in paediatrics, adolescent health, community medicine and rehabilitation, I was exposed to public health and ethical issues that are very pertinent to healthcare not only in China but globally. My elective experience was varied and allowed me to see different aspects of a doctor’s role. It is not only confined to consultation but also education, mentoring and advocacy. As a Chinese-Australian, I was able to make some contribution to the healthcare program for orphans and disabled children in Xi’an. In particular, it is encouraging to know that local Chinese organisations are working to improve Chinese orphans’ health, education, and quality of life. I hope to return one day and make a more significant contribution.

To find out more information, visit http://www.agape.org.cn/eng or email enquiries@agape.org.cn

REFERENCES

Surgeries and safaris in South Africa

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"Are you mad? Do you know it has the highest rates of HIV/AIDS in the world? Did you realise that muggings occur every single day?"

These were some of the comments people made when they learnt that I would be going to South Africa for my elective. Despite their warnings, I was still determined to go, even more so because of the lengthy application process!

Having spent two fantastic weeks doing trauma at The Canberra Hospital, I wanted to experience different types of traumas in a different country where trauma is prevalent. Armed with the warnings and advice of well-wishers, I set off to Durban, KwaZulu Natal, South Africa for my Orthopaedics and Trauma elective. I would be spending three weeks at King Edward VIII Hospital (KEH) and one week at Inkosi Albert Luthuli Hospital.

KEH is a 900 bed public hospital that was built in the 1950s for the non-whites (the blacks, Indians and the coloureds); however after the fall of the Apartheid movement, the hospital became open to everyone. As it was originally for the non-whites, the buildings were more run down compared to other buildings constructed at that time. During my time there, many refurbishments and renovations were occurring and thus much of the hospital was closed, however I was still able to observe a variety of different conditions that I had not previously encountered in Australia.

A typical day started at the gate where our IDs were checked, our bags searched and sometimes a metal detector run over us (figure 1). This certainly was very different from Australia! It was also a similar process when we left the hospital site.

The morning handover meeting was attended by the orthopaedic team of doctors, nursing staff, plaster technicians and medical students (another elective student and myself). The night intern presented the emergency patients and their X-rays. This was a great opportunity to learn about many different orthopaedic conditions and traumas.

Ward rounds followed this. The orthopaedic patients were spread across the hospital due to the renovations. The orthopaedic wards were segregated by gender, and the busiest was the male orthopaedic ward. The wards were one big open room, with curtains around the bed spaces, and surprisingly only one sharps bin for a ward of 35 patients!

Motor vehicle accidents, stab wounds and gunshot wounds were common. Many times, they were due to assaults or attempted robberies. It was common to see prison wardens around the wards, as many of the inpatients were inmates from the local correctional facility. I wondered how far a patient would be able to get with a lower limb external fixateur; however, many were tied to the bed with shackles. Also, due to the great emergency burden, many elderly patients were waiting in hospital for weeks to have their fractured neck of femur fixed, as there was not enough theatre time.

KEH had recently built an operating theatre within the emergency department. I saw wound exploration following multiple stab wounds. Sometimes, during the procedure, analgesia ran out and if no more was found, the awake patient continued to be operated on without any pain relief, while many staff members held the patient down. Fortunately this distressing scene was a rare occurrence.
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drilling. However I was not allowed to do any suturing and rarely
the times I had an opportunity to perform practical skills such as
fact that theatres were on the second floor. Theatres was one of
there was a lot of downtime due to lifts breaking down and the
Another aspect of my elective that I enjoyed was theatres. Often
done without any resuscitation equipment (Figure 3).
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reduction of upper limb fractures with Bier’s blocks, which was
done without any resuscitation equipment (Figure 3).

Figure 2. Traditional medicine at the markets

After ward rounds, I was able to go back and see the patients on
my own. Although Xulu (one of the 11 official languages) was
commonly spoken, most people also spoke English and family
members and nursing staff were able to interpret. Frequently
patients had tried traditional methods of healing prior to coming to
hospital. One patient had presented with ongoing lower leg pain.
He had tried several months of Xulu medicine; getting a razor and
making multiple small nicks on the skin and then applying various
herbs and roots (figure 2). Despite months of this treatment he did
not improve, he was later diagnosed with osteosarcoma. It was
very fascinating to see a combination of Western medicine and
traditional methods of healing.

The outpatient clinics were very busy. Arriving at 7:30am,
the waiting room was already full and the queue of about 50
patients spilled outside, waiting for the clinic to start. As only
the consultation rooms had air conditioning, it was common for
these doors to be open to allow the cool air to reach the waiting
areas. Sometimes multiple consultations occurred simultaneously
in a very small room and it was common to have more than 15
people in that very small room. Often consultations occurred in
the waiting room.

In the outpatient clinics I saw many rare conditions such as
tendon injuries due to rat bites, amniotic constriction bands of
the leg requiring foot amputations of a toddler, and compartment
syndrome requiring fasciotomy as a result of snake bite in a little
girl. I also saw many deformities as a result of Blount’s disease,
as well as tuberculosis affecting many parts of the skeletal system.
This was a great learning opportunity to see such conditions. I
also saw many fractures, where I was able to assist in closed
reduction of upper limb fractures with Bier’s blocks, which was

Another aspect of my elective that I enjoyed was theatres. Often
there was a lot of downtime due to lifts breaking down and the
fact that theatres were on the second floor. Theatres was one of
the times I had an opportunity to perform practical skills such as
drilling. However I was not allowed to do any suturing and rarely
allowed to take blood as the team was very concerned about the

risks of needle stick injuries. Despite these limitations, I learnt a
great deal from observing the doctors. I also had the opportunity to
do some on-call shifts with the interns. The interns were on-call
once every five nights; this shift was 30 hours!

Being a public hospital, patients’ fees were based on their
incomes. Unemployed or beneficiaries of social pension were
entitled to free treatment. The casualty fee was R120 per visit
(AUS$17). There was also a Road Accident Fund that could be
used for patients who were involved in motor vehicle accidents.

I saw a patient one night after he arrived at the clinic following
a fall a few days previous, where he sustained a fractured neck
of femur. He had initially presented to another hospital, however
as he was not able to pay the fees he was transferred to KEH.
Unfortunately, a few hours later, he passed away. This was a most
eye opening experience for me to see a patient not being able to
receive medical treatment due to a lack of funds. This situation
made me realise how fortunate we were in Australia. Although
there was often a lack of resources, the staff did an amazing job
in looking after the patients and everyone was very helpful and
welcoming of foreign students.

For my last week I was at Inkosi Albert Luthuli Hospital, also in
Durban. Although these were both public hospitals, I was amazed
by the vast difference. It was only a few years old and a paperless
hospital. The orthopaedics subspecialties included hand and upper
limb surgery, orthopaedic malignancy, deformity corrections and
a trauma ICU. It was a training hospital run only by registrars and
consultants. I was very fortunate to spend some time there, as this
hospital did not take any local students.

Although the hospital looked very similar to hospitals in
Australia, the medical conditions seen were very different. It was
strange to see total hip replacements due to avascular necrosis
rather than osteoarthritis! Additionally, I saw acute renal failure
due to sjambok injuries. A sjambok is a whip made from synthetic
material (originally hippopotamus hide) frequently used in
assaults, injuries from which may cause rhabdomyolysis. I also
saw patients having bone transposition with the Ilizarov method,
due to non-union of fractures.

Every day was a fantastic opportunity to learn about different
conditions, different presentations and different managements of
conditions, as well as the different cultures within this country.
The two hospitals I spent my elective in reflected the rainbow
coloured nation.

I was also very fortunate to be able to do some sightseeing around
the different parts of South Africa. In Kruger National Park, I
saw four (lion, elephant, buffalo and rhinoceros) of the big five
animals but missed out on the leopard. I also saw many other
animals (figure 4). I was also able to visit townships. Townships
were built for people of one colour to live together, after being
forced to leave their original homes. Informal settlements were
also common, people living in houses with no electricity or
running water. One of the most amazing experiences was visiting

Figure 2. Traditional medicine at the markets
Soweto (the largest township in South Africa) on an evening bike ride on New Year’s Eve.

Food was another aspect of this trip that I thoroughly enjoyed. Staples included pap, which was polenta made from maize, served with tomato bredie (stew). I enjoyed Boerewors (snail shaped sausage) at Brais (barbeques). Commonly found in Durban was Bunny chow, a loaf of bread carved out and filled with curry. Other delicious foods were Koeksisters (sweet pastry) and of course biltong (cured meat)! I also saw shebeens (informal bars and taverns) and many informal markets. I was able to visit Nelson Mandela’s prison cell in Robben Island as well as District 6, where many people were forcibly removed during the Apartheid regime. It was amazing to actually stand in the place where such historical events took place.

Despite the repeated warnings and advice not to go, I am extremely glad that I was able to complete my elective in South Africa. It was an awesome experience and an incredible opportunity to learn about not only medical conditions but also the culture. I am very fortunate to have had the chance to experience this elective and recommend South Africa as the ideal elective destination for those students interested in trauma.
In January 2012 we travelled to Tonga for a four week elective. Tonga is a collection of beautiful islands in the Pacific Ocean just a four hour plane trip from Sydney. We chose Tonga because we wanted to experience medicine in a developing country and also have a holiday. Also, Tonga is a cheap place to travel.

We spent the first two weeks in the Vaiola Hospital on the main island, Tongatapu. In the hospital we spent a week on the paediatric ward and a week on the general medical ward. There is also the opportunity to spend time in theatre, maternity and outpatients/emergency department.

The paediatric ward encompassed the special care nursery and so we got a broad paediatric experience. A normal day would consist of paediatric rounds, neonatal rounds, and then any procedures (eg. bone marrow biopsy under ketamine). The paediatricians did three day baby checks in the maternity ward and outpatient clinics. They also got called to neonatal resuscitations, and so we were able to see a triplet delivery and then the care of the triplets in the special care nursery. We saw many interesting cases including Tetralogy of Fallot, rheumatic heart disease, cleft palate, epilepsy and a few cases of acute lymphoblastic leukaemia. Tonga has very basic imaging and pathology facilities and so there is lots of opportunity to make diagnoses with limited information.

The second week we spent on the general ward. Most patients had complications of diabetes mellitus (chronic renal failure, diabetic foot ulcers etc.). Almost all the doctors in the hospital were Tongan and had trained in Fiji. English was the primary language in the hospital; however communication with patients was usually in native Tongan.

We then spent two weeks in the Prince Ngu Hospital in Vava’u (Figure 1). Vava’u is a small collection of islands north of the main island. It is a very beautiful place and we would highly recommend spending some time there.

The Prince Ngu Hospital was a lot smaller and staffed by two junior doctors. The ward rounds in the morning cover all the wards (paediatric, maternity, general and surgical) so you get to meet all the patients. We were able to scribe on ward rounds, write scripts (on scraps of paper, Tongan style!) and then take blood after the rounds. After rounds there were sometimes clinics (antenatal or diabetes/hypertension), procedures and theatre (mostly caesarean sections and diabetic foot debridement) where we were able to scrub in and assist. On Thursdays there was an outreach clinic which we attended and it was a great way to see more of the island.

We took some basic medical supplies with us (such as clean and sterile gloves, handrub, dressing packs, stethoscopes, otoscopes), and we also recommend taking your own scrubs. If you could afford it they would really appreciate things like glucometers, sphygmomanometers and otoscopes.

In terms of a cultural experience Tonga was amazing. It was our first time visiting a developing country but we felt very safe and welcome in Tonga. We went to a few feasts and were invited to the hospital kava club to serve kava (only males usually drink it). Religion is very important in Tonga and although we never made
it to church many people found it to be a worthwhile experience.

In terms of a holiday Tonga was an awesome place to visit. The hospitals could get very quiet in the afternoons so we took the opportunity to go to the beach, snorkel, visit the botanical gardens, learnt to weave baskets, climb mountains and visit other islands (we visited ten in total). We also met and spent time with other medical students, volunteer workers and travellers.