George Abbott Symposium

The Chateau on the Park

Christchurch

16th & 17th August 2013

"WHAT WILL WE BE DOING IN 2020?"

George Abbott Symposium
Department of Paediatrics, Christchurch
August 16th – 17th 2013

Keynote Speaker

Professor Melissa Wake
The George Abbott Visiting Professor
Director of Research, Centre for Community Child Health
Royal Children's Hospital, Melbourne

Other featured speakers

Professor Harlene Hayne
Vice Chancellor, University of Otago

Professor Martin Kennedy
Carney Centre for Pharmacogenetics, University of Otago, Christchurch

Professor Barry Taylor
Dunedin School of Medicine

Professor Stephen Robertson
Paediatric Genetics, Dunedin School of Medicine

Professor David Murdoch
University of Otago, Christchurch

Professor Steve Chambers
University of Otago, Christchurch

Topics include

- Prevention of developmental problems
- Obesity prevention
- Pharmacogenetics
- Whole exome sequencing
- New diagnostics
- Paediatric pneumonia

Friday 16th August 2013

0900	*Tea & Coffee available*
1000 - 1045	Welcome: Chair: Dr Tony Walls Professor Melissa Wake – Longitudinal Study of Australian Children
	Chair:
1050 - 1130	Professor Barry Taylor – obesity prevention
1130 - 1200	Professor Andrew Day – Coeliac disease in 2020
12.00 - 1245	*Lunch, served on-site*
	Chair:
1245 - 1315	Professor David Murdoch – Expanding our knowledge about Paediatric Pneumonia
1315 – 1345	Professor Steve Chambers – New diagnostics for paediatric lung infections
1345 – 1415	John Garrett – Forget the Teletubbies, telemedicine is where it's at!
1415 - 1445	Professor Harlene Hayne – Out of the mouths of babes: Memory development during infancy and childhood
1445 - 1515	*Afternoon Tea*
	Chair:
1515 – 1545	Professor Tim Wilkinson – The rapidly evolving medical curriculum
1545 – 1615	Maggie Meeks – Prime your mind, prepare your motor system and practice, practice, practice
1615 - 1645	Warren Nairn – Paediatric Surgery in Palestine – the NZ contribution

Saturday 17th August 2013

0800-0830	Meet the expert session – informal ? BJT, ASD, TW, PS, RC, MW Coffee and tea available
	Chair: So, just exactly when will genetics revolutionise medicine?
0830- 0910	Part 1 - Professor Martin Kennedy
0910- 0950	Part 2 - Professor Stephen Robertson
0950 - 1015	Dr Paul Shillito – pharmacogenetics and epilepsy treatment
1015- 1045	*Morning Tea*
	Chair:
1045 – 1115	Professor Melissa Wake – Language, literacy and learning
1115 – 1145	Tony Walls – New vaccines
1145 - 1215	Professor Barry Taylor - What is the future for bedsharing?
1215 - 1300	*Lunch, served on-site*
	Chair:
1300 – 1330	Dr Rob Corbett – advances in cancer therapy
1330 – 1400	Professor Tony Kettle – The battle against chlorine bleach in the lungs of children with Cystic Fibrosis
1400 - 1430	Panel discussion and questions from audience – panel of speakers
1430 – 1500	Professor Melissa Wake – Ecology of Paediatric healthcare
1500	Finish – afternoon tea available

Professor Melissa Wake
Director of Research, Centre for Community Child Health, Royal Children's Hospital, Melbourne

The Longitudinal Study of Australian Children

The right of every child to enjoy the highest attainable standards of health is enshrined in the United Nations Convention on the Rights of the Child. Despite the remarkable gains of the last century, children's physical health still presents many challenges. More children are living with chronic conditions. Social disparities in health are widening. Links between physical and psychological wellbeing are becoming more evident, and their biologic bases more clearly delineated. The costs of early health stem not only from special health care needs during childhood but from the adult diseases inherent in already-measurable, but asymptomatic, childhood precursors. Thus, important challenges are to understand how health care systems interact with health and illness to impact on children's lives, and to improve outcomes through the most cost-effective preventive and treatment services delivered at the optimal point in the prevention-disease continuum.

This presentation will explore how the 10,000-strong Longitudinal Study of Australian Children is already contributing to all these areas, and its growing power as these children become adolescents and – ultimately – sick or healthy adults.

Professor Barry Taylor
Professor of Paediatrics & Child Health, Dunedin School of Medicine

What are the prospects for Obesity Prevention in Childhood?

Our children live in a obesogenic world, with NZ currently third to USA and Mexico in OECD countries for having the highest prevalence of overweight children. The genetic predisposition for bigger size (mainly working through appetite control genes) has probably not changed over the last 30 years, but there have been major environmental changes.
In this environment, there has been an increasing focus on prevention of the rapid early childhood growth which predicts childhood and less well, adult obesity. Duration of being overweight is an important predictor of later life cardiovascular outcomes, so preventing childhood obesity is likely to have major lifelong consequences.
The Prevention of Overweight in Infancy (POI.nz) study is one of 4 Australasian early infancy overweight prevention trials that are currently on-going – many of them now reporting their early results, all of which plan to combine their results into a prospective meta-analysis.
The rationale, methodology and early results will be presented and integrated into our current knowledge of the prevention and management of children who are too big.

What is the future of Bedsharing?

Coroners and most paediatricians are increasingly taking a hard line on bedsharing in infancy, recommending no parent go to sleep with their baby on the same sleeping surface. This approach is based on evidence from NZ and international case controlled studies, and the individual and family tragedies of 50 – 60 deaths each year from Sudden Unexpected Deaths in Infancy in NZ. The recent report on suffocation and strangulation deaths from the Child and Youth Mortality Review Committee has included many deaths previously labelled as Sudden Infant Death Syndrome, with significant consequences for the parents of infants whose deaths are so labelled.
The large majority of these deaths are in high risk families, but the advice is population wide and there are potential unanticipated outcomes from this public health strategy.
I will review the evidence for both sides of this complex equation and outline some possible solutions that are evolving from our research studies using home infra-red video and physiological recordings with high risk families.

Professor Andrew Day
Paediatric Gastroenterology, Christchurch

Coeliac disease in 2020

Over the last decade or so, our understanding of the pathogenesis of Coeliac disease has advanced significantly. These developments have resulted in new approaches and a burgeoning increase in awareness of the importance of coeliac disease and of the spectrum of it's presentation and consequences. Looking forwards to 2020, we can anticipate many further changes in the coming years: rates of coeliac are likely to increase further and diagnostic approaches are likely to evolve. Furthermore, a number of new management options are on the horizon: these include the development of a vaccine to induce tolerance to gluten.

Professor David Murdoch
Department of Pathology, University of Otago, Christchurch & Canterbury Health Laboratories, Christchurch

Expanding our knowledge about Paediatric Pneumonia

Pneumonia is the leading cause of childhood mortality globally with over 2 million deaths per year. Although this burden has been slowly reducing, new strategies are needed in order to enhance prevention and management of paediatric pneumonia. The Pneumonia Etiology Research for Child Health (PERCH) project is a large case-control study that aims to determine the aetiology of and risk factors for severe pneumonia in children from seven countries in Africa and Asia. This study is providing a contemporary picture of the causes of childhood pneumonia in regions with the greatest burden of disease, with the objective of informing future research efforts for the prevention of pneumonia, including the development of new vaccines. Although PERCH has not yet finished, the data have already highlighted the range of pathogens associated with pneumonia and the challenges in assigning causation. In particular, there is increasing evidence that pneumonia is typically a polymicrobial disease.

Professor Steve Chambers
Department of Pathology, Christchurch

New diagnostics for paediatric lung infections

The microbiological diagnosis of lower respiratory tract infections remains a challenge because of the difficulty of obtaining representative specimens for diagnostics tests. While culturing a specific organism and performing sensitivity testing remains the gold standard tests that could identify the species of infecting organism would be a step forward. Because exhaled breath is readily available from almost everyone this offers a possible avenue for investigation.

Exhaled breath which contains volatile organic compounds that may be derived from infecting pathogens and thus form a potential diagnostic target. This principle has been validated for some organisms, such as aspergillus but formidable technical challenges remain that need to be overcome including confounding from the environment, ingested food and fluids, and organisms in the upper airways before the sensitivity and specificity needed for a useful diagnostic test can be achieved.

Recent progress will be reviewed.

Dr John Garrett
Department of Paediatrics, Christchurch

Forget the Teletubbies, telemedicine is where it's at!

Telemedicine consultations by high definition videoconference are becoming more common in New Zealand. Over the last 2 years the Paediatric Service on the West Coast has established ambulatory and acute telemedicine, so that children can be seen in the hospitals and rural clinics by a paediatrician from Christchurch. Other specialties and other regions are doing similar things, but at the same time there remains large potential for more clinical work to be done by telemedicine.

The National Health IT Board through the Telehealth Leadership Group is encouraging greater use of telemedicine, and the Medical Council has recently released guidance for Doctors who consult in this way. There are an increasing number of clinical networks being developed, which usually have suitable models of care to which telemedicine can be easily added. In addition there are technical standards relating to telemedicine that are being developed for New Zealand.

A number of barriers need to be overcome. These include interoperability issues between different vendors and networks, funding of telemedicine consultations, network capacity, logistics, and clinician acceptance. A number of initiatives are getting underway to address these issues.

By 2020 most clinicians will be involved in a form of telemedicine with some of their patients.

Professor Harlene Hayne
Psychology Department, Vice-Chancellor, University of Otago, Dunedin

Is a Picture Worth a Thousand Words?
The Clinical and Legal Value of Children's Art

When given the appropriate materials, most children will readily begin to draw. Children's drawings are typically imaginative and colorful and most adults are inherently fascinated by them. As teachers, parents, or grandparents, we proudly display children's drawings in our classrooms or offices and on our fridge doors. But is there more to children's drawings than initially meets the eye? For over a century now, psychologists have argued that children's drawings are more than mere scribbles on a page. In clinical contexts, some experts have argued that drawings provide a unique window to children's thoughts, feelings, and intellectual development. In legal contexts, children's drawings have been used to make decisions about custody and access and to enhance children's reports of physical and sexual abuse. In short, many experts have argued that a picture is truly worth a thousand words. Unfortunately, psychologists' enthusiasm for children's drawings has often preceded empirical research on the claims that are made. In view of this issue, the overarching goal of my presentation is three-fold: First, I will review some of the claims that have been made about the clinical and forensic value of children's drawings. Second, I will evaluate the validity of those claims on the basis of recent research on children's drawings. Finally, I will present data from my own laboratory in which my students and I have examined the effect of drawing on the content and accuracy of children's accounts of their own past experiences.

Professor Tim Wilkinson
MB ChB Programme Director
Faculty of Medicine, University of Otago, Christchurch

The rapidly evolving medical curriculum

As the Christchurch campus of the Otago Medical School celebrates its 40th anniversary, this paper ponders where medical education might head in the next 40 years. The patient must remain at the centre of health care and health care education but such education needs to be placed within nurturing environments that value support and innovation. Synthesising evidence, weighing up options, considering the personal factors that a patient brings and the uniqueness of a person's particular illness will be increasingly important roles of a future doctor. This requires interpreting complex data, people skills, flexibility, redeployability and, at times even acting like the "Parish priest". Ultimately however, if we select the right people, create the right expectations, and give them the right learning opportunities, then the curriculum will look after itself.

NZMJ 15 March 2013, Vol 126 No 1371; ISSN 1175 8716
URL: http://journal.nzma.org.nz/journal/126-1371/5569/

Dr Maggie Meeks
Consultant Paediatrician, Christchurch

Prime your mind, prepare your motor system and practice, practice, practice.

Many of us are familiar with the phrase 'Medicine is an art not a science' and it is a phrase that can precipitates a healthy debate about the contribution of each. As medicine becomes ever more scientific many of us also believe it becomes ever more an artform tailored to the complexities and idiosyncrasies of each individual patient. The patient may be the human at the centre of the mix but in striving to improve we also need to take into account those human factors within all of us that are not programmable or error free. I will briefly introduce some thoughts on human factors.

The use of simulated experiences continues to gain in popularity primarily as an educational tool for individuals learning specific skills but also as a tool to enhance the quality and safety of patient care and the functioning of systems by providing a window into the complexity of human interactions. In utilising simulation as a learning tool it is important to ensure that it is embedded within an environment that has sound educational principles at its core. These include confidentiality, a supportive learning environment and skilled debrieifing and feedback which aims to maximise effective learning.

The use of technology to create high fidelity manikins and environment as well as the fact that simulation is a resource intensive method of education means that simulation is expensive. As a consequence of this we have to work to establish clear areas of priority for this type of learning and to perform audit and research to validate the use of simulation and to further inform the development of this area. To illustrate this I will present an example of undergraduate simulation education in the Trainee Intern year during their paediatric attachment and postgraduate simulation training for registered medical officers in neonatology.

Books:

The Human Contribution: unsafe acts, accidents and heroic recoveries. James Reason. 2008.

Safety at the Sharp End. Rhona H Flin, Paul O'Connor, Margaret Crichton. 2008.

Warren Nairn
Charge Nurse Manager, CAA, Christchurch

Paediatric Surgery in Palestine – the NZ contribution

Currently I am the Charge Nurse Manager of the Children's Acute Assessment Unit in Christchurch Hospital. Prior to this a significant part of my nursing career has involved working with children with congenital heart disease, firstly at Green Lane Hospital in the ward setting and ICU and later in the Starship PICU. I've had a longstanding interest in working overseas in situations where health care for children is not as good as we are able to offer in New Zealand. This has included working with children with HIV/Aids in Romania and in more recent years children with Congenital Heart Disease (CHD) in Palestine.

The availability and delivery of healthcare in Palestine presents many challenges at any level and especially with such a resource intensive specialty as congenital cardiac surgery. My presentation will include something of the background to the situation regarding treatment of CHD in Palestine; the NGO sponsoring this work, the Palestine Children's Relief Fund (PCRF), the contribution of Alan Kerr and other New Zealanders and some of my own reflections and experiences.

Professor Martin Kennedy
Carney Centre for Pharmacogenetics, University of Otago, Christchurch

Just when will genetics revolutionise medicine, Part 1

Genetics technology has accelerated over the past decade to a degree that few of us would have predicted. It is now possible to rapidly identify most of the genetic variants in any given human genome, and the era of "personal genomics" is upon us. Although staggering gains have been achieved in technologies for probing the genome, we struggle to understand the functional implications of much of this variation. Genome analysis is now being applied widely in the research setting, and to an increasing degree it is being explored for use in a more routine clinical setting. However, such analyses are already available via direct to consumer companies accessible through the internet, and this is rapidly becoming an affordable option for people, despite its uncertain value in most cases. In the laboratory we can now generate genome information far more rapidly than we can understand the relevance of this knowledge, and there remain enormous challenge in the routine application of such data. What does it mean to understand the sequence of all human genes? To what degree can we interpret the clinical relevance of genetic variation that is apparent between human genomes? How might this knowledge be used in the clinical setting? What are the major impediments to translation of genome sequencing from a remarkable research tool into a method that significantly advances the health care of patients? These questions and others will be traversed in this presentation, which will introduce the concepts of genome wide association studies (GWAS), next generation DNA sequencing (NGS), and exome sequencing, with a focus on the applications and limitations of this information in the pharmacogenetics setting. Hopefully, this will help to clarify the answer to the question posed in the title!

Professor Stephen Robertson
Paediatric Genetics, Dunedin School of Medicine

Just when will genetics revolutionise medicine, Part 2

To some degree, genetics underpins and influences the susceptibility to and progression of almost all disease processes. For some conditions this influence is profound, for others it is weak. The revolution in genetic technologies enabling highly parallelised and high resolution genetic analysis over the last 15 years has lead to the claim by some that an understanding of these genetic factors will translate to direct clinical benefit to individual patients. Many of these claims were made in ignorance of the genetic architecture of the genomic factors that underlie the susceptibility to disease states. As the understanding of these issues continues to improve in parallel with technologies that equip us to examine genomes for mutations and chromosomal anomalies, the limits of genetic analysis are slowly coming into view. For chromosomal analysis comparative genomic hybridisation has brought high resolution chromosomal analysis to the clinic over the last 5 years. Although there has been unavowed benefit for many families through the application of this technique, for some conditions like autism the polygenic basis for the condition has been underscored and the definition of susceptibility elements has been relatively disappointing in terms of its clinical utility. Exome sequencing is about to break into the clinical arena is a similar fashion to what CGH did 5 years ago. Preliminary studies would indicate the severe and disabling phenotypes are more likely to benefit diagnostically from the application of this tool, while once again non-specific presentations like non-syndromic mild-moderate intellectual disability appear to be more complex that at first thought. As our understanding of epigenetic factors in disease causation gains more traction many are predicting a diagnostic boon in this domain as well. The caveats surround such analyses will be discussed, including the dynamic and tissue specific nature of these processes, considerations that in my opinion will limit the clinical applicability of this technique even more than analysis of germline DNA.

Dr Paul Shillito
Department of Paediatrics, Christchurch

Epilepsy management through the ages and what to expect next

Possessed by demons, maybe you are a witch, or perhaps you have a sodium channelopathy?

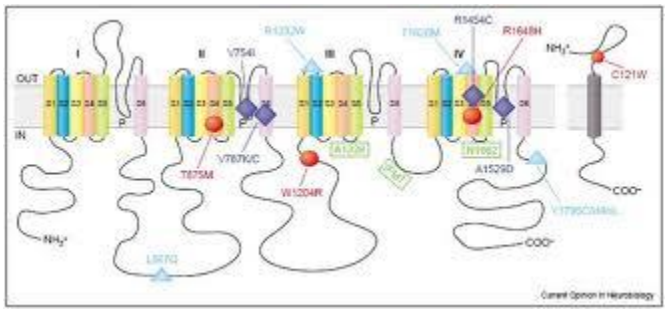
Epilepsy has a colourful and miserable history. Treatments have rarely been helpful and mostly harmful. Yet those treatments have usually been based on the consensus opinions of experts through the ages.

In the past 100 years we have been basing our treatments on science – rudimentary at first but increasingly sophisticated.

Despite our knowledge we still use sledge hammers to crack nuts.

So is this about to change?

Will we develop individualised treatment plans for children based on their genetic profiles or are we still a long way off from this ideal?



Dr Tony Walls
Paediatric Infectious Disease specialist, Christchurch

New vaccines

Pharmac has been recently made responsible for the funding of vaccines on the New Zealand Immunisation schedule. This may lead to some changes to the schedule in the coming years.

Varicella and rotavirus vaccines have been available in New Zealand for several years but are currently not funded. Both have been highly successful in reducing the incidence of disease in Australia and Pharmac are currently considering proposals for their introduction here.

Several meningoccal vaccines have recently been approved for use overseas. The quadravalent meningococcal vaccine is recommended for use in the USA and is available in New Zealand. Group B is still the most common serogroup causing disease in New Zealand but we no longer have a vaccine available. New Meningococcal Group B vaccines are approved for use in Europe and the potential for introducing meningococcal vaccines into our schedule will be discussed.

Finally two areas where vaccines could make a huge impact on clinical care are Group A Streptococcal vaccines and Group B streptococcal vaccines. Where are these at in development and how soon can we expect to have them available?

Worth a read:

http://www.researchreview.co.nz/nz/Clinical-Area/Paediatrics/Paediatric-Vaccines/Private-Market-Vaccines-in-New-Zealand-–-an-update.aspx

Dr Rob Corbett
Paediatric Oncologist, Central/Southern Child/Adolescent Cancer Service

Recent Advances in Childhood (and Adolescent) Cancer

Major gains in the rate of cure of childhood cancer were made 1970 – 1990. Thereafter, the overall rate of progress has slowed. However, success has recently been achieved in particular cancer types. Until the mid-1990s, the outcome for high risk neuroblastoma was very poor. Gradual progress has been made employing intensive induction therapy, high-dose chemotherapy with stem cell rescue and differentiation therapy with cis-retinoic acid. Survival has recently significantly improved using a novel combination of immunotherapy centred on delivery of a monoclonal antibody in concert with agents that stimulate the body's natural defences.

Although relatively rare, retinoblastoma is the most common primary ocular cancer of childhood. Approximately 40% of cases harbour a constitutional mutation or deletion in the RB1 gene, conferring risk to the contralateral eye and offspring, and a marked predilection for other types of cancers later in life. Initially, mainstays of treatment were surgery and radiotherapy, the latter conferring a dramatically increased risk of second cancer in those harbouring a constitutional mutation. Since the early 1990s, chemotherapy has played an increasing role in curing hereditary retinoblastoma whilst salvaging useful vision and reducing the incidence of second cancers. Routine genetic testing of enucleated eyes and blood reveals hereditary retinoblastoma at an early stage, guiding surveillance and therapeutic modalities. Guided infusion of chemotherapy into the ophthalmic artery is now expanding the armamentarium of treatments available to retinoblastoma sufferers.

Medulloblastoma is the most common malignant brain tumour of childhood. Mainstays of treatment typically include surgery, radiotherapy and chemotherapy. Whilst multi-modality therapy has improved survival, long-term sequelae of therapy are commonly encountered. The association of uncommon syndromes with medulloblastoma has identified lesional genetic mechanisms within non-syndromal medulloblastoma tumours. These genetic abnormalities have unravelled different pathways responsible for medulloblastoma, and identified subgroups that vary in prognosis. A study – soon to be opened – stratifies the therapy of patients with medullobastoma according to their genetic lesion with intensity of therapy modified to the perceived risk. Children with more favourable medulloblastoma will receive less intensive therapy, and hopefully encounter less severe long-term side-effects.

Adolescents and young adults (AYA: 15 – 24 years of age) with cancer have benefited least from survival gains of any age range, including geriatrics. International data exposes very significant differences in survival across a range of cancers depending on how and where an AYA patient is treated. The "AYA Gap" is currently being addressed in New Zealand. National coordination will result in consistency of therapy and availability of clinical trials. Challenging, age-specific psychosocial issues that impact upon adaptation and compliance are addressed through the coordinated efforts of AYA Key Workers. Unique solutions are proposed that balance psychosocial demands with the tumour-specific expertise required to maximise cure.

Professor Tony Kettle
[1]Centre for Free Radical Research, Department of Pathology, University of Otago Christchurch, New Zealand

The battle between chlorine bleach and glutathione in the lungs of kids with cystic fibrosis

Glutathione (GSH) protects the airways against damaging chemicals. However, its concentration is low in the lungs of children with cystic fibrosis, presumably because the defective cystic fibrosis transmembrane conductance regulator (CFTR) does not transport it effectively across the epithelium. Alternatively, chlorine bleach generated by neutrophils may oxidize GSH. We aimed to establish whether poor transport or increased oxidation is responsible for the low concentrations of GSH in bronchoalveolar lavage (BAL). We used mass spectrometry to measure GSH and its oxidation products in BAL from young children with CF (n=116) and non-CF disease controls (n=22). Chlorine bleach was assayed by measuring chlorotyrosine in proteins, which is a specific chemical footprint of this oxidant. The neutrophil enzyme myeloperoxidase, which produces chlorine bleach, was detected by ELISA. Infections were assessed by colony counts in BAL and bronchiectasis was scored by computer tomography. The concentration of GSH was lower ($p < 0.001$) in BAL from children with CF whereas the proportion oxidized by chlorine bleach was higher ($p < 0.001$). and correlated with myeloperoxidase ($r=0.54$; $p<0.001$) and 3-chlorotyrosine ($r=0.77$; $p<0.001$). The extent of GSH attached to proteins was substantially higher ($p < 0.001$) in BAL from children with CF (n=25) than controls (n=12). Myeloperoxidase ($p<0.001$), 3-chlorotyrosine ($p=0.019$), and GSH oxidized by chlorine bleach ($p=0.003$) were higher in CF children with infections. Myeloperoxidase was elevated in children with bronchiectasis ($p= 0.009$). We conclude that oxidation of GSH by chlorine bleach produced during infections makes a major contribution to low levels of GSH in the airways of children with CF. Furthermore, myeloperoxidase and chlorine bleach participate in the destruction of the lungs of children with CF.

Anthony Kettle[1], Rufus Turner[1], Catherine Gangell[2], Irada Khalilova I[1], Timothy Harwood[1], Anna Chapman[1], Christine Winterbourn[1], Peter Sly[3] on behalf of AREST CF[4]

[2]Telethon Institute for Child Health Research, Centre for Child Health Research, The University of Western Australia, Perth, Australia, [3]Queensland Children's Medical Research, University of Queensland, Brisbane, Australia and [4]Australian Respiratory Early Surveillance Team for Cystic Fibrosis.

NOTES:

NOTES:

NOTES:

Department of Paediatrics
PO Box 4345, Christchurch Mail Centre, Christchurch 8140, New Zealand
Tel: +64 3 364 0747
Fax: +64 3 378 6355
Email: nicola.drake@otago.ac.nz
www.otago.ac.nz