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New Zealand Medical Student Journal

Te Hautaka o ngaa Akongaa Rongoaa

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Global health and disaster medicine: Is it time to add more to the medical curriculum?

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Internationally, many universities have realised the importance of teaching undergraduate medical students about international or global health issues. As citizens living in an increasingly globalised world, it is important that we as medical students and future doctors have a good understanding of the healthcare challenges faced by clinicians around the world. Additionally recent events, internationally and locally, have led to a call for greater emphasis on education and training in disaster medicine and public health emergencies.

Is there enough space in the medical curriculum to teach these topics? Is it important for medical graduates to know how to manage patients with developing world diseases or manage victims following a disaster?

The field broadly labelled 'global health' or 'developing world medicine' looks at the healthcare challenges faced by clinicians internationally and aims to provide solutions. Global health, at the population level, is concerned with improving health outcomes and reducing disparities across states. It is an increasingly coordinated field of medicine that is underpinned by a set of quantifiable targets articulated in the Millennium Development Goals (MDGs).

In 2000, the United Nations adopted the MDGs, as a series of targets to be achieved by 2015. The eight goals represent the main challenges currently facing our world. They are:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Secure a global partnership for development

As can be seen, some of the MDGs directly relate to health and healthcare provision. However, it can easily be argued that all affect people's health and wellbeing.

The final MDG indicates the well-accepted importance of cooperation and collaboration between developed and developing countries in tackling the challenges faced. With this in mind, many universities in developed countries have incorporated dedicated global health teaching into the undergraduate medical curriculum. Some progress has been made towards replicating this approach in New Zealand; however further enhancements are necessary if we want to produce medical graduates well-equipped to face global health challenges.

Nevertheless, there is already a lot that medical students can do. Global health groups have been established at each campus in the country with

links to other global health initiatives such as the Medical Aid Abroad Programme and Fiji Village Project, as well as opportunities to volunteer locally and internationally. Many Trainee Interns have undertaken their medical elective in a developing country to gain first-hand knowledge and experience in dealing with the challenges people face.

Additionally, preparing medical graduates well-equipped to face disasters and their aftermath is essential. Recent disasters such as the Christchurch earthquakes remind us that disasters can happen anywhere, at anytime, and to anyone. Doctors and medical students who are conversant in the language of these fields are often the best equipped to manage and respond to disaster situations and their aftermath. The general public have an expectation that the medical profession are able to lead and manage in matters of health following a disaster.

Unlike global health teaching, where topics can appear isolated and specific, many aspects of disaster medicine and management are already being taught to medical students, such as infectious disease control and public health promotion. Teaching in disciplines such as occupational medicine and wilderness medicine compliment these, and provide transferable skills and knowledge.

However, what makes disaster medicine training fundamentally different from what is presently taught in the medical curriculum is its focus on taking preventive and preparatory measures, and on how to use creative and innovative approaches in solving disaster challenges. Preparing graduates who are able to think laterally and solve healthcare challenges, in whatever context, is crucial to the future of healthcare delivery in this country whether a disaster occurs or not.

So how can students contribute? The Christchurch earthquake in February this year shows just how powerful students can be in responding to a disaster. Immediately following earthquake, medical students at the Christchurch School of Medicine quickly organised themselves into groups to provide assistance and support where required. The response showed how effective students can be; and also highlights the importance of communication and organisation, in particular the use of social networking tools such as Facebook. Although many students did not receive any disaster management training prior to the earthquake, fundamentals learnt in medical school, such as showing empathy towards stressed and stricken patients and assisting healthcare staff where needed, proved to be invaluable.

Although global health and disaster medicine do not feature in the medical curriculum as modules or core knowledge competencies in their own right, the need to prepare medical graduates competent in these areas is becoming increasingly important.

We hope this issue of the New Zealand Medical Student Journal gives you a taste of the challenges and opportunities out there, encourages you to think creatively and critically about solutions to the wider problems in our world and, to quote Gandhi, "be the change you want to see in the world".

Should global health form a compulsory component of undergraduate medical curricula?

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Whilst global health is now increasingly being introduced as a post-graduate subject or indeed an entire degree, it remains conspicuously absent on the undergraduate radar.

Global health is an exciting and emerging field with proven potential for substantial, broad-reaching impact. Four of the eight Millennium Development Goals have a clear, direct relationship to global health, with many remaining goals displaying an indisputable link to this expansive area. Mammoth sums of money are invested annually in global health initiatives and this outlay has been rewarded by dramatic progress in multiple areas. Major organisations and foundations, including the Bill and Melinda Gates Foundation have made longer-term commitments to addressing global health issues in a comprehensive, evidence-based fashion. Global health is not new, however it is visionary, interesting, relevant, challenging, topical and – in its own way – trendy as heck. Quite simply, global health is where it's at. Why, therefore, does it not currently feature as a compulsory subject for New Zealand (NZ) medical students? How is it possible that some students would likely struggle to articulate what is even meant by 'global health'?

Acknowledging the importance of global health is not a difficult task. As it turns out, developing arguments in favour of routinely teaching global health to undergraduate medical students is also remarkably straightforward.

Firstly, such teaching provides students with a more comprehensive perspective – on life, on health, and on healthcare (including healthcare systems). Armed with this, healthcare practitioners are better equipped to practice in the context of a globalised world. Good doctors offer more than sound medical knowledge: they require an appreciation of the health issues and beliefs of different cultures and societies. Global health teaching has a significant role to play here. Global health is also inextricably intertwined with the socio-economic determinants of health – something that demands attention in 21st century medicine.

Doctors must demonstrate reasonable understanding of the global burden of disease. How can we treat effectively if we are not aware of the extent of the problem, what causes the problem, or even where it can be found? Yes, knowledge of the local situation is vital, but we need to consider whether this should be taught at the exclusion of the broader health picture. This wider-reaching perspective may, in fact, be required to provide the most relevant local care.

New Zealand is blessed with an international population and, if we are to adequately serve our communities, our knowledge of disease and medicine must reflect this diversity. We also house a relatively mobile population. Consequently, our demography and disease burden will change. This article

will not discuss the relative merits of overseas experience and I shall steer clear of the controversial issue of physician migration. However, irrespective of your view or professional intentions, there is no escaping the fact that many local graduates will practice in a non-NZ setting at some point in their clinical careers. To be competitive in a highly international market, you need to know something of the system in which you elect to function. Global health teaching facilitates an understanding of key transferable principles which can be applied no matter the scene. Let us suit up before heading into the battle. Location of practice aside, we also see that global health issues impact on all of us. Time and time again, we are reminded that health threats and disease neither recognise nor respect geographic boundaries (Fukushima, anyone?). Yet, by continuing to neglect the changing trends in global health issues, we currently teach as though this is the case. We cannot afford to be this naïve.

Naturally, there is the pragmatic realisation that we cannot cover everything in just six short years and competition for medical lecture time has always been strong (and contentious, and political, and...). However, it seems that many conditions that feature in top ten global health lists appear only fleetingly in the standard lecture set. There were significant gaps in my knowledge about malaria, HIV/AIDS, diarrhoeal illnesses, under nutrition, oral health and even TB at the time of graduation. This was not a consequence of insufficient study, and I know I was not alone in my relative ignorance around some major global health conditions. In fact, it barely occurred to me that I should know more about these conditions. Without realising it, I left medical school almost believing that these conditions were not particularly relevant to my future career; simply since they do not reflect significant health challenges in NZ. But, can it be that some of the leading causes of death in this world are simply not pertinent to certain doctors – depending on where they train? Do we have an ethical obligation as (current or future) healthcare practitioners to be aware of the major issues affecting a notable proportion of individuals around the world? When we are considering the really big stuff, it is not sufficient to say, "We just didn't know".

We should be questioning why medical curricula are structured so that we learn more about obscure, 'House'-style metabolic or embryological conditions than we do about, say, vitamin A deficiency in children. Why is it that many students would struggle to talk for 60 seconds straight about malaria? The 'House' stuff might make us feel dead smart, but the latter conditions more accurately reflect what the world actually sees. Will we feel quite so smart if we miss or mis-manage a condition that features so prominently on the international scene?

A basic knowledge of the epidemiology of major global health conditions, together with a working understanding of the principal obstacles and challenges facing those striving toward the improvement of the health

status of populations around the world is necessary if we are to consider the allocation of global health resources in a fair, sustainable fashion. All healthcare professionals have a responsibility to know of recent research developments, what the healthcare priorities are, and where future advances might lie. At present, the responsibility for such training appears to be reserved for specialty colleges, but these habits need to be formed much earlier in medical training. This information would form a standard component of any reasonable global health module, therefore filling a current gap in the undergraduate programme. Global health issues are applicable to every eventual medical specialty: what better time to build this foundational knowledge than during the period in which medical education is most generalised? What are we waiting for?

Let us now turn our attention from medical conditions and consider healthcare systems in general. Why is a global health approach relevant?

The problems and challenges that face our world do not lie within a single nation's boundaries. As a result, we are witnessing a shift towards more integrated (if somewhat under-governed) approaches to addressing various issues. Conflict resolution is just one of many examples: David Cameron might have originally proposed the no-fly zone over Libya but a UN resolution was required for that to occur. Further to this theme, the issues that face health and healthcare systems demand solutions that come from more than a single arena (i.e. medical) within a single setting. To solve the big challenges, we need a systematic approach to healthcare provision.

As healthcare systems develop in low- and middle-income countries and as existing systems within developed countries are forced to adapt to cope with changing demands and ever diminishing resource availability, we all have a lot to learn from one another. Despite various distinctions, many of the issues that face developing countries also apply to the developed world. Global health delivery systems should therefore ideally be designed and implemented in close international collaboration, adhering to a set of overriding fundamental principles. Until this occurs, our systems will remain effectively stagnant – or at best we will see incremental improvements. We will continue to witness practice that functions within isolated silos

and does not reflect the true far-reaching determinants of health-related conditions.

Given the challenges ahead, incremental improvements in healthcare delivery are not adequate. Incremental improvements have been the vision, the aim and, resultantly, the extent of the output for years. They are beneficial, but they are not enough. Working in proverbial silos is not sufficient: this approach will not produce success on the scale our society demands and that our patients deserve. We must think and act bigger. We must go global.

The healthcare structure that we see today is at least in part a consequence of how healthcare professionals are trained. Resultantly, overseas institutions are already introducing global health training as part of a core medical curriculum. We need to display real movement now to prevent us from getting left behind. We do so many things well; it would be an incredible pity to continue to lose points here. Through actively engaging with the trend to include this teaching, we find a way to keep NZ close to the rest of the developed world and to make our already strong medical graduates even more competitive.

The question remains as to what we do from here? How do we build momentum for the global health revolution within the confines of our shores? Easy! Be bold. Defy that gravitational pull that leads you to unquestionably accept how your craft is communicated to you. There is no substitute for people with will, guts and determination. Speak up, ask the right questions and be an active part of the change that is needed. Be in the driving seat of your own educational journey. Your medical education has already changed you. The person reading this has progressed beyond the person that started your degree. That transformation is the result of much more than simply the acquisition of knowledge drawn from lectures. Dare to imagine where that can go if the 'blinkers' are removed to fully reveal the scope of your horizon. Dare to engage in global health and dare to encourage others to do the same. A world of opportunity lies ahead.

Seriously, what are you waiting for?

GUEST EDITORIAL

Global health in New Zealand: Opportunities abound

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When I first turned up to class at the dark-grey concrete fortress in Grafton five and a half years ago, there were no organised global health activities for medical students. There were rumours of the odd student taking time off to get involved in some mysterious humanitarian work, and of course the dangling carrot of the developing-world elective at some point in the distant future, but little else. In 2011, the substantial interest of New Zealand medical students in global health activities is matched by a number of organisations and projects.

It must be acknowledged that students have varying levels of interest in global health, from simply being motivated to hear from interesting speakers and to learn more about the world, to working with the local community, performing research, and travelling overseas to get some hands on experience. Through Medical Students for Global Awareness (MSGA), New Zealand students can attend interesting talks and seminars on global health, and there is often a set of interesting speakers from a global health background at the annual NZMSA Conference. The pinnacle academic event in global health in this part of the world is the annual Australian Medical Students' Association Global Health Conference (AMSA GHC), which New Zealand students have been attending in increasing numbers.

However, to get a real feel for global health activities, there is nothing better than getting out of the lecture theatre and into the field. There are several opportunities for New Zealand medical students to gain experience in hands on campaigning and humanitarian work. Although often small in scale, these opportunities allow you to gain insight into the practical challenges, personalities and rewards of advocacy and development work at the coalface. Following the principle of 'think global, act local', MSGA partners with New Zealand based non-governmental organisations to encourage medical students to engage with their community and with local issues of social justice. For example, MSGA has partnered with OraTaiao, the New Zealand Climate and Health Council, to advocate for action on climate change in New Zealand from a health perspective, including lobbying against planned lignite coal mining in Southland. The Medical Aid Abroad Programme (MAAP), based principally in Christchurch, and the group 'Medical Aid Abroad', offer medical students the chance to retrieve medical equipment no longer required in New Zealand and then send this as targeted aid to hospitals in the developing world via elective students.

Internationally, New Zealand medical students have been involved with the establishment and implementation of a number of projects. The Fiji Village Project (FVP), an international student-led humanitarian project, was started in 2007 by medical students from Australia, New Zealand and Fiji to address basic public health deficiencies in a village setting, such as water sanitation. The Fiji Village Project is a year-long commitment ending with an annual two week project trip to Fiji in mid to late January. I was fortunate

Sudhvir has a BMedSci in Public Health, and was involved with establishing Medical Students for Global Awareness and the Fiji Village Project. He has a passion for climate change research and advocacy, and attended the 2010 United Nations Climate Change conference in Cancun as a health lobbyist.

to be involved with organising the initial project, where we worked in partnership with a village of six hundred people to fund-raise and install new water tanks, screen villagers for signs of chronic disease and perform health promotion education. The FVP has maintained the same focus and grown each year, and in 2011 partnered with two villages for the first time.

New Zealand students have also been involved with the Institute for the Indian Mother and Child (IIMC), which resources twenty two schools, five rural health hospitals and clinics, a disabled children's respite centre, a microcredit lending programme and a women's empowerment and peace project in rural Kolkata. MSGA promotes the IIMC and its child sponsorship programme in New Zealand, and in 2010 hosted the institute's enigmatic founder and director, Dr Sujit Brahmochary, for a series of talks at each clinical school.

New Zealand students have also engaged in a number of activities through the network of the International Physicians for the Prevention of Nuclear War (IPPNW), also known as Physicians for Social Responsibility (PSR). IPPNW were awarded the Nobel Peace Prize in 1985 for lobbying against war, environmental degradation and issues of social justice around the world. The key principle of IPPNW involves doctors using their respected, non-political voice to advocate for social change. MSGA is proud to have IPPNW New Zealand as their parent body. Relevant opportunities include policy internships at PSR in the USA, attending the Refugee Camp Project (ReCap), a one month development programme with the United Nations Relief and Works Agency for Palestine Refugees, and elective students authoring 'One Bullet Stories' to provide a health and economic narrative to small arms violence in the developing world.

Opportunities for global health research have also emerged at both New Zealand medical schools, allowing students to undertake studentships and BMedSci research years in topics related to global health. Dr Judith McCool leads the University of Auckland Global Health Group and Professor Philip Hill leads the University of Otago Centre for International Health. In the future, research exchanges may be offered through New Zealand's fledgling membership of the International Federation of Medical Students' Associations, which also offers opportunities to attend a number of international conferences and to engage with transnational public health projects.

If you are interested in getting involved with the above activities, MSGA is a great starting point. The organisation works in partnership with the above projects and organises events at all four New Zealand clinical schools. MSGA also operates local mailing lists, and acts as a bridge between medicals school and wider community and humanitarian groups present at central University campuses. With such a range of activities to get involved with, global health opportunities in New Zealand have blossomed.

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If you are interested in global health opportunities contact your local MSGA representative or visit the MSGA website: www.msga.org.nz

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Disaster response: The need for capacity building amongst healthcare professionals

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ABSTRACT

This paper highlights the importance of disaster preparedness plans and appropriate training for healthcare workers to work in such situations. A case study of the 2004 Sri Lankan tsunami is used to describe how medical schools can play a role in disaster situations. Medical schools can contribute in several aspects including provision of clinical care, training of healthcare workers, publications, compilation of expert guidelines, and capacity building amongst communities. Issues and challenges observed by disaster management teams are used to explain how this could be improved to ensure a better recovery. The inclusion of disaster response training components to the medical curricula is recommended to prepare our health workforce for potential future disasters.



Colombo Medical Faculty, staff, and students arriving in Mutthur by a navy boat.

INTRODUCTION

Major disasters such as tsunami, earthquakes and floods cause extensive damage to human lives and properties. The immediate response to disasters is complex in terms of coordination and management as a consequence of this severe destruction of systems. Recovery is usually slow, expensive and requires external support. Over a quarter of a million people lost their lives in the 2004 tsunami and more than 20,000 people are either dead or missing from the 2011 earthquake and tsunami in Japan. In addition to this invaluable human loss, it was reported that the economic cost of the 2004 Asian tsunami totalled US\$10 billion and in Japan the cost could exceed US\$230 billion. The social and organisational structures that maintain the daily functioning of a society are interdependent and disasters trigger both unexpected consequences and cascading failures. Therefore disaster management requires collective and coordinated responses across all sectors.

The health sector faces critical challenges as it responds in the immediate aftermath of a disaster to minimise further injuries and deaths. To respond in a situation without normal functionality of communication, transportation and staff, health systems need to be adequately prepared and healthcare workers should be trained to meet those challenges. Following the 2004 tsunami, this issue was prioritised in many countries in order to maximise future preparedness. Provision of training and capacity building of healthcare teams are essential components of any comprehensive disaster preparedness plan.

Basic protection principles should be followed by response teams at all times. These principles are explained in the Humanitarian Charter and minimum standards in Humanitarian Response Handbook as:

1. Avoid exposing people to further harm as a result of your actions;
2. Ensure access to impartial assistance – in proportion to need and without discrimination;
3. Protect people from physical and psychological harm arising from violence and coercion;
4. Assist people to claim their rights, access available remedies and recover from the effects of abuse.

This paper will discuss some issues and challenges observed during the aftermath of a disaster by response teams and highlight the need for structured training programmes for healthcare workers including doctors. The lead author has a firsthand experience in organising and participating in response activities within tsunami-affected communities and both authors have worked with medical education teams.

CASE STUDY

A massive earthquake off Northern Sumatra led to a series of tsunamis in countries surrounded by the Indian Ocean. Indonesia, Sri Lanka, the Maldives, India and Thailand were hardest hit. The tsunami devastated over 75% of Sri Lanka's coastal belt and severe damage was recorded in the North and Eastern provinces: areas already affected by conflict for over two decades. Over 30,000 people lost their lives within minutes and more than 850,000 were displaced. A shortage of healthcare workers in war affected regions and the destruction of available facilities and public health systems also placed enormous strain on response teams.

The Faculty of Medicine of the University of Colombo, Sri Lanka was one of the first organisations that volunteered to provide healthcare services in affected areas. Both students and faculty members mobilised resources to collect medicines and other essential equipment. Messages were sent on Boxing Day via functioning telephone connections and other accessible methods requesting that all available individuals meet on University premises. Media organisations collaborated with the Colombo Medical Faculty to request donations including essential medicines, dry rations, drinking water, clothes, milk bottles and transportation vehicles.

Groups of doctors and medical students were deployed to affected areas and a coordinating office established at the Medical Faculty Students Union was responsible for contacting relevant authorities in order to identify areas of greatest need and arrange logistics. A telecommunication company provided a free of charge hotline and television and radio networks advertised response team requirements. Local communities responded immediately and within days common medicines were out of stock in pharmacies. Due to the destruction of roads and bridges, the Sri Lankan Air Force and Navy extended their support to transport mobile medical teams to severely affected areas.

Most doctors and medical students involved in this response did not have prior training and subsequently acquired real-time learning in the field. Mobile healthcare teams also delivered clinical care and worked with local public health officers to enhance other services such as safe drinking water, sanitary facilities and health education.

Within days, a large number of local and overseas response teams arrived. Overseas medical students initiated several activities in displaced persons camps in collaboration with the Colombo Medical Faculty. A study conducted amongst internally displaced persons showed that majority were satisfied with the level of healthcare received in the immediate aftermath of the disaster. They also appreciated other public health interventions and noted the decreasing trend of mobile medical team visits after a few weeks. However, several issues were observed during the immediate and intermediate post-event phases. These issues included the uncoordinated arrival of medical teams, inadequate information regarding the identification of areas of greatest need, the donation of unsuitable shelters, and the perceived inability of recipients to manage and distribute large donations.

Whilst external support is crucial for the recovery of victims, there were reports of negative consequences resulting from various humanitarian programmes. In Northern Sri Lanka, a large amount of culturally inappropriate clothes and other materials were distributed and mounting unwanted aid presented both an environmental hazard and a burden to local authorities. Furthermore, aid-mediated communal tension developed as some donors initiated programmes which widened inequalities amongst victims. Zwi et al recommended a reassessment of how our societies and interactions are organised at local and global levels. They also endorsed the review of resource distribution and control to ensure that disaster responses do not worsen situations for victims.

Following the tsunami, the Colombo Medical Faculty established an organisation known as 'The Core Group for Disaster Management' to streamline responses with the participation of Faculty, students and external collaborators. In addition to mobile response teams, two other projects were identified following stakeholder discussion. They were to use the capacity of Colombo Medical Faculty to develop expert guidelines on disaster management and to initiate a short course to train healthcare workers. Both projects were completed within a short time-frame. The



A clinic conducted by Colombo Medical Faculty in the Eastern part of Sri Lanka.

first version of the expert guidelines was published in February 2005. This project was funded by the World Bank and World Health Organization, and these guidelines were distributed amongst disaster response teams.

A short course for medical students was started by the Core Group for Disaster Management. International collaborations were established to improve disaster management capacity building. The Asia Pacific Academic Consortium for Public Health and its Early Career Network worked together to organise several workshops and community level capacity building activities. These activities included topics such as leadership, management of communal kitchens, storage of safe drinking water, disease prevention measures and supporting vulnerable groups. A certificate level course was started for healthcare workers to enhance their ability to respond to ongoing relief activities and prepare them for future disasters. A detailed description of the approaches used for curriculum development and content of this course is available elsewhere.

CONCLUSIONS AND RECOMMENDATIONS

Lessons learnt from 2004 tsunami highlight the importance of early preparedness and trained response teams to provide optimal support for victims of a disaster. Skills and training required to work in disaster situations may change from one situation to another, but core skills can be provided for medical students during their undergraduate degree. Some medical schools can provide students with firsthand practical experience if such events are common within country, whilst other institutions can utilise alternative methods including videos and expert lectures.

Healthcare workers play a major role in enhancing the protection of victims during the vulnerable period in the immediate aftermath of a disaster. Therefore, medical curricula should incorporate disaster response training components and healthcare workers should receive training to understand the actual needs of victims, to respect local culture and to avoid further harm.

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ARTICLE : REVIEW

The autonomic nervous system

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Aidan O'Donnell is a consultant anaesthetist at Waikato Hospital in Hamilton. He graduated from Edinburgh in 1996 and trained in anaesthetics in the South East of Scotland. He also has an Honours degree in Anatomy. He became a consultant in 2007, and moved to New Zealand in early 2010. He has a special interest in anaesthesia for childbirth, and enjoys teaching students and junior colleagues. His book, *Anaesthesia: A Very Short Introduction*, is due to be published in 2012.

Brigid was born on Hayling Island, near Portsmouth on the south coast of England. She studied medicine at the University of Edinburgh and remained in Edinburgh for two years as a junior doctor. She is currently working at the Palmerston North Hospital as a paediatric registrar while trying to decide between career paths in emergency medicine or obstetrics & gynaecology. In the meantime, she is enjoying the increased availability of outdoor activities and has taken up white water kayaking, mountain biking, surfing, tramping and rescuing penguins.

Table 1. Functions of the parasympathetic nervous system

Constriction of the pupil (miosis)
Lacrimation
Salivation
Slowing of the heart (bradycardia)
Production of bronchial secretions
Production of digestive juices from stomach, pancreas and gallbladder
Peristalsis
Sphincter relaxation
Urination and defecation
Penile erection

THE PARASYMPATHETIC NERVOUS SYSTEM

Physiologically, the functions of the parasympathetic nervous system can be thought of as "rest and digest" (see Table 1). These include salivation, production of digestive juices, peristalsis, urination and defecation. Throughout the parasympathetic nervous system, the neurotransmitter is acetylcholine. Drugs such as atropine block the effects of acetylcholine



ABSTRACT

This is a short accessible review of the autonomic nervous system for medical students. The sympathetic and parasympathetic systems are different anatomically and physiologically. Parasympathetic nerves are all either cranial nerves (notably the vagus nerve) or sacral nerves (from S2, 3, 4). The sympathetic nervous system emerges only from the spinal cord between T1 and L2. Any sympathetic supply above this must travel upwards from T1. For the organism as a whole, the most important parasympathetic nerve is the vagus nerve. In a spinal injury, the vagus nerve is spared, whereas the extent to which the sympathetic innervation is lost depends on the site of injury.

INTRODUCTION

The autonomic nervous system is a part of the nervous system which functions "automatically" without a conscious control, to regulate physiological processes in the body.

Functionally it is divided into two: the sympathetic nervous system and the parasympathetic nervous system. Although these are often mentioned as a pair and appear together on diagrams, they are quite different functionally, anatomically and physiologically. In general, these two components of the autonomic nervous system act in opposition to one another.

Autonomic nerves may carry sensory (afferent) signals to the brain and spinal cord, or efferent signals from the brain to the target organs. Central control of the autonomic nervous system comes mostly from the hypothalamus, with some input from the limbic system and the reticular activating system.

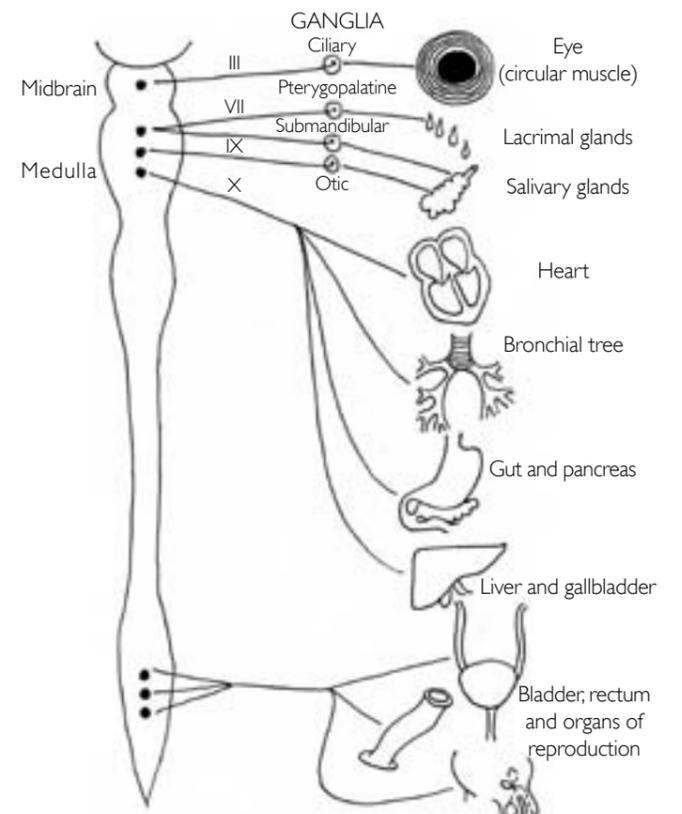


Figure 1. The parasympathetic nervous system

and therefore counter many of the effects of the parasympathetic nervous system (see Figure 3).

Anatomically, the parasympathetic nervous system consists mostly of fibres which travel in cranial nerves III, VII, IX, and X. (Additionally, a small amount of parasympathetic supply comes from the sacral nerve roots, S2, 3 and 4 (see Figure 1).

For the organism as a whole, the most important of these is the *vagus nerve* (Lt: "wandering"), which supplies parasympathetic signals to almost all the organs of the thorax and abdomen (those derived from foregut and midgut). The functions of the *vagus* are many and complex; only parasympathetic functions are described here.

The *vagus nerve* arises from the medulla oblongata, and leaves the skull via the jugular foramen. In the neck, it travels in a neurovascular bundle which includes the internal jugular vein and the common carotid artery. In the mediastinum, the *vagus nerves* lie on either side of the oesophagus, and cross the diaphragm with the oesophagus. Below the diaphragm the *vagus nerves* contribute to a plexus around the coeliac arterial trunk, known as the *coeliac plexus* (formerly called the solar plexus) which also includes sympathetic fibres. The plexus has branches which pass throughout the abdomen and therefore it is impossible to follow the *vagus nerve* as a single structure, although its fibres extend to almost all the viscera.

As a result of its wide distribution, many different stimuli (such as stretching the peritoneum) can stimulate the *vagus nerve* to produce bradycardia. This effect can be used therapeutically in the treatment of supraventricular tachycardia: massaging the carotid sinus (which is innervated by the *vagus nerve*) can slow the heart by vagal stimulation.

Since the *vagus nerve* is a cranial nerve, it is spared in lesions of the spinal cord. A high spinal cord injury, e.g. at C5, may render the patient quadriplegic, but the processes of digestion still continue because the function of the *vagus* is unaffected. However, the sacral component of the parasympathetic nervous system is lost, resulting in loss of voluntary continence and sexual function.

The other cranial nerves which contain parasympathetic fibres are as follows:

- The *oculomotor nerve* (cranial nerve three) contains both motor and parasympathetic fibres. The motor fibres supply the muscles of the orbit. The parasympathetic action of cranial nerve iii is on both the iris muscles of the eye (constricting the pupil) and the ciliary muscle, which causes thickening of the lens for close focusing (accommodation).
- The *oculomotor nerve* emerges from the midbrain, and has a comparatively long course before it enters the orbit via the superior orbital fissure. In conditions of raised intracranial pressure (such as trauma or intracranial bleeding), the innermost part of the temporal lobe (the uncus) may be squeezed downwards by pressure from above (uncal herniation). This causes stretching of the *oculomotor nerve*. The first sign of this is a dilated pupil which fails to respond to light (known colloquially as a "blown pupil"); later, complete paralysis of the nerve occurs. A blown pupil occurs on the same side as the lesion. It is a sign of severe intracranial pathology, usually requiring immediate surgery.
- The *facial nerve* (cranial nerve seven) contains, motor, sensory and parasympathetic fibres. The motor fibres supply the muscles of facial expression. The sensory fibres convey taste sensation from the anterior two thirds of the tongue. The parasympathetic fibres innervate the sublingual and submandibular salivary glands (but not the parotid gland), and the lacrimal gland of the orbit.
- The *glossopharyngeal nerve* (cranial nerve nine) is a predominantly sensory nerve whose parasympathetic fibres supply the parotid salivary gland. The ninth nerve also conveys sensation from the throat and the posterior third of the tongue. The sensory component of the gag reflex is mediated via the ninth nerve. It also conveys taste sensation from the posterior third of the tongue.
- The *pelvic splanchnic nerves* (sometimes called the *nervi erigentes*) emerge from the sacral nerve roots S2, 3 and 4. They supply parasympathetic

fibres to hindgut-derived structures, which includes the distal third of the colon, the rectum and the anus. They are responsible for voluntary relaxation of the urinary and anal sphincters, and hence for continence. They also supply the genitals and are responsible for penile erection.

Table 2. Functions of the sympathetic nervous system

Increased heart rate (tachycardia)
Vasoconstriction of skin and viscera
Sweating
Bronchodilation
Dilation of the pupil (mydriasis)
Inhibition of production of digestive juices
Inhibition of peristalsis
Relaxation of the uterus

THE SYMPATHETIC NERVOUS SYSTEM

Physiologically, the functions of the sympathetic nervous system are concerned with readying the body to deal with threat or danger: the "fight or flight" response (see Table 2). Blood is diverted away from non-vital areas and directed to the heart, brain and muscles, while heart rate and breathing are increased to meet extra demands for blood and oxygen. The sympathetic nervous system is also responsible for the transmission of visceral pain from organs such as the gut, bladder and uterus.

Many functions of the sympathetic nervous system oppose those of the parasympathetic nervous system, although it is important to note that not all organs receive innervation from both components of the autonomic nervous system. For example, most large arteries are richly innervated by the sympathetic nervous system but are sparsely innervated by the parasympathetic system.

The sympathetic nervous system innervates the adrenal glands. The adrenal medulla can be thought of as a specialised synapse, which releases its transmitter directly into the bloodstream. The transmitters involved are adrenaline and noradrenaline. The effects of the sympathetic nervous system are therefore mediated both by direct neural connections and by endocrine effects of adrenaline and noradrenaline in the circulation.

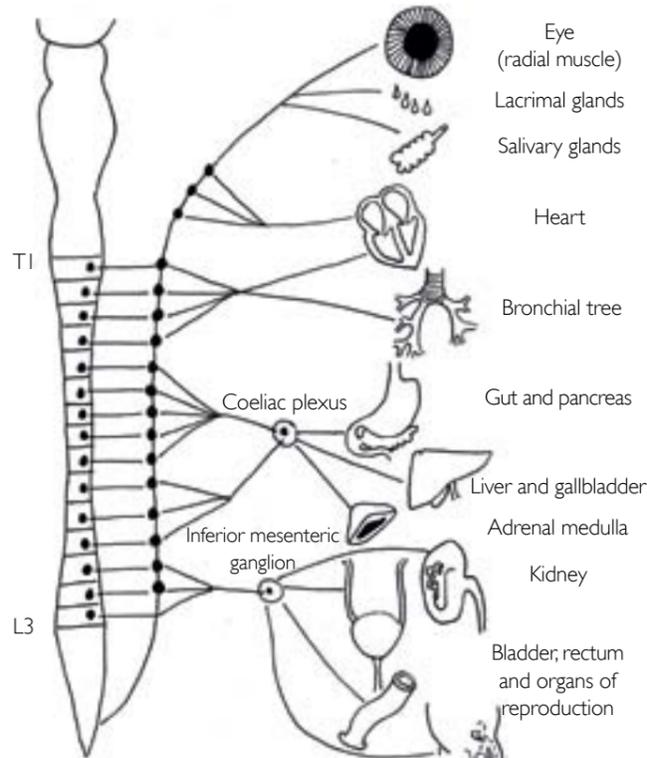


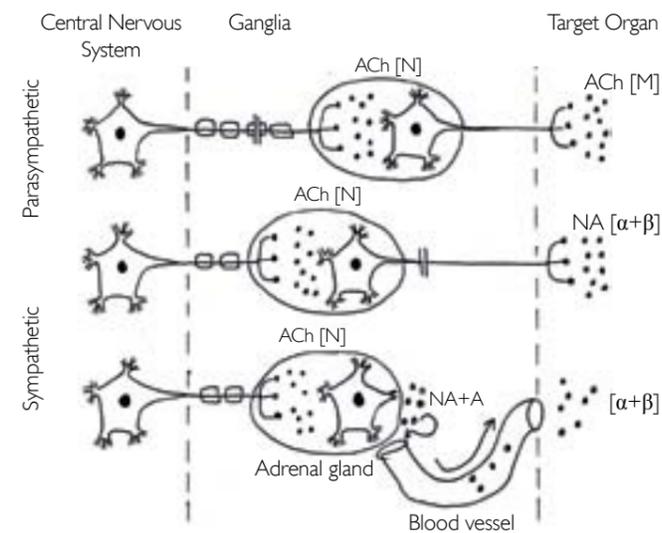
Figure 2. The sympathetic nervous system

A *phaeochromocytoma* is a rare tumour of the adrenal medulla which releases pathological quantities of adrenaline and noradrenaline into the circulation.

The neurotransmitter between the sympathetic nervous system and the target organs is noradrenaline (except in sweat glands where it is acetylcholine). Noradrenaline receptors are categorised as α or β . α receptors tend to be found in blood vessels, where they promote vasoconstriction. β_1 receptors are found in the heart, where they stimulate rate and force of contraction. β_2 receptors are found in the smooth muscle of the bronchial tree and the uterus, where they cause relaxation.

Fibres from the sympathetic nervous system arise only from the spinal cord, between T1 and L2. Most sympathetic fibres travel only a short distance, before synapsing in a chain of ganglia, the sympathetic trunk, which lies on either side of the vertebral bodies. Thereafter, the fibres pass to the target organs (see Figures 2 and 3).

In order for sympathetic supply to reach the arm and the head, sympathetic fibres must travel upwards from T1. Lesions of the T1 nerve root, or the sympathetic trunk above T1, will remove all sympathetic innervation of the head and arm on that side. The effects of this are most pronounced in the head, and are known as *Horner's syndrome* (see Table 3).



Ach	Acetylcholine	[N]	Nicotinic acetylcholine receptor
NA	Noradrenaline	[M]	Muscarinic acetylcholine receptor
A	Adrenaline	[α + β]	Alpha and beta adrenoceptors

Figure 3. Autonomic ganglia

Horner described three specific findings: a constricted pupil (miosis), a drooping upper eyelid (ptosis, because levator palpebrae superioris which opens the eyelid is partly innervated by the sympathetic nervous system), and unilateral absence of sweating (anhidrosis). A fourth sign not described by Horner is unilateral congestion of the nasal mucosa, which can be thought of as "stuffynosis".

The upper sympathetic trunk passes over the dome of the pleura. A tumour at the apex of the lung (known as a *Pancoast tumour*) may erode the sympathetic trunk at this point, causing Horner's syndrome, which may

Table 3. Features of Horner's syndrome

Constriction of the pupil (miosis)
Drooping of the upper eyelid (ptosis)
Absence of sweating (anhidrosis)
(Unilateral nasal congestion: "stuffynosis")
All of these signs are present on the same side as the lesion.

First described by Johann Friedrich Horner, Swiss ophthalmologist, in 1869.

be the presenting feature of the tumour. Horner's syndrome may also result from damage to the sympathetic system at other sites such as the brain stem, the cervical cord, or the internal carotid artery.

Alternatively, some patients who suffer from excessive sweating of the hands (hyperhidrosis) may have the upper sympathetic trunk surgically divided via the pleural space. This procedure, a thoracic sympathectomy, can be performed using keyhole surgery, having deliberately collapsed the lung first. Dividing the trunk around T2 can reduce sweating in the hands without necessarily causing Horner's syndrome.

Above T1, the sympathetic trunk continues as three more ganglia, the superior, middle and inferior cervical ganglia. The inferior cervical ganglion is sometimes continuous with the T1 ganglion and this is known as the *stellate* (Lt: "star-shaped") *ganglion*.

Fibres from the superior cervical ganglion enter the skull with the internal carotid artery and form a plexus, the internal carotid plexus, whose branches accompany several cranial nerves to supply the structures of the head.

Below L2, the sympathetic chain continues downward in a series of ganglia which terminates at the coccyx.

Because it arises only from the spinal cord, the sympathetic nervous system is affected by lesions of the spinal cord. A cord lesion above T1 will result in complete loss of sympathetic function for the whole body. This can make the patient's heart rate and blood pressure unstable (the heart receives its own sympathetic supply from T1, 2 and 3). A cord lesion lower down, e.g. at T8, will be less severe in its effects, but sympathetic function will still not be normal, since the adrenal glands themselves receive sympathetic innervation from T10-12.

CONCLUSION

We hope that this introduction will provide the reader with a good working understanding of the autonomic nervous system. However, for the sake of simplicity many anatomical and physiological details have been omitted. We recommend that the interested reader consult a textbook of neuroanatomy if further detail is required.

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Screening for breast cancer: Should we or shouldn't we?

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Haitham Al-Mahrrouqi is a fifth year medical student at the University of Otago, Christchurch. His BMedSc (Hons) degree was on the epidemiology of stomach cancer in Oman and he recently graduated with first class honours. Apart from public health, Haitham has a passion for ophthalmology.

Have we got breast cancer screening wrong? Recent evidence suggests that we may certainly have.

Breast cancer is an important cause of morbidity and mortality for women. Globally, breast cancer is the most frequently diagnosed cancer among women, affecting nearly a million and a half women annually.¹ Despite its relatively good prognosis, breast cancer is nevertheless the most prevalent cancer in the world.² The incidence of breast cancer has been increasing and mortality decreasing over the past few decades, particularly in the more developed countries. This phenomenon may be partly attributed to the existing screening programmes.³

Breast cancer screening is a secondary preventative measure aiming at reducing breast cancer mortality. Ideally, a screening programme should be cost-effective, accepted by the public and have high quality evidence confirming that its benefits outweigh its harms. Mammography, as a breast cancer screening tool, involves imaging the breasts using low dose x-ray. A large Canadian study found that the sensitivity and specificity of mammography were 0.75 and 0.94 respectively.⁴ However, the sensitivity and specificity are likely to differ according to the phase of the menstrual cycle and with hormone replacement therapy.⁵

Screening using mammography has been practiced for at least 10 to 20 years in many developed countries. In New Zealand, breast cancer screening began in 1998.⁶ Earlier on, the decision to embark on breast screening was based on two large trials, one conducted in New York and the other in Sweden.⁷ At the time however, the harms of breast cancer screening were unclear.

A meta-analysis of seven large randomised controlled trials (RCTs), which tested the effectiveness of screening using mammography in decreasing mortality from breast cancer, was recently published by The Cochrane Library.⁸ Seven large RCTs involving 600,000 women 40 years or older were included in the review. Three of the seven trials were adequately randomised and the meta-analysis showed no significant reduction in breast cancer mortality at 13 years in the screened arm compared to the controlled group (RR 0.90, 95% CI 0.79–1.02).⁸ Randomisation in the other four trials were sub-optimal, but the meta analysis found a 25% risk reduction in breast cancer mortality with mammography (RR 0.75, 95%CI 0.67–0.83). Combining the seven trials gave a risk reduction of 19% (RR 0.81, 95% CI 0.74–0.8).⁸

In screening programs, mortality is a better measurable outcome than survival in reducing lead time bias* and length time bias.⁹ The authors of the

meta-analysis found that breast cancer-specific mortality was an unreliable outcome because the screened group were more likely to be assigned breast cancer as a cause of death than the controlled group.⁹ This bias may result in an exaggerated harm of screening. Nevertheless, the three adequately randomised trials found no difference in breast cancer-specific mortality or in all-cause mortality between women who were screened and those who were not.

The biggest harm from screening is over-diagnosis and unnecessary treatment. Over diagnosis results from the screening process preferentially identifying slow growing tumours or non-malignant changes that would have caused no harm if left untreated. This meta analysis found that there was a 30% increase in the rate of lumpectomies and mastectomies in the screened arm compared to the controlled arm.⁸ Similarly the rate of radiotherapy was higher in the screened arm.

Absolute risk is better than relative risk in understanding the magnitude of the screening effect.⁸ Using reasonable estimates, this meta-analysis found that if 2000 women were screened for ten years, only one woman would have her life prolonged, ten would be treated unnecessarily, and a further 200 women would experience significant psychological distress and pain due to false positive results.

From this recent evidence, it is uncertain whether the benefits of breast cancer screening really outweigh the harms of over-diagnosis, unnecessary treatment and anxiety. Before doctors advocate breast cancer screening, it is pertinent to discuss the benefits and the harms of screening with the individual to allow her to make an informed decision as to whether to be screened or not. It is also important to consider the risk of breast cancer on an individual basis as the benefit of screening may outweigh the harm, especially in women with a strong family history and those who are older. In addition, it is important for the National Screening Unit in New Zealand to make the information regarding the harms of screening clearly available to the public and not present a one-sided view towards the benefits of screening on their website (www.nsu.govt.nz) and in the Breast Screen Aotearoa brochures.

Further research should be carried out to find ways to lessen the problem of over-diagnosis from breast cancer screening such as developing better correlation of histological findings with the risk of malignancy.

ACKNOWLEDGEMENTS

I would like to thank Dr Ben Hudson for reviewing this article.

**Lead time bias is a seemingly prolonged survival due to earlier diagnosis through the screening programme rather than prolonging longevity, a situation arising where effective treatment is unavailable.*

Length time bias occurs as screening detects slow growing tumours that would otherwise have not caused any problem in a person's lifespan.

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FEATURE : OPINION

Kia Kaha Christchurch

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Living through a major earthquake, and amidst a National State of Emergency, is definitely not part and parcel of completing your clinical years of medical school.

Or so I thought.

I first found out about the February 22nd earthquake on the way back from my elective, an hour or so after it had occurred. It was totally unreal. The first pictures I saw were of the bent and broken Cathedral; an international icon of the city I have gotten to know well over the two years I've spent here as a clinical medical student. Even though my loyalties will always lie with Dunedin, the city I grew up in, there was something gut wrenching about this image. The Tui billboard ran through my mind when my flatmate text me, "kitchen knee deep in silt" ... Yeah Right, I thought. It took a while to actually sink in and most of us were living in a daze of this reality.

Despite all the chaos, the medical students who were in Christchurch at the time did a great job helping out in the hospital, the community, and most importantly, looking after each other. It is a massive credit to them all.

I came back to Christchurch, a city that looked like a war zone, shortly after February 22nd. The centre of town felt, and still feels, eerily like a ghost town; deserted and silent with a fine layer of silt coating it in a greyish tinge. Overtaking an army truck became a novelty. Having a curfew, not being able to shower, flush, or drink tap water; navigating horrendous traffic and a city in ruins have not. There has been a lot of destruction, and it continues, as Christchurch is made safe again. It is a strange feeling to drive to the supermarket past familiar buildings with walls missing, half standing as they wait for the bulldozer. It is even stranger the next time you pass by and all there is, is empty land.

Lisa is enjoying completing her final year at medical school and has been active in several student run initiatives throughout her training, including NZMSA conference 2010: Queenstown and NZMSJ.

We still do not have access to our beloved Medical School building. No library, common room, tutorial rooms, computer lab, Medici (the local café hangout), support staff on site, UBS, lecture theatres, lockers, or pathology museum; who knows what happened to the specimens. This, along with the 4th and 5th years' time off, has obviously had an impact on teaching and caused disruption to our learning environment. Our teaching staff are doing a great job despite all of this and working well beyond any specified job description to keep things on track. We do now have access to a temporary computer laboratory and a temporary common room, which in the future may be dubbed the 'dungeon' as opposed to the well-known 'den'. These have both made a big difference. CMSA in conjunction with the NZMSA held a free lunch to show their support for all the Christchurch students, and to say thanks for all the hard work they have done in the hospital and the community. This was well received by the students.

I'd like to put out an enormous thank you to everyone who has shown their support throughout this trying time, especially the students of the other schools around the country, the Christchurch School of Medicine, and all of our teaching staff.

I would like to say that even though the immediate trauma is over, the dead identified, the injured in rehabilitation and buildings demolished, a sense of the 'new normal' is washing over us and the scars are still maturing. Things are still far from normal and will be for some time. In fact, things will never be the same again. It is a credit to the medical school community in Christchurch that everyone has worked together to get through.

Lastly, Christchurch students, always remember that there's help if you need it. All you need to do is ask.

The tacit expression: Pakistan floods 2010

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Mohammad Bilal is the President of Amcolians' Undergraduate Research Forum (AURF) at the Army Medical College, National University of Science and Technology, Pakistan; and the Editor of the Journal of Pakistan Medical Students. He along with his fellow mates express what they witnessed and felt during the relief work carried out during the devastating floods in Pakistan.

Daniyal Asim is an enthusiastic volunteer always willing for any social work and considers it the basis of his profession. Although being involved in social work from his school days, the floods in his homeland have really moved him.

Aun Raza Shah is also active in research and is the General Secretary of AURF. He is a great writer but even he believes after the floods that the word is not the feeling.

Javaid Usman is the Director of the AURF. He is the inspiration behind the students excelling in research at the Army Medical College. An excellent teacher, he keeps the college students motivated in academics, co-curricular, research and social work activities.

"The word is not the feeling" (Anon). This quote made an immediate and tremendous impact the moment I read it, but it was not until a couple of months ago that I began to understand what it really meant.

"This place used to be my house, these fields were lush green, my grandfather had planted a tree here and I lost my only son."

These were some of the sentiments that echoed across Pakistan during the floods of 2010.

They say that the biggest stress known to man is the loss of a child followed by the loss of his home. I do not know how to describe the feelings of the man who wakes up one fine morning, has breakfast in the house that he built with years of struggle and hard work, and drops his child to school. Then returns home to sirens signalling imminent flooding and house evacuation, and has no idea where to go. In a matter of hours, suddenly, he is all alone in the world, without a place to cover his head. This is how life changed one day for a large number of people.

It was the month of July 2010 when the ruthless water started its journey, a journey that would damage half of Pakistan before it poured finally into the Arabian Sea. The floods started after a series of torrential monsoon rains which spanned all regions of the country and affected widespread areas. The combined rainfall for July and August produced a body of water moving southwards that was equal in area to the entire landmass of the United Kingdom. On a single day, (July 30) the northern city of Peshawar

recorded 274 mm of rain. The floods hit 79 of the 124 districts of Pakistan affecting an estimated 20.2 million people. Nearly two million houses were damaged or destroyed and at least seven million people are still without shelter. The death toll has been close to 2,000. More than 62,000 students have been affected and are now attending make-shift schools in displacement camps. Structural damages in the flood have been estimated to exceed \$4 billion; and wheat crops damage over \$500 million. Officials estimate the total economic impact to be close to \$43 billion. The United Nations Secretary-General Ban Ki-moon, after having visited some of the flood hit areas, stated that this was the worst disaster he had ever seen. In short, the number of individuals affected by the flooding exceeds the combined total number of individuals affected by the 2004 Indian Ocean tsunami, the 2005 Kashmir earthquake and the 2010 Haiti earthquake.¹

Addressing the massive task of putting it all back together again would daunt the best-prepared and funded of governments. Ours was neither. Every resource had to be stretched to its limit to ensure that efforts were fruitful. It warranted solidarity not only at the government or organization level, but also at an individual level. To help those affected, various government departments, the armed forces, NGOs, the international community, students and citizens all came together and united under the banner of providing relief.

We, the students of final, fourth and third year MBBS at the Army Medical College, volunteered our humble services under the arrangements of our college's alumni, the Amcolian Alumni Association (the final year class being officially designated). Ours was a twenty strong student team supporting our senior doctors from various specialties including, general medicine, surgery, ophthalmology, ENT and dermatology.

Our first visit was to the city of Nowshera, about 120 kilometres in the north of the federal capital Islamabad. It was totally submerged in water and most of it was damaged beyond local repair. We arranged a free medical camp and facilitated specialist consultations and distribution of medicine. We also distributed some items of basic needs like clothes, bed sheets, pillows and bottled drinking water.

After the initial first week, it was back to the drawing board to devise a plan to set up medical camps where the victims could be provided medical support along with food supplies and drinking water. Our first target was the city of Nowshera, Khyber Pakhtunkhwa. This city was completely submerged and most of it was destroyed beyond repair. Medical students were enlisted to provide manpower to carry the equipment to where it was needed. Patient profiling was done to divert the long list of patients to the respective specialists. Free medicine was also provided at a makeshift pharmacy.

Another essential task for the medical students was to provide awareness of various diseases and sanitation to the locals. The locals were educated about various diseases such as viral conjunctivitis and how it is transmitted; they were taught about sanitation and hygiene; they were warned about possible diseases that may show up soon such as malaria and cholera and how to preempt and avoid them; they were also taught about the need to have proper drinking water and given chlorine tablets to sterilise the water. Pamphlets and directions were also given in their native language to convey the message with full effectiveness. Around 500 patients, male and female were seen by the respective specialists. Most patients suffered from diarrhoea, scabies or conjunctivitis which had spread rapidly due to floods and reduced hygiene.

Another day camp that was setup was in the village Mohib Banda, Charsadda, Khyber Pakhtunkhwa. This town had also been damaged to quite an extent and there was no local hospital available to provide medical assistance. Specialist doctors, medical students, medical supplies and food items were taken along to set up a makeshift camp in a mosque in this village. Two teams were made so that one could distribute the food and water supplies fairly while the other could effectively run the medical camp. Medical students were once again in charge of patient profiling, ushering patients to the respective specialist and explaining drug prescriptions. Another vital role was to spread awareness of the possible flood related diseases, hygiene, sanitation and proper drinking water. Counselling was provided to help people work with their losses and feel more optimistic

about the future. Medicines were also provided, free of cost to all the patients.

The turnout was impressive and around 700 patients, male and female were seen and treated by the doctors. Most people suffered from diarrhoea, viral conjunctivitis and scabies and other forms of skin infections. On the way back, the area was also surveyed for future rehabilitation purposes to provide aid and construct houses for those affected.

Since the area of Charsadda was so badly affected, a need was identified and additional camps were set up in that region. This time the resources were carefully planned and the doctors and medical student volunteers were split into three teams to set up three different medical camps. One camp was set up in a village in Nowshera while two camps were set up in different villages in Charsadda. In the village of Gohar Abad in Charsadda, a medical camp was set up in an old house where separate areas were divided to see male and female patients. A temporary pharmacy was also set up to provide patients with the prescribed medications free of cost. Around 450 patients were seen from the village. Most patients presented with gastroenteritis, skin infections and throat infections. The other two camps set up also saw a similar amount of patients and in total around 1400 patients were seen in the three different camps.

Even though there is still a lot to be done, everyone is putting in their best effort. The Army provided relief by supplying goods, manpower and doctors to even the most remote areas. The NGOs helped by donating goods for the relief camps and providing doctors for medical support.

We the medical students were important in our own way and helped to the best of our ability, commuting to different areas for five consecutive Sundays as well as also having regular academic sessions at the college. We helped around 2500 patients at these camps. It is indeed nothing considering the magnitude of the problem, but the spirit of our doctors and particularly my young colleagues, in working tirelessly in the hot and humid weather while fasting (it was the month of Ramadan), was very admirable.

In medical terms, this hands-on experience taught us the basics about epidemiology, diagnosis, treatment /management and prioritising of post-flood diseases which would have otherwise taken many weeks, a number of text books and teaching. More importantly were the intangible and unimaginable experiences which hardly any curricula at our level attempts to address.

The biggest lesson was on a humane level. This flood has created suffering and unforgettable horrifying memories for three generations. What we did was to help relieve the physical symptoms only. The deeper scars were untold and it made us realise how limited our vocabulary can really be.

Ever since our first visit to these places, the most striking thing has been the emotional trauma expressed through the eyes of those people who experienced so much loss.

Even now, everytime I wake up early and don't feel like getting out of my warm bed, I look up and see the roof of my house and think of those people who wake up and see the dirty tent as their only cover. I get up and try to think how they would feel and all that comes to my mind is that "words cannot describe these feelings".

Our enthusiasm has not been exhausted and we are still as enthusiastic and willing to participate in the next phase of the rehabilitation process, which is to provide shelter and reconstruction of the devastated areas. One day all these experience and knowledge that we the medical students have gained will show up in our work and will no doubt make us become more competent and able doctors.

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Report from Onagawa Japan: March 31st - April 4th 2011

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BACKGROUND

At 14:46 on Friday 11 March 2011, a magnitude 9.0 earthquake struck Japan; the epicentre located 81 miles east of Sendai, the capital of Miyagi prefecture. The tremor triggered a massive tsunami and seriously damaged the Tohoku and the Kanto districts. Even now the aftershocks continue everyday.

We followed a volunteer team from the Japan Association for Development of Community Medicine (JADCOM) to the Onagawa municipal hospital.



Figure 1. Devastation caused by tsunami in Onigawa, Miyagi Prefecture, Japan.



Figure 2. Backdoor of the Onigawa municipal hospital.

The team consisted of doctors, nurses, caregivers, pharmacists, physical therapists and medical assistants.

Onagawa is a town in Miyagi prefecture on the eastern coast facing the Pacific Ocean. The town is approximately 65.8 kilometres squared, with a population of 9965. The area boasts a successful fishing port. The Onagawa nuclear power plant is located in the southern part of the region.

Onagawa was hit by the highest tsunami in the disaster: The tsunami was as high as 17 to 25 metres. The inland area of the city was inundated and completely destroyed (Figure 1). Four hundred and fifty four people are dead and 744 people are missing; and at least 1900 people are now dwelling in refuges and temporary shelters.

PROVISION OF HEALTH SERVICES

Since the tsunami, medical care is being provided by a network of facilities and organisations. After the tsunami, Onagawa municipal hospital transformed into a unique medical facility. Except for the first floor which was damaged by the tsunami despite being twenty metres above the sea (Figure 2), the hospital functions as a dispensary, an inpatient's ward and a nursing home. The adjoining Ishinomaki Japan Red Cross Society (IJRCS) hospital provides tertiary medical services, while the municipal hospital provides primary care services and receives elderly patients who need special care, or face difficulty living with others in IJRCS or in the shelters. Medical staff from other regions as well as the Japanese self defense force also provide medical care. Every three or four days, multidisciplinary meetings are held so that there is a coordinated approach to delivery of health services in the spirit of cooperation (Figure 3).

IN THE REFUGE SHELTERS

Norovirus, influenza and other infectious diseases are prevalent amongst many survivors of the tsunami especially those dwelling in temporary shelters. At the shelters we were involved with the clean-up operation. This involved many tasks including disinfecting the floors, clearing spaces so that they could be habitable, making partitions for privacy and prevention of disease, and keeping the floors warm. We also supported the doctors, nurses and pharmacists when they performed health checks; and also provided social support by playing with the young and talking with the elderly.

In the shelters there are more than 700 internally displaced people, as well as medical professionals, city officers, members of the self-defense forces, and professional volunteer groups from non-disaster area. Almost all the people are very anxious about their daily life, have no hope for their future, and are beginning to feel the stress of the situation. Sometimes they are enthusiastic and cooperative for projects, other times irritated, sickly and self-centered. Many suffer from acute stress disorder and pollinosis, and several suffer from norovirus and influenza.



Figure 3. Multidisciplinary meeting

IN THE HOMES OF VICTIMS

We observed two types of home visits (Figure 4). On the first type of visit, we accompanied a doctor to the home of an elderly woman who had died, and observed a post-mortem inspection. After the tsunami, policemen became victims themselves as they were burdened with the significant number of postmortem inspections. On another visit, staff from the health welfare section in Onagawa, including a public health nurse and doctor, visited victims' homes. The tsunami had swept away and destroyed multitudes of health ledgers and records. On these home visits staff examined victims' health conditions and household composition, to develop a database of information and to also provide necessary information to support victims. Lack of information hinders their access to appropriate support provided in the refuge shelters. Specific problems include patients with chronic diseases becoming anxious about discontinuation of their medication, diabetic patients facing difficulties with control of their blood sugar because the distributed food is full of carbohydrates, and the necessity of sharing toilets outside makes them hesitant about using laxatives.

MANAGING THE HEALTH OF THE INDIVIDUAL HOLISTICALLY

We try our best to provide the people with the necessities of basic life (food, clothing) and medical care. However their quality of life is also impacted by their living environment (access to clean water, well balanced food, warm living spaces), as well as regular provision of daily information and instilling a sense of hope and the prospect of reconstructing their lives



Figure 4. Home visits are fraught with many challenges, including assessing the homes themselves!

and the community in which they live. Appropriate measures are also required to deal with survivors' guilt and post traumatic stress disorder.

It is important not to forget the health of health workers and volunteers in the region. Addressing their physical and mental health is also important. Many have been working days on end without sufficient rest.

WHAT CAN MEDICAL STUDENTS DO?

Regular reports to other countries prevents forgetfulness of victims and improves measures against disasters in the Asia-Pacific region. In fact, we met a man who survived the tsunami by following the lessons he learnt from the 2004 tsunami in Aceh, Indonesia. The man's house was on a hill ten metres above sea level. He had previously watched a programme about the 2004 tsunami and learned how people survived the disaster. Many of his neighbours remained in their homes despite the tsunami warnings, believing that they would be safe. The man fled his house and survived, while those who remained behind perished.

Medical students can bridge the gap between citizens, the health care sector, and the administrative sector. We need to look beyond an individual's health needs and consider their total wellbeing; we can make a huge impact on the total wellbeing of adult and paediatric patients through a simple chat or by playing with them.



Figure 5. The authors (L-R) Ayaka Daizo, Konomi Ueshiba, and Eisuke Muto.

Resilience in the face of disaster: Reflections on the Japanese earthquake and tsunami

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Mitsuyoshi Mita is a sixth year medical student at the Jikei University School of Medicine in Tokyo, Japan. He is interested in cardiology and physiology, and aspires to become a clinician as well as a basic researcher. He is also interested in the world's social conditions, urban planning and urban problems. He is a member of a soft tennis (Japanese-style tennis) club at the university. Skiing and snowboarding are also his favourite sports.

This year I had the worst experience of my life. It happened at 2:46 pm on March 11th, and shocked all Japanese people including myself. This disaster was especially shocking to me as my hometown was near the disaster areas. In this article I'm going to write about Japan's earthquake and tsunami disaster and how it has impacted me.

The disaster was caused by a magnitude 9.0 earthquake; the seismic centre under the Pacific Ocean, about 130 kilometres from Miyagi prefecture (Figure 1).

The direct damage caused by the earthquake was minimal because the Japanese Government had taken many preventive measures against earthquakes. Both Japan and New Zealand sit on the Pacific Ring of Fire, in a zone of extreme crustal instability, so preventative measures are essential. In Japan these measures include constructing buildings to strict earthquake resistant codes and earthquake-preparedness education for all residents.

Despite these preventative measures, the earthquake created unanticipated mega-tsunamis and they engulfed many Pacific seaside cities especially in the Tohoku area. The tsunami climbed a record of 40.5 metres above sea



Fig. 1 Map of eastern Japan. The Tohoku region is shaded. The Pacific coastal areas of Miyagi, Iwate, and Fukushima prefectures were devastated by the tsunami.



Figure 2. Rikuzentakata City. The seashore area is littered with debris.

level (in Miyako City) and many cities were severely damaged. As a result 15,628 people died, 4,823 people are missing (as of July 25th), and many more displaced.

Unfortunately the misfortune was not over. The tsunami also hit the Fukushima Daiichi Nuclear Power Station and washed away almost all of the buildings for generating the emergency power supply. Three of the six nuclear reactors and at least one spent fuel pool were unable to cool down due to station blackout (loss of off-site AC power), which resulted in a full melt down. The area within a 20 kilometre radius from the nuclear power station became an evacuation zone, and the area 20 to 30 kilometres from the station became a voluntary evacuation zone.

People in Tokyo also suffered from the disaster although there was little damage or injury. Immediately after the earthquake, all of the trains and buses were temporarily out of service and many people working in central Tokyo had travel back to their suburbs by foot. Highways were closed and there were many severe traffic jams in Tokyo. Airports were closed and many travellers were stranded and unable to leave the country. Drivers rushed to the gas stations to fill their cars up, and many residents stripped supermarket shelves bare to stock up on essentials such as water and tinned food. There was widespread panic over food and petrol shortages. 'Chaos' was the best word to describe Tokyo at that time.

When the quake began I was on the sixth floor of my university in Tokyo, taking part in our graduation ceremony (in Japan our academic year begins in April). At the beginning of the earthquake I felt dizzy and I didn't notice it because of the vertical shake. As the shaking became horizontal, I soon realised that it was a big earthquake. It was too hard to stand still during the shake. When I looked outside the window, I saw that part of an old building's wall had collapsed and thought that this earthquake was not normal. I turned on the television on my cellphone and was shocked to hear

news about the earthquake near Miyagi prefecture and the large tsunami warning issued to all Pacific seaside areas. After I heard the news I began to worry about my family living in my hometown (Morioka city) because my hometown's prefecture (Iwate prefecture) is next to Miyagi prefecture. Luckily Morioka city is far from the coast and no tsunami damage occurred there. After going back home from the university by taxi, I found my family, my parent's house and my house in Tokyo were fine. It was a very long day for me.

Tokyo is now recovering gradually, but many problems still exist. Public transportation is in service again and citizens have already started working. Stores and offices are open now, but rolling blackouts across the city are about to begin again. Building owners are encouraged to save electricity and Tokyo is now a little darker, especially at night. Residents across the city are also advised to save electricity as many of the nuclear power stations have stopped for inspection and power shortages may occur especially in summer. It is important to note that nuclear panic is not happening so much in Tokyo, as the city is about 230 kilometres from Fukushima and there is low risk of radiation exposure. However the problem is that the nuclear crisis is impacting on the country's productivity. Many companies such as Sony and Toyota have had to halt their production lines. There is concern that this crisis will impact on Japan's export sector and thus worsen the Japanese economy.

People in disaster areas are suffering even now. Many of the 91,552 refugees still live in shelters erected soon after the tsunami. Some of the refugees have health problems on account of the long periods they have spent in cramped living conditions. One example is deep vein thrombosis, caused by living in cars for a long period. Infections are not a common aftermath in Japan's disasters, but this time the number of influenza patients is rapidly increasing in some disaster areas. A scarcity of drugs is a big problem for refugees who have severe hypertension or insulin-dependent diabetes mellitus. Medical teams from other prefectures and foreign countries have come to disaster areas in rotation to address the health problems. Temporary housing is being constructed now and debris removal in disaster areas has just started. Reconstruction of Tohoku will be a long way away.

In March 30th 2011, I had the opportunity to visit Rikuzentakata city, a tsunami-hit area, to participate in post-mortem examinations with my father. In Japanese law, death certificates must be written by medical doctors. As

my father has a medical licence and works at the medical university near the disaster areas, he was ordered to participate in post-mortem examinations by the police. I was able to get permission to accompany my father and assist him during the examinations. The examination was an unforgettable experience for me although we only identified five bodies. The bodies were quite different from the bodies I dissected during anatomy and pathology classes. As many of the bodies had been submerged in water they had swollen systemically and the skin turned red, blue or green with adipocere. Many parts of the bodies had been eaten by fish or injured by rocks or other debris, so the muscles and bones were exposed. None of the bodies had any eyes. All of these are typical appearances of drowned bodies. I thought it was hard to identify each body because I couldn't even identify whether each face was male or female, or whether she/he is young or old!

On the day of the examination I walked down to the seashore and could see the horrible view of the city (Figure 2). There were piles of debris and some broken cars and ships were still floating or submerged in the water. The city was completely devastated and appeared like a war-zone. When I walked along Route 45, I found one road sign which said, "End of Estimated Tsunami Inundation Area" (Figure 3). This sign represented the estimated limit of a tsunami and the beginning of a safety zone determined by the government. Interestingly the government didn't predict that a tsunami would engulf beyond the sign. In fact the tsunami did engulf the area beyond the sign. Humans can never win against nature I thought.

Through many experiences I had after the earthquake, I thought how peace is of great importance. 'Tsunami' is a word of Japanese origin. Historically Japan has endured many kinds of disasters, such as earthquakes, tsunamis, eruptions and typhoons. However even the Japanese people, who should have been the most prepared for any disaster experience, couldn't anticipate and prepare for this disaster. I would like everyone to know and not to forget the danger of earthquakes and tsunamis. The geography of New Zealand is so similar to Japan that people in New Zealand must think about it as well. The Japanese people greatly thank New Zealanders for saving the lives of Japanese students in Christchurch earlier this year and appreciate the numerous donations for this earthquake. Reconstruction is going to take time, but we Japanese will never give up.



Figure 3. This road sign states that tsunami would never go beyond this point.

Simplified guide to slit lamp examination for medical students

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In medical school the use of ophthalmoscope has been well taught. However, you then discover that the slit lamp is the tool central to ophthalmic diagnosis and management. The ophthalmoscope, though handy, only allows limited view of the retina (fundus), which is why it's also called direct fundoscopy. Its use as a loupe to examine the anterior segment is somewhat limited.

As junior doctors, you might find yourself working in an emergency department with slit lamps. This article is aimed to guide non-ophthalmologists to examine the anterior segment of the eye in more detail, to complement direct fundoscopy.

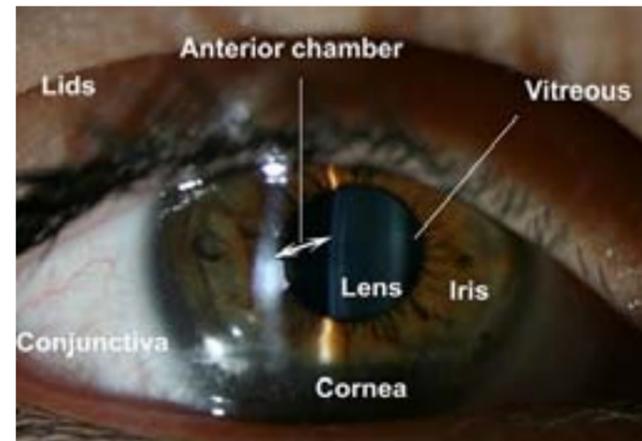
As the name implies slit lamp examination is examination with a slit of light beam. There are many models of slit lamp but the basic operations are similar. The instrument was first devised by an ophthalmologist from Sweden, Allvar Gullstrand, who earned himself the Noble Prize in Medicine 1911 for his invention that has revolutionised ophthalmological practice since.

GET YOUR ANATOMY RIGHT

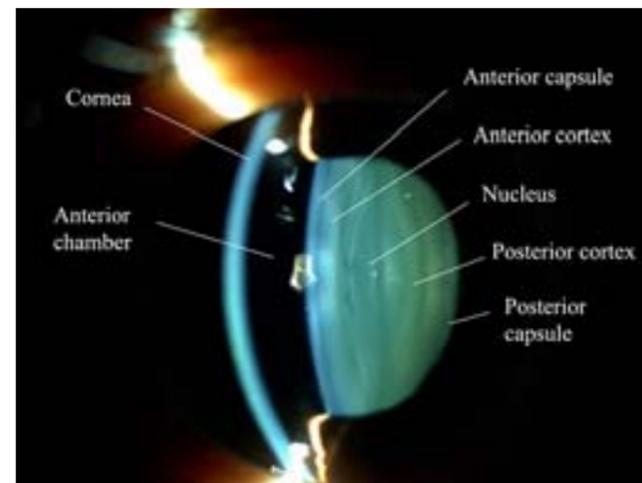
The eye is divided into anterior segment and posterior segment by the lens. You should study the relation of the different structures to each other.

Visual impairment increases three fold with age, with the main causes being cataract, glaucoma and macular degeneration. Cataract is the most common cause of blindness worldwide affecting 15.83 million persons.

Do familiarise yourself with the appearance of the normal and pathological anterior segment and fundus by looking up ophthalmology atlases.



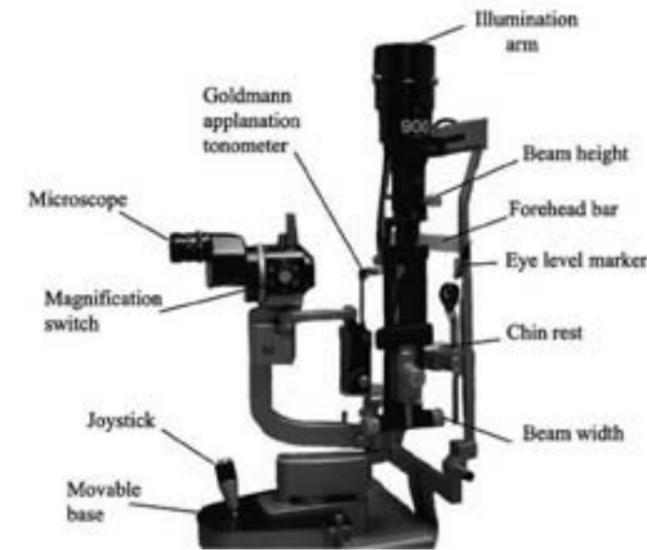
Eye anatomy. Image acknowledgement: G Helfet.



Projecting the slit beam from an angle gives a cross section of the cornea, anterior chamber and lens. Imagine the lens like a cross section of an onion. Image acknowledgement: ProfTien Wong

PARTS OF THE SLIT LAMP

The slit lamp is essentially a combination of the binocular microscope and the illumination arm. Light is directed at the eye and the clinician looks through the microscope.



Basic parts of the slit lamp. Image acknowledgement: ProfTien Wong

BASIC OPTICS

The underlying principle of slit lamp examination is optics, which is a branch of physics studying the behaviour and properties of light. The character of the illuminating light can be manipulated to enable the examiner to visualise a particular detail.

There are broadly two illumination techniques employed to visualise different aspects – direct and indirect. Direct illumination is self-explanatory, where light directed is reflected. Indirect illumination uses light reflected from a structure behind to illuminate a structure in front. This is feasible by varying the angle of light directed and the slit dimensions.

BEFORE STARTING

As in any other clinical examination, explain the procedure to the patient prior to starting. It is important to spend a little time for positioning as patients come in different sizes and heights. A comfortable patient will be more cooperative during examination. The patient's eye should be aligned to the eye level marker; chin on the chin rest, and forehead resting forward against the forehead bar. Make sure you sit straddling the table to prevent backache.

Adjust the eye piece according to your interpupillary distance. Adjust for refractive errors as you would with your ophthalmoscope. You may choose to keep your glasses or contact lenses on.

The power knob is usually below the left side of the table. If the knob has options controlling the intensity of illumination (the brightness of light), start off by using low illumination.

VISUALISING THE EYE

A systematic 'outside-in' approach, viewing the eye from external to internal, should be routine. The key is to be observant.

Lids

Large lumps and bumps, swellings and lacerations will be obvious macroscopically. Slit lamp is useful for detecting blepharitis (inflammation of the eyelid margin) and differentiating small lid lumps.

The external eye is best viewed with bright light of the widest width, with infrared filter if available.

The direction of the eyelashes is important as it may cause associated keratitis.

Conjunctiva

Conjunctivitis is a common condition. Look for injection, which is prominent reddening of vessels radiating around the cornea. Look also for pigmentation, follicles, papillae, foreign body, scar, hyperaemia, chemosis.

Evert the upper lid to assess the underside for follicles, papillae, erythema from inflammation, tumour and foreign body. You would not be expected to carry out the procedure. You should not attempt lid eversion in post-operative patients.

Cornea

Various illumination techniques are based on light reflection to view abnormalities of the cornea. Firstly, direct illumination of the whole cornea with low intensity light allows detection of gross abnormalities. The normal cornea should be smooth and clear without any opacity.

Using low magnification maximises the depth of focus. A narrow slit beam is then used to reveal a cross-section. Move the slit across the cornea. The light reflex should be clear and unbroken. Observe the shape of the cornea which is steeply curved in keratoconus.

The fluorescein dye is used with the cobalt blue filtered light to highlight epithelial defects and ulcers. As cobalt blue has shorter wavelength it scatters light better. Fluorescein binds to collagen and any epithelial defect which exposes the corneal collagen will light up green. Caution should be taken in contact lens wearers as the dye can stain the lenses.

Iris

The normal pupils are round and reactive to light. As you move your light across the pupil, you should be able to see the brisk constriction of the pupil. Pupil reaction to light is lost in rapid afferent papillary defect (RAPD) and iris spasm/trauma. Inspect for; abnormal pigmentation, defects, rubeosis iridis, and pupillary distortion or displacement.

An indirect illumination method termed transillumination enables you to view any atrophic defects in the iris. This technique is also used to assess patency of peripheral iridotomy typically located superiorly. You must line your illumination beam coaxially with the microscope and the red reflex can be seen through the pupil as well as any hole in or thinning of the iris.

Anterior chamber (AC)

Diagnosis and monitoring of treatment of anterior uveitis commonly depends on presence of AC cells and flare.

This aqueous-filled space is best viewed with a narrow and short slit beam (1mm x 1mm) of highest magnification power and light intensity. Change the magnification switch to enhance your view. Swing the illumination beam as if to direct the vertical slit beam of light into the centre of the pupil. The anterior chamber is the dark space in between the two slit reflections. The presence of anterior uveitis may give the appearance of dust in front of a projector light, representing AC cells (the dust) and flare (projector light) respectively. AC cells can be better ascertained by asking the patient to look down and then straight ahead again as eye movement floats the cells. This is common post-operatively. Look also for hyphaema (haemorrhage) and hypopyon (pus) which will be seen as fluid level in the inferior.

Subjective estimation of AC depth has importance in glaucoma. The Van Herick's method compares the width of a thin vertical slit beam at the edge of the cornea to the width of the space between the cornea and iris. The peripheral AC is commonly shallow in the presence of narrow iridocorneal angles, giving a risk of acute angle closure glaucoma attacks. Avoid dilating the pupils in such cases.

Lens

The lens is clear as in normal or opaque (cataract) with increasing age. The eye may well be aphakic (no lens) or pseudophakic (intraocular lens).

By directing the vertical slit beam, but this time focusing behind the anterior chamber, you will note the yellowing or browning of nuclear sclerosis cataract. By retroillumination to obtain the red reflex through the pupil, you can detect the peripheral spokes of cortical cataract or the opaque blob of posterior subcapsular cataract at the centre of the pupil. Cataract is best observed through dilated pupils.

Vitreous

The anterior vitreous is visualised by using a vertical beam of light focusing behind the lens. 'Tobacco dust', pigmented cells in the vitreous, is a sensitive marker of retinal detachment. It has similar appearance as AC cells though brown in colour and can be encouraged to float by asking the patient to move the eye.

There are many more advanced uses of slit lamp including Goldmann applanation tonometry, gonioscopy and funduscopy with condensing lenses. These skills are however not expected of a non-ophthalmologist.

SOME TIPS

1. If you are not in focus, you are either too near or too far from your target. Always navigate the slit lamp backwards so that you do not hit patient's face with the slit lamp, then refocus.

2. Try to use the swing the illumination arm from temporally so that it does not hit the patient's nose.

SLIT LAMP - A VERSATILE INSTRUMENT

The slit lamp is an instrument that incorporates many functions. There are a whole range of ophthalmological tools for various specific indications. Despite these, slit lamp remains unrivalled as the first line tool in ophthalmology practice.

SUMMARY OF HOW TO USE THE SLIT LAMP

To position patient and yourself, make the following necessary adjustments:

- Patient chair
- Chin rest: turn the knob under it to slide it up or down. This is especially useful for eye to chin distance variations.
- Table height: adjust the lever which may be found below the table.
- Examiner chair: make sure the microscope is at your eye level while you are sitting comfortably.

Slit beam properties:

- Dimensions: The beam width and height can be manipulated using their respective knobs (refer to the diagram).
- Intensity: The brightness is varied by controlling the voltage using the power knob or the filter control.
- Colour: The filter control has the options of blue-cobalt, red-free (green) or no filter (some have infrared filter which reduces heat from light)

To focus the slit beam:

- Joystick: navigate forwards, backwards, diagonally, or laterally with one hand. The other hand is free to manipulate the knobs on either side of the illumination arm, swing the illumination arm or hold a condensing lens in front of the eye for funduscopy.
- Magnification switch: low magnification is used most of the time. Higher magnification is used to give detailed focus but has the disadvantage of reducing perception depth.

To manipulate the angle of illumination:

- Move the slit beam horizontally: steadily hold the beam width knob and swing the illumination arm within a 180° arc.
- Change to orientation of the slit beam: steadily hold the beam height knob and swing the top of the illumination arm within a 180° arc.

FURTHER READING

- James CB., Benjamin L.
Ophthalmology: Investigation and Examination Techniques
- Lim ASM, Constable JJ, Wong TY
Colour atlas of ophthalmology
- Pane A., Simcock P.
Practical Ophthalmology: A Survival Guide for Doctors and Optometrists

ADDITIONAL SOURCES FOR PDA USERS

- www.eyepalm.com

FEATURE : ARTICLE

Runway to a dream: A flying doctor's story

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Dr Koert-Jan Schonewille is an emergency medicine registrar from Holland currently working in Queensland, Australia. He has successfully combined his two great passions of flying and medicine, and hopes he can inspire others to follow their dreams too!

Childhood dreams

From a young age I was always attracted to the sky. Airplanes, birds, views from the tall buildings or mountains in Europe, I loved it all. My favourite Lego toy was a yellow rescue helicopter, which I took everywhere. In high school I fantasised about being a rescue diver. I dreamed that I would be picked up by a rescue helicopter from the school's sport ground and depart on life saving adventures!

At the age of 16 I realised that despite a good academic performance at school, I was not happy. Thankfully I discovered gliding and ballroom dancing. These helped me to become more social and a team player. Although these new commitments caused my school marks to drop, my quality of life soared!

In the 1980s I watched the Australian television series 'Flying Doctors' every Sunday night. Although my mum thought I was too young to watch the gory scenes, I had no concerns. I loved it! The adventure, flying, suspense, gossip, romance and heroism were thrilling. I fell in love with Coopers Crossing, the Australian Outback and the pretty sister Kate (ask your dad, I am sure he remembers her too!).

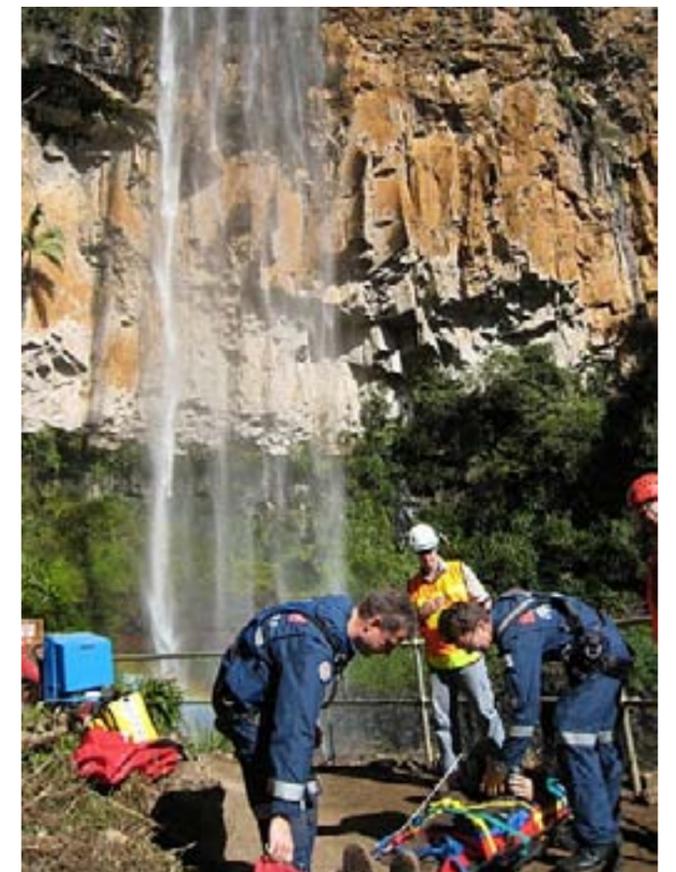
During medical school I tried to organise an elective with the Australian Royal Flying Doctor Service. Countless communications between the Netherlands and Australia ended in no more than "thanks for your interest, but we can't help you". A bit disillusioned I organised a non-flying research programme involving hyperbaric medicine in Sydney. It was mostly for treatment of carbon monoxide poisoning, patients with non-healing wounds and divers with 'the bends'. During those three fantastic months I went gliding, ran a marathon, completed a scuba diving course, and the amazing Landmark Forum and Landmark Advanced courses.

The Landmark Forum is a revolutionary self-education programme focusing on personal and professional growth, training and development. It challenges conventional thinking about ourselves, the world around us and how we interact with it. It filled me with even more passion and drive to take medicine to the sky. I highly recommend this course to everyone!

A few weeks after Sydney I arrived in Christchurch for six weeks of anaesthetics and pain management with Prof Shipton. I'll be honest here;

I didn't spend even a few days in the operating theatre! On my first day I mentioned my dream of becoming a flying doctor. Prof Shipton immediately referred me to the Christchurch retrieval specialist, Dr David Bowie. Within minutes I was in his office. He was showing me pictures of the NZ Flying Doctor Service's planes and helicopters when his phone rang. A retrieval job to pick up a patient from Greymouth came through. I couldn't believe my ears when Dr Bowie asked the flight nurse & pilot if I could join them in flight. Within hours on my first day in Christchurch I was flying over the Southern Alps to pick up a patient. My childhood dream was fulfilled!

As a medical student I didn't have any direct responsibility for the patient, but the experience introduced me to the challenges faced when transporting patients by air. I thoroughly enjoyed these flights, when I would accompany the flight nurse and occasionally Dr Bowie. Not all retrieval flights require a doctor. When the Airway, Breathing, Circulation and neurological state of



the patient (Disability) are not threatened, a flight nurse can manage the patient alone. When the ABCD's are unstable, a doctor with resuscitation experience and airway management skills joins the retrieval team. I was simply observing and loving it all! And I was 'only' a medical student; a rookie!

Quickest way to the sky!

Fired up after eight amazing months in Australia & New Zealand, I returned to Maastricht, the Netherlands and quickly finished my medical studies. The next step was applying for dutch anaesthetic training positions. My intention was to become an anaesthetist within five or six years and then move to Australia & New Zealand to become a flying doctor.

While waiting for replies from the training programmes, I started as a resident in a large cardiothoracic intensive care unit (ICU). The cool thing about this job was that only consultant anaesthesiologists and ICU specialists worked here. It was hands on learning from the masters. This was my first medical job and quite scary despite adequate supervision. Some patients would come to ICU with arrhythmias, continuous bleeding or blood clotting derangements after their coronary bypass or heart valve surgery. Many required defibrillation, blood product infusions, medications or interventions to maintain their blood pressure and heart contractility or even a return-trip to the operating theatre.

I found the coolest procedures to be intubations and central venous and arterial line insertions. Central venous lines go in the right internal jugular, subclavian or femoral veins. In those days I used anatomical landmarks to guide me, but in recent years the ultrasound scanner has taken over. Direct visualisation with ultrasound decreases chances of hitting arteries or causing a pneumothorax. For some unknown reason I feared chest drain insertions. Luckily I eventually came to 'enjoy' putting them in.

Adventure training before the real thing

In 2004 I moved to Australia and worked as resident registrar in ICU and internal medicine in Toowoomba. The medical chief of 'CareFlight', an aeromedical retrieval organisation, advised me to do six or twelve months of emergency medicine to get more exposure to paediatric and trauma patients before starting aeromedical retrieval work. So I did. After passing the Australian Medical Council exams for general medical registration and permanent residency in Australia, I moved to the Gold Coast and fell in love with emergency medicine. I enjoyed this so much that I chose it as my main specialty.

Before flying in fancy helicopters and aircraft, I had to survive a full-on training week with 16 other young doctors. Experienced consultants taught us the ins and outs of the medical equipment; the advanced first aid pack, airway pack, ventilator; syringe drivers, pelvic splints, and vacuum mattress to name a few pieces.

A full day was spent with the fire and rescue services to observe their skills which included cutting open cars with the 'jaws of life'. Two days were spent in a swimming pool for Helicopter Underwater Escape Training. Strapped



in a fake helicopter (cage) and dumped into a pool while the "cage" rolls over and sinks. The purpose is to be in the brace position till all movement stops, then (blindly) find the door handle or emergency window, undo the straps and escape to the surface. It sounds scary, but in reality this training is fun, safe and exciting!

Passing this training was a huge buzz and, finally, my childhood dream was realised. I had qualified as a flying doctor!

Winching: The most exciting part of helicopter retrievals

Sometimes patients can only be reached by winch which requires dropping someone down on a winch and cable to pick up the patient. All the while the helicopter hovers above. It can be done over all ranges of terrain, from a dense rain forest to ships in heavy swell. A few weeks after my winch training I was lowered 60 metres into a valley to retrieve a walker with a fractured tibia. After inserting a cannula and giving him I.V morphine, we splinted his leg, winched him up in a stretcher and returned him to hospital. Both of us were held by a simple 7mm cable. Performing feats like this calls for amazing trust in equipment, engineers and aircrew.

Teamwork to save lives

The teamwork shown in this profession is amazing. A typical helicopter crew has a pilot, crew man/winch operator, rescue crewman, intensive care paramedic and a doctor. Each team member has their own unique area of expertise and the other team members are dependent on those skills. The doctor's skills of clinical assessment, focusing on the ABCD, applying clinical skills to manage the patient's condition is just one part of ensuring a successful mission.

I clearly remember one (busy!) day when we flew from Gold Coast base to an 'ultralight' plane crash. The pilot was reasonably well-off, but the passenger had a large bruise on her right hip and a malrotated right femur. She hadn't lost consciousness after the impact. After satisfying ourselves that her ABCD were within normal limits, the paramedic and I put a pelvic splint around her, splinted her leg and put her in a vacuum mattress before flying her to a trauma centre. Pelvic fractures can easily cause hypovolemic shock as litres of blood pool in the pelvis and thighs. We normally take two to four units of O negative blood with us when we fly out to an accident site. Thankfully this time the blood was not needed and she made a good recovery.

Later that day we were tasked to attend a motor vehicle accident. A bus hit a truck, throwing the unrestrained driver through the windscreen. He landed head first on the road. By the time the ambulance, and fire and rescue service arrived, he had regained consciousness, but was confused and agitated. He was restless and would not tolerate an oxygen mask on his face. He had to be held down on the ambulance stretcher by his rescuers. They were all relieved when the rescue helicopter arrived.

After a primary survey and working diagnosis of severe head injury, we quickly decided to anaesthetise, paralyse and intubate him. This way, we could safely transport him to a neurosurgical unit for a head scan and possibly an operation to evacuate a blood clot in his head. By controlling his breathing, blood pressure and conscious state, we could prevent another harmful brain injury occurring.

The next job necessitated preparing the intubation and we laid all the equipment out near the patient. This included all the different airway adjuncts, endotracheal tubes, and laryngeal masks. We also eyeballed the surgical airway kit in case the 'can't intubate, can't ventilate' scenario occurred. Suction was working, all the drugs drawn up in the right dosages, two patent I.V lines completed with an all important team briefing. I love the saying, "If you fail to plan, you plan to fail!" Don't worry, once you become a doctor these things just become a second nature.

To cut a long story short, he was intubated, packaged up with full spinal immobilisation and flown to a major trauma centre in Brisbane. These jobs are exciting, rewarding and a bit scary which keeps you focused. Unfortunately there is a lot of waiting around as well. Nonetheless, it is good for studying the latest literature, drinking tea and emptying the email inbox!

Free as a bird as a (glider) pilot

Part of the job is to transport ventilated trauma or ICU patients from smaller hospitals to tertiary centres by fixed wing aircraft. I thoroughly enjoy these flights. On the empty legs I often sit in the right hand seat next to the pilot. Most of them love talking about flying and I am a keen listener. The only rule is that I have to keep my hands away from the flight control.

All Australian Royal Flying Doctor Service and NZ Flying Doctor pilots have logged thousands of flying hours and possess a wealth of experience. Twenty thousand hours flight time is the highest I have heard of. This amounts to over two years in the sky. This experience is imperative because sometimes they are required to land on roads or dirt strips near farms, and at night time they might even use car headlights to light up a strip.

My lifelong passion for aviation has reached another level after passing the New Zealand private pilot license flight test in Christchurch. In my spare time I fly (with passengers) over the stunning South Island and the Australian Outback in gliders or motorised aircraft feeling free as a bird. I encourage you all to combine work with something you are really passionate about.

International retrievals from Pacific Islands to New Zealand and Australia by Learjet

Promise yourself to ALWAYS have travel insurance when you travel overseas and know that medical care overseas is often way below the standard that you expect in New Zealand. It costs about \$5000 per flying hour to retrieve a patient. International retrievals take many hours to complete, thus creating HUGE bills for the insurance company or worse: for you.

Over time I have been involved in picking up numerous tourists, teachers, businessmen and missionaries from Pacific islands and flying them to Australian or New Zealand hospitals. I remember picking up a tall, tough fisherman whose right hand got caught in metalwork while fishing far away on the Pacific Ocean. The skipper had applied first aid and had changed the dressings twice daily while sailing full steam for three days and nights to reach a Pacific island with a runway long enough for a Learjet 36 ambulance jet to land on.

On our arrival the patient looked clinically well, his pain was well-controlled with morphine, but his hand looked and smelled infected with three fingers partially amputated. We continued with antibiotics and pain relief, flew him straight to Auckland and on to Middlemore Hospital. The hand surgeon had great concerns about the hand, fearing she would have to amputate the fingers and perhaps auto-transplant a toe in order to maintain grip function. Imagine being stuck in an overseas hospital with suboptimal treatment and without proper insurance.

Last year I worked in Christchurch ICU in a registrar position and did about 20 retrievals with the ICU flight nurse in the NZ Flying Doctor Service's King Air plane. We flew mainly to the West Coast but paediatric and burns patients were flown to Auckland. Retrievals over shorter distances were done by helicopter. If the weather was too bad, we were forced to travel by road. It was fun to work again with the nurses, pilots and consultants that I had first met as a medical student eight years earlier. Some have grown a few grey hairs since then!

What does it take to become a flying doctor?

First of all, you need to be enthusiastic. It opens a lot of doors which would otherwise remain closed. Secondly, you need dedication and commitment. After graduating from medical school it took me six years of working as a resident and (advanced) registrar in the Netherlands, Australia and New Zealand before it was safe enough for me to care for critically ill patients in the pre-hospital setting.

Experience in emergency medicine, paediatrics, ICU or anaesthetics is necessary. Most paediatric retrievals are done by a team from a Paediatric Hospital, but not always! Resuscitating two toddlers in the same week had a much bigger impact on me than trying to revive adult patients. Getting used to treating critical ill patients comes with the experience. It gets less scary over time. Consider participation in resuscitation courses like advanced trauma life support, advanced paediatric life support and pre-hospital trauma life support in your resident years. These are fun, practical and extremely useful and prepare you for the 'real stuff' in a safe and (often very!) realistic teaching environment.

Anything is possible!

If there is one thing I would like to get into your hearts and minds, it is that ANYTHING IS POSSIBLE. So follow your dreams. Remember that despite the ups and downs in a medical career, it is rewarding to make a difference in other people's lives. In two years time I will be an emergency physician and I look forward to combining clinical work with flying, teaching, travelling and participating in adventurous medical projects all over the world.

Last year I met many of you at the NZMSA conference in Queenstown. It was a pleasure to present at the conference and to write this article for you. If you would like more information, email me on koertjanschonewille@yahoo.co.nz.

I wish you all the best with recovering from the consequences of the earthquake, with your medical careers and with finding the right balance between work and your personal life. Who knows, we might work together in a Kiwi, Aussie or overseas hospital in the (near) future.

Warm regards from the Gold Coast, Koert-Jan Schonewille.



An African adventure: St Francis Hospital, Katete Eastern Province, Zambia

Shynn Ooi

House Officer
Hawkes Bay Hospital

Dr Shynn Ooi is a first year House Officer at Hawkes Bay Hospital. She studied at the Waikato Clinical School through the University of Auckland's medical programme. In her spare time she enjoys skiing, baking and dancing.

The medical elective is a rare opportunity to experience developing world medicine in a supervised environment. It allows you to take on the responsibility of being a doctor while having good personal and professional support available. It is also a chance to learn about the complex world of tropical medicine. With these requirements in mind, I set out to find a hospital in a safe country with an English-speaking medical system. This narrowed the field considerably. I preferred a rural hospital for the depth of practical experience as well as the pathology of late-presenting cases. St Francis hospital fitted all these requirements.

My elective began with a four week stint on the male medical ward, St Augustine. I was supervised by Dr Christopher Hopkins, a general medical registrar from the UK. We started ward rounds at 08:00 with the ICU patients. These patients enjoyed close proximity to the nurses' station as well as use of the oxygen machine. From here, we continued down to see the thirty-odd patients in the main ward as well as the TB corridor. After rounds, we would finish the jobs (lumbar punctures, pleural and ascitic taps, etc.) before attending to any referrals from the other wards.

After lunch, we would continue onto the general outpatients department. The patients would typically have been triaged by the medical officers

and we would see a huge variety of cases: paediatrics, obstetric, surgical, gynaecological, general practise as well as acute admissions. This would take us until anywhere between 16:00 and 18:30.

Twice a week, I would assist on the evening round or over the weekends. The evening round started at 17:30 with the children on Mbusa ICU. We would then progress to special care baby unit (SCBU), where we would see any acutely unwell babies as well as the new admissions. We would finish with the adult ICU, around 22:00. The weekend rounds started at 08:00, where we would see all the paediatric patients as well as the adult ICU cases and new admissions. This would finish mid-afternoon but the same doctors had to do an evening round as well as be on call overnight, so working weekends soon became quite taxing.

Three times a week we had morning meetings to attend. Tuesday at 07:30 was the mortality and morbidity meeting, run by a different department each week. This was followed by reports from the lab and the pharmacy, who would keep us up to date on which drugs and reagents had gone out of stock, and which had become available. Thursdays at 07:30 were dedicated teaching sessions, much like grand rounds. We learnt a wide variety of topics, including congenital heart disease and dental caries. Fridays at 07:45 was the HIV session, where the HIV specialist would offer her advice and opinion on cases for discussion.

Working on St Augustine was initially disorientating; it was difficult to bear the heat and the smell of the wards at the same time as conducting a history and examination through a translator. Nursing care on the wards, such as bathing and feeding patients, are performed by the patient's family. This leaves the nurses free to dispense medications, insert intravenous luers,

and translate for the doctors. However, the quality of care administered by bedsiders hugely varied. Some patients went unfed for days, while others lay stagnant in pools of their own urine/faeces. It was a huge problem when families absconded to care for the patient as they were usually too sick to care for themselves. It took time to adjust to a workplace environment so different from the New Zealand medical system.

We saw many cases of HIV-associated illnesses. The population prevalence of HIV is 17%, and life expectancy is only 33 years. Inpatient prevalence of HIV is extremely high and therefore the patient's HIV status is almost always relevant to the presenting complaint. There were many patients whom we offered voluntary counselling and testing (VCT) but a small proportion declined, partly due to the stigma associated with HIV. To reduce the stigma, St Francis uses the term "retroviral disease" (RVD) instead of HIV.

In many cases, a lack of laboratory tests and imaging severely hampered our diagnostic ability. A tight budget meant that repeat tests could only be justified under extreme circumstances. Our lack of head imaging made it difficult to differentiate between ischaemic and haemorrhagic strokes. Lacking thrombolysis, this only affected the administration of aspirin. If the patient had a neurological deficit with a preceding headache, the stroke was assumed to be haemorrhagic in nature and therefore aspirin was not administered.

Although the lack of specialised imaging impaired our diagnostic ability, our poor neurosurgical capacity meant that management was often unaltered. One patient in his fifties presented with three days of confusion and aphasia on a background of chronic alcoholism. Through our translators, we eventually discerned he had fallen three days ago during a drinking binge. We suspected an intracranial bleed but could not diagnose this without further imaging, and with such a poor prognosis, there was very little we could do. I had to explain the situation to the family and eventually they took him home to care for him there. It was certainly a sharp introduction into breaking bad news and counselling families through difficult situations.

Many of the patients arrived with altered mental states as well as HIV. This proved a diagnostic dilemma as the differential includes TB meningitis, cryptococcal meningitis, bacterial meningitis, and cerebral malaria. Some of the treatments for these diseases were very specific, others very toxic, so it was important to establish a diagnosis before commencing therapy. Doctors hence had a low threshold for requesting lumbar punctures, and I performed seven over the course of my elective.

One interesting case I admitted was a 33 year old gentleman who presented with a progressive headache and confusion two weeks after commencing antiretroviral therapy. He had stopped speaking days before admission and therefore taking a history became difficult. I performed a lumbar puncture which was clear; negative CrAg (cryptococcal antigen), no acid-fast bacilli or organisms seen on microscopy. Cryptococcal and bacterial meningitis was thereby excluded but the differential included TB meningitis and toxoplasmosis. TB meningitis is difficult to diagnose as acid fast bacilli are often absent from CSF (Thwaites, 2004) and PCR was not available. A diagnosis would therefore commit the patient to long-term antituberculous treatment (ATT) as well as a one month course of steroids. Prednisone at these doses would cause the patient to deteriorate if the diagnosis was incorrect, so it was prudent to trial toxoplasmosis therapy. Unfortunately, he failed to improve on high dose cotrimoxazole and died within a week.

There were also many cases of HIV-associated Kaposi's Sarcoma (KS). I would administer palliative chemotherapy for day-stay patients on a daily basis. I soon learnt the indications for starting chemotherapy and I would be responsible for prescribing and administering the medications. First, I would check the patient's lesions (if cutaneous KS) to ensure there was no overlying infection. Next, a full blood count needs to be performed to ensure the patient was not neutropenic or thrombocytopenic, and if anaemic (Hb < 9g/dL) a blood transfusion was required pre-treatment. I would double check that the patient was compliant with ARV's as well as their prophylactic septrin. Finally, the maximum lifetime dose of doxorubicin must be calculated to prevent cardiotoxicity. The patient then required premedication with promethazine before I could administer 50mg doxorubicin and 2mg vincristine.

It was rewarding seeing patients' quality of life improve on chemotherapy as there was little we could do for other illnesses. Many patients had long durations of stay as we attempted to improve their function to the point where they could be discharged. This was especially difficult in patients with long-term neurological diseases. One patient in his forties had been admitted with a long history of lower limb weakness as well as constitutional symptoms. He was diagnosed with spinal TB (Pott's disease) and developed urinary retention while in hospital. This required long-term rehabilitation, including a wheelchair and an indwelling catheter. Unfortunately, St Francis did not have the facilities to supply him with a wheelchair. He lived in a rural area, making physio follow-up almost impossible. We started him on ATT's and discharged him to begin ARV's at his local HIV clinic. I hope he continued to be compliant with treatment as his quality of life would be unlikely to improve without halting the progression of his TB.

Many of the patients we treated were very young, with poor prognoses. The mode decade of age at presentation was between 30 and 40 years; many younger. Children over the age of ten were generally admitted to the adult ward; so we were treating malaria and sickle cell disease alongside strokes.

It tried my patience to work with the busy ward staff in patient education as the language barrier made it difficult. Western concepts of medicine were hard to grasp due to poor education levels and strong traditional beliefs. I developed ways of effectively delivering education for the more common diagnoses on the ward, including type one diabetes after a diabetic ketoacidosis (DKA). Day one involved the pathogenesis of diabetes and long-term consequences of poor glucose control. On day two, I talked about the importance of eating the right foods. During the hungry season, Zambians would often go without eating and we would train them how to handle hypoglycaemic attacks. Day three was dedicated to teaching them how to draw up and administer their own insulin. Tight control was impossible due to the lack of glucometers, so all patients were commenced on bd insulin regimes. I would often draw tables to remind illiterate patients of insulin doses.

St Augustine was a stepping stone to the hectic world of tropical paediatrics. Between myself and one other doctor, our ward rounds would cover over 100 patients on a busy day. We begun at the SCBU and worked our way through the ICU. The acute malnutrition ward came next, before the general ward. We would finish up with the babies room, the overflow ward, and the regular malnutrition ward. Some of the wards were heated (despite the 35°C ambient temperature) and there were often two or three patients to a bed. There were always children crying and the stench of stale urine filled the air. It was certainly a different working environment to Starship hospital.



St Lukes outpatient clinic



Special Care Baby Unit (SCBU)

Mornings began with rounds at SCBU. Antenatal care is very limited in Zambia as there are few midwives, let alone prenatal ultrasound. Multiple births would often come as a surprise, and it was difficult to estimate prematurity. Our patients came as small as 500g with very poor prognoses. This is partly due to our poorly resourced unit. There was only one oxygen machine, which fluctuated between functional and "at the workshop". We could give IV fluids to only one neonate at a time as there was only one syringe pump. The poorly designed incubators allowed cockroaches to crawl into the warm spaces; however the insect bites prevented apnoeas in patients with poor respiratory drive. Our pharmaceutical arsenal was reduced to IM antibiotics and aminophylline. The mortality of these patients was startling. By the 5th of January, we had five neonatal deaths in the year 2010.

Next came the paediatric ICU, where a child would frequently arrest over the course of the ward round. In my limited experience, an average of two children would die each day, and the overall mortality was 10%. I became proficient in ventilating and performing chest compressions. The doctors would often administer 1mg intracardiac adrenaline if circulation did not spontaneously recover. Patients here were usually cerebral malaria cases who had presented late. Many parents are not concerned until their children start displaying seizure-like activity. Patients may live up to 300km from the hospital, most do not own motorised transportation, and so late presentation is common. Resuscitation was rarely successful, and when it was, the patients often arrested later that day. Therefore I also examined many deceased patients in order to pronounce them dead.

There was a minority of meningitis cases admitted to ICU, many of whom were misdiagnosed as malaria by the clinical officers. I came across a 2½ year old patient who was admitted with fits, fevers and a cough. Although she was RDT (rapid diagnostic test for *Plasmodium falciparum*) negative as well as blood slide negative, she had been started on quinine and left in the general ward. On examination she had an increased respiratory rate and widespread crepitations, so I moved her to the ICU and started her on oxygen, IV benzylpenicillin and chloramphenicol (to cover sepsis as well as an LRTI). Over the next 48 hours, she failed to respond and in consultation with the director, we decided to start her on dexamethasone as well as ceftriaxone. The patient showed no neurological improvement and developed fixed, dilated pupils. After consulting the family, we decided to trial gentamicin to cover a gram negative sepsis, but would withdraw treatment if she failed to improve.

The most heart-wrenching cases were in the acute malnutrition corner. Children would often come in malnourished and oedematous, having very poor physiological reserves, and be extremely unwell from concurrent infection. All malnourished children received vitamin A and cotrimoxazole, and if they had a concurrent illness they were upgraded to ampicillin and gentamicin. They were all screened for malaria and given F75, a high-calorie supplement, to feed them to within one standard deviation of their median weight for height. Many children were malnourished not due to poverty but secondary to a defective alimentary tract, such as a cleft palate or lip.

One five month old presented with an acutely distended abdomen and abdominal x-rays displayed dilated bowel loops. He was diagnosed with Hirschsprung's disease and we attempted to insert flatus tubes to relieve the pressure on the megacolon. Unfortunately he died before surgery could be performed. Death is not uncommon as children with malnutrition have the poorest prognosis, with a mortality of 30%.

The general ward provided great opportunities for learning as it held a wide range of pathology: from chronic illnesses like lymphoma to acutely unwell children with malaria. Soon I could take basic histories in Nyanja, the local language, and could quickly assess and triage children.

The most varied and interesting part of my day was the afternoon clinics. Held in the jam-packed St Lukes clinic, there would often be five doctors, two translators, and as many patients as possible. There was only one bed available and this was often taken with acutely unwell patients who required immediate admission. Patient privacy was negligible as translators would often have to shout across the room to be heard.

This was a difficult environment to discuss sexually transmitted infections, especially when using relatives as translators. Many women presented with

non-specific lower abdominal pain and vaginal discharges. Due to a paucity of resources, we were unable to swab all of our patients, and we relied on syndromic management. It became extremely difficult to explain the need for partner treatment and importance of contraceptive use in this population. The translators we used were very staunchly Christian, and they would sometimes use inappropriate or judgemental tones with patients. For example, I had a 14 year old patient who presented for a police report following being sexually assaulted. The translator proceeded to lecture her about the importance of abstinence while I filled in the paperwork. As she was speaking in Nyanja, I was unaware what she was saying until after the consultation had ended.

The pathology I saw at the outpatient clinics was astounding. There were many cases of late-presenting tumours which I referred on to the surgical ward. For example, a female in her thirties presented with a two year history of a breast growth. It was pungent, dripping with pus and had a peau d'orange appearance. I admitted her to the surgical ward for further management.

There were often trauma cases, mainly motor vehicle accidents, which presented via outpatients. I became adept at reading X-rays and we managed many fractures and orthopaedic injuries. I saw a 14 year old boy who presented with a right leg mass following a fall one month ago. We diagnosed him with an osteosarcoma and referred him to the surgeons who recommended an amputation, along with chemotherapy. Unfortunately, due to the acute onset of his tumour, and his general good health, it was difficult to explain the severity of the situation to his parents. They refused treatment and took him home to trial traditional therapies.

Another interesting case was a 38 year old woman who presented with a two month history of chest pain, headaches, irregular paravaginal bleeding and a mass sensation in her lower abdomen. She was convinced she was pregnant and may be miscarrying, however a pelvic ultrasound revealed a non gravid uterus. CXR revealed cannonball metastases and her urine β HCG was positive. She was diagnosed with choriocarcinoma and we referred her to the gynaecologists for further management. Although she commenced chemotherapy, she soon absconded from treatment and has since been lost to follow up.

There were many cases of "western-style" medicine in the elderly population, for example hypertension, GORD and type two diabetes. Patients have poor knowledge about these diseases, which makes it difficult to counsel patients about the cause of their illness and lifestyle modification. Locals believe that obesity is a sign of good health as they see high mortality in malnourished, cachexic people. They also see salt as a luxury so it is difficult to implement exercise and dietary changes.

CONCLUSION

I highly enjoyed my elective at St Francis Hospital. This experience was a real eye-opener to the poverty and illness of the developing world. There was great cultural difference compared to working in a New Zealand hospital, and working with translators and poorly educated patients was certainly a challenge.

The steep learning curve forced me to develop on both a professional and personal level. Seeing patients on my own helped me decipher signs and symptoms and formulate management plans. The complexity of the cases allowed me to study whole new avenues of tropical medicine. I developed new skills, performing lumbar punctures and pleural taps. It was difficult to see so many children die despite our best resuscitation efforts; always wondering if I could have done more to prevent their deaths.

I would highly recommend this hospital for anyone wanting to experience the pros and cons of tropical medicine in Africa.

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ELECTIVE FEATURE : REPORT

A taste of medicine in Zambia

Victoria Gates

House Officer
Tauranga Hospital

Dr Victoria Gates graduated from Auckland Medical School in 2010, and is currently a first year House Officer at Tauranga Hospital. She loves sports and the outdoors, especially tramping and skiing.

Victoria Gates undertook her elective during her Trainee Intern year at St. Francis Hospital, in Katete, Eastern Province, Zambia.

I chose Saint Francis Hospital and Zambia, as an elective destination, for several reasons. Firstly I had always wanted to do my elective in Africa. In recent years, several students at the Auckland medical school had been to Zambia for their electives, and it consistently receives positive reports from the students. Zambia is a very poor country that is currently relatively safe for visitors. This, and the fact that Saint Francis Hospital has English-speaking staff, made it an obvious choice for me over other options in Africa.

I also wanted to challenge myself by travelling to a country outside my comfort zone. Developing world medicine has always appealed to me. I believed doing this for my elective would be a great opportunity to get a lot of hands-on experience making clinical decisions as well as learning procedures.

OVERVIEW

My time at the hospital was spent on the adult medical and paediatric wards. I also spent several days in surgery. My days would start at 8am every day, apart from Tuesday and Thursday, when there were clinical meetings at 7.30am. Ward round would go until 1pm, and often we would have to briefly go back to the ward after lunch to finish jobs. The afternoons were spent in OPD (outpatient department) which would keep us busy until 6pm and sometimes later! I also did many evenings and several weekends on call.

During my time at the hospital I was exposed to an amazing range of pathology. In general, the patients are in an immunosuppressed state and so the presentations and aetiology of common diseases, such as COPD, cirrhosis and epilepsy, differed from that in New Zealand. The main aetiology of COPD in New Zealand is cigarette smoking, but in Zambia the disease predominantly affects women (who do the cooking and have high exposure to toxic gases in poorly ventilated houses). Cirrhosis in Zambia is commonly caused by aflatoxin exposure (from mould), schistosomiasis, hepatitis B and alcohol (only the latter two are usual in New Zealand). Portal hypertension from schistosomiasis can be dramatic and may present with massive ascites or malaena. Often the most revealing information in the history is that the patient is a fisherman! A stat dose of praziquantel is standard treatment, and therapeutic ascitic drainage may also be required. Adult onset epilepsy in Zambia with no history of trauma is usually due to neurocysticercosis, which is also treated with praziquantel.

ADULT MEDICINE

On the wards, I saw patients on my own and decided on management with support from the doctor if necessary. By the end of my time here I had gained confidence in making management decisions. I was able to perform ascitic taps, chest drains, and lumbar punctures. I also made up and administered chemotherapy for patients with Kaposi's sarcoma (KS) and lymphoma. The wards were understaffed with only a few nurses who, in addition to their ward jobs, had to translate for us. This made the ward rounds much less efficient.

Some particularly interesting cases on the ward were Addison's disease presumed secondary to TB, toxic epidermal necrolysis, transverse myelitis, and Stevens-Johnson Syndrome from antiretrovirals. I also assisted in managing several emergencies such as an iatrogenic pneumothorax that required immediate intervention..

There is one old ECG machine in the hospital that requires a lot of wiring up and is used very infrequently partly due to the staff's lack of operating knowledge. Also, there is very little ischaemic heart disease in Zambia so the main indication for an ECG is to check for arrhythmias or for evidence of hyperkalaemia (since the lab cannot test for electrolytes). One day there was a 60 year old patient who had presented in shock following a collapse and we initially suspected the cause to be cardiogenic. We managed to carry out a 'Zambian exercise ECG test', which involved asking him to run up and down the ward and then lie down quickly while we attached all the leads – quite a task!

SURGERY

My brief time in surgery gave me an appreciation of the stark contrast between the surgical management here and at home. In the wards, there are patients lying in traction for weeks, with no operations done on simple conditions such as fractured neck of femur, bed rest being the only option. However there were also some remarkable operations performed, such as



a case of a severe snake bite, where it seemed inevitable that the patient would lose their leg but the outcome was successful. Skin grafting is done frequently, mostly for burns victims who are often epileptics and have fallen into a fire.

In theatre, I spent time with the anaesthetist and was able to perform many spinal anaesthetics. It was sometimes alarming to see how anaesthetic drugs would be injected straight into a vein without drawing back or cannulation, for procedures such as manipulation of fractures under anaesthesia. There was also limited monitoring of patients under general anaesthesia.

OUTPATIENT DEPARTMENT (OPD)

My afternoons in OPD were one of the highlights of my time at the hospital. Extremely busy and unpredictable, it was a great way to get exposure to a wide range of conditions and decide on management. Right from the first day, I saw patients on my own but had support from a doctor when required. There was a spectrum of presentations, ranging from stable to critical patients. Many of the children had life threatening malaria and required immediate resuscitation with dextrose and fluids.

Some interesting cases I saw included the snake bite mentioned above, eardrum perforation by lightning, decompensated liver disease with huge ascites requiring immediate drainage, massive lymphoedema from filariasis, and a new diagnosis of ankylosing spondylitis. There were also lots of fractures and accidents, and patients with police reports; we had to examine the patient and decide if our findings were consistent with the alleged assault/injury. I was able to do many procedures in OPD, such as participating in resuscitations, diagnostic ascitic taps, and reduction of a rectal prolapse. Patients would usually present late with spectacular pathology, partly due to difficult and long distance travel for medical attention. Many patients would walk for days to reach the hospital.

In OPD, privacy was non-existent as there would be four doctors, four patients and two translators in a room. The translators would end up shouting across the room to patients, and swapping between different consultations. The result was that every patient in the room knew exactly what was going on with everyone else – this would be unheard of in New Zealand! Also, there was one examining couch in the corner with a screen that had to be shared by everyone. The waiting area was extremely crowded and it was often difficult to even get into the room to start the clinic with so many patients jammed up against the door.

OUTREACH HIV CLINIC

The hospital also had an extensive HIV service which offered pre- and post-test counselling, dispensed antiretroviral (ARVs), and provided follow-up for patients. The rate of HIV in outpatients was about 20%. The quantity of medication dispensed was massive; approximately 15,000 patients were provided with ARVs, both through the hospital as well as the outreach clinics. Patients attended for follow-up every month or three months depending on their condition, and had their CD4 count as well as any side effects monitored.

I travelled to one outreach clinic, which was an amazing experience. It was located in a village about 45 minutes drive from the hospital, down a bumpy road. Each month, an outreach team came to see patients due for follow up, as well as anyone else on ARVs. The team consisted of people from the pharmacy, medical laboratory, doctors, and a nurse. The nurse took blood pressure and temperature readings for every patient before they were seen. I saw patients with the help of a local woman who was able to translate.

The clinic was a great way to learn how ARVs are prescribed and their side effects. It definitely gave me a better appreciation for the magnitude of the disease in Zambia and the huge challenges faced in the future. With the hospital pharmacy noting an average of over ten new cases each week, it made me wonder how sustainable it was to provide ARVs free of charge to a rapidly increasing number of people. The consequences of loss of funding and overseas support would be disastrous.

Clearly, education is central to controlling the disease but the resources required to increase awareness of safe sex are also huge. Even in the hospital OPD, there were numerous cases where a known HIV positive man would come in with an STI and we would discover that he was having unprotected sex with his multiple wives. The concept of having consideration for the partners' wellbeing was really foreign.

Victoria faced many challenges during her elective, some of which are not uncommon for health professionals practicing medicine in the developing world. These challenges included limitations of health resources, communication difficulties, and cultural differences. Victoria outlines these challenges.

I. LIMITED RESOURCES

Investigations

There were only basic lab investigations available and often the results would take days to come back, if at all. The FBC machine was broken most of the time I was there, although usually we were able to get a haematocrit but not electrolytes. Alternative methods were sometimes used to investigate patients when we did not have the basic resources. Examples of this are using the ECG machine to look for evidence of hyperkalaemia (no K blood test available), and requesting US scans on women as a pregnancy test (no urine pregnancy tests available). I found this really unfortunate as it seemed to me that the hospital was using even more resources by trying to compensate for the lack of basic tests.

Another consequence of limited investigations was diagnostic uncertainty, resulting in the patient being started on treatment for multiple conditions. This was particularly relevant for CNS lesions in HIV positive patients.

The main differential diagnosis for headache/fever/confusion in such patients is meningitis (cryptococcal, TB, toxoplasmosis, bacterial), neurocysticercosis, or a space occupying lesion due to toxoplasmosis, TB, or lymphoma. While a few tests could be done on the CSF (including cryptococcal antigen, gram stain, and rapid plasma reagin), the result would often be inconclusive and we would be left trying to decide which treatments to use. A chest x-ray would be done to look for evidence of pulmonary TB, as well as sputum samples if the patient had a productive cough. TB treatment is for six months so it is not a diagnosis to be made lightly. On the other hand, even if a diagnosis of TB seems unlikely, starting treatment immediately can be life saving especially in an HIV positive patient. In addition, there was no way of testing for toxoplasmosis (usually done with CT imaging at home).

Studies have shown that in HIV positive patients, the most likely CNS lesions are TB and toxoplasmosis so all patients would generally get cotrimoxazole (for toxoplasmosis) for four to six weeks, start TB medications (for six months), and sometimes also get amphotericin (for possible cryptococcal), medendazole and praziquantel (for neurocysticercosis), as well as chloramphenicol and penicillin (standard antibiotics for bacterial infection). The amount of medication the patient would be on was surely a drain on the already limited resources.

Blood

Shortage of blood for transfusions was another major issue. The hospital frequently ran out of blood, receiving only a certain number of units every fortnight. On occasions when patients required blood urgently, we had to carry out person to person transfusions on the ward. When there were no blood packs (that enable a donor's blood to be given into a bag and then to transfuse the bag to the patient), we used multiple syringes.

To do this, the relatives of the patient were consented first to have their blood cross-matched and checked for HIV, hepatitis B, and syphilis. If this came back clear and the group was compatible, we would proceed. The main risks with such transfusions were that the relative could be in the 'window period' for HIV, and that the hospital could not test for hepatitis C. In most cases however, the relative accepted this risk and it was thought to

be minor compared to the benefit of saving the patient's life. In a few cases where a relative was not able to donate blood due to anaemia, or failing the infection screen, a doctor with a compatible blood group would donate blood. This type of practice raises huge ethical and political questions, and was quite a dilemma for the hospital while I was there.

Medications and treatment options

Another challenging aspect of work here was the limited management options, with only a small range of medications and other therapy available. In Zambia, people have limited access to good healthcare, which I found frustrating. This could be seen at both ends of the spectrum: outpatients without medication for their benign prostatic hyperplasia (no alpha blockers and no surgical options), through to resuscitation situations where some medications and equipment were unavailable.

On my first morning on the male adult medical ward, a patient had become extremely septic overnight (and the nurses had not called the on call doctor; which often happens). He was peripherally shut down when we arrived and was going into shock. We started resuscitation with stat IV fluids and boluses of IV antibiotics but it was too late – he went into cardiac arrest minutes later and died despite our attempts at CPR and IV adrenaline.

I found it difficult at first to accept that in critically ill patients such as this, there was often nothing more we could do. In New Zealand, the patient would have been intubated, ventilated, and monitored intensively. However in Zambia, once a patient got to such a critical stage any attempts at resuscitation were futile.

2. COMMUNICATION

Another major challenge was communication. All the hospital staff spoke English but very few patients did. On the wards, nurses would translate and in OPD there were translators. Although the language barrier made it difficult to build rapport with a patient, I found that I was still able to connect with patients with basic greetings, body language, and attempts at using their language – which were often laughed at!

In OPD, working with translators was enjoyable but challenging at times. It made me appreciate the value of being able to ask open questions and have the patient talk freely to you in their own language. Even open questions were answered briefly, and because the patients would not volunteer relevant information (such as the fact that a heavy spade had fallen on their abdomen while in the field on the day their abdomen pain started) it made history taking much less efficient. The history became more like an interrogation to extract the necessary information.

There were a few times when miscommunication occurred. For example a patient had injured his eye and the translator told me it was from a 'door', which seemed unusual. On further questioning, it turned out to be a 'thorn'!

Sometimes it was difficult to convey emotions through a translator; for example empathy, when telling a pregnant woman that the foetus had died. Often in the hectic OPD, the exhausted translators would occasionally take their emotions out on patients, so my empathetic tone was lost. Furthermore, attempts to lower my voice when discussing sensitive topics with the patient were lost on the translator; who would repeat the question loudly.

3. CULTURAL BELIEFS

It was interesting to see how cultural beliefs played a large part in attitudes to health and healthcare. Often patients would go to a traditional healer before coming to hospital, or self discharge to go to a healer if there was no rapid improvement in hospital. One morning in special care baby unit (SCBU), we discovered that all the babies had lost weight. The midwife then informed us that a baby had died yesterday just after being given milk so all the mothers were now afraid to feed their babies. Also certain cultural practices such as the men having multiple wives or women usually covering their knees, were very different to New Zealand.

Attitudes towards life and death were also very different from home. I found myself frequently giving bad news to patients and relatives, and their attitude were always of acceptance with plans to go home to spend time with family. People accepted death as a natural part of life.

It seemed to me that as a consequence of high mortality rates in the hospital (average mortality over a month in the adult wards ranged from 5 – 20 %), life was not valued as much as in New Zealand, and sometimes only limited efforts were made by nursing staff to keep patients alive. The normality of daily deaths on the ward was a real shock to me.

CONCLUSION

My elective was an amazing experience and one that I believe will stand me in good stead for starting work as a junior doctor. I gained a lot more confidence in making management decisions and I really thrived in an environment where limited resources meant clinical assessments and problem solving were more important than investigations. On the medical wards each patient had many disease processes and clinical findings, and it was great to learn about tropical diseases which are rarely seen in New Zealand. Although the days were long and exhausting, it was thoroughly enjoyable.

I felt privileged to work with the Zambian people and learn about their culture. The patients in general are so friendly and unassuming, with a great sense of humour.

This elective has definitely inspired me to return and work either here or in another developing country in the future. It is so rewarding to work in a place like this where people have so little but are grateful for everything. I believe I achieved all my goals in coming here and definitely made the most of my elective.

A life less ordinary: Jacob Beck-Jaffurs 09/01/87 - 11/03/11

Rachel Lister

Trainee Intern, Auckland School of Medicine
Trustee, Professional Pathways Trust

Rachel Lister is one of Jacob's classmates, flatmates and friends. Prior to medicine, she trained as a nurse and paramedic in Wellington, and has spent much of her life living and travelling overseas. Along with Jacob, she was heavily involved in the development of the Professional Pathways Trust and continues to have a hands-on role in the management of this charity. She enjoys travelling, attempting to surf and, like Jacob, embraces every minute possible on the beautiful coastlines of New Zealand.

At medical school, we are surrounded by overachievers. We are all relatively intelligent, we are all hard-working; many students excel in academics, sports or other skills. Some have multiple degrees or qualifications; some play music, or golf. We are accustomed as a group to being around people who excel. And because we are accustomed to it, in many ways we become immune to it. Immersed in our own achievements we often forget how fortunate we are and how much we have to give. Sometimes it is necessary to take a step back and ask ourselves: What is the purpose of our achievements and skills? What value can we add to our communities? And what more could we be doing with our time now? A few students show us just how much more we could be doing and humble us with their quiet contributions to the world.

Jacob Beck-Jaffurs was one of these students. In the trainee intern year of 2011 at the University of Auckland, Jacob was one of the most enthusiastic, pragmatically altruistic and modest overachievers many of us will ever meet. He died this year on 11th of March in a diving accident, and this article is to celebrate the life and contributions of such an awesome and inspirational young man.

Jacob Beck-Jaffurs was born in the USA, and moved with his family to Whangarei as an 11-year-old boy. His father Chip is an emergency physician and his mother Barbara, a lawyer. Jacob grew up surrounded by people who encouraged and pushed him to excel. He was an athlete and a waterman who honed his surfing skills at the Raglan surf academy as a young teen, and competed on the national stage. Later, as an avid diver, he would drop 40, 50 or even 60 feet underwater in one breath to spear a fish or simply watch the majesty of the depths play out before him. He was a distance runner, played soccer and volleyball competitively, and at the time of his death, was committed to training as a boxer, and aiming to compete internationally. He loved to surf, dive, climb mountains, explore and to generally participate in anything that would get him out of a lecture theatre and into the open air.

Jake did well in medical school- keeping up his grades throughout (a massive achievement considering the amount of time he spent skiving off class to go surfing). He thrived on emergency medicine and trauma, and he was forever proposing some new venture for the future, usually in expedition medicine, from marathons in the Amazon, to Surf-Aid in Bali, to being the medic at Scott base where he could go ice climbing. He had a simple enthusiasm for the fun side of medicine, content when suturing a patient's arm in ED or scrubbed in theatre and generally bored (like the rest of us) with too many lectures. He took a year off after 3rd year to work, travel and surf his way across every windswept beach he could find on this beautiful planet. He also worked weekends throughout medical school, managing to get to T1 year with very little debt (not so much through his earning power, but through his unparalleled ability to scrimp on absolutely everything)- something worth mentioning as an achievement in itself for those of us who know how much time and money medical school can drain from your life.



As a man who grasped every opportunity he was given, Jacob was able to see the disparities in opportunities available to other students in high schools such as his own. He was shocked and concerned at the poor representation of low decile high school students in the medical programme. Not one to look at a problem without searching for a solution, Jacob co-founded the Professional Pathways Trust in his 4th year of medicine. Managing to juggle the demands of the hospital, study and his beloved surf, he spent countless hours working on this charity, building it up to one of the largest of its kind in the country.

Professional Pathways provides mentoring to students from low decile high schools into professional careers such as medicine or law. It gives these students a real life connection with the professional world that they don't necessarily find in their school or home lives. Jacob believed, and Professional Pathways was founded on this belief, that exposure and encouragement can make a profound difference in the lives of young people and he wanted to see some of these students achieving things they may never have dreamt of. With hard work and commitment, Professional Pathways expanded rapidly from just three mentors in February 2009, to over 150 mentors in the space of one short year. Starting a national charity was not easy, with financial stress, time pressures and logistical problems along the way. However, along with the management team, Jake worked hard to iron out the kinks so that at the beginning of 2011, Professional Pathways was relaunched with a new website, new management systems and plans to take on every low decile school in the country.

When meeting with students from various high schools, Jacob had them spellbound, mesmerized by this energetic young man who was able to conclusively demonstrate that it is possible to look like you just left the beach and still be a doctor. He would sit and listen, quietly acknowledging their fears and feelings of inadequacy and boosting their confidence by giving them medical school exam papers to work through, proving that common sense and a keenness to learn are more than enough to survive medical school.

A scholarship has been established in Jacobs's memory, which will be awarded annually to an exceptional student who has received mentoring through the Professional Pathways program. If you would like to contribute to this scholarship or learn more about Jacob's charity, please visit www.professionalpathways.org

The years I knew Jacob were too short, but the impact he made upon my life and the lives of hundreds of others will last forever. He was an athlete, a doctor, a professional and a friend. The Jacob I knew was selfless and modest, quietly going about the business of bettering himself and supporting others without ever seeking recognition. He walked through this life with a perpetual grin on his face, forever chuffed with the simplest things, like a sunny lunch break in the Auckland Domain or being able to smuggle free coffee from the hospital. I can only hope that my medical practice in the future will live up to the high expectations he not only demanded of himself, but also inspired in everyone around him. Jacob lived with dignity, passion and grace and he died doing something he loved. Jacob was just 24 years old.

We will miss him always.

AMSA Global Health Conference – Sydney 2011: *One world. One life. What will you do?*

Pulasthi Mithraratne

5th Year Medical Student
Waikato Clinical School
University of Auckland

Pulasthi Mithraratne is a fifth year medical student from the currently based at Waikato Hospital. He is a committee member of Medical Students for Global Awareness (Auckland), and hopes to do a tropical medicine elective in Samoa next year.

The Global Health Conference (GHC) is an annual event organised by the Australian Medical Students' Association (AMSA), allowing students the chance to learn more about health issues from a global perspective. Initially established as the Developing World Conference in 2005, the event made a return to Sydney for the 2011 edition, with 600 students from all over Australasia and beyond (its largest delegation to date). The theme of the conference this year was *One world. One life. What will you do?* – a challenge to the delegates to see how they could make a positive change for the community around them. The academic programme was hosted at the University of New South Wales.

As a first time delegate to the conference, I began the event expecting to learn about health issues pertinent to just the developing world. Much of the programme did look into health in developing nations and issues such as maternal health and communicable diseases. However, there were plenty of opportunities to learn more about issues relating to our own backyard, in particular the health of marginalised populations like indigenous and refugee health. New and interesting perspectives were also provided about traditionally "Western" diseases such as diabetes and obesity. The conference truly did give a global perspective on health issues.

GHC was opened by Her Excellency Dr Marie Bashir, Governor of New South Wales, and a pioneer in Aboriginal mental health. Over the next four days, delegates were provided with plenary lectures by high-profile speakers, as well as panel discussions where delegates could ask questions of experts in various population health issues. Delegates were also split into smaller workshops to brainstorm strategies for various topics.

Particular highlights of the academic programme included a plenary lecture by Lt Col Michael Campion. He told sobering tales as an army doctor, working in the front line of conflicts such as Iraq and Afghanistan, where patient management literally involved saving life and limb. Another highlight was Dr Wanjiku Methenge, an advisor to the Fred Hollows Foundation in Rwanda. She presented a fantastic talk about the five simple steps to a successful public health programme, using the Foundation's efforts to eliminate preventable blindness in Africa as an example.

Panel discussions of note included a session regarding non-governmental organisations (NGOs) and their role in health; challenging questions were asked of the speakers, including the politics of religion in the work that some groups do. Another panel discussed career planning for those interested in a role in global health, and delegates were reminded that there is always great work to be done in one's own community as well as half way around the world. The conference was taken as an opportunity to launch a recent e-publication by the Medical Journal of Australia called "A guide to working abroad for Australian medical students and junior doctors". As the title suggests, it is Australia-specific but there is useful information for New Zealanders too.

Workshops provided a more intimate setting for delegates to delve into certain topics of their choosing. I was assigned to a thought-provoking discussion about gender equity, looking at how health outcomes for both men and women could be enhanced. In the malaria workshop, delegates were divided into groups representing different interests in a Vanuatu village and discussed strategies to prevent the spread of the disease.

GHC also included a challenge day with practical, hands on workshops such as knitting sessions to make woollen shawls for patients at the Addis Ababa Fistula Hospital (which treats women suffering from obstetric fistulas). Skills stations were also available for delegates to practice IV cannulation, cross-cultural communication and developing a public health programme.

Outside of the conference, delegates were spoiled with a range of social events throughout Sydney. Those who had arrived the night before the conference were able to mingle at a meet and greet event at Circular Quay, overlooking the Sydney Harbour Bridge and Opera House. We also had two dress-up parties at Cogiee Beach and Bondi Junction, allowing for much merriment. The final night of the conference saw delegates at the Reduce, Reuse and Recycle Ball on a boat cruise, with fantastic views of the harbour as delegates danced the night away.

Delegates were housed at the Sydney Central YHA, in the heart of the city. We were provided with a transport pass that allowed us to use Sydney's extensive public transport system to travel to and from the academic programme and social events. Unfortunately with Sydney being such a large city, long travel times were at times encountered. However, the organisers did a great job mobilising such a large delegation.

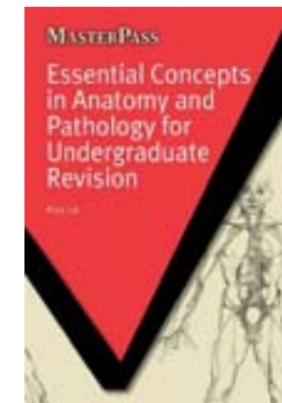
All in all, my GHC experience far exceeded any expectations. I was able to learn much about the world beyond my immediate surrounds in my own home patch. I met a great group of Australian medical students and learnt more about the medical system across the Tasman. I would thoroughly recommend New Zealand students attend the 2012 GHC, which will be held in Cairns, Queensland.

For further information about the guide to working abroad, please visit:
http://www.mja.com.au/public/issues/194_12_200611/working_abroad.html

Stefan Fairweather

Third Year Medical Student
Dunedin School of Medicine
University of Otago

Stefan Fairweather is a 3rd year medical student at Otago University. He is still searching for that elusive branch of medicine that will allow him to ski and tramp full-time, all the while dramatically improving the public health outlook for New Zealanders.



Essential Concepts in Anatomy and Pathology for Undergraduate Revision

Aida Lai.
Publisher: Radcliffe Publishing Ltd.
NZRRP: \$54.90.

It's cut-throat out there for any author who wishes to move in on the big boys of anatomy and pathology text books. The *Gray's*, *Netter's* and *Robbin's* of this world have a pretty good foothold with undergrads, and it would take something extraordinary to complement, let alone compete with them. Lai's claim that her book

complements the more visually orientated learning guides is a big call, and on closer examination, fails to meet her claims.

I gleefully received my copy of Lai's book and quickly flicked through it, to be greeted by pages and pages of text. Two hundred and twenty five pages of bold headings, bullet points and excruciatingly long lists. The only break from this barrage of text was the half dozen or so tables that Lai works into her collection of lists.

When I study anatomy and pathology, I expect to see the colours red and purple. Is that natural? Have I been conditioned by clever publication companies, or am I merely reflecting a method that works? When I think anatomy of the upper limb, I think *Gray's* and its beautiful diagrams that show where all the muscles lie in relation to each other, the major blood

vessels, and the nerves. I also think of the table on the opposite page that succinctly lists the muscles attachments, blood supply and innervation. Compare this to Lai's book and the section on the upper limb. She lists all necessary information, but not in table form and with no visual cues to appreciate the relationship between the different muscles. There was no mention of the interossei muscles of the hand (despite describing other intrinsic hand muscles), and the description of the brachial plexus was a nightmare. What could be represented in one carefully labelled diagram, Lai floundered through in a list that comprised of 16 bullet points! Pity the student who tries to work through that for the first time.

To be fair to Lai, she does sell this book as a 'revision guide'. Only those who have studied the relevant anatomy, pathology and histology texts and don't need glossy pages of purple stained tissue sections to identify underlying cellular pathology need apply. Though she does recommend such books as an aid to hers, you may find this book unnecessary, particularly if you have your own study notes and access to other text books.

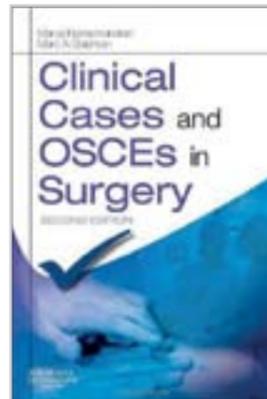
One last point before I wrap up my general grumble: Lai could have done her readers a favour by including a list of abbreviations and acronyms. To flick the book open and come across unexplained acronyms like DM, SS, DCIS, DIC, HF etc. did little to soften my opinion. Please, sympathise the acronym challenged amongst us – even the clinically aimed *Oxford Handbook* series (OHCM, OHCS) makes no assumptions and gives the reader a very comprehensive list of all acronyms used.

In summary, this is a book for the very confident anatomy and pathology student, perhaps the student who, having worked studiously all year, wants to go over a list (225 pages of lists) and measure their understanding of essential concepts by looking at key words. But if you're like the majority of students who like visual cues to revise, this will not be the book for you.

Benson Chen

Trainee Intern
Auckland School of Medicine
University of Auckland

Benson Chen is a Trainee Intern in Auckland. He is a self-confessed Japanophile and still daydreams about his elective in Tokyo, which he undertook earlier this year. He likes neurology and radiology; and hopes to combine the two in the future!



Clinical Cases and OSCEs in Surgery (2nd edition)

Manoj Ramachandran
Marc A Gladman
Publisher: Churchill Livingstone
NZRRP: \$70.60

I recently had the opportunity to see Part II candidates of the FRACS undertake mock clinical examinations. Interestingly these examinations were not dissimilar to the OSCE I had completed in my fourth year surgical run; albeit requiring a greater depth

of knowledge and understanding about the topic including operative techniques, risks and outcomes. Underpinning this, these examinations tested the candidate's ability to perform a thorough and systematic clinical examination.

There is no substitute for good clinical examination skills. *Clinical Cases and OSCEs in Surgery* (2nd ed.) by Ramachandran and Gladman is essential reading for any medical student looking for a book to help with just this.

A key strength of this book is its simplicity. Unlike other examination texts, *Clinical Cases* is written to guide the reader how to perform the examination in a systematic step-by-step fashion. Reading this book you almost feel like you are at the patient's bedside, being taught how to examine the patient by a professor of surgery. The step by step instructions

reads like the examiners marking sheet, beginning from the opening line that is given to the candidate eg 'examine this gentleman's neck', right down to the part of the examination where you should stop.

This concise book should be a compulsory basic text for all preclinical students starting on the wards, as well as clinical students undertaking rotations through the surgical specialties. Designed for candidates sitting both the Royal College of Surgeons clinical section as well as undergraduate clinical examinations in surgery, *Clinical Cases* covers over 140 cases encountered by surgical trainees and students alike in surgical OSCEs and short case examinations.

Cases are grouped into five sections and arranged in order of frequency of appearance in examinations. The cases themselves are actual medical diseases, rather than a complaint that a patient may come in with. Each section begins with a run-through of the general examination, however specifics for each case are dealt with individually. Readers should therefore bear this in mind, as in OSCEs and short case examinations, the patient's diagnosis is not usually provided, so the candidate must use all their clinical skills to formulate a working diagnosis early on to perform the correct examination!

For those of us who hate being grilled by our consultants; the answers to commonly asked questions relating to each case are provided. Some surgical history is thrown in as well. Useful tables are provided as adjuncts to the examination, for example the relevant liver function tests and their interpretation are included in the examination of the patient with jaundice.

Detailed photographs and diagrams in full colour accompany each case, illustrating key manoeuvres in the examination. I must admit that I found these to be rather amusing; paint-on anatomy showing how and why an examination technique is performed a certain way. Despite this, the use of photographs is quite sparse. The chapter on superficial skin lesions is completely devoid of photographs of the lesions they are attempting to teach us how to examine.

In summary, this book would make an excellent companion for students undertaking any general surgical, orthopaedic or vascular run. Easy to read, comprehensive, and compact, *Clinical Cases* is sure to help all students, from those starting off on the wards, to those looking to revise before sitting the surgical OSCE and short case.

Both titles reviewed in this issue are available through Elsevier Australia. Visit <http://www.elsevierhealth.com.au/> for more great titles.

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The Editors of the *New Zealand Medical Student Journal* aim to support medical student development, be a forum for opinions and discussion, and publish the educational writing of medical students. To this end, the Journal accepts submissions in the form of original research articles, academic review articles, feature articles including case reports and conference reports, book reviews and letters. The Journal commits to rigorous peer review and freedom from commercial influence.

Format Requirements

- Use Microsoft Word
- Include figures, legends and tables
- Save as a word document (*.doc)
- Photographs are to be included as separate files

Type of Submission

- Original research articles
- Academic review articles (<3000 words)
- Feature articles (<3000 words)
- Case reports (<1500 words)
- Book reviews (<500 words)
- Letters (<500 words)

Criteria for Submission

- Submissions are of interest to medical students
- Written approval from research supervisors is required
- Author's email address for correspondence is necessary
- Short blurbs about authors should be included
- Completed article coversheet, available from: www.otago.ac.nz/nzmsj

Style

The British Medical Journal house style is to be followed. This is available at: <http://resources.bmj.com/bmj/authors/bmj-house-style>
Use the Vancouver referencing style, insert numbers within the text using superscript, do not use brackets around the numbers
Abstracts are required for research articles

Electronic Submission

Access the ESS at: www.otago.ac.nz/nzmsj
Register as an author
Follow the five step submission system
Upload article and completed article cover sheet

Manual Submission

Email articles and authors' blurb to: nzmsj@otago.ac.nz
with "Article Submission" in the subject header
Post completed article cover sheet to:
New Zealand Medical Student Journal
c/- Medical Teaching Support Unit
Dunedin School of Medicine
PO Box 913
Dunedin
New Zealand

Process

All submissions will be subedited for spelling, grammar and clarity. They will then be sent for expert reviews. Authors will be required to revise their articles during this process.

Final article selection for publication will be made in conjunction with our academic advisors and editorial board once the review and revision process is completed to a professional publishing standard.

Acceptance of an article into the review process does not constitute a guarantee of publication. It is the intention of the NZMSJ to provide authors with the benefit of external review and revision processes that are standard internationally for published journals. This is in keeping with our educational aim to assist medical students in making the transition from writing for medical school to writing as a graduate.

In keeping with the NZMSJ's ethos of encouraging students to submit articles, we are proud to offer prizes to acknowledge excellent work.

Prizes are awarded under the categories of **Best Academic Submission** and **Best Features Submission**.

We are currently accepting submissions for Issue 14, due for publication in October 2011.





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