

SMJ

SINGAPORE MEDICAL JOURNAL

6th KKH Annual Scientific Meeting **Academic Excellence Towards Better Healthcare for Women and Children**

15 & 16 July 2011 (Friday & Saturday)

KK Women's and Children's Hospital
Training Centre, Level 1, Women's Tower



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Dear Colleagues and Friends,

Academic medicine encompasses the missions of education and research while caring for patients. This is of crucial importance as it is vital that the next generation of clinicians and scientists are well placed to deal with upcoming challenges in healthcare with the help of the new innovations and technologies developed by us today. At least as important as these three pillars is the interrelationship between teaching, innovation and service. Each of these can exist in isolation; however, it is only when they coexist in a vibrant environment that synergies are forged and sustainable improvements in healthcare are achieved.

The theme of this meeting, 'Academic excellence towards better healthcare for women and children,' focuses our attention on progress made within KKH to create such an academic environment. The programme highlights examples where our colleagues have challenged themselves to enhance the standards of clinical care in their respective areas through innovation and research. This is also an opportunity for all of us to take time to study their achievements and to reflect on how these were accomplished, and to be motivated to apply the same principles of scholarship and reasoning to advance practice in our areas as well.

We are privileged to welcome Professor Martyn Partridge, Senior Vice Dean, Lee Kong Chian School of Medicine, as our Guest of Honour. This new medical school will introduce several innovative educational approaches and we are delighted to partner with the Imperial College and Nanyang Technological University in this exciting collaboration.

I wish to thank Dr Kevin Lim and A/Prof Thaschawee Arkachaisri and their outstanding teams for putting together this scientific programme. They have worked tirelessly and their drive and enthusiasm has allowed us to look forward to this meeting.

It is my hope that everyone will participate actively, take the opportunity to learn from one another and be inspired to take on the challenge of pushing the frontiers of medicine.



A/Prof Kenneth Kwek

Chairman, Medical Board

KK Women's and Children's Hospital

Message from the Organising Chairpersons

Dear Colleagues and Friends,

Welcome to the 6th KKH Annual Scientific Meeting!

The theme of this year's meeting is in keeping with our hospital's goal of becoming a Centre of Excellence in Academic Medicine — an institution where medical research and advanced teaching play major roles in producing the finest doctors, nurses and allied health professionals, who will in turn provide the best clinical care and quality to their patients.

We have lined up three plenary sessions and twelve symposia for the meeting. The three plenary sessions will focus on Nursing Education, Medical Education and Translational Research — key focus areas as we journey towards excellence in academic medicine. In the twelve symposia, speakers from different specialties will share their insights on various aspects of patient care. They will also highlight newer aspects of their work and explain in greater detail new clinical methods and techniques.

We are delighted and honoured that many eminent subject leaders have agreed to share their knowledge and expertise with us at this meeting. We have no doubt that you will enjoy their presentations over the next two days. We would also like to invite you to attend the various free paper presentations and visit the poster displays; you will see for yourself that the culture of research and innovation is very much alive and well at KKH.

Our heartfelt thanks to Professor Martyn Partridge for taking time off his busy schedule to be here with us. We were very encouraged by the number of abstracts received and would like to thank everyone for meeting the tight deadlines of submission. Finally, we wish to thank the members of the Organising Committee for their hard work, and all of you for coming and making this a successful ASM.

Enjoy the meeting!



Dr Kevin Lim

Chairman, Organising Committee

6th KKH Annual Scientific Meeting 2011



A/Prof Thaschawee Arkachaisri

Co-Chairman, Organising Committee

6th KKH Annual Scientific Meeting 2011

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Senior Principal Speech Therapist
Department of Plastic, Reconstructive & Aesthetic Surgery
Division of Surgery

Programme : Day One - 15 July 2011 (Friday)

8.30am - 10.00am Registration, Breakfast and Viewing of Posters

Auditorium

10.00am - 10.30am Opening Ceremony

10.00am - Arrival of Guest of Honour, Prof Martyn R Partridge, MD FRCP, Professor of Respiratory Medicine and Deputy Director of Education, Imperial College London, Senior Vice Dean, Lee Kong Chian School of Medicine, A Joint Medical School by Imperial College London and Nanyang Technological University, Singapore
10.05am - Welcome Speech by Organising Chairman, Dr Kevin Lim, Senior Consultant & Deputy Chairman, Division of Surgery
10.10am - Speech by Prof Ivy Ng, Chief Executive Officer, KK Women's and Children's Hospital
10.15am - Speech by Guest of Honour, Prof Martyn R Partridge, MD FRCP

10.30am - 11.30am **Plenary 1: Evolution in Nursing Education**

Chairperson: Ms Paulin Koo, Deputy Director, Division of Nursing

- 1) Evolution of Nursing Education: Moving with the Time
Ms Wong Sook Thow, Assistant Director, Division of Nursing
- 2) Finding The Right Fit
Ms Julia Eng, Assistant Director, Division of Nursing
- 3) Academic Nursing: Where's the Place for the Nurse Scholar?
Dr Chia Yen Yen, Deputy Director, Division of Nursing
- 4) Question and Answer Session

11.30am - 12.30pm **Symposium 1: Myths and Facts on Fever**

Chairperson: Ms Sim Boon Eng, Senior Nurse Clinician, Division of Nursing

- 1) Acute Fever in Children: Basic Concept and Management
A/Prof Theechawee Arkachaisri, Head & Senior Consultant, Rheumatology & Immunology Service
- 2) To Sponge Or Not To Sponge
Ms Lim Sok Lin, Nurse Clinician, Division of Nursing
- 3) A Comparison of 3 Methods of Thermometry in Critically Ill Children
Ms Habibah Ibrahim, Senior Staff Nurse, Division of Nursing
- 4) Question and Answer Session

12.30pm - 1.00pm Lunch

1.00pm - 2.30pm **Poster Presentation and Judging (Medical)**

Venue: Women's Specialist Outpatient Clinics

1.00pm - 2.00pm **Awareness Play on Maternal Depression - When The Bough Breaks**

Production by The Necessary Stage & supported by Health Promotion Board

2.30pm - 3.30pm **Plenary 2: Medical Teaching and Learning in the 21st Century**

Chairperson: A/Prof Theechawee Arkachaisri, Head & Senior Consultant, Rheumatology & Immunology Service

Prof Matthieu Gwae, Professorial Fellow, Department of Pharmacology, Charman, International and Education Programmes, Medical Education Unit, Yong Loo Lin School of Medicine, NUS; Fellow, NUS Teaching Academy, National University of Singapore

Feedback: Importance in the Teaching and Learning of 21st Century

A/Prof Tan Chay Hook, Associate Professor, Department of Pharmacology, Medical Education Unit, NUS; Consultant Psychiatrist, NUHS

3.30pm - 4.30pm **Symposium 3: Assisted Reproduction, Genetics & Perinatal Outcomes**

Chairpersons: Adj Prof Yeo Seow Heong, George Senior Consultant, Department of Maternal Fetal Medicine

Dr Luh Seong Fee, Head & Senior Consultant, Department of Reproductive Medicine

- 1) Current Concepts and Controversies in Assisted Reproduction and Obstetric Considerations
Dr Tan Heng Hao, Consultant, Department of Reproductive Medicine
- 2) Preconception Genetics
A/Prof Samuel Chong, Associate Professor, Department of Paediatrics, National University of Singapore
- 3) ICSI Babies: Fetal Anomalies & Neurodevelopmental Issues
Dr Pralibha Agarwal, Head & Senior Consultant, Special Care Nursery
- 4) Question and Answer Session

4.30pm - 5.00pm Tea Break

5.00pm - 6.30pm **Symposium 5: Clinician Scientist - Balancing Clinical Services and Research**

Chairpersons: Dr Aung Le Le, Staff Physician, Haematology/Oncology Service

Dr Winnie Fung, Senior Research Coordinator, Division of Surgery

- 1) Do You Want To Be Like Doraemon?
Dr Masakazu Nakao, Registrar, Cardiothoracic Surgery Service
- 2) Learning Research - From a Clinician's View
Dr Sng Ban Leong, Consultant, Department of Women's Anaesthesia
- 3) Ebony and Ivory: Integrating Research and Service from a Pathologist's Perspective
A/Prof Tan Soo Yong, Senior Consultant, Department of Pathology, Singapore General Hospital
- 4) The Development of Fetal Gene and Stem Cell Therapy
Dr Jerry Chan, Consultant, Department of Reproductive Medicine

Lecture Theatre

(11.30am - 12.30pm)

Symposium 2: Cleft and Craniofacial Anomalies

Chairperson: Dr Vincent Yeow, Head & Senior Consultant, Department of Plastic, Reconstructive and Aesthetic Surgery

- 1) Genetics of Cleft Lip and Palate
Dr Angelina Lai, Senior Consultant, Genetics Service
- 2) Antenatal Detection of Cleft and Craniofacial Anomalies
Adj Prof Yeo Seow Heong, George Senior Consultant, Department of Maternal Fetal Medicine
- 3) Management of Cleft and Craniofacial Anomalies
Dr Por Yong Chen, Consultant, Department of Plastic, Reconstructive and Aesthetic Surgery
- 4) Speech Difficulties in Individuals with Cleft Palate
Ms Selena Young, Senior Principal Speech Therapist, Department of Plastic, Reconstructive and Aesthetic Surgery
- 5) Nursing Care of Cleft and Craniofacial Anomalies
Ms Ani Bte Dahlan, Senior Staff Nurse, Department of Plastic, Reconstructive and Aesthetic Surgery
- 6) Question and Answer Session

(3.30pm - 4.30pm)

Symposium 4: Adolescent Health

Chairperson: Dr Ong Say How, Senior Consultant, Child and Adolescent, Mental Wellness Service

- 1) Adolescent Weight Management Programme at KKH
Mr Michael Lim, Senior Clinical Exercise Physiologist, Sports Medicine Service
- 2) Management of Eating Disorders in an Acute Paediatric Setting
Dr Oh Jean Yin, Consultant, General Paediatrics & Adolescent Medicine
- 3) Lost in Transition? - Young Adult Cardiac Clinic
A/Prof Wong Keng Yoon, Head & Senior Consultant, Cardiology Service
- 4) Question and Answer Session

Conference Room 2

(3.30pm to 5.30pm)

Workshop 1: Suture 101

Chairperson: Dr Ong Lin Yin, Consultant, Department of Paediatric Surgery

- 1) Short Introduction to Types of Sutures/Knot Tying
- 2) Practical Session - Instrument Tie, Hand Tie, Anchoring of Tubes and Drains

(5.00pm to 6.30pm)

Symposium 6: Neonatology - The Way Forward

Chairpersons: Adj A/Prof Mary Daniel, Head & Senior Consultant, Neonatal Ambulatory Service

Dr S Bhavani, Senior Consultant, Department of Neonatology

- 1) Excellence in Neonatal Care Through International Benchmarking
Dr Khoo Poh Choo, Senior Consultant, Department of Neonatology
- 2) Collaborative Learning in Neonatal Medicine
Dr J M Gomez, Head & Senior Consultant, Neonatal Intensive Care Unit
- 3) The Late Preterm Neonate: Is He Safe?
A/Prof V Samuel Rajadurai, Head & Senior Consultant, Department of Neonatology

Programme : Day Two - 16 July 2011 (Saturday)

8.30am - 9.00am Registration and Viewing of Posters

Auditorium

9.00am - 10.00am

Plenary 3: Bench to Bedside

Chairperson: Dr Manelle Fortier, Senior Consultant, Department of Diagnostic & Interventional Imaging

1) Familial Influences on Brain Development and Function

Dr Michael Meaney

James McGill Professor, Faculty of Medicine, McGill University, Montreal, Canada
Adjunct Senior Investigator, Singapore Institute for Clinical Sciences

2) Cell Biology via NMR

Prof Philip Kuchel

Executive Director, Singapore Biomaging Consortium, A*STAR

3) Personalising Cancer Medicine in the Era of Targeted Therapies

Dr Ong Sin Tiong

Associate Professor

Cancer & Stem Cell Biology Signature Research Program

Duke-NUS Graduate Medical School, Singapore

10.00am - 10.30am

Tea Break

10.30am - 11.30am

Symposium 7: Massive Obstetric Haemorrhage - Optimising Outcomes of a Condition that Continues to Plague Us

Chairpersons: Dr Yim Chik Foo

Senior Consultant, Department of Women's Anaesthesia

Dr June Tan, Senior Consultant, Department of Maternal Fetal Medicine

1) The Importance of a Multidisciplinary Approach to the Prevention & Management of Massive Obstetric Hemorrhage

Dr Shephali Tagore, Consultant, Department of Maternal Fetal Medicine

2) Challenges & Strategies in the Anaesthesiological Management of Massive Obstetric Haemorrhage

Dr Eileen Lew, Senior Consultant, Department of Women's Anaesthesia

3) Organisation of an Effective Response Team in the Control of Massive Obstetric Hemorrhage

Mrs Mani Bte Jumhassan, Nurse Clinician, Division of Nursing

4) Question and Answer Session

11.30am - 1.00pm

Symposium 8: New Developments in Pain Control

Chairperson: Dr Sean Yeoh, Associate Consultant,

Department of Women's Anaesthesia

1) Technology Based Labour Epidural Analgesia

Dr Serene Leo, Associate Consultant, Department of Women's Anaesthesia

2) Persistent Pain after O&G Surgery

Dr Sing Ean Leong, Consultant, Department of Women's Anaesthesia

3) Relieving Pain in Women Through Acupuncture

Dr Swee Yong Peng

CEO, Family Physician and Acupuncturist, Primary Care Division, Parkway Health

4) Aches and Pain in Women: Pills and Needles

Dr Bernard Lee, Director, Women's Pain Centre,

Consultant, Department of Women's Anaesthesia

5) Question and Answer Session

1.00pm - 2.00pm

Lunch

Poster Presentation and Judging (Nursing/AHS/Multidisciplinary)

Venue: Women's Specialist Outpatient Clinic

2.00pm - 3.00pm

Symposium 9: Enhancing Parent-Child Interactions in Children Presenting with Behavioural Difficulties

Chairperson: Mrs Sylvia Mun, Chief Medical Social Worker, Medical Social Work

1) Signposts: Helping Parents & Caregivers in Building Better Behaviour for Pre-school Children with Developmental Needs

Mrs Nasirah Bte Nasir, Senior Medical Social Worker,

Department of Child Development

2) PCIT-Parent Child Interaction Programme

Mrs Mercy Teo, Senior Medical Social Worker, Medical Social Work

3) Understanding Our Adolescent and What We can do to Help

Ms Joanne Hwee, Psychologist, Psychology Service

4) Question and Answer Session

3.00pm - 3.30pm

Tea Break

3.30pm - 5.00pm

Symposium 11: H1N1 - How Much Do We Know?

Chairperson: Adj A/Prof Cheng Chia Yin, Head, Department of Paediatrics, Senior Consultant, Infectious Disease Service

1) Overview of Influenza Pandemics

Dr Thoon Koh Cheng, Head & Consultant, Infectious Disease Service

2) Rapid Tests for Influenza Diagnosis

Dr Nancy Tee, Head & Senior Consultant,

Department of Pathology and Laboratory Medicine

3) Influenza in O&G Patients

Dr Lim May Li, Consultant, Department of Maternal Fetal Medicine

4) Public Health Response to Influenza Pandemics

Dr Jeffery Cutter, Director, Communicable Diseases, Ministry of Health

5) Question and Answer Session

5.00pm - 5.30pm

Prize Presentation Ceremony

Lecture Theatre

(10.30am - 11.30am)

Free Papers 1: Nursing/AHS/Multidisciplinary

Conference Room 2

(10.30am to 12.30pm)

Workshop 2: Wound Management

Chairperson: Dr Ong Lin Yin

Consultant, Department of Paediatric Surgery

1) Current Concepts in Wound Management

Dr Chia Hui Ling, Registrar, Department of Plastic, Reconstructive and Aesthetic Surgery

2) Overview of Available Dressings

Ms Correen Low

Nurse Manager, Department of Plastic, Reconstructive and Aesthetic Surgery

3) Round Table Discussion on Difficult Cases

Ms Huang Fang, Advanced Practice Nurse,

Division of Nursing

Ms Lim San Ling, Nurse Clinician, Division of Nursing

4) Question and Answer Session

(11.30am - 1.00pm)

Free Papers 2: Medical

(2.00pm - 3.00pm)

Symposium 10: MIS in Paeds & Gynaecology - What's New? What's Cool?

Chairpersons: Dr Ong Lin Yin, Consultant,

Department of Paediatric Surgery

Dr Jasmine Mohd, Associate Consultant, Department of O&G

1) Recent Development in Management of Endometriosis

Adj A/Prof Bernard Chern, Deputy Chairman, Division of O&G,

Head and Senior Consultant, Minimally Invasive Unit,

Department of O&G

2) Single Port Surgery

Dr Anthony Siow, Director, Minimally Invasive Surgery Centre,

Senior Consultant, Minimally Invasive Surgery Unit,

Department of O&G

3) MIS in Tiny Tots - Singapore and Beyond

Adj A/Prof Anette Jacobsen, Chairman and Senior Consultant,

Division of Surgery, Clinical Director,

International Medical Programme (Paeds)

(3.30pm - 5.00pm)

Symposium 12: GUSTO

Chairpersons: A/Prof V Samsat Rajadurai

Head & Senior Consultant, Department of Neonatology

Adj A/Prof Anne Goh

Head & Senior Consultant, Allergy Service

1) Overview of GUSTO

Dr Pratibha Agarwal, Head & Senior Consultant,

Special Care Nursery

2) GUSTO Family Album

Dr Manelle Fortier, Senior Consultant,

Department of Diagnostic & Interventional Imaging

3) The GUSTO Body

Adj A/Prof Fabian Yap, Head & Senior Consultant,

Endocrinology Service

4) Question and Answer Session

(All information is correct at time of printing.)

Plenary 1: Evolution in Nursing Education

Evolution of nursing education: moving with the time

Ms Wong Sook Thow

Division of Nursing, KK Women's and Children's Hospital, Singapore

Introduction

Nursing, throughout the modern world, is challenged by the continuing dearth of school graduates choosing nursing as a profession. This has resulted in an acute shortage of nursing professionals in a constantly evolving healthcare environment. Rapid advancement and progress in the medical world also means that providers of nursing education are challenged to prepare nurses who are cognizant of these constant changes.

There appears to be a mismatch between the perceptions of school leavers regarding the incentives and disincentives of being in the nursing force. Nursing recruiters and the healthcare education industry need to bridge this mismatch and work toward attracting more competent school leavers to join the profession. To do this, nursing educators have to remain in tandem not only with advancements in the healthcare industry but also the educational aspirations of the youth of today.

Prewar

Prior to 1867, medical teams were primarily male, including doctors, dressers and orderlies (Lee, 2005). The first female 'nurse' was employed in the General Hospital in 1867, but instead of being a professionally trained nurse she was a woman who mainly cared for the sick.

Singapore was introduced to the nursing profession on 1 August 1885 with the arrival of the French nuns who cared for the sick in the General Hospital at Sepoy Lines. However, they were also not trained nurses and their duties were merely to carry out medical orders, clean and cook for the sickly. The country had her first trained midwife in 1888 with the arrival of Mrs Woldstein, a qualified midwife. The first paediatric trained nurse was only available in Singapore in May 1933.

Training for nurses in the prewar era was mainly conducted in the hospital. Trained nursing sisters were recruited from England and probationers were given on-the-job training in the hospital. This apprenticeship model of training lasted until 1936 when the first nursing tutor was appointed. Local nurses continued to make their mark in the profession, but it was only in 1937 when the first local nursing sister took over a leadership role in nursing.

Postwar

The progress of nursing education and the development of the nursing profession stalled during the war. After the war, the progress of nursing in Singapore was concentrated in public health. Education for nurses focused on meeting the demand for more nurses as a result of changing trends in medicine.

From 1956 to 1992, the School of Nursing (SON) took over the training of basic and postbasic nursing training programmes.

The training was medically focused, with more than 50% of the training period spent at the hospital to enhance bedside nursing skills and to carry out medical orders. Nurses graduated with general certificates in nursing.

Tertiary nursing education in Singapore was not available until 1992, when Nanyang Polytechnic took over the training of nurses in collaboration with the University of Sydney, to prepare nurses to have higher order thinking skills and to introduce the concept of research to challenge nurses to become more proactive in improving patient care. This is in tandem with improving the image of nurses and upgrading their standing from being a doctor's handmaiden to that of a critically thinking professional with the ability to question and problem solve.

The Present

Since 1992, nursing education has advanced tremendously in Singapore. Nurses are constantly on the look-out to upgrade themselves. Gone are the days when graduating with a general certificate was enough to keep them in the profession for a lifetime. More nurses are now Bachelor's and Master's prepared. Nurses today can opt to continue upgrading themselves in any of the various specialised areas available, at both private and public educational institutions. Opportunities to go overseas to further broaden their views and keep abreast of advancements in the complex setup of nursing care today are also available. In spite of such efforts to improve the image of nursing and upgrade the profession's status in the eye of the community, the take up rate among school leavers joining the profession remains low even as the attrition rate among local nurses remains high.

The Future

Nursing education has to progress in concert with the changing mindset of the population toward joining the nursing force. Redefinition of the nursing role to engage a new generation of nurses calls for resourcefulness that moves beyond didactic teaching in the classroom. New teaching modalities that incorporate information technology as a media tool are needed to challenge and stimulate the mobile generation of today. The use of web-based teaching and simulations are just some of the new teaching modalities that can be utilised to engage young school leavers. Redefining the nurses' roles by replacing top-down management with participatory management will also help to project nursing at a higher hierarchy within the medical model (Lim, 2005). This calls for more advanced practice nurses and doctorate-prepared nurses to participate in the healthcare delivery system and influence the policies that shape the care of patients.

Plenary 1: Evolution in Nursing Education

Finding the right fit

Ms Julia Eng

Division of Nursing, KK Women's and Children's Hospital, Singapore

Introduction

Nursing has evolved over the years from mere general nursing to one that is now much more specialised in nature. Nursing education has also come a long way and moved toward academic excellence. Various schools are now offering several nursing courses, with each providing a different emphasis in curriculum. The nursing curricula have been optimised in recent years as well to empower nurses with critical thinking and to enable them to provide better patient care. These courses also offer better career development opportunities to nurses.

Finding the Right Fit

This paper illustrates my personal journey through nursing — from being a new graduate of the first batch of the nursing diploma

course to, now, graduating as a part of one of the first few batches of advanced practice nurses. Choosing the 'right fit' may seem difficult at first, as no particular choice can provide a good 'fit' for all. However, finding the 'right fit' does make a difference in determining your career path and achievement chart. So, map your career by planning, assessing and even designing your own position.

Conclusion

Graduating from a basic training course definitely provides us with competencies necessary for providing appropriate care to our patients, but the factors that determine an individual's success depend on the person herself, one's work setting, the opportunities available and utilised and keeping one's priorities in line with that of the organisation.

Plenary 1: Evolution in Nursing Education

Academic nursing: where's the place for the nurse scholar?

Dr Chia Yen Yen

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Introduction

The phrase 'academic nursing' conjures images of nurses embarking on undergraduate and postgraduate programmes, as well as nurse academics in universities engaged in teaching, research and publication. These scholastic pursuits have often been criticised for their emphasis on intellectual development over skills acquisition. Such an anti-intellectual ethos regarding nursing arguably may have delayed the introduction of Singapore's first local undergraduate nursing degree, which only commenced in the mid-2000s and has less than 100 graduates annually. The growing demand for nursing services necessitates therefore nurse training in the masses. Hence, the diploma in nursing course being offered by Nanyang Polytechnic and Ngee Ann Polytechnic, with total annual intakes of 1,300 or more, is expected to coexist with the nursing degree from National University of Singapore.

This paper records the author's personal views on the following points: whether academic nursing in this small city-state is out of our reach? What are the consequences of a vacuum in academic nursing leadership? With research invariably given scant regard, is there a place for intellectual scholarship in nursing? How is the integration of the academic and clinical settings essential for building up a pool of nurse scholars for the future?

Academic Nursing: Intellectual Scholarship

The growing number of top-up nursing degrees being offered in Singapore by universities from Australia and the United Kingdom, with one university having its presence in Singapore for more than a decade, is testament to the keen interest among nurses to upgrade themselves. Acquiring a basic degree, the first step into the world of academia is no longer out of reach for the majority of certificate and diploma nurses. Many have moved on to pursue postgraduate studies at the Master's level; a doctoral degree, which is the pinnacle of formal education, though is open to only a few. Until two years ago, pursuing a PhD in nursing from an overseas university was the only option and this was fraught with high personal and opportunity costs. Understandably therefore only a handful of local nurses had a doctoral degree.

Findings from the United States suggest that acute shortage of nursing academics is having a grave impact on the development of the next generation of nurses. A 'parallel shortage' in the clinical workplace and academia have immediate and long-term impacts, respectively, as the inadequate nursing faculty limits the enrolment/intake levels in nursing programmes and thus reduces the supply of new nurses to not only the workforce but also the pool of nurses for future academic roles (Hindshaw, 2001). Berlin

and Sechrist (2002) have cited the National Sample Survey of Registered Nurses in 1992, 1996 and 2000 and showed a steady decline in the employment of doctorates in schools of nursing. Preparing new faculty to meet higher academic standards becomes a lengthy process, and for that reason Berlin and Sechrist (2002) had recommended shortening of the period from entry into Bachelor's degree to completion of doctorate degree.

Integrating Nursing Research and Clinical Excellence

While Thompson and Watson (2001) posit that universities are cornerstones of intellectual life, with their mission being the acquisition, assessment and dissemination of knowledge, the author argues that retaining the approach that teaching and learning are central only to academic life is no longer sustainable. There is a need for greater integration of universities and healthcare service institutions because "scholarly work in nursing is essential to the development of the discipline, both in terms of theory and practice" (Thompson and Watson, 2001; p2). Nursing scholarship must be given equal value by, and commitment from, both clinicians and nurse academics.

For an Academic Medical Centre (AMC) to be an ideal place for nurturing a cadre of nurse scholars, the clinical setting must have an intellectually vibrant and stimulating environment.

This can be created by establishing a research agenda, including research training, mentorship and fellowship programmes for new researchers and sabbaticals for experienced researchers, as well as providing more scholarships for further studies. Furthermore, more joint academic appointments could be extended to senior nurses to encourage active contribution as adjunct faculty. On the other hand, academics should be given joint clinical appointments to return to service settings for regular update. Furthermore, the importance of a supportive employer and community in mitigating the challenges involved when balancing teaching, research and service, as expected in an academic career, cannot be overemphasised. A distinctive career path will be needed to reflect the nurse scholars' progression from novices to experts and to reward and recognise their contributions accordingly.

Conclusion

To keep the 'intellectual' life alive in nursing, nurse scholars must be identified early and nurtured onto maturity in the clinical setting in order to be ready to contribute actively towards building the nursing profession for the future. An AMC will inspire nurses to pursue an academic career and provide a conducive milieu for research and teaching, while keeping them close and relevant to clinical practice.

Plenary 2: Medical Teaching and Learning in the 21st Century

The learning sciences and transformative healthcare professional education in the 21st Century

Prof Matthew Gwee

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International and Education Programmes, Medical Education Unit, Yong Loo Lin School of Medicine, National University Health System, Singapore
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"Across the continuum, we observed that medical education does not adequately make use of the learning sciences."

– Cooke, Irby and O'Brien (2010; p3)

"[Best Evidence Medical Education]...is defined as the implementation by teachers, in their practice, of methods and approaches to education based on the best evidence available."

– Dent and Harden (2005)

The learning sciences have advanced significantly in the past two decades or so. However, healthcare professional (HcP) education has not kept pace with these advances, especially with respect to educational practice in the classrooms. Why has HcP education lagged behind advances in the learning sciences? One possible reason could be the fact that 'old habits die hard;' another could be a lack of knowledge and understanding of the *evidence* available

in the field of learning sciences, which can be used to support and enhance student learning in HcP education. The education of HcPs is a continuum that involves a major *transformative process* (i.e. starting from the *novice* learner or the student to the *competent*, then the *advanced* practitioner and finally the *expert*). Thus, it is imperative that the optimal design and delivery of the curriculum for *transformative HcP education* in the 21st Century be *evidenced-based* (i.e. based on BEME) rather than based on a PHOG (Prejudices, Hunches, Opinions, Guesses) approach that is often used in traditional educational practice.

In this context then, *three fundamental learning principles* have been identified as the basis of how *human learning* occurs, namely (Donovan and Bransford, 2004):

- *Prior knowledge recall* (i.e. recalling *relevant* existing knowledge stored in the memory bank to build new related knowledge);

- *Organising factual knowledge acquired into conceptual frameworks for deep learning*, i.e. organising *factual* knowledge into *interconnected knowledge concepts* for more efficient knowledge *retention, retrieval* and *application*; and,
- *Metacognition*, i.e. engaging in *reflective learning* (the *self-assessment* of one's own *strengths* and *weaknesses* in learning) for the purpose of *self-improvement* or *self-remediation*.

The three fundamental learning principles should therefore be the foundational basis for the design and delivery of HcP curriculum in order to meet the challenges and demands of healthcare delivery in this new millennium. How then should learning be organised for HcP students in the 21st Century in view of the evidence now available? The presentation will provide some insights into the *issues, challenges* and *opportunities* related to *transformative learning* for HcPs in the 21st Century.

Plenary 2: Medical Teaching and Learning in the 21st Century

Feedback: importance in the teaching and learning of the 21st Century

A/Prof Tan Chay Hoon

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“Is there learning whenever there is teaching?”

Current trends in clinical teaching are shifting from a student-centred approach to one that is patient-centred, from apprenticeship to systematic teaching, with an emphasis on multiprofessional education, ambulatory care clinical teaching and supporting reflective practice in the learner.

Systematic alignment of teaching strategies with these trends in teaching and learning for healthcare professionals in the 21st Century include the following: learners need to understand that patients are no longer to be viewed as

disease entities; and, learners need to practice collaboration and be effective team players while working with other healthcare professionals. When teachers provide timely feedback, they add a vital function to the learning context and set the stage for improvement in the monitoring of the progress of their learners. If executed properly, feedback could have a transformational effect on the learners and the practical environment, making it enjoyable for all healthcare professionals involved. This talk will elaborate the neuroscience of feedback in learning.

Plenary 3: Bench to Bedside

Familial influences on brain development and function

Dr Michael Meaney

Faculty of Medicine, McGill University, Montreal, Canada
Singapore Institute for Clinical Sciences, Singapore

(Abstract not available at time of print)

Plenary 3: Bench to Bedside

Cell biology via nuclear magnetic resonance

Prof Philip Kuchel**Singapore Bioimaging Consortium, A*STAR, Singapore**

Many unique insights into the mechanisms of metabolism and membrane transport have emerged from the application of nuclear magnetic resonance (NMR) spectroscopy to cellular systems. Using the human red blood cell (RBC) as an example, I will show that NMR can be used to monitor metabolic reactions, membrane potential and cell volume changes over time. NMR has also provided estimates of metabolite concentrations for detailed enzyme-mechanistic models in the RBC.

RBC shape changes from discocyte-to-echinocyte-to-spherocyte (the DES transition; a model of apoptosis) can be measured using fast-acquisition pulsed field gradient spin echo (PGSE) q-space imaging.

Many of these methods are generalisable to cells other than the RBC, and we aspire to apply these approaches to tissues from living laboratory animals and humans.

Plenary 3: Bench to Bedside

Personalising cancer medicine in the era of targeted therapies

Dr Ong Sin Tiong**Cancer & Stem Cell Biology Signature Research Program
Duke-NUS Graduate Medical School, Singapore**

(Abstract not available at time of print)

Symposium 1: Myths and Facts on Fever

Acute fever in children: basic concept and management

A/Prof Thaschawee Arkachaisri**Rheumatology & Immunology Service, KK Women's and Children's Hospital, Singapore**

"Fever is nature's engine which she brings into the field to remove her enemy."

– Thomas Sydenham (1624–1689)

Fever is one of the commonest symptoms that cause children to seek medical attention, accounting for one-third of paediatric outpatient visits. Fever has been regarded as not only a cardinal sign of disease but also a major cause of concern and anxiety for caregivers and physicians for centuries.

Body Temperature

Normal body temperature (BT) is maintained by a delicate interaction between the neuro (autonomic)-endocrine and behavioural mechanisms. The body's thermoregulatory centre is located at the preoptic nuclei of the hypothalamus. It is this special group of neurons that acts as the BT 'set point' or 'thermostat,' maintaining constant BT despite wide variations in ambient temperature or physical activity. There is no consensus as to what the normal/baseline BT is, especially in children, for whom the temperature varies with age. 37.0°C (98.6°F) as the baseline adult BT was derived from the one million axillary temperature readings that were reported by Wunderlich (1868). Normal BT has a diurnal fluctuation that is also maintained during a febrile episode. The lowest temperature is in the morning (4.00 am–8.00 am) and highest is in the early evening (4.00 pm–6.00 pm). Temperature measurements vary according to the anatomic site and this has been the subject of much study. While core BT is measured at the pulmonary artery, a close approximation can be obtained from the lower oesophageal area, too. However, as these sites are impractical, many other anatomic sites have been used. Axillary and oral temperature measurements are not reliable and vary with many factors. Rectal temperature is close to the core temperature, but is not suitable for children aged ≤ 5 years. The tympanic thermometer has gained popularity in the past decade due to its easiness and convenient use. It is believed that the blood supply to the tympanic membrane (TM) is similar to that of the hypothalamus. However, the accuracy of TM temperature measurements remains debatable. Similarly, aiming in a direction other than the cerumen is crucial for obtaining accurate temperature readings when using an infrared thermometer, as the cerumen interferes with the reading. Likewise, tactile temperature assessments, especially by parents, are unreliable as it has high sensitivity (71%–89%), but low specificity and positive predictive value ($< 50\%$).

Fever and Beliefs

Schmitt, in 1980, first used the term 'fever phobia' and demonstrated a high prevalence of unrealistic fear of fever among parents of inner-city febrile children. Brain damage or death was believed to be a consequence of fever $> 38.9^\circ\text{C}$ by 52% of parents. 46% of parents reportedly give antipyretics for temperatures between 37.0°C – 37.9°C , which is not even considered as fever. Another study, by Kramer et al, of higher educated and well-to-do parents showed similar results. Interestingly, a report of a survey of 151 Massachusetts paediatricians in 1992 revealed that 65% believed that fever alone could be dangerous; 58% of these physicians believed that fever $> 40^\circ\text{C}$ in an otherwise healthy child could cause seizure, while 23% believed that dehydration could result and 10% believed brain damage could occur. Misconception about fever among parents and physicians has not only a significant impact on healthcare expense but also increases the risk of a negative psychosocial relationship between patients/parents and physicians during the evaluation of simple febrile illnesses.

Many investigators have helped clear some of the above concerns. Increased core BT does decrease seizure threshold in predisposed individuals, but by itself fever is not its cause. Antipyretic therapy has not been shown to prevent or reduce the recurrence rate of febrile seizure. The benefit of fever to certain infections has also been demonstrated. Children with chickenpox who took acetaminophen were found to need a longer time to control the crusting of lesions as compared to a placebo group. Similarly, rhinovirus infected adults treated with antipyretics had a longer viral shedding duration and increased nasal signs and symptoms.

Indeed, most paediatricians treating fever are aiming to provide comfort to the febrile child. A temperature of 38.9°C or higher is considered to be an appropriate temperature to begin treatment for most paediatricians. In fact, it is around this temperature range (38.3°C – 38.9°C) that a child experiences discomfort, though some may start treating a child with persistent temperature above 38.3°C or 38.9°C . Most physicians feel quite comfortable with not treating a fever below 38.9°C , if a child has no symptoms otherwise.

Acute Fever Management

Approach to acute febrile episodes is different from prolonged fever and will not be mentioned here. In general, the height of fever does not correlate with the severity of illnesses especially for infections *per se*. However, high fever can serve as an

alarm, if it is associated with other symptoms of concern. The key concept of fever management is to decrease a child's discomfort. Pharmacological means remain the mainstay of treatment. Antipyretics lower the 'set point' by decreasing the production and release of prostaglandins, but have no significant effect on modulating the production of the endogenous pyrogen, IL-1. Acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs), especially ibuprofen, are the two popular antipyretics used to date. Only the latter possesses an anti-inflammatory effect. Appropriate and correct dosage and interval of administration are crucial for the full effect of therapy. Studies have shown that ibuprofen shared similar safety and analgesic effects with acetaminophen for moderate to severe pain, but it was a more effective antipyretic and offered a longer duration

of antipyretics. While a combination use of antipyretics is not recommended, alternating use of acetaminophen and ibuprofen remains a subject of further discussion with regard to the safety and efficacy of such therapy. However, it was found that 67% of parents and half of paediatricians surveyed advocated such therapy. Non-pharmacological adjunct therapies are discussed elsewhere.

Fever phobia remains prevalent around the world. It may be more common in Asia for which Singapore is not an exception. Local prevalence of fever beliefs is unknown. Healthcare professionals need to have the 'correct' basic knowledge about fever and a concept of its management based on the patient's accompanying manifestations in order to decrease the public's phobia of this symptom.

Symposium 1: Myths and Facts on Fever

To sponge or not to sponge

Ms Lim Sok Lian

Division of Nursing, KK Women's and Children's Hospital, Singapore

Introduction

Traditionally, tepid sponging has been a practice for fever reduction in children with body temperatures $\geq 38.5^{\circ}\text{C}$. Yet, there is little research or no scientific proof of its efficacy. Moreover, children have reacted to tepid sponging by crying inconsolably and developing goose pimples, chills and rigors. These can worsen the fever and pose challenges to managing fever in children.

Facts and Myths

Fever is defined as when the body temperature rises above 37.8°C when taken via the axillary route or 38.0°C if tympanic temperatures are recorded. It is a common sign of infection and is the body's natural response to infection. At home, simple measures, such as nursing the child under a fan or in an air-conditioned room, using light clothing and sufficient fluids are encouraged in an attempt to reduce the temperature of febrile children. However, many parents perceive that fever can cause brain damage and febrile convulsions, and have little knowledge regarding its pathophysiology. And so, as most parents believe that bringing down the fever could prevent these conditions, they use various means, such as wrapping the child in thick clothing in order to make him/her perspire, to bring down the temperature. While other methods, such as a 'cooling plaster' placed on the child's forehead, have become 'fashionable' in recent years with the commercial availability of related products, their efficacy remain untested and unchallenged. Such 'cooling plasters' are easily available from any pharmaceutical store and can be obtained over the counter.

Interestingly, the Clinical Practice Guidelines released by

Royal Children's Hospital in August 2008 reported that febrile convulsions are common and occur in 3% of healthy children between the ages of 6 months and 6 years. Febrile convulsions are benign, with minimal morbidity and essentially no mortality. The risk of bacterial meningitis in a child who has fever and a convulsion lasting less than 10 minutes is between 0.5%–2%. Parents' 'fever phobia' and 'fever induced brain damage' are thus more or less unfounded.

Cooling mattress, a water-filled mattress, is widely used as an alternative method within the hospital setting, and originated from a process improvement project that looked at fever management among postcardiac patients from the children's intensive care unit. This mattress is kept in an air-conditioned room at a set temperature of 25°C , is used when required for any febrile patient and is changed whenever the mattress gets warm. These water-based mattresses promote conductive heat loss, as body heat is constantly dissipated via the mattress. The project reported that water-based mattresses were more effective in reducing temperatures in febrile postcardiac surgery patients than antipyretics alone. With the hospital management's approval, its use has been implemented in the hospital's paediatric wards since 2006, and since then has been well accepted by patients, parents/caregivers, nurses and doctors from these wards, while receiving positive feedback. Parents' feedback reports that the cooling mattress is comfortable for children, they do not cry excessively and remain consolable in spite of the discomfort from the fever. Staff feedback reports state that while there is no drastic drop in the body temperature when compared to tepid sponging, patients do not feel distressed when the cooling mattresses are used and this helps to lessen parent/caregiver anxiety, with

parents being more able to cope with and manage the patient's fever and have a sense of satisfaction as well.

Prior to the use of cooling mattresses, tepid sponging was routinely done whenever a child's temperature hit 38.5°C and was deemed the gold standard practice for bringing a child's temperature down. Tepid sponging is often distressing for parents and nurses, as great effort and time is needed to hold and pacify the crying child during the process. A systematic review conducted in 2006 revealed that tepid sponging alone was not effective in normalising temperature and its antipyretic effect was doubtful. Since there is little support for its sole use without antipyretics, which are more efficacious, and due to the associated distress to the child, the practice of

tepid sponging was discontinued as its clinical significance was in question. The use of cooling water mattress is now the main approach for fever reduction in the hospital. This shift in approach has prompted the development of a Policy and Procedure on Management of Fever in Children and has greatly enhanced patient care and comfort during fever management.

Conclusion

Fever management is a therapeutic intervention that is frequently performed by nurses and the present evidence-based analysis using a systematic review has resulted in children-friendly and children-centric nursing care at the hospital.

Symposium 1: Myths and Facts on Fever

A comparison of three methods of thermometry in critically ill children

Ms Habibah Ibrahim

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Introduction

Monitoring patients' body temperature is an activity usually performed by nurses in the healthcare settings and by patients and/or caregivers at home. No-contact temporal thermometry (NTT) is the most recent technological advancement in thermometry to be introduced into the mass market. Currently, oral, axilla, tympanic and rectal thermometry are the traditional ways of measuring body temperature. However, these may be 'intrusive' to already fretful children and temporary restraint may be needed if they are unable to cooperate.

A Comparative Study

The aim of this study was to compare the temperature readings obtained by three methods of thermometry — NTT, tympanic thermometry (TT) and rectal (core) temperature (RT) — in critically ill paediatric patients in intensive care. A convenience sample of 50 patients, aged 6 months to 16 years, admitted to the children's intensive care unit (CICU) in our hospital was enrolled. Four trained paediatric intensive care nurses performed temperature measurements prospectively for subjects when RT monitoring was clinically permissible. Each set of reading consisted of simultaneous measurement of TT, NTT and RT for each patient. Thus, 8 sets of measurements per patient were performed according to manufacturers' recommendations.

Data from 49 participants were analysed using the Statistical Package for the Social Sciences (SPSS, version 14.0), as one participant had incomplete data and was omitted from the analysis. The proportion of male (40.8%) and female (59.2%)

patients was comparable. The mean age of participants was 5.8 years. The mean difference between NTT and RT was 0.2°C ($p = 0.05$, 95% CI 0.001–0.35) while that between TT and NTT was -0.3°C ($p < 0.001$, 95% CI -0.45–0.17). The mean difference between TT and RT was -0.1°C ($p = 0.01$, 95% CI -0.24°C to -0.03°C). 15.6% of NTT readings were found to have under- or over-estimated RT readings by $> 1^\circ\text{C}$ as compared to 4.3% of TT readings.

These mean differences suggest wider variations in the temperature readings obtained via NTT as compared to RT and TT. NTT overestimated the core temperature by a mean of 0.2°C. Although TT underestimated the core temperature by an average of 0.1°C, TT and RT readings appear to have a stronger correlation than those from TT and NTT.

Conclusion

The 'non-intrusiveness' of NTT enhances the approach's 'attractiveness' as the method of choice for thermometry in fretful and ill children. However, for critically ill children, in whom accurate core temperature monitoring is essential, the replacement of RT and TT with NTT needs to be considered with caution as NTT is prone to user variation and inter-rater reliability. A statistically significant difference was observed between the various modes of thermometry tested ($p < 0.001$) in this study. In addition, 15.6% of NTT readings either under- or over-estimated RT readings by $> 1^\circ\text{C}$ as compared to 4.3% of TT readings. In view of these differences, it is clinically not acceptable to use NTT as the method of choice for thermometry.

Symposium 2: Cleft and Craniofacial Anomalies

Genetics of cleft lip and palate

Dr Angeline Lai

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Orofacial clefts are the commonest craniofacial birth defect, with a worldwide prevalence of about 1.2 every 1,000 births. In the Asian population, it is even more common, with an estimated prevalence of 1 in 500 births. Orofacial clefts can broadly be divided as those that affect the lip only (CL), the lip and palate (CLP) and the palate only (CP). Traditionally, cleft lip with or without cleft palate (CL/P) and cleft palate (CP) are thought to have distinct developmental origins. Occasionally, however, there are pedigrees with both CL/P and CP, suggesting some overlap in the aetiology of these two broad groups.

Orofacial clefts may be divided into syndromic or isolated forms, depending on whether additional structural and/or developmental anomalies are present. Approximately 70% patients with CL/P and 50% of those with CP do not have additional anomalies and can be classified as isolated cases. In the remaining patients, orofacial clefts occur in association with other anomalies or as part of recognised syndromes. The OMIM (Online Mendelian Inheritance in Man) database reports over 400 syndromes for which clefting occurs as part of the clinical presentation.

Common syndromes for which CP is a feature include velocardiofacial syndrome (VCFS) and Stickler syndrome. Features suggestive of VCFS include concomitant congenital heart disease, neonatal hypocalcaemia and characteristic facial features. VCFS is caused by a submicroscopic chromosomal deletion at 22q11.2. The VCFS diagnosis is confirmed by fluorescent *in situ* hybridisation (FISH) analysis. Stickler syndrome is an autosomal dominant (AD) connective tissue disorder characterised by CP (sometimes as part of Pierre Robin sequence) and midfacial underdevelopment, ocular findings of myopia, cataract and retinal detachment, hearing loss (both conductive and sensorineural) and mild spondyloepiphyseal dysplasia. Diagnosis of Stickler syndrome is clinical. Therefore, during the assessment of a child with CP, examination for features of VCFS and an ophthalmologic assessment are recommended. Investigations should also include karyotyping and FISH analysis for 22q11.2 deletion.

The majority of cases of CL/P are non-syndromic. These are regarded as being multifactorial in origin, with both genetic and environmental factors. Compared with other birth defects,

orofacial clefts have a high rate of familial recurrence. Twin studies also demonstrate a high concordance rate in monozygotic twins, suggesting a strong genetic component to orofacial clefting. In recent years, there have been great advances in the identification of causative genes and developmental pathways leading to this birth defect. There is some suggestive evidence for a possible role of folic acid in the prevention of orofacial clefts. Lower socioeconomic status is reported to increase the risk of orofacial clefts. Gene-environment interactions also contribute to orofacial clefts, with strong evidence for interaction between maternal smoking and specific detoxification-gene variants.

The causes of syndromic forms of CL/P include more than 400 conditions, including chromosomal anomalies, single gene disorders and syndromes of unknown cause. The most common cleft syndrome is the van der Woude syndrome, which is an AD condition characterised by pits and/or sinuses of the lower lip and CL/P or CP. Mutations in the *IRF6* gene have been found in patients with van der Woude syndrome from several populations. Interestingly, non-syndromic CL/P has also been associated with the *IRF6* locus. This and other research have led to the recognition that genetic mutations associated with clefting can, in other individuals, manifest only with subtle clinical features, such as submucous cleft palate, bifid uvula, subepithelial defects in the superior orbicularis oris muscle and dental anomalies.

The clinical approach to an individual with CL/P involves detailed history taking, including information about possible prenatal teratogenic exposures and family history, physical examination, paying special attention to the lips, oral cavity and teeth, and relevant investigations to assess for the presence of other anomalies. In patients with multiple congenital anomalies, appropriate investigations include karyotype analysis, FISH analysis for specific microdeletion syndromes, as suggested by the phenotype, and chromosome microarray analysis, if available.

Genetic counselling for families of children with orofacial clefts would depend on whether the cleft is isolated or syndromic and, for individuals with syndromic clefts, on the underlying cause. Management of orofacial clefts is complex and ideally provided in a multidisciplinary setting. Centralisation of care in cleft centres would not only improve the standard of care but also facilitate data collection, which is important for genetic research.

Symposium 2: Cleft and Craniofacial Anomalies

Antenatal detection of cleft and craniofacial anomalies

Adj Prof George Yeo Seow Heong

International Medical Programme (O&G), Department of Maternal Fetal Medicine, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

Symposium 2: Cleft and Craniofacial Anomalies

Management of cleft and craniofacial anomalies

Dr Por Yong Chen

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Cleft and craniofacial anomalies are among the most distressing congenital conditions not only because they may present with an abnormal appearance and its associated stigmatisation but also in their need for long-term treatment as the patient passes through different phases in life and matures into adulthood. The Cleft & Craniofacial Centre at KK Women's and Children's Hospital is dedicated to the holistic treatment of patients with such problems. At birth, the first and foremost necessity is to ensure adequate breathing and feeding of the child. Patients with micrognathia and airway problems due to glossoptosis can be treated with mandibular distraction osteogenesis to lengthen the mandible. We also encourage patients to feed via the bottle where possible. This is to enhance the normal reflex mechanisms of sucking and swallowing in the child.

Cleft lip and palate patients have fairly well described management protocols. In these patients, an assessment is first made to exclude any other syndromes or congenital anomalies. An appropriate feeding technique, usually using a specialised bottle and teat, is then made use of. The patient is thereafter referred to the orthodontist for presurgical nasoalveolar molding, which is particularly useful for wide clefts and bilateral clefts. The cleft lip will usually be repaired at 3–6 months and the cleft palate can be repaired from 6–12 months. Following this, the patient receives speech therapy and is assessed for velopharyngeal insufficiency, which may require surgical correction. The patient is then given an alveolar bone graft and closure of the oronasal fistula is attempted around 9–12 years. For patients with retrusion of the midface, jaw surgery is provided upon completion of growth, which is usually at 15 years for girls and 17 years for boys.

Craniofacial anomalies are different due to the involvement of the skull and brain. In general, if there is an abnormal head shape due to a fused cranial suture, the patients can be divided into syndromic or non-syndromic types. Non-syndromic patients, in general, have a better outcome than the former group. Both groups can be operated on as early as 3–6 months after birth depending on the baby's health. Surgery performed after 2 years of life gives poorer results as the skull is stiffer and does not regenerate as well. In syndromic patients, such as in those with Apert's syndrome, there are other problems such as syndactyly, which need to be treated as well. In this group of patients with abnormal head shapes, it is important to realise that relief of intracranial pressure, which can be raised as a result of the abnormally fused cranial sutures, is as important as improvement of the head shape. Syndromic patients will have continued poor growth of the remaining facial skeleton and frequently need further corrective surgery, such as midface distraction osteogenesis or osteotomies and fixation, depending on the patient's age.

The complete care of these patients requires a multidisciplinary team comprising of plastic surgeons, orthodontists, ENT surgeons, paedodontists, neurosurgeons, paediatricians, anaesthetists, geneticists, obstetricians and gynaecologists, psychologists, radiologists, specialist nurse clinicians, speech language therapists and the centre coordinator. We are fortunate to have such a team at the Cleft & Craniofacial Centre at KK Women's and Children's Hospital.

Modern medicine and surgery makes it possible for us to treat these patients and achieve good outcomes. This enables the integration of such patients into society and allows for a meaningful and fruitful life.

Symposium 2: Cleft and Craniofacial Anomalies

Speech difficulties in individuals with cleft palate

Ms Selena Young Ee-Li

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Introduction

Clefts of the lip and/or palate (CLP) are one of the most common yet complex congenital birth defects resulting from genetic and environmental factors (Murray, 2002). Clefts can be complete or incomplete, unilateral or bilateral, and involve the lip, hard palate and/or soft palate. Individuals with CLP require long-term transdisciplinary intervention to repair the cleft and remediate interrelated disorders in dentition, hearing, feeding, communication and facial growth.

Internationally, the rate of clefting (per 1,000 live births) among Asians and Native Americans (range 1.1–2.53), Caucasians (0.8–1.4) and Africans (0.2–0.4) are known to be different (Cooper, Ratay and Marazita, 2006). Singapore, with its primarily Asian population, has one of the highest rates of clefting in the world, with rates rising from 1.57 in 1993 to 2.21 in 2002, with variation across the country's four main racial groups (Tan, Tan and Yeo, 2008).

Individuals with CLP are known to display a variety of communication and cognition disorders. The overall trend reported is of an elevated prevalence of speech, resonance, language and learning difficulties in individuals with CLP, which emerge in the early years itself (Kuehn and Moller, 2000; Morris and Ozanne, 2003; Young, Purcell and Ballard, 2010). The focus of this article is speech and resonance difficulties, which is commonly reported in the literature to affect individuals with CLP from infancy to adulthood. Certain speech characteristics are typical of individuals with CLP who require intervention for such difficulties. These difficulties typically can be and are identified perceptually by speech language therapists who are experienced in working with individuals with CLP.

Articulation

Structural differences, incompetent velopharyngeal function, fluctuating middle ear disease and dental deviations place children with CLP at a high risk for speech difficulties. The significance for speech often depends upon the severity of the structural issues (mostly associated with cleft palate) and velopharyngeal inadequacy. Distinctive cleft-type speech characteristics have been reported in the literature to include nasalised plosives and fricatives and weak pressure consonants (Kuehn and Moller, 2000). Other articulation disorders result from an attempt by the individual to overcome velopharyngeal inadequacy, thereby resulting in compensatory articulation, such as glottal stops and pharyngeal fricatives. In addition, articulatory deviations can be a result of dental anomalies, such as an interdentalised

's' production from an anterior open bite, or a narrow palatal arch resulting in a lateralised distortion of sibilants (e.g. 'z'). Furthermore, articulation can be influenced by phonological and language development (Morris and Ozanne, 2003) and, as such, it is clinically important for the speech language therapist to identify the aetiologies behind articulatory disorders to ensure the appropriate management of these difficulties.

Resonance and Voice

Excessive nasality or hypernasality is a signature feature of individuals with CLP. This is usually a result of a faulty velopharyngeal mechanism, whereby the velum is unable to close off the oral cavity from the nasal cavity during speech. This can arise even after palatal surgery to close a cleft is performed. As a result, excessive air escapes during speech production and, as such, articulation can be accompanied by disordered resonance that affects the overall intelligibility of speech. There can also be instances whereby speech is characterised by insufficient airflow (e.g. obstruction in the nasal cavity or pharynx) resulting in hyponasal resonance or a combination of both excessive and inadequate nasal airflow. Some individuals have been found to have an additional voice disorder as a result of laryngeal compensatory behaviour and velopharyngeal inadequacy (Kuehn and Moller, 2000). These voice disorders include hoarseness, reduced loudness, breathiness and unusual habitual pitch breaks, which can mask nasality judgements in speech.

Speech Assessment and Intervention

It is reported that many individuals with CLP will have articulation problems that continue into adulthood. However, individuals who receive regular speech language therapy are less likely to have protracted speech difficulties. Speech language therapists working with this population require specialised training to assess and remediate the articulation and resonance disorders in individuals with CLP. For assessment, speech language therapists utilise universal speech parameters to characterise speech production behaviour (Henningsson et al. 2008) and employ traditional and specialised therapy techniques to remediate misarticulation. In Singapore, speech language therapy for individuals with CLP is instituted from infancy, thereby ensuring that speech and resonance difficulties are addressed early and the relevant treatment options are made available to correct the structural, functional and psychosocial problems associated with these difficulties.

Symposium 2: Cleft and Craniofacial Anomalies

Nursing care of cleft and craniofacial anomalies

Ms Aini Bte Dahlan

Department of Plastic, Reconstructive & Aesthetic Surgery, KK Women's and Children's Hospital, Singapore

The Cleft & Craniofacial Centre at KK Women's and Children's Hospital, Singapore, is located at level 5, Women's Tower. The centre provides a centralised venue for patients with cleft and craniofacial anomalies. The patients' long-term treatment plans at the centre often spans their entire childhood, from infancy to teenage years. This centralisation of treatment at the centre saves patients' time.

One of the most common congenital anomalies seen at the centre is the cleft lip and/or palate, which is characterised by a gap in the lip and/or palate due to a failure of the fusion of tissues during the first trimester of pregnancy. The cause in specific cases is largely unknown. Several factors, such as genetics, environmental causes and certain drugs (e.g. phenytoin, isotretinoin), may be involved. Most evidence points to a multifactorial origin for the anomaly.

The other common condition seen at the centre includes craniofacial anomalies. The term 'craniofacial' refers to the cranium, face and ears. Modern craniofacial surgical techniques have enabled surgeons to correct severe deformities of the skull, face, ears and associated soft tissues. These conditions usually require a multidisciplinary management team that is comprised of both medical professionals and paramedical staff. The coordination of specialists across

various disciplines, such as plastic and reconstructive surgery, neurosurgery, ophthalmology, oral and maxillofacial surgery, otorhinolaryngology, medicine, speech therapy and nursing is apparent at the centre. This holistic approach is integral to successful patient management and care.

At the nursing care level, parents of prospective patients may receive antenatal counselling prior to delivery. Upon birth, detailed planning, ordering of specific investigations and education of parents and caregivers is begun in preparation for the patient's surgery. The focus of preoperative education is on feeding assessment, feeding techniques and guidance in nutrition. The emphasis of postoperative instruction is nutrition, wound care, physical activities to be avoided and follow-up management.

Parents and caregivers play a vital role in the overall success of surgical outcome for these patients and are expected to participate actively in patient care and management throughout. During patients' hospitalisation, they are involved in the care of patients in the wards. Discharge instructions are provided before patients are discharged home, which ensures a smooth transition of patient care from the hospital to home setting. This presentation will focus on the management of patients before and after cleft and craniofacial surgeries.

Symposium 3: Assisted Reproduction, Genetics & Perinatal Outcomes

Current concepts and controversies in assisted reproduction and obstetric considerations

Dr Tan Heng Hao

Department of Reproductive Medicine, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

Symposium 3: Assisted Reproduction, Genetics & Perinatal Outcomes

Preconception genetics

A/Prof Samuel Chong

Department of Paediatrics, National University of Singapore, Singapore

(Abstract not available at time of print)

Symposium 3: Assisted Reproduction, Genetics & Perinatal Outcomes

ICSI babies: fetal anomalies and neurodevelopmental issues

Dr Pratibha Agarwal

Special Care Nursery, Department of Neonatology, KK Women's and Children's Hospital, Singapore

Over the course of the last three decades, assisted reproduction technology (ART) has progressed from *in vitro* fertilisation (IVF) in the 1970s to the development of microassisted intracytoplasmic sperm injection (ICSI) in the 1990s and, most recently, to preimplantation genetic diagnosis (PGD).

Due to the various changes in medicine and people's lifestyles, ART is increasingly becoming necessary and frequent. More than a million babies have been conceived worldwide using ART. ICSI represented a major breakthrough in ART, with superior fertilisation rates and success in all forms of infertility. However, valid concerns persist regarding adverse neurodevelopmental outcomes and the higher incidence of congenital malformations in children conceived via this technique. Since ICSI bypasses the natural sperm selection barrier, the sperms used in ICSI may carry genes for abnormalities in the child. Other factors predisposing the technique to a higher risk include advanced parental age, use of ovulation-inducing medications and factors associated with the procedure itself.

A meta-analysis of international data showed that children conceived via ICSI had a higher incidence of birth defects,

especially genitourinary abnormalities. However, there is no difference between ICSI children and spontaneously conceived peers with regard to general health, growth and mental and psychomotor development. In a local prospective cohort study conducted at KK Women's and Children's Hospital, Singapore, neurodevelopmental and functional outcomes were comparable in 76 ICSI and 261 control children aged 2 years. Cognitive outcomes were related to socioeconomic and maternal educational status.

ICSI pregnancies are associated with higher pregnancy-related and subsequent perinatal complications due to prematurity and multiple pregnancies, and result in higher usage of hospital resources. Single embryo transfer (SET) is an important intervention to consider for fine-tuning future ART programmes, as SET enables an adequate success rate while simultaneously decreasing the neonatal and neurodevelopmental complications associated with multiple gestations.

Further research on the safety and outcome of ICSI pregnancies is vital to enable appropriate counselling for infertile couples, assist in informed parental decision and to ensure the long-term follow-up of this cohort of babies.

Symposium 4: Adolescent Health

Adolescent weight management programme at KKH

Mr Micheal Lim

Sports Medicine Service, Division of Medicine, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

Symposium 4: Adolescent Health

Management of eating disorders in an acute paediatric setting

Dr Oh Jean Yin

General Paediatrics and Adolescent Medicine, KK Women's and Children's Hospital, Singapore

Eating disorders are of interest to paediatricians and adolescent physicians because of the significant impact of illness on physical health — both the acute and long-term consequences can be serious and, in some cases, fatal. Although the prevalence of patients diagnosed with anorexia nervosa (AN) and bulimia nervosa (BN) in Singapore is less than 1%, many mental health professionals, in the last 10 years, have reported the increasing incidence of youngsters, typically teenage girls, developing these eating disorders. There has, in recent years, been increased awareness and earlier recognition of these conditions, so that parents are seeking help for their children and doctors are referring such patients more readily for assessment. It is now estimated that many patients who do not fulfil the strict criteria for DSM-IV diagnosis of AN or BN, may be characterised as having 'partial syndromes' or 'eating disorders not otherwise specified' (ED-NOS). These patients often have the same physical and psychological effects as those who satisfy the criteria for AN or BN.

The Adolescent Medicine Service at KK Women's and Children's Hospital, Singapore, has seen a dramatic increase in the referral of patients with eating disorders in recent years (8 in 2007, 17 in 2008, 13 in 2009 and 33 in 2010), with nearly 90% of those referred being girls (age at presentation, 8–17 years). More than 50% were patients with AN (restrictive type) and up to a third were diagnosed with ED-NOS. A few patients had BN and binge-purge disorders. Only one patient had used laxatives as medication for weight loss. Most patients also had physical hyperactivity — restlessness, prolonged standing, walking after meals or compulsive exercise. Many younger patients, especially those younger than 12 years, had features highly suggestive of the restrictive phenotype of AN, but did not fulfil the DSM-IV criteria — almost all were prepubertal and most were not able to verbalise any significant body image distortion. However, somatic complaints, such as abdominal pain or bloatedness and chest pain were more prominent in this group.

Many patients with AN were referred due to medical instability following admission. All patients had significant sinus bradycardia, with resting heart rates in the range of 35–50 beats per minute. Other complications that required acute admission included hypotension, vasovagal syncope, abnormal electrolytes and pneumomediastinum. Referrals who were seen as outpatients commonly presented with a history suggestive of an eating disorder, such as weight loss or fluctuations in weight secondary to intentional caloric restriction or disordered eating patterns or purging behaviour. A few patients were referred from

other subspecialties following initial assessments of primary or secondary amenorrhoea, constipation or gastritis.

Indications for admission were based mainly on medical instability and the determined specific guidelines (*The Baby Bear Book — A Practical Guide on Paediatrics*, Second Edition, p202). The average length of hospital stay was approximately two weeks, with the primary aim being refeeding to reverse the patient's unstable physical parameters, initiating a supervised meal plan that translates into a desired weight recovery rate and empowering the family to support the patient in the recovery process.

An open and collaborative multidisciplinary team approach is vital to achieve this goal. The team comprises of an adolescent medicine physician, adolescent specialist nurse, dietician, psychologist and psychiatrist who evaluates the patient for disordered eating patterns from different perspectives. The medical team takes into account the patient's history while conducting the examination for possible differential diagnoses and screening for medical complications and guides the refeeding regimen to achieve the expected weight recovery while looking out for possible complications. Initial mental health assessments involve understanding the patient's obsession with food and weight and appreciating his views on the problem. The psychiatrist also reviews for any concurrent comorbidities.

Outpatient follow up with an adolescent physician subsequently aims to reinforce family support to help the youngster recover in the home setting. This, with a close monitoring of weight recovery especially in the early part of treatment, is essential and may require weekly reviews of weight and vital parameters, eating behaviours and management of other medical complications, such as constipation, delayed gastric emptying, primary or secondary amenorrhoea, osteopenia or osteoporosis.

When discussing treatment options with parents, it is important to emphasise that in an acute paediatric setting, medical admission aims to achieve medical stability with refeeding from meal supervision. Long-term follow up with intensive medical, nutritional and mental health intervention is vital. Collaboration with child and adolescent psychiatrists and eating disorder specialists is essential to provide patients access to individual and family therapy, day treatment programmes or an inpatient psychiatry based programme. Paediatricians are encouraged to advocate strategies that ensure that patients with eating disorders receive the appropriate services, coordinating medical care, nutritional intervention and mental health therapy.

Symposium 4: Adolescent Health

Lost in transition? — young adult congenital cardiac clinic

A/Prof Wong Keng Yean

Cardiology Service, Department of Paediatric Subspecialties, KK Women's and Children's Hospital, Singapore

The incidence of congenital heart disease is 8/1,000 live births. In Singapore, where the number of live births is 40,000 a year, we would expect about 320 children to be born with congenital heart defects annually. As mortality from congenital heart defects decreases with improved care, more and more children with complex congenital heart defects are reaching adulthood.

While most hospitals for children manage patients up to 16 or 18 years of age, a small number of patients may still be seen in their early twenties. Discharging a patient from a child-friendly environment to an adult-oriented hospital with merely a letter can prove to be a bewildering experience for someone who has spent his or her infancy and childhood in a children's hospital. While some adolescents could delight at being free of the cossetting and mollycoddling atmosphere seen in children's hospitals, others might be apprehensive of the unfamiliar and uncertain environment that awaits them in adult-oriented hospitals.

The need for a seamless transfer of care between the paediatric and adult settings has been recognised in countries, such as the United Kingdom and the United States. In the past, adult patients with congenital hearts were attended to by doctors who had some or little expertise in the management of such problems. However, the recent flooding of patients needing such adult care has caused doctors and administrators to realise the potential for inadequate or inappropriate management, as well as the financial cost and societal burden, in the case of these patients. Hence, grown-up congenital heart (GUCH) or adult congenital heart defect (ACHD) clinics have been set up and adult congenital heart disease has emerged as a recognised subspeciality.

Transition is a change or passage from one state or stage to another. The Latin word 'transitionem' means 'a going across or over.' The concept of transition dictates that patient transfer be accomplished in an organised manner. The transition clinic is patient oriented and plans, organises and formally approaches the transfer of a patient to a new setting.

The creation of a transition clinic began in 2003, when an interested adult specialist from the National Heart Centre spent several months training at our unit and learned about not only the complex morphology and haemodynamics of congenital heart defects, as seen in neonates and infants, but also the medical and surgical procedures that these patients undergo. The specialist subsequently went overseas on a Health Manpower Development Programme fellowship from the Ministry of Health to attend an established adult congenital programme. She has continued to attend the weekly cardiology/cardiac surgery meetings at our hospital on her return.

In 2005, the Young Adult Congenital Heart (YACH) Clinic was set up at KK Women's and Children's Hospital. An adult congenital specialist and adult congenital resource nurse from the National Heart Centre attend the clinic with a paediatric cardiologist on the last Friday of each month. The paediatric cardiologist highlights the events that patients have been through. Very often these teenage patients have complex histories dating back to the day of their births and may have received cardiac interventions, such as a balloon septostomy, valvuloplasty and angioplasty, together with single-or multiple-staged surgical procedures.

The person-to-person interaction between the paediatric and adult cardiologists and the patient allows the adult cardiologist to obtain rapid and complete in-depth knowledge of the patient prior to his transfer to an adult setting. Patients are prepared ahead of their meeting with the adult cardiologist prior to their 'graduation' to the adult hospital. Patients and parents, on meeting the doctor and resource nurse at the clinic, thus are reassured by the knowledge of who they will be consulting following transfer to the adult hospital and are aware that their past medical histories have been completely communicated to the new place.

Since 2005, we have been transiting 15–20 patients a month on an average, which adds up to about 200 patients a year. There are plans to increase the total number of adult congenital heart specialists to three to cater to the increasing workloads.

The transition clinic is in contrast to discharging the patient to the adult unit with a letter. As a Canadian study on adult congenital heart patients has shown, it is possible that nearly 50% of these patients may be lost to follow up in the absence of proper transition and the consequences of delayed care, in such cases, may prove much more costly medically and financially to the health service.

We believe this transition service is fundamental to ensuring the complete care of our older patients with congenital heart defects. There is a similar need for other paediatric medical and surgical disciplines to develop a proper transfer format for their long-term patients who have grown older and may by moving towards adult care. Our model can be adopted and adapted, as it only requires preparation, planning, active participation and interaction from interested adult and child specialists. A transition or crossing over clinic is an important and essential means of ensuring the assured future of older patients in a children's hospital.

Symposium 5: Clinician Scientist — Balancing Clinical Services and Research

Do you want to be like Doraemon?

Dr Masakazu Nakao

Cardiothoracic Surgery Service, Division of Surgery, KK Women's and Children's Hospital, Singapore

Doraemon, whose Chinese name is Xiao Ding Dang, is probably the most loved Japanese hero. His appearance is short and fat. His head is bigger than his body. He can take anything out from magical pocket, which connects to unlimited storage of wonderful futuristic or innovative products. For example, he can open a door that can take you anywhere you wish. He also has small propellers that allows him or anyone else to fly.

He is, however, nothing about science — Doraemon is an animated character. He is fictional and doesn't exist. But if you had the chance to have him with you, wouldn't you want him? If I were you, I would say "YES!". Unfortunately, we can't have him with us in the real world. But, we can have desires. For example, many of us might have thought along the lines of "Hmm, if only we had that here..." during a ward round, operation or even in daily life. While we cannot ask Doraemon for this, we could question ourselves on why we do not have the thing we wished we did. It might even be impossible to make it possible, but who should decide so?

Doraemon is not perfect. He is scared of rats although he is a cat-like robot. He also makes mistakes. But, he and his friends cooperate and solve problems every time. He is generous. He never says, "No, it's mine." He is friendly but meddlesome. His master and best friend, Nobita (Da Xiong), is brainless, stubborn and even more meddlesome. But, together they are brave. Although they are always involved in funny business, they make new friends along the way and experience fantastic journeys.

We tend to be possessive. When we have a new idea, sometimes we think that it is a great idea and should be kept

from others. But, think about it! People have similar desires, so it's only natural that from time to time, we come up with similar ideas. Why do we need to keep it to ourselves and struggle alone, when at the end, we often realise that so many people have similar questions and ideas? The difference only lies in the fact that we have our advantages while others have theirs. Why can't we share and work together? It isn't easy to develop a network of people, and if we happen to start at the bottom, this becomes even more difficult. But, try not to be disheartened. Should a good offer come your way or a chance to pursue your dreams present itself, humbly but confidently say "Yes." Someone might be able to introduce you to a new network that might lead you finally to a new promising network. We must believe that there exists for each of us a suitable path that will allow us the chance to make a fantastic journey of our own.

Doraemon may be stubborn and persistent. But, he never gives up. The goals of a project or research, in the same way, won't be accomplished within a short period of time. It could take a year or two, sometimes even a decade or longer. While some geniuses might be able to make a big jump in a day, most people cannot. We need to take it one step at a time, much like how building blocks lay out a solid foundation in play.

This talk was more about common sense — sure, it doesn't convey anything new in saying that anybody can try to achieve his or her dreams. But, if you are thinking that research is difficult or that it wouldn't lead anywhere, Doraemon might be able to help you.

Symposium 5: Clinician Scientist — Balancing Clinical Services and Research

Learning research — from a clinician's view

Dr Sng Ban Leong**Department of Women's Anaesthesia, KK Women's and Children's Hospital, Singapore**

Research should be an essential part of a clinician's development. Often, there are several barriers to embarking on research, including competing clinical commitment, inadequate knowledge of research and technical jargon. Studies have also reported related economic disincentives, sacrifices in family life and a lack of time. A practising clinician arguably is, however, the best person to identify the gaps in clinical practice. A clinician would have the knowledge and skills needed not only to identify and investigate the gaps in knowledge regarding the causes, diagnosis and treatment of disease but also to conduct research that could have a significant impact on patient care.

Formal courses for learning research, such as a Master's degree in clinical investigation, are available locally from National University of Singapore. This course was developed by Yong Loo Lin School of Medicine, in consultation with the Ministry of Health, senior clinician-researchers from various hospitals and research funding agencies. It has been designed to meet the needs of clinicians in healthcare institutions who desire to incorporate scientifically sound research into their clinical practice.

The goal of the programme is to equip clinicians with basic methodological and practical skills to design and conduct clinical investigations that are relevant to patient care. The main aims are to evaluate new treatments and technologies, diagnostic modalities, mechanisms of human disease, determinants of disease outcomes and the effectiveness of health services. Interesting aspects of the course include hands-on practical sessions for biostatistics, a simulated scientific review panel and practical tips for scientific and grant writing. Individual students are required to submit a grant proposal that is developed during the coursework for potential grant submission with the help of experienced researchers. A multidisciplinary and collaborative approach to research involving translational researchers, clinicians, biostatisticians and epidemiologists is introduced to provide a holistic view. It is also heartening to share experiences and expertise with like-minded fellow coursemates from varied fields of medical practice. More details are available about the course on its website at www.med.nus.edu.sg/dgms/MCI.

Thinking of innovative solutions to problems faced during daily practice is one of the most rewarding aspects of clinical research. For example, although epidural labour analgesia is currently considered the gold standard for pain relief during labour pains, the incidence of breakthrough pain has remained between 30%–40% during the past 3 years at KK Women's and

Children's Hospital, Singapore, in spite of epidural continuous infusion of local anaesthetics and opioids. This has reduced patient satisfaction and increased the workloads of obstetric anaesthetists. The challenge was to reduce breakthrough pain by providing a closed-loop feedback mechanism for women to titrate their own analgesic demands. The Department of Women's Anaesthesia consequently embarked on research to improve epidural analgesia through novel delivery techniques. Computer-integrated patient-controlled epidural analgesia was developed and shown to significantly improve patient satisfaction and reduce breakthrough pain in randomised controlled trials. This technique used computer integration to titrate the background infusion according to the patient's demands in the previous hour, which individualises the analgesic regimen for each patient according to patient feedback and experience. Concurrently, automated intermittent mandatory bolus was investigated to combine the capability of machine- and patient-activated epidural boluses with good patient satisfaction, reduced breakthrough pain and reduction in local anaesthetic consumption in randomised controlled trials.

By the end of 2009, a central monitoring system was introduced in the delivery suite to monitor epidural analgesia via wireless connection. This enabled obstetric anaesthetists to track patient progress in epidural analgesia with information on patient bolus, total bolus delivered, background infusion rate and total volume infused from a remote site without having to enter the individual patient's room. This, together with the implementation of computer-integrated patient-controlled epidural analgesia and automated intermittent mandatory bolus techniques, moved research and its findings into daily practice and has translated into a reduction in breakthrough pain to about 18% according to a recent audit. This also served to significantly reduce the workloads of obstetric anaesthetists in a busy maternity delivery suite unit. A prognostic model is currently being investigated to predict breakthrough pain at our centre. Larger body mass index and lower good-to-total demand bolus is associated with a higher risk of breakthrough pain. The computer system also allowed easier data collection on patient's epidural usage characteristics for further research and auditing as information is processed and stored electronically.

Clinical research can be rewarding and inspires one to improve patient care. Other areas that could assist the development of research in a clinical setting would be to identify good research mentors, assigning protected time for research and teaching research as part of specialist training.

Symposium 5: Clinician Scientist — Balancing Clinical Services and Research

Ebony and ivory — integrating research and service from a pathologist's perspective

A/Prof Tan Soo Yong

Department of Pathology, Singapore General Hospital, Singapore

(Abstract not available at time of print)

Symposium 5: Clinician Scientist — Balancing Clinical Services and Research

The development of fetal gene and stem cell therapy

Dr Jerry Chan

Department of Reproductive Medicine, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

Symposium 6: Neonatology — The Way Forward

Excellence in neonatal care through international benchmarking

Dr Khoo Poh Choo

Department of Neonatology, KK Women's and Children's Hospital, Singapore

Advances in neonatal care have resulted in the improved survival of very low birth weight premature infants over the decades and, with this improvement, ensuring the quality of life and safety of these babies has become of prime importance. Benchmarking is one way of ensuring that the best care available is given to these survivors in order to obtain the best outcomes in view of quality of life and long-term outcome.

KK Women's and Children's Hospital joined Vermont Oxford Network in 1998

The Vermont Oxford Network is a non-profit voluntary collaboration of healthcare professionals dedicated to improving the quality and safety of medical care for newborn infants and their families. It was established in 1988 and, to date, the network comprises of over 850 neonatal intensive care units at hospitals worldwide.

The network's mission is to improve the quality and safety of medical care for newborn infants and their families through a coordinated programme of research, education and quality improvement. In support of its mission, the network maintains

databases that contain information about the care and outcomes of high-risk newborn infants. These databases can be used by participating hospitals for quality management, process improvement, internal audits and peer review. It also provides core data for randomised clinical trials, outcome research and epidemiological studies, and creates the foundations for educational materials and programmes for healthcare professionals, policy makers, families of high-risk infants and the public.

We have used the data obtained from the network to look at key performance areas in the care of our premature very low birth weight infants. Our department's aim has been for our key performance indices to be within the best quartile of the network. As a result of the database and benchmarking, we were able to identify key areas in need of improvement and use these to monitor the success of the improvement methods implemented. This talk will focus on the quality improvement projects that the department has embarked on in its endeavour to strive for 'excellence in neonatal care through international benchmarking.'

Symposium 6: Neonatology — The Way Forward

Collaborative learning in neonatal medicine

Dr Joseph Manuel Gomez

Neonatal Intensive Care Unit, Department of Neonatology, KK Women's and Children's Hospital, Singapore

Introduction

The broadest definition of 'collaborative learning' is that it is a situation in which two or more people learn or attempt to learn something together.

Collaborative Learning in Vermont Oxford Network

The Vermont Oxford Network (VON), a voluntary group of neonatal intensive care units (NICUs), engages in collaborative learning and is committed to:

- achieving measurable improvements in the quality, safety and efficiency of NICU care;
- developing new resources, tools and knowledge for quality improvement in the NICU; and,
- disseminating this improvement in knowledge to the neonatology community.

Much of the knowledge of what makes for good care

is currently locked away in undocumented innovation and unexamined variation in practice. We can get to this knowledge by forming collaboratives. Collaboratives involve the coming together of multidisciplinary teams from many organisations with a focus on a specific topic. Teams share details of practice, conduct site visits and exchange data, and use this knowledge to make changes in the local setting.

Our NICU has documented a significant reduction in healthcare-associated bloodstream infections among very low birth weight infants since 2008 through collaborative learning with VON.

Conclusion

We can replicate VON's success by forming national and regional networks of NICUs and engaging in collaborative learning.

Symposium 6: Neonatology — The Way Forward

The late preterm neonate: is he safe?

A/Prof Victor Samuel Rajadurai

Department of Neonatology, KK Women's and Children's Hospital, Singapore

Newborn infants born between 34 completed weeks and less than 37 completed weeks of gestation are referred to as late preterm infants and have higher risks for mortality and morbidity when compared with term infants. They account for a significant proportion of preterm births. At our centre, 10% of all live births fall into this category, accounting for 77% of all preterm births. The causes of late preterm birth include spontaneous preterm labour, premature rupture of membrane (PROM), hypertensive disorders complicating pregnancy and elective induction of labour or elective caesarean delivery. In the past, these infants were referred to as larger preterm or near-term infants implying that they could be passed off as mature infants thus giving a false sense of security.

Studies have shown that up to 33% of all NICU admissions occur in this group of births. Nearly 8% of infants born at 36 weeks require intensive care and this figure increases to 15% at 35 weeks and 30%–50% at 34 weeks. A higher incidence of respiratory morbidity has been reported in late preterm deliveries by elective caesarean section and these include transient tachypnoea of newborn (TTNB), respiratory distress syndrome (RDS), hypoxic respiratory failure and severe persistent pulmonary hypertension

of the newborn (PPHN). A study done at our centre revealed that the risk of developing TTNB increased by ten fold and RDS by 54 fold in late preterms as compared with full-term infants; the need for NICU care also increased by 26 fold at 34 weeks and six fold at 35–36 weeks. In addition to respiratory morbidity, these infants often have other problems including hypoglycaemia, hyperbilirubinaemia, hypothermia, sepsis and feeding difficulties, which may need prolonged hospitalisation. These high-risk infants continue to have problems even after discharge from the hospital. There is clear evidence in the literature that these infants face more problems in the immediate postdischarge period when compared with full-term infants. Moreover, general practitioners and junior doctors in the polyclinics may not be able to recognise readily the often subtle early signs seen when they are unwell and this may result in delayed recognition of the problems in this vulnerable group of babies. A study has shown that after discharge from the hospital, 20% of infants need to be seen in the Children's Emergency Department and about a third of them required readmission to the hospital. The common causes for readmission were apnoea, apparent life threatening events, jaundice, fever, sepsis, respiratory problems and feeding issues.

Follow-up studies have revealed that late preterm infants have a significantly higher incidence of developmental delay and disability compared to full-term counterparts (OR 1.46, 95% CI 1.42–1.50) and are more likely to be referred for special-needs

preschool resources. There is an urgent need for educating parents and healthcare providers of this group of babies about the vulnerability and morbidity associated with late preterm births and to optimise the timing of delivery as far as feasible.

Symposium 7: Massive Obstetric Haemorrhage — Optimising Outcomes of a Condition that Continues to Plague Us

The importance of a multidisciplinary approach to the prevention and management of massive obstetric haemorrhage

Dr Shephali Tagore

Department of Maternal Fetal Medicine, KK Women's and Children's Hospital, Singapore

Obstetric haemorrhage remains the leading cause of maternal morbidity and mortality globally. Management of obstetric haemorrhage is a major challenge to optimising maternal outcomes by balancing conservative approaches and radical procedures, such as hysterectomy. There is significant morbidity associated with the event, such as infection, prolonged hospitalisation, exposure to large amounts of blood products and a traumatic experience for the woman and her family.

Uterine atony is the commonest cause (75%–90%) of primary postpartum haemorrhage (PPH). Other causes include genital tract lacerations, uterine rupture, uterine inversion, placental abruption, coagulopathies and morbidly adherent placenta. The incidence of morbidly adherent placenta is increasing with the rising incidence of caesarean sections. Common aetiologies for secondary PPH include retained products of conception, endometritis and subinvolution of the placental site. A higher risk of PPH should always be anticipated in patients with antepartum haemorrhage and women with risk factors, such as operative delivery, chorioamnionitis, multiple pregnancies, or prolonged labour.

Principles of management of PPH are assessment of severity, timely resuscitation (restoration of blood volume) and measures to arrest bleeding. As blood loss occurs in an otherwise 'well' woman and a young woman may maintain a normal blood pressure until sudden decompensation occurs, there should be a heightened sense of awareness and preparedness. The need for blood transfusion should be assessed based on the clinical picture rather than by waiting for laboratory tests. At KK Women's and Children's Hospital, we have implemented a massive transfusion protocol (MTP) involving a rapid response team to aid in the resuscitation of such women.

Simple measures such as emptying the bladder, 'rubbing the uterus' and bimanual uterine compression can stimulate uterine contraction and should be instituted early in minor PPH. Conservative management is the first line of treatment, which includes the use of oxytocin, ergot derivatives, prostaglandins

(15-methyl F2a), misoprostol, uterine packing and balloon tamponade (Rusch balloon/Sangstaken tube balloon). If conservative management fails, surgical approach is often considered. Surgery may involve exploratory laparotomy, local haemostasis (e.g. placental bed, serosal edges), uterine or internal iliac artery ligation, uterine compression sutures (e.g. B lynch suture) and, ultimately, hysterectomy in cases of severe intractable bleeding. Recently, the use of recombinant activated factor VII (rFVIIa) for PPH unresponsive to conventional treatments was proposed. Intraoperative cell salvage, whereby blood shed is collected, filtered and washed to produce autologous red blood cells for transfusion is done in some centres.

Treatment should always involve a multidisciplinary approach. Early involvement of appropriate senior staff, including the anaesthesia team, blood bank personnel, haematologists and senior obstetricians, is fundamental to the successful management of PPH.

Morbidly adherent placenta (accreta, increta and percreta) carries high morbidity and mortality and is associated with massive haemorrhage while separating the placenta during caesarean delivery. Management of these pregnancies is extremely challenging and requires forward planning to minimise blood loss. As there is a risk of life-threatening bleeding, a multidisciplinary approach is crucial and the team should involve interventional radiologists, pelvic surgeons and senior obstetricians and anaesthetists. Conservative management of morbidly adherent placenta involves placental retention after delivering the baby by fundal incision along with insertion of occluding balloons into appropriate vessels to control the bleeding, as hysterectomy is technically difficult and involves extensive dissection of invaded tissues. It also gives an option for preservation of fertility.

As evidence suggests substandard care in a majority of fatal cases, appropriate PPH protocols and clear guidelines should be available in cases of emergency and measures to allow preservation of the uterus and future fertility, where

possible, should be undertaken. Team roles should be delegated appropriately with mutual support, assuming responsibility. Communication should be clearly worded and acknowledged within the medical team and also with the woman and her family members.

At KK Women's and Children's Hospital, a simulation workshop (Combined Obstetrics Resuscitation and Emergencies; CORE) aims to teach the management of obstetrics emergencies using a multidisciplinary approach involving obstetricians, anaesthesiologists and nurses/midwives working in the delivery suite and the women's intensive care unit. Participants practice their skills in a simulated environment without putting themselves

or real patients at risk and also work together to ensure prompt and efficient treatment in an emergency.

The drills also provide 'hands-on' experience of practical skills including estimation of blood loss, as visual blood loss is often underestimated and resuscitation can be inadequate. Clinical risk management involving incident reporting and a follow-up meeting to discuss events after a massive PPH is important to enhance safety and improve clinical care. Appropriate follow up is essential as there is a risk of long-term psychological impact on the woman and also to screen for the rare complication of panhypopituitarism (Sheehan syndrome) secondary to hypotension.

Symposium 7: Massive Obstetric Haemorrhage — Optimising Outcomes of a Condition that Continues to Plague Us

Challenges and strategies in the anaesthesiological management of massive obstetric haemorrhage

Dr Eileen Lew

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Maternal haemorrhage remains a major cause of morbidity and mortality, even in developed countries. Substandard care and delay in diagnosis have been implicated as major contributing factors to maternal death in Confidential Enquiry into Maternal and Child Health (CEMACH). The primary role of the anaesthesiologist in the management of a bleeding parturient lies therefore in: (1) directing and coordinating resuscitative efforts; and (2) providing safe anaesthesia and analgesia for any surgical intervention planned.

Resuscitation of the severely bleeding parturient is a challenge for clinicians and the blood bank. At term, up to 700 mL/minute of blood loss may occur during placental separation, necessitating an immediate need to transfuse large amounts of blood components. Successful management is, thus, dependent on close collaboration of clinical providers and the blood bank and the timely initiation of treatment.

Institutional protocols that focus on identifying the underlying cause of bleeding, aggressive medical and surgical therapies, improving response times and alleviating obstacles to care can help coordinate the multifaceted care needed in the management of these patients. Evidence is emerging from trauma literature that implementing a massive transfusion protocol (MTP) can improve survival and reduce blood product utilisation after multiple traumatic injuries. For a start, it allows the empiric transfusion of standardised quantities of blood components in a sustainable manner that could potentially retard the onset of coagulopathy.

Globally, tertiary obstetric centres have begun to adopt MTPs for the management of massive obstetric haemorrhage. Currently,

there is no consensus on the optimal ratio of blood components to be transfused into severely bleeding patients. Recommended ratios for red cell concentrate (pRBC) and plasma and platelet transfusions vary, ranging from 10:1 to 1:1 for pRBC-to-plasma and from 10:6 to 1:1 for pRBC-to-platelets. These were either formulated empirically from clinical experience or using mathematical and computer simulation models. A major consideration is the assumption of a *common pathophysiology* in traumatic and obstetric bleeds. A ratio of 6:4:1 for pRBC, plasma and platelet concentrates seems a reasonable option as it allows the blood bank to provide support in the acute phase of resuscitation. At KK Women's and Children's Hospital, which provides care for 8,000 deliveries a year, an MTP has been implemented since January 2009 to manage the massive haemorrhage that complicates 0.2% of all deliveries. Preliminary data analysis suggests the immediate benefit of faster attainment of blood components. The use of adjuncts, such as tranexamic acid and recombinant activated factor VII (rFVIIa), may be incorporated into the MTP. To date, the use of tranexamic acid in obstetric bleeds is limited. rFVIIa is increasingly used as adjunctive therapy in the management of patients with life-threatening haemorrhage. Data from registries suggest that appropriate use of rFVIIa may help save parturients from hysterectomies during massive haemorrhage.

The choice of anaesthesia (general versus regional anaesthesia) in major haemorrhage is determined by the condition of the parturient and her baby. In the presence of haemodynamic instability or impending coagulopathy, regional anaesthesia

is contraindicated and general anaesthesia with controlled ventilation via endotracheal intubation is the safer option. For elective caesarean delivery complicated by placenta praevia, a combined spinal-epidural anaesthetic technique may be feasible, provided there is low or no likelihood of placenta accreta, percreta or increta. The parturient should be counselled for general anaesthesia in unforeseen circumstances that dictate the need for conversion (e.g. uterine atony, undiagnosed accreta). Following surgery, the majority of these bleeding parturients would be looked after in an intensive care unit, with further respiratory and haematological support till the physiology of normal clotting is restored and the underlying pathology has been effectively treated.

As part of anaesthetic care during massive haemorrhage, the responsibilities of anaesthesiologists has been expanded to include operation of the cell salvage machine and performing sophisticated point-of-care clotting tests, such as rotational thromboelastometry (ROTEM). Intraoperative cell salvage (ICS) for management of postpartum haemorrhage is now endorsed by Obstetric Anaesthetists Association, Association of Anaesthetists of Great Britain and Ireland, National Institute for Clinical Excellence, and American College of Obstetricians and Gynecologists. With proper guidelines, cell salvage is a safe and effective blood conservation technique for high-risk patients with placenta praevia/accreta, massive fibroids, rare blood type or unusual antibodies and patients belonging to the Jehovah's

Witnesses sect, who reject allogeneic blood transfusions on religious grounds.

ICS is safe for both mother and baby. Earlier concern about possible infusion of amniotic fluid and cellular debris has been addressed. Discarding the first litre of aspirated blood, efficient washing of subsequent salvaged red cells, followed by reinfusion via a leukocyte-depletion filter can significantly reduce contamination of salvaged blood with amniotic fluid. Isoimmunisation of Rhesus negative mothers can be effectively prevented by administering an appropriate dose of anti-D immunoglobulin within 72 hours of delivery.

There is a higher rate of hyperfibrinolysis in postpartum haemorrhage. A decrease in fibrinogen has been found to be an early predictor of the severity of postpartum haemorrhage. Using point-of-care coagulation testing, the anaesthesiologist could obtain a prompt diagnosis of the underlying clotting disorder and facilitate specific therapeutic decisions. Its use should be combined with ICS in the management algorithm of maternal haemorrhage.

A multidisciplinary team effort is essential to ensure good maternal and fetal outcomes. Haemorrhage drills and simulation-based training, conducted by trainers who include anaesthesiologists, obstetricians and midwives, may help providers achieve timely and coordinated responses in the treatment of massive obstetric haemorrhages.

Symposium 7: Massive Obstetric Haemorrhage — Optimising Outcomes of a Condition that Continues to Plague Us

Organisation of an effective response team in the control of massive obstetric haemorrhage

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Massive obstetric haemorrhage — abruptio placentae, placenta praevia and postpartum haemorrhage being the main causes — is a major cause of maternal death and morbidity. The patient's outcome may depend on the quick action of the emergency response teams. Organisation of an effective response team is crucial, as appropriate management rendered by the team contributes to the successful recovery of the patient. When an emergency code is activated, it would usually trigger immediate response from many obstetricians, nurses, anaesthetists and neonatal staff who are on duty at the scene. The scenario would be one of chaos where everybody wants to lend a helping hand in some way. The focus of this presentation is to discuss factors that can contribute to organising an effective response team in such crises, such as teamwork and a better understanding of individual

roles, with an emphasis on clear communication for ensuring a smooth workflow. A major factor in enhancing the effectiveness of a resuscitation is conducting regular combined training and drills for medical and nursing staff from different departments to help them react confidently to critical moments of emergency. The availability of adequate resources, such as guidelines and protocols, and the implementation of a postpartum haemorrhage box are other factors for ensuring the effective control of the situation. A mass transfusion protocol should also be available for rapid supply of blood products when the need arises. In summary, continuous integrated training for medical and nursing staff, building a teamwork culture and providing adequate resources are key factors for the organisation of an effective response team for controlling a massive obstetrics haemorrhage.

Symposium 8: New Developments in Pain Control

Technology-based labour epidural analgesia

Dr Serene Leo

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Introduction

Labour pain is often considered to be the worst pain a woman will experience in her lifetime. It is very subjective and dynamic, increasing with the progress of labour. Its intensity is also determined by a multitude of factors, such as the presence of dysfunctional labour, initiation of oxytocin augmentation regimens and various psychological and sociocultural factors that influence the way pain is perceived by the parturient.

The introduction of epidural analgesia has been of paramount significance in allowing women to have a more satisfactory birthing experience. The ideal labour epidural should be able to provide adequate pain relief throughout the different phases of labour while safeguarding the wellbeing of both mother and baby. Recent research at our institution has been focused on exploiting computer technology to develop innovative epidural drug delivery systems and create novel analgesic regimens for the adequate maintenance of labour analgesia.

Patient-Controlled Epidural Analgesia

Patient-controlled epidural analgesia (PCEA) is a mode of epidural drug delivery, which allows the parturient to self-administer boluses of epidural solution with the press of a button. This confers autonomy and flexibility to accommodate her increasing analgesic requirements as labour progresses. Numerous studies have affirmed the advantages of PCEA over continuous epidural infusion and it is now an acceptable mode of labour epidural drug delivery.

Computer-Integrated PCEA

Despite offering patients some control over their pain relief, a conventional PCEA pump lacks the flexibility to vary its basal infusion rate to match the increasing analgesic requirements that accompany the progress of labour.

In an attempt to address the dynamic nature of labour pain, our institution created a software programme that converts an ordinary continuous infusion pump into a computer-integrated PCEA (CI-PCEA) pump which is able to respond to the patient's needs. This interactive pump analyses the history of the patient's analgesic consumption over the past hour and adjusts the rate of its basal infusion proportional to the number of patient-boluses made. When the pump is first initiated, there is no background infusion. After the first demand-bolus, the basal infusion rate starts at 5 mL/hour. If a second demand-bolus is made, the basal infusion rate increases to 10 mL/hour. If the patient activates three demands over the preceding hour, the basal infusion increases to 15 mL/hour. If no demands were made during the preceding hour, the infusion steps down by 5 mL/hour.

CI-PCEA versus Continuous Epidural Infusion

We conducted a pilot study involving 40 parturients who were randomised to receive either a continuous epidural infusion of 10 mL/hour or the computer-integrated regimen following successful induction of combined spinal-epidural analgesia. The same infusion pump was used for all study patients. Each patient was given a modified hand-held computer mouse and taught to self-administer an epidural bolus dose by clicking the mouse button. Patients assigned to the continuous infusion group essentially received a 'sham' PCEA. We found that there was a significant reduction in the incidence of breakthrough pain that required supplementation by an anaesthetist when using CI-PCEA. Both groups had comparable incidences of side effects and consumptions of total local anaesthetic.

CI-PCEA versus Conventional PCEA

The objective of our follow-up study was to compare total epidural drug consumption using the CI-PCEA pump to a demand-only PCEA pump with no background infusion. We found no difference between the time-weighted consumption of local anaesthetic between the two groups. Interestingly, the CI-PCEA group reported significantly higher maternal satisfaction scores.

In the following year, we replaced the cumbersome laptop system with a more portable personal digital assistant (PDA) operating on a Windows Mobile system. Software for the CI-PCEA algorithm was loaded onto the PDA, which was synced to an ordinary syringe pump. Our subsequent study compared total epidural drug consumption using CI-PCEA to a PCEA that had a basal infusion rate of 5 mL/hour. Again, we found no difference in the time-weighted consumption of local anaesthetic between the two groups. The CI-PCEA group had a higher infusion rate during the second stage of labour, but the duration of the second stage of labour was similar in both groups. Similar to previous results, parturients from the CI-PCEA group reported higher maternal satisfaction scores.

PCEA with Automated Intermittent Boluses

Previous studies have shown that maintenance of labour analgesia using regular intermittent epidural boluses in place of continuous infusion is associated with a reduced need for epidural rescue medication. This could be attributed to a more extensive spread of epidural solution when delivered as a bolus rather than via slow infusion.

In order to capitalise on these findings, we created a software programme that incorporated regular automated background boluses into a PCEA regimen in place of basal infusion. We conducted two studies to look at the characteristics of analgesia obtained using PCEA, with background automated boluses

(AMB), and compared it to a conventional PCEA with basal infusion. Our results demonstrated that the AMB groups obtained similar analgesic efficacy while displaying reduced overall hourly consumption of local anaesthetic and a longer duration of time to the first PCEA self-bolus.

Conclusion

CI-PCEA is a feasible and efficacious modality for epidural drug delivery. Future research will be focused on fine tuning our existing CI-PCEA algorithms in order to enable better customisation of therapy to suit each parturient.

Symposium 8: New Developments in Pain Control

Persistent pain after O&G surgery

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Persistent pain after surgery is defined as surgical incisional pain that persists for over 3–6 months. Persistent pain is a well-recognised problem following various types of surgery, such as amputation, thoracotomy, mastectomy, gallbladder surgery and inguinal hernia repair. Its incidence is reported to be between 5%–32% in obstetrics and gynaecological surgery.

The management of postoperative pain after caesarean section is important, specifically as good pain relief will improve the recovery of mothers who need to care for their newborn babies. Our centre investigated the incidence and risk factors associated with chronic pain after elective caesarean section under spinal anaesthesia in an Asian population. A prospective cohort study was conducted among patients who underwent elective caesarean section under spinal anaesthesia, with morphine patient-controlled analgesia administered for 24 hours postoperatively. Perioperative surgical and obstetric factors were investigated prospectively. Phone surveys were conducted to identify risk factors associated with chronic pain. A total of 857 patients completed both the perioperative study and phone survey. The incidence of wound scar pain for three months after surgery was 9.2% ($n = 79$). The independent risk factors for development of chronic pain were higher pain scores recalled in the immediate postoperative period and pain present elsewhere. The two most common sites of pain elsewhere were back pain and migraine.

Our centre also investigated whether polymorphisms of the ATP-binding cassette subfamily B member-1 (ABCB1) gene that codes for p-glycoprotein could influence the efflux of morphine from the central nervous system affecting its analgesic action. The association between ABCB1 polymorphisms and the effect of morphine was investigated. There was no significant statistical difference in total morphine consumption, pain scores and side effects among the various genotypes. Polymorphisms of ABCB1 were not associated with differences in morphine use in the first 24 hours after surgery. Women with the T allele of C3435T polymorphism showed a trend towards a higher risk of developing persistent postoperative pain.

Currently, our centre is embarking on the development of a prognostic model to predict acute and chronic pain after caesarean section by dynamic psychophysical testing and genetic screening in an Asian population. This involves the use of testing of the inhibitory and excitatory pain pathways using

diffuse noxious inhibitory control and mechanical temporal summation, respectively. Pain questionnaires and anxiety and pain catastrophising scales are being used to assess the pain history and psychological state of patients. It is hoped that closer monitoring and preemptive analgesic strategies can be implemented by identifying patients at a higher risk of chronic pain.

Chronic pain after hysterectomy may be the result of surgery or be attributable to other factors, such as preoperative and postoperative pain or physical and psychosocial status. Women who underwent hysterectomy for benign conditions were enrolled. 15 women (16.7%) out of 90 enrolled had persistent pain four months after hysterectomy. Preoperative 'pain problems elsewhere' and a high 'acute postoperative pain intensity' were associated with pain four months after hysterectomy. Women with pain at four months reported lower quality of life in four Short Form-36 subscales and less control of pain preoperatively.

Women scheduled to undergo hysterectomy for benign indications frequently have preoperative pelvic pain, but it is largely unknown why pain in some cases persists or even develops after surgery. A large questionnaire and database study described pain and identified risk factors for chronic postsurgical pain one year after hysterectomy for benign indications. The pain reported by 31.9% of patients one year after hysterectomy was defined as chronic pain and 13.7% of patients reported pain more than two days a week. Pain was not present before surgery in 14.9% of women with chronic postsurgical pain. Risk factors for chronic pain were preoperative pelvic pain, previous caesarean delivery, pain as the main indication for surgery and pain problems elsewhere. 32% of patients had chronic pain after hysterectomy, and risk factors were comparable to those seen in other operations.

Treatment of chronic postsurgical pain requires a biopsychosocial approach. Preoperative pain management counselling is important to alleviate anxiety and provide patient education. Optimal treatment of acute pain may prevent development of chronic pain. Also, antineuropathic medications, such as gabapentin, may be useful in preventing chronic postsurgical pain following hysterectomy. Further research will be aimed at identifying patients at higher risk of severe pain and individualising analgesic strategies to treat acute pain and prevent chronic pain after obstetric and gynaecological surgery.

Symposium 8: New Developments in Pain Control

Relieving pain in women through acupuncture

Dr Swee Yong Peng

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(Abstract not available at time of print)

Symposium 8: New Developments in Pain Control

Aches and pains in women: pills and needles

Dr Bernard Lee

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Many women suffer from chronic pain and aches. Chronic pain affects a higher proportion of women than men around the world. Unfortunately, however, women are also more likely to experience pain and less likely to receive treatment compared to men. This disparity can be traced to a number of factors — genetic factors of lowered threshold and perception to pain, the pharmacogenetics of altered processing of opioids and cyclical hormonal influences, societal and cultural norms (that women complain more) and economic and governmental barriers.

Pain is an alarm to alert the body that something is wrong and one should seek medical attention. In the acute pain model, there is good congruence of pain perception to pain generator. Acute treatment of pain with anti-inflammatory drugs and opioids gives good resolution of pain. However, chronic pain can persist due to central sensitisation mechanisms even following the resolution of peripheral pain generators. Sometimes, pain may persist even after the tissue has healed, underlying causes been treated and all reasonable attempts been made to identify and treat the offending causes. Such persistent pain no longer serves any useful purpose. Standard analgesics would be non-responsive and unable to treat such pain adequately.

Biomechanical models of chronic pain include ongoing osteoarthritis, rheumatoid arthritis and myofascial spasm, while functional chronic pain models would be neuropathic pain, trigeminal neuralgia, fibromyalgia, irritable bowel syndrome,

tension headache, phantom pain and hypersensitivity nerve syndrome.

Functional pain conditions are a very misunderstood condition by both medical and non-medical practitioners alike. This has given rise to the misconception that the syndrome is a psychiatric condition.

While proponents of peripheral inflammatory models have advocated a removal of the pain generator by surgery, there is strong evidence now linking an aberrant central processing of pain in such patients. There is new understanding that apart from persistent nociceptive input from inflamed tissues that might lead to peripheral sensitisation, there is central sensitisation resulting in the increased responsiveness of dorsal horn neurons innervating the viscera and somatic tissues. Very often, management plans in such patients include the enhancement of the descending inhibitory pathway using both pharmacological and interventional pain procedures. Interventional pain procedures using needles, such as pulsed radiofrequency ablation or desensitisation of nerves, can be helpful for the treatment of chronic pain conditions. The use of steroids in epidural or sleeve root injections to temporise painful conditions may also have a role to play here. For instance, basic science research and clinical studies suggest that fibromyalgia is present in 5%–10% of the general population. New drugs, such as pregabalin and duloxetine, which are now available may mitigate the symptoms as well as treat the underlying condition for this cohort.

Symposium 9: Enhancing Parent-Child Interactions in Children Presenting with Behaviour Difficulties

Signposts: helping parents and caregivers in building better behaviour for preschool children with developmental needs

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Introduction

In this article, the author provides information on the Signposts parenting programme from Australia and how it is being run in Singapore. The programme is currently available to parents and caregivers of children with developmental needs who are being seen at the Department of Child Development (DCD), KK Women's and Children's Hospital, Singapore.

The Signposts Programme

Signposts is a parenting programme for parents of children with developmental delay and intellectual disability. The programme is designed for parents and caregivers whose children are aged between 3–15 years and was developed in 2001 by Parenting Research Centre, Melbourne, Australia. It is a five-session programme where parents learn parenting strategies that can help them build better behaviour in their children. It teaches parents strategies to manage their children's difficult behaviour while increasing their good behaviour. The programme is run over five sessions fortnightly in Australia. In the first few sessions, parents and caregivers are taught ways to measure the behaviour that they intend to change and to also identify triggers for such behaviour. Subsequently, they are taught strategies, such as 'time out,' and other effective ways of giving instructions to children.

In Australia, the programme is funded by the Victorian government and is being run over the entire state since 2005. Several research efforts have evaluated the effectiveness and benefits of the programme. A study by Hudson, Cameron and Mathews in 2008 evaluated the manner in which Signposts was effective in helping parents cope with challenging behaviour seen in children when it was implemented on a wide scale basis in Victoria. Study results indicated that, in families that participated in the programme, parents had increased satisfaction about their roles and were better able to manage their children. They also reported being less hassled, less stressed, less anxious and less depressed. Parents observed that their children became more obedient and their level of aggressiveness and disruptiveness decreased. Overall, the families were satisfied with the programme.

Signposts in Singapore

The Signposts programme was brought to Singapore by DCD in 2009. In 2010, DCD started running the programme for the parents

and caregivers of their patients. There are now two trainers and over 60 trained facilitators locally. The programme is run jointly with voluntary welfare organisations. In 2011, Temasek Care provided funding for the programme's running.

For Signposts at DCD, some of the programme's features were localised to better meet the needs of the Singaporean target group. One of these changes is the regular introductory workshop session that provides information regarding the programme. The session allows parents and caregivers the opportunity to assess the programme before signing up for it. A DVD was also recently developed on the perspectives of Singaporean parents, in which some of the parents who had already completed the programme shared their perceptions. This DVD is a localised version of the 'Parents' Perspectives' DVD that was developed by Parenting Research Centre for the Victorian target group.

The programme is only delivered in closed groups and is provided over five sessions on a weekly basis. Ongoing monthly workshops also deliver the five-session programme to parents and caregivers at DCD. From January 2011 to March 2011, for example, DCD completed eight runs of the parenting programme, following which verbal and written feedbacks received from the participants indicated positive outcomes. A majority of parents found the programme to be useful in helping them better manage the difficult behaviour of their children and for also teaching their children new skills. Most felt more confident of managing their children's behaviour after attending the programme.

Conclusion

When working with parents and caregivers of children with developmental issues, the theme that repeatedly surfaces is managing their grief. One way of coping with this grief is for them to gain more information on how to help and manage their children. As stated by Hooyman and Kramer in 2006, "given the cultural vulnerability in the meanings of disability, preparation for dealing with a disability, and the family members' capacities and competing needs and ethics, culturally competent assessment and interventions must be developed to support families of children with disabilities." DCD, by making Signposts available to the parents and caregivers of children with developmental needs in Singapore, shares the parenting journey with such parents and better equips them to deal with the challenges that they may face.

Symposium 9: Enhancing Parent-Child Interactions in Children Presenting with Behaviour Difficulties

PCIT: parent-child interaction programme

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Parent-child interaction therapy (PCIT), developed by Dr Sheila Eyberg, is an evidence-based treatment that has been shown to be effective in not only improving children's behaviour but also easing parental stress and increasing their confidence while parenting. This treatment focuses on the parent-child relationship. Parents are coached in two sets of skills — child-directed interaction and parent-directed interaction — to increase appropriate behaviour, leading to improved child compliance and a reduction of inappropriate behaviours, such as hitting, whining and tantrums.

Treatment involves live coaching behind a one-way mirror, which allows the therapist to observe the interaction between the parent and child. Parents learn how to use consistent and predictable strategies to enhance the parent-child relationship and improve the child's behaviour. In addition, the child feels more secure and positive about himself. The main skills taught to parents include PRIDE (praise, reflect, imitate, describe behaviour and enthusiasm) and other important skills, such as using 'timeouts' when a child fails to follow commands.

Four main assessment tools are used in PCIT — Dyadic Parent-Child Interaction Coding System (DPICS-III), Eyberg

Child Behaviour Inventory (ECBI), Parents Stress Index (PSI) and Therapy Attitude Inventory (TAI). DPICS quantifies the quality of parent-child interaction and determines whether parenting skills have been mastered. ECBI measures the severity of parenting problems. PSI measures the parents' stress level, which can also be used to assess the risk of child abuse. TAI measures the customers' satisfaction levels.

PCIT was introduced at KK Women's and Children's Hospital (KKH), Singapore, in August 2010 given its evidence-based benefits. Seven medical social workers were trained by Dr Elizabeth Knight and her team. The KKH PCIT team is still in the process of fulfilling the post-training criteria to achieve a PCI certification, while also working to install a specialised PCIT setup at the same time. This setup includes equipments, such as 'bug-in-ear' and a sound system, which would serve to enhance communication and coaching between therapists and parents during the sessions once installed. In a nutshell, the KKH PCIT team is working so that many more families can benefit from this intervention. In the near future therefore even families experiencing violence, such as in child abuse cases, will receive effective treatment.

Symposium 9: Enhancing Parent-Child Interactions in Children Presenting with Behaviour Difficulties

Understanding our adolescents and what we can do to help

Ms Jolene Hwee

Psychology Service, KK Women's and Children's Hospital, Singapore

A family's transition out of middle childhood brings with it a new set of issues and concerns, as interpersonal and intraindividual equilibria are often disrupted by the sudden changes that come with adolescence. Adolescence is a period of dramatic change in a child's physical, cognitive, emotional and social competencies. With the possible exception of toddlerhood, perhaps no other developmental period brings

about such rapid transformation in a child, as does adolescence. This talk will inform the audience of the key psychological milestones in early, middle and late adolescence, as well as educate both healthcare professionals and parents on how to identify atypical and high-risk behaviour in this unique population. Specifically, the causes and symptomology of depression and anxiety in adolescents are discussed.

Symposium 10: MIS in Paediatrics & Gynaecology — What's New? What's Cool?

Recent development in management of endometriosis

Adj A/Prof Bernard Chern

Minimally Invasive Unit, Department of Obstetrics & Gynaecology, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

Symposium 10: MIS in Paediatrics & Gynaecology — What's New? What's Cool?

Single-port surgery

Dr Anthony Siow

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(Abstract not available at time of print)

Symposium 10: MIS in Paediatrics & Gynaecology — What's New? What's Cool?

MIS in tiny tots — Singapore and beyond

Adj A/Prof Anette Jacobsen

International Medical Programme (Paediatrics), Division of Surgery, KK Women's and Children's Hospital, Singapore

Paediatric minimally invasive surgery (MIS) took off from mere basic viewing to undertaking complex procedures in 1997, when we 'moved in' with our gynaecology partners at KK Women's and Children's Hospital, Singapore. Laparoscopic appendectomy quickly became a standard 'teaching and training' procedure, and an ovary-sparing MIS approach was adopted. Local mentors and HMDP visitors next assisted us in developing our capabilities to include a wide range of thoracic and abdominal procedures. A training and accreditation programme was also established.

While it is true that new developments are often pioneered in adult surgical services, as size and space are obvious limitations in the case of tiny tots, it is also beyond doubt that paediatric surgeons are innovative in their approach to implementing

any such new techniques to their patients. It is imperative that training programmes and quality assurance systems be in place to review the outcomes of any such implementation. International publications and presentations of outcomes will help us benchmark our performance with that of our peers elsewhere.

While MIS surgery may be seen as a luxury by many in the region, improved outcomes in children tell us otherwise. When a thoracoscopic approach to lung and mediastinal pathology in a child is able to prevent long-term growth and scoliosis problems and an MIS approach to a large ovarian cyst is able to preserve fertility in a female child, most people would argue for a universal minimally invasive approach wherever possible.

Symposium 11: H1N1 — How Much Do We Know?

Overview of influenza pandemics

Dr Thoon Koh Cheng

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(Abstract not available at time of print)

Symposium 11: H1N1 — How Much Do We Know?

Rapid tests for influenza diagnosis

Dr Nancy Tee

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The H1N1 pandemic provided both an opportunity and incentive to evaluate influenza diagnostics. Much attention was focused on the accuracy and speed of influenza testing due to concerns about the virulence of the pandemic virus.

A rapid test should be simple to use and require only a few uncomplicated steps. Results should be available within 15–30 minutes and non-laboratorians should be able to do the test outside the laboratory. Rapid testing obviates the delays inherent in laboratory testing, which are associated with the transportation, sorting and accessioning of a large number of specimens in the laboratory.

The rapid influenza test is an antigen test in a point-of-care format. The most common format used is the lateral flow immunoassay, in which the nucleoprotein of the influenza virus is often used as a target. The basic principle involves the use of a conjugate pad with dried colloidal gold-labelled antibodies. The patient's specimen extract (antigen) is added to the conjugate pad and the antigen and labelled antibody complex (immunoassay) is subjected to a chromatography-like migration along a nitrocellulose membrane (lateral flow). The complex is immobilised by a capture reagent and visualised as a coloured line for reading. These tests may differentiate between influenza A and B, but not between the different influenza A subtypes. Some kits specifically detect pandemic H1N1 influenza A.

The many commercially available rapid tests vary in their complexity, acceptability of specimen type, sensitivity and specificity. The varied sensitivities and specificities of these tests could stem from several factors, including the different patient groups involved in a particular study, day of illness during sampling, sampling procedures and the test used as a gold standard for comparison.

The reported sensitivities and specificities of these tests ranged between 50%–70% and 90%–98%, respectively, when compared with virus culture or reverse transcriptase-polymerase chain reaction (RT-PCR). Also, it is possible that the sensitivity of a single kit to the different influenza A subtypes varies or that a kit may have better sensitivity for seasonal H3N2 than

the pandemic H1N1 virus. The low sensitivity of rapid tests thus affects the interpretation of results as well as necessitates additional testing.

The positive predictive value (PPV) and negative predictive value (NPV) of a test result depend on the disease's prevalence in a population. If disease prevalence is low, the PPV of a positive result is low but the NPV is high (negative results are more likely to be true). When disease prevalence is high, the PPV of a positive result is high but the NPV is low (negative results are more likely to be false). As a result, the following algorithm was recommended by World Health Organization in 2005 — rapid tests are not recommended when influenza activity is low due to its low PPV. However, at the beginning of the influenza season or during an outbreak, rapid tests may be used as it may influence clinical decisions. Positive rapid test results are acceptable as the PPV is relatively high. Then again, negative results should be tested using a more sensitive test, such as RT-PCR or virus culture.

Centers for Disease Control 2010 reported the following on the PPV and NPV of rapid testing, based on the performance of current antigen tests against virus culture or RT-PCR, during high and low influenza periods using a kit with poor sensitivity (50%) but good specificity (98%). If the influenza prevalence is moderate (20%), then the PPV is good (range 86%–93%). In contrast, if the influenza prevalence is very low (2.5%), then the PPV is poor (range 39%–56%). As the rapid kits have poor sensitivities, it should be noted that the NPV is actually lower when influenza prevalence is higher. At a moderate influenza prevalence of 20%, the NPV is 86%–89%; NPV decreases to 70%–75% when the influenza prevalence is higher at 40%. Therefore, rapid tests may be used when influenza prevalence is at least moderate ($\geq 20\%$) for good PPV. However, as earlier mentioned, for moderate NPV, negative results should be confirmed using a more sensitive method.

Several steps can be taken to ensure better sensitivities. One is to sample within 2–3 days of symptom onset. As children shed the virus longer, testing after five days may still be considered for

the group. Secondly, ensure that adequate material is sampled, particularly when swabs are used. Lower respiratory tract specimens may have a higher yield than nasal and throat swabs. Finally, follow the manufacturers' instruction for specimen collection by using collection devices that come with the kits and collecting the types of specimen recommended.

Based on the limitations discussed, rapid tests may be considered in situations, such as infection control isolation and cohorting during the influenza season. In the outpatient triage

for treatment, patients at high risk of complications may be tested to assist the clinician in making a clinical judgement. This may be done during the influenza season where the PPV is high. Results may assist in the decision to use only antivirals and possibly withhold unnecessary antibiotics. However, negative results will require additional testing by RT-PCR or culture. Lastly, rapid tests may be used together with indirect fluorescent antibodies, RT-PCR or virus culture in institutional outbreak investigations.

Symposium 11: H1N1 — How Much Do We Know?

Influenza in O&G patients

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Influenza viruses are the most common cause of serious respiratory illness worldwide. Certain groups of the population are considered to be at increased risk of complications from influenza infection. The at-risk groups include children aged between 6–23 months, adults over the age of 65 years and people with comorbid medical conditions, such as diabetes, pulmonary disease (including asthma), heart disease and renal disease. In obstetrics and gynaecology, the obstetric cohort comprises pregnant women who have an increased susceptibility by virtue of physiological suppression of the immune system to facilitate tolerance of paternally derived fetal antigens. In contrast, gynaecology patients may be at increased risk due to factors, such as malignancy and presence of comorbid medical disorders.

When discussing influenza in obstetrics and gynaecology, a greater challenge is posed by the pregnant cohort as there is a need to consider not only the mother but also her fetus. Both seasonal and pandemic influenza infections have been observed to impact adversely on the pregnant population. Population-based data have demonstrated increased rates of doctor visits and hospital admissions among pregnant women during the influenza seasons. Maternal mortality was reported to be as high as 27% during the 1918 influenza pandemic. The outbreak of 1957 was equally devastating, with 50% of deaths among women of childbearing age occurring in pregnancy. In the recent influenza A H1N1 (2009) outbreak, early reports of affected pregnant women demonstrated a high incidence of pulmonary complications, such as pneumonia and acute respiratory distress syndrome. In terms of effect on fetuses, respiratory hospitalisation for seasonal influenza has not been shown to be associated with a significant increase in adverse perinatal outcomes, such as prematurity or low birth weight. In addition, influenza infections have not been shown to exert a direct teratogenic effect. There is, however, concern regarding

the indirect effects of influenza, such as maternal fever, in causing complications (e.g. congenital malformations). In cases of severe maternal hypoxaemia associated with severe influenza, as observed during the recent H1N1 (2009) pandemic, perinatal morbidity and mortality can be significant.

In influenza management, treatment with neuraminidase inhibitors, such as oseltamivir, has many benefits including a shortened duration of fever, expeditious decline in viral shedding and a reduction in the length of hospital stay. Oseltamivir is approved for use in adults and children (age ≥ 1 year) with seasonal influenza. However, the significant effects of the influenza A H1N1 (2009) pandemic observed in pregnancy has led to its use in pregnancy being authorised as well. It is noteworthy that data relating to oseltamivir use in pregnancy is scarce. Nevertheless, there is suggestion that there is little transfer of oseltamivir or its active metabolite across the placenta. The current recommendation is that oseltamivir is not a major teratogen.

Vaccination is the most effective method for preventing severe influenza illness and its sequelae. The presence of incontrovertible evidence demonstrating reduced influenza-associated morbidity and mortality with influenza immunisation has been the drive behind the recommendation for annual vaccination in the high-risk groups in many countries, such as the United States and Canada. However, concerns over the safety of the influenza vaccine in pregnancy among women and healthcare providers have hampered efforts towards immunisation coverage of the pregnant population. Although safety data is inadequate, a few published studies have reported no serious adverse effects from the influenza vaccine in pregnant women or their infants. There is also no indication of harm resulting from influenza vaccination in the first trimester of pregnancy.

Symposium 11: H1N1 — How Much Do We Know?

Public health response to influenza pandemics

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The Ministry of Health (MOH) began planning for an influenza pandemic shortly after human cases of avian influenza A (H5N1) were reported in Thailand and Vietnam in early 2004. MOH's Pandemic Preparedness and Response Plan was first published in mid-2005. The Ministry of Home Affairs coordinated the overall national planning by different government agencies. The national preparedness plan was established by 2006, but was only published publicly in January 2009. A colour-coded risk alert management system (DORSCON) was developed to provide a framework to guide the various appropriate responses. However, during the 2009 influenza pandemic, the DORSCON framework was found to be too rigid, as severity had not been taken into account. During the 2009 pandemic, Singapore applied containment measures from late April to early July. These containment measures included active case finding and isolation of cases, contact tracing and quarantine of contacts. Border screening using thermal scanners and public education was used for case finding. Cases were screened at public hospitals using polymerase chain reaction testing.

Confirmed cases were isolated in hospitals and treated with oseltamivir. However, bed capacity became an operational issue within a month.

Contact tracing included tracing of air passengers who had disembarked in other countries. Information on such contacts was relayed to the public health authorities in these countries. Residents were quarantined in their own homes while non-residents were quarantined in government resorts. Quarantine capacity for non-residents also became an issue after about a month. Containment measures gave way to mitigation measures once community spread became established. Mitigation measures focused on reducing morbidity and mortality through treatment of high-risk groups with antivirals, slowing the virus's community spread through public education and school-based measures and, eventually, vaccination with the pandemic vaccine. Vaccine became available from early November 2009, but uptake was low. Singapore stepped down its DORSCON alert status to Green on 12 February 2010 while World Health Organization declared the pandemic phase to be over on 10 August 2010.

Symposium 12: GUSTO

Overview of GUSTO

Dr Pratibha Agarwal

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(Abstract not available at time of print)

GUSTO Family Album

Dr Marielle Fortier

Department of Diagnostic & Interventional Imaging, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

The GUSTO Body

Adj A/Prof Fabian Yap

Endocrinology Service, Department of Paediatrics, KK Women's and Children's Hospital, Singapore

(Abstract not available at time of print)

CATEGORY: NURSING / ALLIED HEALTH / MULTIDISCIPLINARY

S/no	Reference number	Presentation title	Page number
1.	ASM2011-NUR-021	Comparing the effects of spontaneous versus directed pushing in the second stage of labour on maternal and fetal well-being	S40
2.	ASM2011-NUR-023	Preschool screening for learning difficulties in children with chronic medical conditions: a nurse-based screening programme	S40
3.	ASM2011-AHS -001	Liver and cardiac iron measurements in thalassaemia patients: initial experience with gradient echo T2* sequence	S41
4.	ASM2011-AHS-010	Performance of Singaporean children in Clinical Evaluation of Language Fundamentals Preschool 2-United Kingdom (CELF Preschool 2-UK)	S41
5.	ASM2011-MD-008	Laboratory experience with the VPIII DNA probe test for <i>Gardnerella vaginalis</i> , <i>Candida</i> spp. and <i>Trichomonas vaginalis</i>	S42

CATEGORY: MEDICAL

S/no	Reference number	Presentation title	Page number
1.	ASM2011-MED-009	Rhabdomyosarcoma: our experience in Singapore	S42
2.	ASM2011-MED-022	Retrospective study of patients who underwent tension free vaginal tape in 2004: a five-year review	S43
3.	ASM2011-MED-027	Risk factor assessment after mid-urethral sling surgery for stress urinary incontinence at one year	S43
4.	ASM2011-MED-054	Neonatal outcome of the late preterm infant (34–36 weeks): the KKH experience	S44
5.	ASM2011-MED-057	Lifestyle habits as risk factors for threatened miscarriage	S44
6.	ASM2011-MED-074	Predictive validity of Bayley MDI at 2 years for assessing cognitive outcome at 5.5 years in extremely low birth weight infants	S45
7.	ASM2011-MED-092	Detection of subtelomeric genetic aberrations in patients with developmental delay and/or multiple congenital anomalies by multiplex ligation-dependent probe amplification	S46

Category: Nursing ASM2011-NUR-021

Comparing the effects of spontaneous versus directed pushing in the second stage of labour on maternal and fetal well-being

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Introduction: There are two methods of caring for women during the second stage of labour — coached, directed pushing immediately at 10-cm dilation or spontaneous pushing when the woman feels the urge to push. Currently, there is limited data concerning which method is most optimal for maternal and fetal well-being.

Methods: A randomised controlled trial was carried out to determine the effects of spontaneous pushing versus directed pushing in the second stage of labour on maternal and fetal well-being. Midwives from the delivery suite were randomly allocated to either spontaneous or directed pushing groups to guide women who were nulliparous and without epidural in the second stage of labour. Data collected for comparison between the groups included length of labour, mode of delivery, perineal trauma, apgar scores, fetal heart rate and patterns, umbilical cord pH and base excess.

Results: No statistically significant difference was found in the fetal outcomes, as measured by cord venous blood gas, apgar scores and the mean duration of late deceleration in the second stage of labour. Episiotomy rate in the directed pushing group was significantly higher compared to the spontaneous pushing group. The duration of the second stage of labour was longer for women in the directed pushing group, which also showed a slightly higher rate of instrumental deliveries.

Conclusion: No significant risks are associated with using spontaneous pushing during the second stage of labour. The spontaneous pushing method could help to minimise perineal trauma and reduce the rate of instrumental delivery. It could also shorten the second stage of labour.

Category: Nursing ASM2011-NUR-023

Preschool screening for learning difficulties in children with chronic medical conditions: a nurse-based screening programme

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Introduction: Preschool children with chronic medical problems have a high risk for learning difficulties that could have detrimental effects on their overall school achievement. A nurse-based screening programme, supported by a HQIIF grant, was started to ensure early identification and intervention of these learning difficulties during the kindergarten years. Families do not pay for this screening, which includes fine and gross motor skills, concepts, speech and language, literacy, working memory, numeracy, handwriting, behaviour, self-help and social development. The paper presents the results of the first phase of the programme.

Methods: The data was obtained from prospectively maintained records of screening in the programme.

Results: A total of 35 referrals were seen from neonatology (91%), genetics (5.7%) and neurology (2.9%). Three parents

(8.6%) declined screening for their wards and eight children (22.9%) were not screened as they were younger than five years. 24 children (68.6%) were screened (mean age 65.0 ± 6.4 months). Ten children (40%) needed referrals to the Department of Child Development for further management. Four children (16.6%) were identified with global developmental delay/intellectual impairment. 16 children (66.6%) required intervention at the Department of Rehabilitation. Of the seven children with no overt problems, three required referrals for occupational therapy or physiotherapy. The majority of problems identified had not been recognised prior to screening. Only four children (16%) did not require any additional services.

Conclusion: The nurse-based screening programme helps in early identification and intervention for learning difficulties in children with medical conditions that place them at risk.

Category: Allied Health ASM2011-AHS-001

Liver and cardiac iron measurements in thalassaemia patients: initial experience with gradient echo T2* sequence

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Introduction: Thalassaemia is the most common genetic disorder worldwide. In Singapore, at least 150,000 among the population possess one of these abnormal genes. The study aimed to develop a non-invasive magnetic resonance (MR) imaging technique for quantifying liver and myocardial iron depositions for timely diagnosis and intervention in such individuals.

Methods: Between 1 February 2010 and 1 November 2010, 15 thalassaemia major patients and two healthy volunteers were scanned using a 1.5T GE HDxt MR imaging system (Milwaukee, USA) at our hospital. The T2* values (ms) of the liver and myocardium were acquired at 8 echo times. A trendline was produced to demonstrate an exponential T2* decay curve. Coloured parametric maps were produced for the liver and

myocardium, with red representing higher iron concentration and blue/green representing normal iron concentrations.

Results: For the patients tested, the T2* values of the myocardium (range 22.8–58.9 ms, mean 38.9 ms) and liver (range 0.6–6.8 mg/g, mean 3.3 mg/g) suggested mild iron overloads. For the volunteers, the T2* values suggested normal iron concentrations for the myocardium (range 24.6–26.3 ms, normal values > 20 ms) and liver (range 1.2–1.4 mg/g, normal values < 2 mg/g).

Conclusion: This initial study of iron deposition in the heart and liver of thalassaemia major patients demonstrated that a multiple-gradient echo T2*-weighted fast gradient-recalled echo sequence is a useful, reproducible and non-invasive alternative for the rapid and accurate assessment of myocardial and liver iron deposition in such patients.

Category: Allied Health ASM2011-AHS-010

Performance of Singaporean children in Clinical Evaluation of Language Fundamentals Preschool 2-United Kingdom (CELF Preschool 2-UK)

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Introduction: In Singapore, standardised language assessment tools are often selected to determine if a child is at risk of language difficulties. These tools are commonly constructed and normed based on monolingual Anglo-American children. The use of such assessment tools for children in Singapore may result in test bias, reducing the sensitivity and specificity of resultant clinical diagnoses. The purpose of this study was to analyse the performance of Singaporean English-Mandarin bilingual children in the Expressive Vocabulary (EV) subtest of the Clinical Evaluation of Language Fundamentals Preschool 2-United Kingdom (CELF Preschool 2-UK) assessment tool.

Methods: A total of 79 Singaporean ethnic Chinese children (age 4–5 years), with no known speech, language and sensory difficulties were recruited. The EV subtest was administered to

each participant in a controlled single sitting.

Results: A one-sample *t*-test analysis showed that the Singaporean sample achieved significantly lower scores than the UK standardisation sample ($t[78] = -8.801, p < 0.001$).

Conclusion: Local children performed poorly in the EV subtest, as compared to their UK counterparts, perhaps for the following reasons: (1) a single measure in English which does not take into account the language abilities of local bilingual children in their second language; and, (2) the presence of culturally and linguistically biased test items. Thus, the use of standardised assessment tools, like CELF Preschool 2-UK, should be checked for the presence of biased test items and modified appropriately. Future studies should include the collection of local normative data before utilising the tool for Singaporean children.

Category: Multidisciplinary ASM2011-MD-008

Laboratory experience with the VPIII DNA probe test for *Gardnerella vaginalis*, *Candida* spp. and *Trichomonas vaginalis*

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Introduction: Vaginitis is one of the most common problems encountered in clinical medicine. The three main aetiologies of vaginitis are bacterial vaginosis (BV), yeast vaginitis (candidiasis) and trichomoniasis. The VPIII test is a DNA probe test for the detection and identification of *Gardnerella vaginalis* (associated with BV), *Candida* spp. and *Trichomonas vaginalis* in vaginal specimens. The VPIII test is based on nucleic acid hybridisation followed by enzymatic detection (colour change). The test requires about one hour.

Methods: 31,002 vaginal swab samples from patients were tested over a five-year period between 2006 and 2010. Samples were tested for positive response and results were analysed.

Results: A total of 17,813 specimens were positive for single or multiple pathogens. Positive results were obtained for *G. vaginalis* (n = 12,544, 70.4%), *Candida* spp. (n = 8,437, 47.4%)

and *T. vaginalis* (n = 523, 2.9%), including patients with more than one simultaneous infection. Many specimens were found to be positive for multiple infections — 3,461 (*G. vaginalis* plus *Candida* spp.), 121 (*Candida* spp. and *T. vaginalis*), 19 (*G. vaginalis* and *T. vaginalis*) and 10 (all three pathogens positive). Patients were also grouped into different age groups as those below 20 years (n = 1,256, 7.0%), between 21–30 years (n = 7,476, 42%), between 31–40 years (n = 5,549, 31%), between 41–50 years (n = 2,583, 14.4%) and over 50 years (n = 1,019, 5.6%).

Conclusion: The VPIII test is useful and convenient for the diagnosis of vaginal infections. Our experience shows that *G. vaginalis* is the commonest cause of vaginal infections, followed by *Candida* spp. The young and sexually active are most vulnerable to these infections. Simultaneous infections by more than one organism are also common.

Category: Medical ASM2011-MED-009

Rhabdomyosarcoma: our experience in Singapore

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Introduction: This study aimed to determine the clinical profile and outcome of rhabdomyosarcoma (RM) patients in Singapore.

Methods: A detailed retrospective analysis of 56 patients who were diagnosed and treated for RM at National University Hospital and KK Women's and Children's Hospital between April 1993 and February 2010 was conducted.

Results: There were 18 girls (32.1%) and 38 boys (67.9%) in the study group, with a medium age of 6.3 (range 0.1–17.3) years. The median follow-up period was for 2.5 (range 0–15.6) years. Primary tumour sites included the head and neck region (n = 22, 39.2%), abdomen (n = 5, 8.9%), central nervous system (n = 1, 1.7%), genitourinary system (n = 19,

33.9%) and the extremities (n = 10, 17.8%). RM subtypes seen included the embryonal (n = 23, 41%), alveolar (n = 15, 26.7%) and undifferentiated (n = 18, 32.1%) types. Patients were categorised as high risk (n = 14, 25%), intermediate risk (n = 21, 37.5%) or low risk (n = 19, 33.9%) according to Intergroup Rhabdomyosarcoma Study Group (IRSG) classification. The risk stage was unknown for two patients. Patients' treatments were mainly based on the IRSG regimen (n = 25, 44.6%) and Society of International Pediatric Oncology (SIOP) protocol (n = 19, 33.9%); treatment options were unknown for the remaining patients (n = 12, 21.4%). Patient outcome at the time of analysis included patients alive with no evidence of disease (n = 45, 80.3%), those alive with disease (n = 2, 3.5%) and those that had died of disease (n = 9, 16%).

Conclusion: Our experience demonstrates that the head and neck region is the most common primary site of RM, with its embryonal subtype being the most prevalent. Although a

majority are of intermediate risk, survival is excellent. Further research with standardisation of treatment protocols and a multidisciplinary approach is warranted for optimal cure.

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Category: Medical ASM2011-MED-022

Retrospective study of patients who underwent tension free vaginal tape in 2004: a five-year review

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Introduction: Stress urinary incontinence (SUI) is an important health concern in women and significantly affects quality of life. The current study aimed to evaluate the efficacy, safety and long-term complications of tension-free vaginal tape (TVT) for female SUI over five years.

Methods: This was a retrospective observational institutional study. All women who underwent TVT in 2004 were included in the study. The case records were reviewed for patient profile, preoperative evaluation, operative details and complications. Postoperative evaluation was done at six months, one year and yearly for five years thereafter. The data were analysed using the Statistical Package for the Social Sciences (SPSS).

Results: A total of 176 patients underwent TVT in 2004. The

long-term subjective cure rate at the end of six months, one year and five years was 89.0%, 86.5% and 66.4%, respectively. Additionally, 11.9%, 12.5% and 24.0% of patients showed improvement in leakage at six months, one year and five years, with an overall patient satisfaction rate of over 90% at one year and five years. Intraoperative bladder perforation was noted in five patients (2.1%). Postoperative voiding difficulty was reported by four patients (3.1%) at six months and 13 patients (7.4%) at five years. Tape erosion was noted in three patients (2.4%) at the end of six months and only one patient (1.0%) at the end of five years.

Conclusion: Based on the current available data, TVT is considered a safe and effective minimally invasive surgical alternative for women with SUI. Long-term satisfaction and cure rate needs further study and evaluation.

Category: Medical ASM2011-MED-027

Risk factor assessment after mid-urethral sling surgery for stress urinary incontinence at one year

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Introduction: This study was performed to evaluate predictive factors affecting the one-year continence rates after mid-urethral sling (MUS) procedures (such as tension-free vaginal tape [TVT] and TVT-obturator [TVT-O]) in patients with stress urinary incontinence (SUI) or urodynamic stress incontinence (USI).

Methods: A retrospective review was performed for patients who received MUS procedures between October 2001 and December 2006. Patients with a minimum follow up of one year were included in the study. The Independent Sample *t*-test, Fisher's exact test and Pearson's chi-squared test were used to calculate significance.

Results: Of the 217 patients included, 201 patients (92.6%) were cured at one year while the procedure failed for 16 patients (7.4%). In persistent SUI, there was a trend of instrumental deliveries (0.38 vs. 0.19, *p* = 0.16). Previous continence surgery did not worsen outcomes, contrary to previous published data (3.0% vs. 6.3%, *p* = 0.42). Preoperative voiding dysfunction was a significant predictor for failure (12.4% vs. 31.3%, *p* = 0.04). There was a trend toward increased failure when a concomitant anterior colporrhaphy was done (71.1% vs. 93.8%, *p* = 0.08). The six-month postoperative subjective questioning and urodynamic test was highly predictive for one-year failure. Patients with initial voiding difficulty (OR 3.48) and anterior repair (OR 6.08) had persistent SUI. At six months, persistent

SUI (OR 31.83) and persistent USI (OR 35.37) indicated MUS failure at one year.

Conclusion: Instrumental deliveries, preexisting voiding

difficulties and persistent signs and symptoms six months after surgery appear to worsen one-year failure rates following MUS procedures. Future prospective trials would be useful in further elucidating risk factors for failure.

Category: Medical ASM2011-MED-054

Neonatal outcome of the late preterm infant (34–36 weeks): the KKH experience

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Introduction: Late preterm (LP) neonates (34–36 weeks) are often considered to be healthy. However, they have a higher risk for morbidity and increased healthcare resource utilisation. This study aimed to identify the trends of incidence of LP deliveries from 2002–2008, evaluate and compare neonatal morbidity and mortality in LP versus term infants and assess resource utilisation among LP infants.

Methods: A retrospective analysis was conducted of LP and term infants born at KK Women's and Children's Hospital, Singapore, between 1 January 2001 and 31 December 2008 using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes. The data were analysed using the Statistical Package for the Social Sciences (SPSS, version 16).

Results: Of 12,459 deliveries, LP deliveries ($n = 1,221$, 10%) showed a significantly increasing trend over the last seven years ($p < 0.001$). Compared to term infants, LP infants had significantly higher incidence of lower uterine segment caesarean section (LSCS) deliveries (45% vs. 27.5%, $p < 0.001$; OR 2.16,

95% CI 1.9–2.4) and low apgar scores at 1 and 5 minutes ($p < 0.001$). A greater number of LPs had birth weight < 2 kg compared to term infants (12.5% vs. 0.2%, $p < 0.001$). Neonatal complications were significantly higher ($p < 0.001$) in the LP group: hypoglycaemia (17% vs. 1%), hypothermia (2.2% vs. 0.2%), feeding difficulties (12.4% vs. 1.4%), respiratory distress syndrome (1.8% vs. 0.1%), transient tachypnoea of the newborn (1.4% vs. 0.1%) and neonatal jaundice (24% vs. 8%). Resource utilisation, including intermittent positive pressure ventilation (6.1% vs. 1%), total parenteral nutrition therapy (23.2% vs. 3%) and length of stay (5.8 days vs. 2 days), was significantly higher in the LP group.

Conclusion: An increasing trend of LP deliveries was observed over the last seven years with significantly higher neonatal morbidity and resource utilisation in the LP group compared to term infants. There is a need to educate healthcare providers about the vulnerability of LP infants and to define guidelines for the evaluation, monitoring and follow-up care of such infants.

Category: Medical ASM2011-MED-057

Lifestyle habits as risk factors for threatened miscarriage

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Introduction: Threatened miscarriage occurs in 20% pregnancies and can cause complete miscarriage in up to 30% of patients. Our study aimed to assess the association of maternal lifestyle factors with threatened miscarriage during the first trimester.

Methods: A case-control study was conducted at KK Women's and Children's Hospital from November 2010 to February 2011.

Patients were defined as women with per vaginal bleeding between 5–10 weeks of pregnancy. Controls were asymptomatic women seen at the antenatal clinics between 5–10 weeks of pregnancy. We recruited 424 pregnant women (158 patients and 266 controls). Data were analysed by univariate and multivariate statistical methods. Lifestyle factors, such as smoking, use of computer/handphone and fish oils/cafeine/alcohol consumption, were assessed as risk factors for threatened miscarriage.

Results: Women reporting exposure to second-hand smoke at home (OR 3.8, 95% CI 2.50–5.7), higher computer usage (> 4 hours/day) [OR 3.9, 95% CI 2.5–5.9] and higher handphone usage (> 1 hour/day) [OR 4.6, 95% CI 2.8–7.6] had a significantly increased risk for threatened miscarriage as compared to those who did not. Consumption of fish oils protected against miscarriage risks (OR 0.17, 95% CI 0.09–0.32). Caffeine and alcohol intakes

were not associated with increased risk for threatened miscarriage.

Conclusion: Lifestyle factors, such as prolonged handphone/computer usage and second-hand smoking, are risk factors for threatened miscarriage. Consumption of fish oils protects against it. Early modification of undesirable lifestyle behaviours may therefore benefit women at risk of miscarriage.

Category: Medical ASM2011-MED-074

Predictive validity of Bayley MDI at 2 years for assessing cognitive outcome at 5.5 years in extremely low birth weight infants

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Introduction: Psychometric scores at 2 years are used for predicting school-age cognitive function and establishing guidelines for counselling in extremely preterm deliveries. We aimed to determine the predictive value of two-year Bayley II-mental development index (MDI) scores for assessing cognitive function at 5.5 years in extremely low birth weight (ELBW) survivors.

Methods: A longitudinal study was conducted of 298 ELBW survivors (2000–2004). The Bayley Scales of Infant Development, Second Edition (BSID-II) and Full Scale Intelligence Quotient (FSIQ) test at two and 5.5 years, respectively, were compared in 201 ELBW survivors. The predictive values were calculated using Pearson's correlation and the positive and negative predictive values (PPV, NPV). Cognitive impairment was defined as MDI or FSIQ scores < 70. Neurosensory impairment (NSI) included cerebral palsy,

deafness or blindness. Cognitive outcomes were compared in the presence and absence of NSI.

Results: Mean birth weight and gestation of the 201 infants studied were 824 ± 127 g and 26.7 ± 2.1 weeks, respectively. The mean MDI and FSIQ scores at two years were 77 ± 18 and 89 ± 14 , respectively. Significantly lower MDI (62 ± 15) and FSIQ (71 ± 17) scores were seen in the presence of NSI. Cognitive impairment decreased from 38% at two years to 8.5% at 5.5 years ($p < 0.001$). The PPV for FSIQ < 70, in presence of MDI < 70, was 0.17; PPV was even lower at 0.08 in the absence of NSI. In the presence of NSI, PPV of MDI was 0.7. MDI > 70 had high NPV of 0.96.

Conclusion: MDI < 70 at 2 years is a poor predictor of cognitive outcome at 5.5 years, especially in the absence of NSI. MDI > 70 has a good NPV at 5.5 years. Caution should be exercised when using MDI at 2 years for developing guidelines for extremely preterm infants.

Category: Medical ASM2011-MED-092

Detection of subtelomeric genetic aberrations in patients with developmental delay and/or multiple congenital anomalies by multiplex ligation-dependent probe amplification

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Introduction: In addition to gross chromosomal imbalances, subtle changes in the subtelomeric regions have recently been reported to be associated with developmental delay and multiple physical anomalies. The aim of this study was to assess the feasibility of using multiplex ligation-dependent probe amplification (MLPA) for the detection of subtelomeric aberrations.

Methods: Upon informed consent, 52 patients were recruited. MLPA (SALSA MLPA P070 human telomere-5 probe mix) reaction was carried out using DNA extracted from whole blood. Fluorescence *in situ* hybridisation (FISH) was performed to confirm the positive MLPA results wherever possible.

Results: Of 52 patients analysed, nine had subtelomeric genetic aberrations — two had 6p deletion; two had Xq

deletion; and, one patient each had 4p, 4q, 8p, 16p deletions and 12p duplication. The pickup rate was 17.3%. The 6p, 8p, 12p and 16p deletions were confirmed by either FISH or karyotyping. One of the Xq deletions was not detected on FISH and two (4p and Xq) were pending FISH analysis. The 4q deletion was not confirmed by FISH, as the sample was not sent for cytogenetics tests.

Conclusion: MLPA analysis can detect small genetic imbalances that are often missed by conventional tests. It can be processed using frozen blood samples and takes shorter time when compared to cytogenetics tests (1.5 days vs. 6 days). Subtelomeric MLPA is thus useful for further investigating the cause of developmental delay or multiple physical anomalies in patients with negative results for conventional tests.

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Category: Medical ASM2011-MED-001

Compliance of the Boston brace versus SpineCor for adolescent idiopathic scoliosis

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Introduction: This study aimed to compare the compliance rates for the Boston brace against that of SpineCor in patients with adolescent idiopathic scoliosis (AIS).

Methods: Patients from our centre with AIS, who satisfied Scoliosis Research Society (SRS) criteria for bracing, were included in the study. Demographic data and brace type were captured at chart review. Data on brace compliance and any issues associated with the brace were collected via phone interviews, which were carried out no sooner than 3 months after brace commencement.

Results: Between July 2008 and December 2009, 53 women (mean age 12 years) were recruited for study and advised to

wear the brace for 20 hours a day. 20 patients chose SpineCor, while 33 chose the Boston brace. The average time of wear for SpineCor was 17.1 ± 5.17 (range 8–20) hours while that for the Boston brace was 9.79 ± 4.37 (range 1–20) hours; the difference in compliance was statistically significant ($p = 0.000$). Patients who chose SpineCor found the brace more acceptable and were generally happy with it: it was not excessively warm, allowed for some flexibility and could be worn discreetly under clothing.

Conclusion: Compliance with SpineCor was significantly better when compared with the Boston brace. Efficacy studies will help us understand whether improved brace compliance translates into better control of scoliosis.

Category: Medical ASM2011-MED-002

Displaced supracondylar humeral fractures: beware the medial spike!

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Introduction: In a supracondylar humeral fracture (SHF) with posterolateral displacement, an oblique fracture line is sometimes associated with a sharp medial spike of the proximal fragment. We aimed to determine whether this fracture configuration had any bearing on closed reduction and percutaneous pinning (CRPP).

Methods: The preoperative radiographs of all surgically stabilised SHFs between 2006 and 2008 were reviewed. Patients with a medial spike were identified. The shortest distance between the tip of the medial spike and the adjacent skin surface (tip-skin distance) was measured on coronal radiographs. Data on operative time, need for open reduction and pre- and post-operative problems were obtained from clinical charts. Controls were randomly selected.

Results: 17 patients (3.4%) with a medial spike were identified

among a total of 494 surgeries done for displaced SHFs. 34 patients were included in the study as controls. Two of 17 patients (11.8%) required open reduction, while the remaining 15 and controls received successful closed reductions. Mean tip-skin distance was 6.6 mm in the spike group and 17.9 mm in the control group ($p = 0.003$). Mean operative time for CRPP was 28.1 minutes for the spike group and 16.6 minutes for controls ($p = 0.003$). The presence of a medial spike was significantly associated with the need for an open reduction ($p = 0.042$). There was no significant difference between the groups with regard to preoperative ($p = 0.057$) and postoperative ($p = 0.565$) problems.

Conclusion: A medial spike in a displaced SHF whose tip lies close to the adjacent skin surface should be recognised as a sign that CRPP may be difficult; open reduction is sometimes necessary for such patients.

Category: Medical ASM2011-MED-003

Correlation of radiographic features with neurovascular injury in displaced paediatric supracondylar fractures

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Introduction: Previous studies have noted a relationship between neurovascular injuries and Gartland type III supracondylar humeral fractures. However, there is no consensus on whether the degree of displacement in these fractures contributes to a higher risk of neurovascular compromise. This study aimed to determine the incidence of neural and vascular injuries associated with the fracture and the relationship of fracture displacement to neural and vascular compromise.

Methods: A retrospective review of the clinical records of 598 children treated for isolated type III extension supracondylar humeral fractures during a 48-month period from January 2005 to December 2008 was performed. Patients with neurovascular injuries were identified. Data on the direction and distance of displacement were recorded from preoperative radiographs (anteroposterior/lateral view). A comparison was made with randomly selected controls.

Results: 49 patients (8.2%) showed neural compromise, vascular

compromise or both. Nerve injuries were seen in 18 patients (3%), vascular compromise occurred in 19 patients (3.2%) and combined nerve and vascular compromise was seen in 12 patients (2%). Nerve injuries included median (n = 18, 52.9%), radial (n = 12, 35.3%) and ulnar (n = 4, 11.8%) lesions. Posterolateral fracture displacement was correlated with median nerve and vascular compromise. Posteromedial fracture displacement strongly correlated with radial nerve injury (p = 0.025). The difference between the mean displacement distance, as seen from the preoperative radiographs (anteroposterior vs. lateral), for patients with neurovascular compromise (18.7 mm vs. 20.48 mm) and controls (15.8 mm vs. 15.49 mm) was significant (p = 0.005).

Conclusion: Recognition of fracture displacement patterns aids in the clinical examination and assessment of associated neural injury, especially in a child who is uncooperative. The distance of displacement is indeed significant for predicting neurovascular injury.

Category: Medical ASM2011-MED-005

Unilateral twin (live) tubal ectopic pregnancy: a case report

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We report a woman with live twin tubal ectopic pregnancies, whose condition was identified and managed at an early stage using 24-hour facilities, such as quantitative β -human chorionic gonadotropin (BHCG) and high-resolution transvaginal colour flow Doppler. Methotrate was administered for suboptimal fall in BHCG during the postoperative period, which optimised the patient's quick recovery without any complications. Early diagnosis of such ectopic pregnancies is possible in a clinically

stable condition and appropriate early surgical intervention with postoperative BHCG monitoring is viable for such women. Increased awareness regarding atypical presentations and appropriate guidelines for the management of ectopic pregnancies can help avoid missing or delayed diagnosis for such patients and thus reduce maternal morbidity. This report presents key details of a unique case that was managed recently at our tertiary referral centre.

Category: Medical ASM2011-MED-007

Ingrowing toenails in children: the quest for a long-term solution

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Introduction: Ingrown toenail (IGTN) or onychocryptosis is generally considered to be a minor problem in surgical practice. For patients, however, it is often a lasting nuisance. Although many procedures have been described for its treatment in the past decade, none has proved to be entirely satisfactory.

Methods: All children and adolescents who presented to our department with IGTN between 2007 and 2009 were included in the study. Data recorded included that on demographics, treatment prescribed and outcome at 6 months.

Results: 151 patients, including 80 boys (53.0%) and 71

girls (47.0%), were recruited for the study (median age 13.8 years, range 0.43–16.0 years). 77 toes (60.6%) were treated conservatively (nail care advice, antibiotics, daily cleansing) while 74 toes (49.0%) were treated surgically. In the operative group, 48 toes (64.9%) needed wedge resections while the remaining 26 (35.1%) had total nail avulsions. At six months, seven recurrences (9.1%) were seen in the conservative group while 13 recurrences (17.6%) were found in the operative group.

Conclusion: For children, the recurrence rate for IGTN treated conservatively is lower than that for those treated operatively.

Category: Medical ASM2011-MED-008

Pattern of fracture in non-accidental injuries in the Singapore paediatric population

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Introduction: Recognition of the characteristics of non-accidental fractures helps to guide clinical practice and initiate child protection. The aim of our study was to describe the patterns and risk factors associated with fractures from non-accidental injuries (NAI) in children in Singapore.

Methods: A retrospective study was conducted of the children admitted for NAI between 2007 and 2009. Data evaluated included demographic data and risk factors associated with child abuse.

Results: Out of 978 children admitted for NAI, 570 (58.28%) were diagnosed with injuries. The majority (n = 302, 52.9%) were Chinese (male-to-female ratio 2:1). NAI fractures were most common for female infants. The commonest perpetrator was the biological father (n = 194, 34.03%); the perpetrator was unknown for 40% fractures (n = 14). Physical abuse was reported by all patients, contributing to 97.1% of all fractures. Many

patients (n = 304, 53.3%) had soft tissue injuries. Radiographs were needed for 228 children (40%), among who 106 (46.5%) also needed skeletal surveys. Closed fractures were detected in 35 children (6.14%), with humerus (n = 10, 28.57%) being the commonest site. Divorced parents were seen for 166 children (29.12%) and 77 patients (13.5%) reported repeated abuse. 32 children (5.6%) had preexisting illness. Age < 1 year, parental divorce and unknown perpetrators were found to be significant risk factors for fractures from NAI.

Conclusion: The patterns of skeletal injuries and risk factors revealed in this study have helped to identify causal factors associated with fractures from NAI and highlight the importance of the prevention of repeated abuse and the subsequent physical and psychological morbidities in at-risk children. A holistic approach is needed to address the contributing issues, such as broken homes, neglect and pre-existing illness, in this problem.

Category: Medical ASM2011-MED-010

Is prophylactic atropine necessary during ketamine sedation in Asian children?

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Introduction: Ketamine is a dissociative anaesthetic drug used in children for its sedative and analgesic properties. Coadministration of atropine with ketamine is used to prophylactically counteract the hypersalivation side effect of ketamine, although the practice is not standardised among institutions. The use of atropine with ketamine may also result in increased side effects. The clinical significance of hypersalivation as a result of ketamine use is not determined in Asian children. The necessity of atropine as an adjunct is thus questionable, as studies have shown inconsistent outcomes.

Methods: This retrospective study of paediatric patients who received ketamine for procedures done between July and September 2010 at the Department of Children's Emergency, KK Women's and Children's Hospital, Singapore, was approved by the institutional review board. Patients given atropine were compared to those who did not receive atropine with regard to

clinically significant hypersalivation and other intervention-based side effects.

Results: Out of 283 patients, 119 (42%) were not given atropine. None had clinically significant hypersalivation. All three patients (1.1%) who desaturated had airway malalignment and were aged between 1–5 years. Two of five patients (1.8%) who vomited received atropine ($p = 0.35$). No other side effects were recorded in the study group.

Conclusion: Ketamine is a relatively safe drug for children with appropriate indications. Administering atropine with ketamine did not protect against clinically significant hypersalivation or result in more side effects. The omission of atropine therefore can be considered during ketamine sedation. More studies are needed to establish the use of atropine with ketamine sedation.

Category: Medical ASM2011-MED-012

Single-breath inhalation induction with sevoflurane in children: with or without nitrous oxide?

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Introduction: Single-breath vital capacity (SB-VC) inhalation induction with sevoflurane is a rapid and 'needleless' technique that is preferred and well-tolerated in a cooperative child. Despite its postulated concentration and second gas effects, studies conducted in adults have not shown a more rapid induction of anaesthesia with the addition of nitrous oxide (N_2O). Our aim was to investigate the effect of N_2O on the time for single-breath (SB) inhalation induction with sevoflurane in children.

Methods: 80 unpremedicated ASA (American Society of Anesthesiologists) I and II paediatric patients (age 5–15 years) undergoing elective surgical procedures under general anaesthesia were recruited and randomised into two groups — group A (8% sevoflurane in O_2 6 L/minute) and group B (8% sevoflurane in N_2O 4 L/minute and O_2 2 L/minute). The primary outcome was time (seconds) to loss of eyelash reflex. Secondary outcomes were the times to achieve five regular tidal

breaths and centralisation of pupils. Outcomes were assessed by an independent observer, who was blinded to the group assignment.

Results: The time to loss of eyelash reflex was significantly shorter for group B (duration 53.57 ± 16.07 seconds) when compared to group A (duration 63.46 ± 53.57 seconds) [mean difference 9.88, $p < 0.01$]. Differences in secondary endpoints were not statistically significant for the two groups. Group B patients had less excitatory movements ($p = 0.007$), but the incidence of other adverse events (e.g. cough, laryngospasm, breath holding, secretions, desaturation) was low and did not differ significantly between the two groups.

Conclusion: We conclude that for SB-VC inhalation induction, the addition of N_2O resulted in faster loss of consciousness and reduced excitatory movements.

Category: Medical ASM2011-MED-013

Tetrasomy 12p (Pallister-Killian syndrome)

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Introduction: Tetrasomy 12p (Pallister-Killian syndrome) is a rare chromosomal disorder where there are four copies of the short arm (p) of chromosome 12 in some cells of the body. These four copies of 12p are present as a small extra chromosome made up of two copies of 12p in the form of an isochromosome. The characteristic clinical features are craniofacial abnormalities, coarse face, pigmentary skin anomalies, profound mental retardation and seizures. A 3-month-old baby was referred for blood karyotyping with indications of dysmorphism, imperforate anus and short limbs.

Methods: Chromosomal analysis was performed on G-banded metaphases from the patient's peripheral blood. Additional investigations using fluorescence *in situ* hybridisation (FISH) probe for subtelomeric 12p and whole chromosome paint 12 (WCP12) were performed.

Results: As the routine analysis of 15 metaphases revealed a metaphase with an additional marker chromosome, an

additional work-up of 30 metaphases was conducted to rule out the abnormality. A similar marker chromosome was detected in another metaphase from another culture, which was further confirmed and identified as an isochromosome of the short arm of chromosome 12 using FISH.

Conclusion: This patient was reported as 47,XY,+? i(12)(p10) [2].ish i(12)(WCP12+)/46,XY[43], where a very low mosaic tetrasomy 12p was detected in the peripheral blood. Non-mosaic tetrasomy 12 is probably incompatible with intrauterine survival. The incidence of metaphases containing the isochromosome is 0%–2% in lymphocytes and 50%–100% in fibroblasts, which is why the disorder is usually underdiagnosed. Clinical recognition is important in order to initiate necessary cytogenetic investigations. Analysis of skin fibroblasts might be required to establish the diagnosis. Skin culture was not required for the present patient, however, as the marker chromosome was identified and confirmed as an isochromosome 12p using FISH.

Category: Medical ASM2011-MED-014

Fetal sacrococcygeal teratoma: our experience

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We present the diagnosis and management of two patients with sacrococcygeal teratoma (SCT) at KK Women's and Children's Hospital, Singapore, between 2008 and 2009. In patient 1, SCT was diagnosed at 17 weeks of gestation. The patient was regularly followed up at the Fetal Medicine Clinic, with fortnightly ultrasonographs for monitoring tumour size, fetal growth and signs of hydrops fetalis. A girl (birth weight 4.47 kg) was delivered by uncomplicated elective lower segment caesarean section (gestational age 37 weeks 3 days; apgar scores 9 at 1 and 5 minutes). The patient underwent an uneventful resection of the SCT on day 1 of life.

Postoperatively, the patient recovered well and was discharged on day 13 of life. In patient 2, SCT was diagnosed at 20 weeks of gestation. Three *in utero* fetal blood transfusions were performed in view of hydrops fetalis and anaemia, and a boy (birth weight 3.59 kg) was delivered by uncomplicated elective lower segment caesarean section (gestational age 28 weeks 6 days). A large friable SCT, measuring 16.0 × 13.0 × 14.5 cm, with massive haemorrhage complicated by disseminated intravascular coagulation was identified. The infant died 30 minutes after birth despite maximal active resuscitative efforts.

Category: Medical ASM2011-MED-015

Childhood cancer and its impact on the family: an Asian experience

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Introduction: There is a lack of available information on the impact of childhood cancer on families in Singapore. This study aimed to assess the medical and non-medical costs of childhood cancer and its psychosocial impact in the local context.

Methods: All patients diagnosed and treated at the paediatric departments at KK Women's and Children's Hospital and National University Hospital were included in the study. Families were given two self-administered questionnaires. The total score was obtained by summation of all scores, with high scores correlating to high impact. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS, version 7.0).

Results: 79 parents were enrolled during the study period (October 2008 to February 2009). There were 48 boys (61%) in the group and 57 respondents (72%) were mothers. Children were categorised based on age as < 5 years (51%), 5–10 years (25%) and > 10 years (24%). A majority of the patients were

Chinese (54%), with Malays and Indians accounting for 13% of the group. 56% of patients had haematological malignancies while 38% had solid tumours. Key study findings on the domains indicated that: (1) financial burden was reportedly higher than in studies from the United States and Italy; (2) familial/social burden was not reported as a high disruption by Malay or Indian caregivers ($p = 0.05$); (3) psychological burden was reported by all Malay or Indian caregivers as 'low-moderate,' but as 'high' by a large proportion of Chinese respondents ($p = 0.03$); and, (4) mastery was reportedly highest for the Chinese within all ethnic subgroups ($p = 0.001$). Internal reliability according to Cronbach's alpha was 0.64.

Conclusion: Overall, the burden of childhood cancer in Singapore is comparable to that in other countries. However, a higher impact was seen in the domains of financial burden and social/familial impact. Factors associated with high impact were ethnicity, employment status and leave status.

Category: Medical ASM2011-MED-016

Acceptability and outcome of treatment for postnatal depression

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Introduction: The Mental Wellness Service provides treatment for women with postnatal depression (PND). Previous two years' data were examined to determine the acceptance of treatment among affected women and postintervention outcomes.

Methods: From April 2008 to March 2010, screening using Edinburgh Postnatal Depression Scale (EPDS) was offered to all women ($n = 4,283$) attending their first postnatal appointment at two obstetric clinics. High scorers were offered psychiatric intervention. Baseline symptom severity was assessed using EPDS, functional status using Global Assessment of Functioning scale and health-related quality of life using the Euroqol questionnaire. Patients were reassessed using the same scales upon discharge or six months later — whichever was earlier — and asked to rate their satisfaction with treatment.

Results: 3,084 women completed screening, of which 173 (5.6%) obtained EPDS scores of 11–12, indicating possible PND. All 173 accepted intervention by a psychiatric case manager. While 245 women (7.9%) obtained scores of ≥ 13 , indicating probable PND, only 86 women accepted intervention by a psychiatrist. 64 out of 259 women who accepted intervention completed treatment. Postintervention assessment revealed that: (1) 97% showed $\geq 20\%$ improvement in symptom severity; (2) 98% showed improved functioning; (3) 89% showed improved health-related quality of life; and, (4) 88% expressed satisfaction with treatment.

Conclusion: PND is common but acceptance of intervention is low. However, most women who underwent treatment were satisfied with it. Efforts should be made to increase awareness of this illness and reduce the stigma associated with it, as treatment is effective and improves quality of life.

Category: Medical ASM2011-MED-017

Non-immune hydrops fetalis at KK Women's and Children's Hospital: a six-year experience

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Introduction: To study the profile and identify the causes and outcomes of non-immune hydrops fetalis (NIHF) at KK Women's and Children's Hospital, Singapore, between 2005 and 2010.

Methods: A retrospective review was conducted of the medical records of pregnancies with an antenatal diagnosis of NIHF between 1 January 2005 and 31 December 2010. A data collection sheet was formulated. Clinical information was collected and analysed.

Results: 29 pregnancies with an antenatal diagnosis of NIHF were identified. The women had received chromosome analysis (66%), intrauterine infection screening (59%) and thalassaemia screening (100%) antenatally. The median gestational age at diagnosis was 27 (range 12–37) weeks while that at birth was 33 (range 27–37) weeks; median birth weight of live births was 2,480 (range

1,230–3,900) g. Aetiology found in patients (n = 21, 72%) included cardiac anomalies (n = 5), haematological problems (n = 5), congenital tumours (n = 4), genetic/metabolic disorders (n = 4) and cystic hygromas (n = 3). No cause for NIHF was identified for the remaining eight patients (28%). There were 19 live births — with both survival (n = 8) and death during the neonatal period (n = 11) — and one stillbirth. Nine pregnancies were medically terminated following the NIHF diagnosis.

Conclusion: In this study, almost a third of the NIHF cases spotted had no identified aetiology and the neonatal mortality rate was approximately 58%. Thus, it is important to thoroughly investigate all NIHF, so that its common and known causes are not missed. Further studies are essential to improve our understanding of NIHF.

Category: Medical ASM2011-MED-018

Haemorrhagic cystitis in paediatric haematopoietic stem cell transplant

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Introduction: Haemorrhagic cystitis is a known morbidity in the haematopoietic stem cell transplant (HSCT) setting. This paper describes our experience of 12 years.

Methods: A retrospective chart review was conducted for patients with haemorrhagic cystitis at our children's cancer centre between 1998 and 2010. Data collected included patient characteristics, type of HSCT, description of haemorrhagic cystitis episodes, their management and outcomes.

Results: Seven patients (girls 3, boys 4; age 3–15 years) had haemorrhagic cystitis during the study period. The HSCT indications were chronic myeloid leukemia (n = 1), myelodysplastic syndrome (n = 2), relapsed acute lymphoblastic leukaemia (n = 2), acute myeloid leukaemia (n = 1) and high-risk neuroblastoma (n = 1, autologous HSCT). Conditioning for all allogeneic HSCTs included cyclophosphamide (BuCy

or CyTBI). The onset of haemorrhagic cystitis ranged from day +5 to day +68. Duration was 3–153 days. Urine BK virus was positive for four patients, two of who received intravenous infusions with/without intravesical cidofovir, with unsatisfactory results. All patients received blood product support. Five patients (56%), two of who had BK viruria, required bladder catheterisation, washout and cystodiathermy; one patient needed suprapubic catheterisation. One patient underwent intravesical prostaglandin (PGF2 α) treatment, with disappointing results. Two patients, both BK positive, had spontaneous resolution.

Conclusion: Haemorrhagic cystitis caused significant morbidity in HSCT patients. Although this was a small series, BK viruria did not seem to correlate with severity in the patients reviewed. Optimal management of this problem is still unknown.

Category: Medical ASM2011-MED-019

Hepatocellular carcinoma in children: characteristics and outcome

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Introduction: Hepatocellular carcinoma (HCC) is a rare liver cancer in childhood. Similar to adult HCC, paediatric HCC is highly associated with hepatitis B virus (HBV) as well as other causes of liver cirrhosis. Therefore, the incidence of paediatric HCC is higher in areas, such as Southeast Asia, where HBV is endemic. Patients diagnosed with paediatric HCC from 1997 to 2010 at our centre were reviewed.

Methods: Patients diagnosed with paediatric HCC (age 0–15 years) were included in the study. Data, which was obtained from Singapore Childhood Cancer Registry as well as hospital records, collected included patient demographics, HBV status, staging, treatment and outcomes.

Results: Six patients were diagnosed with paediatric HCC during the study period. A majority of the patients were boys ($n = 5$, 83%) and all patients were Chinese. Mean age at diagnosis was

9.7 (range 6.1–12.7) years. Three patients (50%) were positive for HBV, but none were positive for hepatitis C. Only the three HBV-positive patients had evidence of liver cirrhosis. Four patients (67%) had metastatic disease at diagnosis. One HBV-positive patient underwent initial surgery for resectable disease followed by successful liver transplant. Two patients underwent resection after neoadjuvant chemotherapy. Other treatments for unresectable cases included transarterial chemoembolisation ($n = 2$) and sorafenib ($n = 1$). Only one patient (17%) survived.

Conclusion: Paediatric HCC is rare in Singapore, especially after the introduction of HBV vaccines into the National Childhood Immunisation Programme in 1987. A significant proportion of paediatric HCCs in Singapore now occur in HBV-negative patients with non-cirrhotic livers. Most patients presented with advanced disease and the outcome was dismal.

Category: Medical ASM2011-MED-020

Genetic polymorphisms in the transforming growth factor- β receptor I (TGFBRI) gene in keloid patients

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Introduction: Keloids are characterised by excessive dermal fibrosis. Growth factors, such as transforming growth factor- β (TGFB), have been implicated in the pathogenesis of keloid disease. Studies involving keloid fibroblasts have shown mutations in genes regulating cell death, differential gene expression compared to normal skin and downregulation of genes regulating cell death. An autosomal dominant pattern of inheritance has been suggested for the disease, though never proven. These studies suggest that a genetic basis may be responsible for keloidogenesis.

Methods: Keloid and blood samples were obtained from five unrelated patients undergoing excision of keloids. Keloid fibroblasts were isolated and cultured using a dissociation technique. Fibroblast subculture was repeated until sufficient cells were available for DNA analysis. The primer sequences for TGFB receptor 1 (TGFBRI) gene were obtained from

National Center for Biotechnology Information's (NCBI) probe database. The genetic material from the samples was amplified by polymerase chain reaction using these primers and DNA sequencing of the *TGFBRI* gene was performed. Sequences from blood samples and fibroblasts were compared with each other and with known sequences from the NCBI database.

Results: All ten exons of the *TGFBRI* gene were sequenced. No sequence differences were found between the germline and fibroblast DNAs. Two of five patients had identical variants — one downstream of exon 9 in the 3' UTR and another in intron 4.

Conclusion: Polymorphisms in the *TGFBRI* gene were identified in some patients with keloids. Comparison with normal subjects and investigation of more keloid cases are needed to evaluate the significance of these findings.

Category: Medical ASM2011-MED-021

Immaturity of ganglia in neonates: a case report

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Infants born to mothers with gestational diabetes mellitus have increased risk of perinatal mortality and congenital anomalies. This paper presents a hitherto unreported and rare association of gestational diabetes mellitus and immaturity of intestinal ganglion cells. A newborn, whose mother had gestational diabetes mellitus and was on the insulin regime, developed intestinal obstruction that required ileostomy intervention. Histology showed immaturity of intestinal ganglion cells. The first ileostomy closure at four months broke down due to a non-

functioning distal bowel. The second closure of ileostomy 13 months after the initial stoma closure was uneventful and the baby has since regained its normal bowel function. Ganglion cells have a natural history of maturation. It is an uncommon problem and a rare cause of neonatal intestinal obstruction. The association with gestational diabetes mellitus is hitherto unreported as well. Future studies could attempt the possibility of staging the maturation of ganglion cells, so as to guide the management of immaturity of ganglia.

Category: Medical ASM2011-MED-023

Evaluating the three-year perioperative outcome post Gynecare Prolift[®] system in pelvic organ prolapse surgeries

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Introduction: Pelvic organ prolapse (POP) is a common condition affecting up to 50% of women and its incidence is expected to increase as the population ages. The polypropylene mesh system (anterior, posterior and total Gynecare Prolift[®]), which is designed to provide permanent pelvic floor support with increased durability, was evaluated in this study.

Methods: A retrospective non-funded review of patients who underwent the Gynecare Prolift[®] surgery from January to December 2006 was conducted to determine the three-year perioperative outcome in such patients.

Results: 95 patients received treatment for anterior (n = 54, 56.8%), posterior (n = 6, 6.3%) and total (n = 35, 36.9%) POPs. Mean age of patients was 64.63 ± 9.74 years and there were 35 (36.8%) defaulters in the group. Before surgery, patients presented with associated stress incontinence (n = 25, 26.3%), frequency (n = 15, 15.8%), urgency (n = 23, 24.2%), urge

incontinence (n = 12, 14.5%), anterior POP (n = 93, 97.9%) and posterior POP (n = 90, 94.7%). The mean operative time was 74.67 ± 27.87 minutes, with an average blood loss of 116 mL and hospital stay of 4.81 days. The only intraoperative complication was excessive blood loss (2 L) in one patient (1.1%). Early postoperative complications included haemorrhage/haematoma formation (n = 3, 3.2%), voiding difficulty with urinary retention (n = 4, 4%) and thigh pain (n = 13, 14%). A three-year follow up revealed *de novo* stress urinary incontinence (n = 8, 13.3%), *de novo* urge incontinence (n = 3, 5%), mesh erosion (n = 5, 8.3%), vault prolapse (n = 1, 1.7%) and recurrence of cystourethrocele (n = 6, 10%), but no cases of recurrent rectocele.

Conclusion: Gynecare Prolift[®] is an effective and safe mesh system for the surgical repair of pelvic floor defects in women affected by POP. The three-year overall cure rate was 88.3% and associated complication rates were low.

Category: Medical ASM2011-MED-024

Comparing the two-year perioperative outcome post Gynecare Prolift® system in pelvic organ prolapse surgeries performed in 2006 and 2007

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Introduction: Pelvic organ prolapse (POP) is very common in women, afflicting 50% of parous women over the age of 50 years. The risk of reoperation is 29%.

Methods: A retrospective non-funded review of patients who underwent the Gynecare Prolift® mesh repair surgery between January 2006 and December 2007 was conducted to determine the two-year perioperative outcome in such patients.

Results: 169 patients underwent the Gynecare Prolift® surgery for total (n = 76), anterior (n = 82) and posterior (n = 11) POPs. The incidence of haematoma was lower in 2007, although not statistically significant. Operative blood loss $\geq 1,000$ mL and the number of patients needing blood transfusions were also lower in 2007. One patient (1.4%) had rectal perforation in 2007. Postoperatively, the incidence of thigh and buttock pain

was statistically lower in 2007. However, the incidence of fever, urinary tract infections and the need for catheterisation ≥ 7 days did not reveal statistically significant differences between the two years. At two years, the mesh erosion rates were equal for patients with total and anterior POPs, but lower for those with posterior POPs. 138 patients (81.6%) were available for review at two years. Some patients had recurrent cystourethroceles (n = 9, 6.5%) and recurrent vault prolapse (n = 2, 1.4%); recurrent uterine descent was seen in 2 of nine patients (1.4%) who received total Prolift® and uterine conservation surgeries. The subjective and objective cure rates at two years were 98.7% and 89.6% for 2006 and 100% and 91.8% for 2007, respectively.

Conclusion: At two years, most patients were satisfied with surgical outcome. The complication rates were inversely proportional to the learning curve of the surgeon.

Category: Medical ASM2011-MED-025

Comparing the one-year outcome of the use of Gynecare Prolift® system in pelvic organ prolapse surgeries performed in 2008 as compared to 2006 and 2007

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Introduction: Up to 50% of women are affected by pelvic organ prolapse. Traditionally, pelvic reconstructive surgical techniques with conventional sutures have a failure rate of up to 30%.

Methods: This was a retrospective non-funded review of patients who underwent the Gynecare Prolift® surgery from January 2006 to December 2008 to compare the one-year outcomes of these patients.

Results: 254 patients were included in the study. Patients with total Prolift® had higher incidence of haematoma, intraoperative blood loss $\geq 1,000$ mL, urinary tract infections, catheterisation ≥ 7 days, and rectal perforation as compared to the other two Prolift® types. There were no cases of buttock pain and thigh pain was

significantly lower in 2008. No statistically significant differences were found for mean operating times and length of hospital stay. However, intraoperative blood loss, haematomas, bleeding $\geq 1,000$ mL, number of patients requiring blood transfusions, duration of catheterisation ≥ 7 days, wound dehiscence and reoperation rates were lower in 2008. 209 patients (82.3%) were available for review at one year. Nine patients (4.3%) had recurrent cystourethroceles. Two of nine patients who had their uterus conserved with total Prolift® had recurrent uterine descent. There were two patients (1.0%) with recurrent vault prolapse. The subjective and objective cure rates at one year after Prolift® surgeries were 92.1% and 92.1% for 2006, 97.0% and 92.4% for 2007, and 100% and 97% for 2008, respectively. The mesh

erosion rate was lower in 2008 as compared to 2007 and 2006.

Conclusion: The Gynecare Prolift® system of mesh-incorporated

pelvic reconstructive surgery is effective and safe for recipients. The learning curve and operating skill of the surgeon also improves the surgical outcome.

Category: Medical ASM2011-MED-028

Two case reports of voiding disorder secondary to cancer of the vagina

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Vaginal cancer often does not cause early symptoms. When symptoms do occur, they may usually present with bleeding or pain. A review of the literature did not find any case report(s) of vaginal adenocarcinoma presenting with voiding disorder initially. This study describes two patients with adenocarcinoma of the vagina, who presented with voiding disorder. The clinical histories of the two patients were obtained from their medical records. Patient 1 was a 71-year-old Chinese woman, with no significant medical history, who presented with voiding dysfunction over one month and managed with clean intermittent self-catheterisation. She had anterior vaginal wall granulation tissue and was treated with local oestrogen cream. 14 months later, the patient had vaginal bleeding and was diagnosed with adenocarcinoma of

the vagina, grade 3 stage 4 disease. She received radiotherapy and chemotherapy but died of the disease four months after diagnosis. Patient 2 was a 79-year-old Chinese woman, with a past history of multiple medical problems, who presented with voiding disorder of eight months and managed with clean intermittent self-catheterisation. 16 months after presentation, she developed vaginal bleeding and was diagnosed with stage 4 adenosquamous cancer of the anterior vaginal wall. The patient died three months after diagnosis. Common causes of voiding disorder include those secondary to uterovaginal prolapse, after incontinence/prolapse surgery and after childbirth. However, physicians need to be vigilant in order to exclude other causes of voiding disorder, such as vaginal cancer.

Category: Medical ASM2011-MED-029

Complications following titanium elastic nail insertion for forearm fractures

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Introduction: Elastic stable intramedullary nailing (ESIN) is currently the treatment of choice for children who sustain an unstable forearm fracture. The titanium elastic nail system (TENS) is a type of ESIN commonly used in our institution. Complications associated with the use of TENS are highlighted in this article.

Methods: A retrospective review was performed of all forearm fractures requiring TENS over a 24-month period (January 2007 to December 2008) at our institution. Patient records and radiographs from the time of admission to the final follow up were reviewed. Postoperative complications relating to the distal radius insertion point and proximal and distal ulna insertion sites were recorded.

Results: 40 patients received operative intervention with TENS. Five patients developed postoperative complications

— attrition ruptures of the extensor pollicis longus (EPL) tendon (n = 2), ulnar nerve neuropathy (n = 2) and superficial branch of radial nerve neuropathy (n = 1). Both patients with EPL ruptures subsequently received tendon transfers while those with nerve palsies had resolution within three months of the index surgery. Iatrogenic nerve injury was related to duration of intraoperative time. Of the two patients with attrition rupture of the EPL, one patient had neglected implant removal resulting in nail migration while the other had radial nail insertion through the lister's tubercle.

Conclusion: The use of ESIN for treating paediatric forearm fractures must be done with close attention to nail insertion points, avoiding multiple attempts at closed reduction that may influence operative time and firm temporal endpoints for removal of hardware.

Category: Medical ASM2011-MED-030

Supracondylar humeral fracture stabilisation: a safe method for passing the medial pin first

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Introduction: Proponents of cross-pinning believe that it affords greater stability for the stabilisation of paediatric supracondylar humeral fractures (SHFs). We describe a method of passing the medial pin before the lateral pin(s) and report our incidence of iatrogenic ulnar nerve injury.

Methods: Records of patients who underwent closed reduction and percutaneous pinning (CRPP) for displaced SHFs (2006–2008) were reviewed. Inclusion criterion was the use of a medial pin, which was inserted before the lateral pin(s). Technical points included: (1) holding the K-wire close to its tip for accurate placement on the tip of the medial epicondyle; (2) confirming the trajectory of the medial pin before drilling to minimise the number of passes; (3) applying an anteriorly directed force to the distal humeral fragment during drilling to avoid the need for

elbow hyperflexion; and, (4) observing the ring and little fingers for movement when placing the medial pin. Patients with flexion-type SHFs or preoperative ulnar neuropathy were excluded.

Results: 125 patients were recruited for the study, with 84 boys (67.2%) and 41 girls (32.8%). The mean age of the group was 7.1 years. The left elbow was injured in 91 patients (72.8%). 72 patients (57.6%) had a true cross-pin construct and 53 (42.4%) had a second lateral pin. No patients had ulnar neuropathy post-CRPP.

Conclusion: The medial pin can be safely applied before and after the application of lateral pin(s), without making an incision over the medial epicondyle. This safe easily reproducible technique should be known to all paediatric orthopaedic surgeons.

Category: Medical ASM2011-MED-031

Grade III supracondylar humeral fractures associated with ipsilateral forearm fractures in children

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Introduction: The study aimed to share our management experience of grade III paediatric supracondylar humeral fractures (SHFs) associated with ipsilateral forearm fractures.

Methods: The records of 31 patients with grade III SHFs and concomitant ipsilateral forearm fractures were retrospectively reviewed. Data, including specific fracture type and management, were collected for analysis.

Results: The study group included patients with closed displaced distal radius fractures ($n = 15$), closed displaced distal radius and ulna fractures ($n = 13$), undisplaced mid-ulna fractures ($n = 2$) and open distal radius and ulna fractures ($n = 1$). Mean age of patients was eight years. All, but one, of the SHFs were treated by closed reduction and percutaneous pinning. The exception was a compound type 3A fracture that required open reduction

and internal fixation. Severely displaced forearm fractures ($n = 5$) were treated operatively, while the rest were managed by non-circumferential cast immobilisation. Reduction was performed starting proximally, reducing the SHF and then the forearm fracture(s). Two patients presented with pulseless hands; pulse was restored after closed reduction in the first patient and after brachial artery exploration in the second patient. Five patients had neuropraxia at presentation, all of which resolved. There were no significant long-term complications.

Conclusion: These injuries merit careful evaluation to reduce the incidence of missed fractures. Timely reduction decreases the risk of permanent neurovascular deficits. The forearm fractures were primarily managed by closed methods unless unstable. The preferred order of reduction was proximal to distal. Non-circumferential cast immobilisation was preferred.

Category: Medical ASM2011-MED-033

Haematopoietic stem cell transplantation for primary immunodeficiency disease: a Southeast Asian perspective

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Introduction: Haematopoietic stem cell transplant (HSCT) is the only cure for primary immunodeficiency disease (PID). If left untreated, PID is associated with high mortality due to infections in childhood. We describe our experience of HSCT for children with PID.

Methods: The medical records of patients who received HSCT for PID at two paediatric centres in Singapore over a 12-year period from December 1996 to February 2009 were reviewed.

Results: HSCT was performed for 14 children with PID. Bone marrow transplant sources included umbilical cord blood transplant (UCBT; n = 10), matched sibling donors (MSD; n = 3) and matched unrelated donors (MUD; n = 1). The underlying diseases included severe combined immunodeficiency disease (SCID; n = 5), hyper-IgM immunodeficiency syndrome (HIgM; n = 5), chronic granulomatous disease (CGD; n = 2), Wiskott-Aldrich syndrome (WAS; n = 1) and leukocyte adhesion deficiency (LAD; n = 1). The median age of patients

was 35 (range 3–204) months. The conditioning regimes consisted of busulphan (BU)/cyclophosphamide (CPA)+/- ATG for all patients except those with SCID (n = 5), who received reduced intensity conditioning (RIC). The RIC regime consisted of fludarabine+/- melphalan+/- CPA. Graft-versus-host disease (GVHD) prophylaxis consisted of cyclosporine A and a combination of short courses of methotrexate, methylprednisolone or mycophenolate mofetil. 14% of patients showed graft rejection — one patient with HIgM had a second successful transplant from the same MUD and one patient with CGD died after 1.5 years due to pneumonia. Transplant-related mortality (TRM) was 14% — both patients had unrelated CBT — one died due to pneumonia and the other from chronic GVHD. Overall survival was 79%. Among those with unrelated CBT, 70% of patients were alive.

Conclusion: PID is curable in patients receiving MSD transplants (80%–90%), MUD (50%–60%) and UCBT (70%). In summary, unrelated CBT offers children with PID a good chance of cure.

Category: Medical ASM2011-MED-034

Fetal skeletal deformity: a rare case of isolated absent bilateral radii

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We describe a rare case of isolated bilateral absent radii and thumbs diagnosed prenatally during a screening scan in a primigravida. A 37-year-old primigravida woman booked for the 20-week ultrasonography screening at nine weeks of pregnancy. The foetus showed bilaterally absent radii and thumbs, with no other obvious fetal anomaly, during the scan. The patient and her father had bilateral hypoplastic thumbs. A baby boy was delivered vaginally (gestational age 38 weeks), with a birth weight of 2,505 g. Further evaluations were carried out at birth to establish the extent of disease. Radiographs showed absent bilateral radii and thumbs, with a left accessory thumb. Echocardiography to assess cardiac anomalies and evaluation of renal structure and function were

normal, with normal platelet count and orthopaedic assessments of the lower limbs and chest. The differential diagnoses for radial aplasia include thrombocytopenia-absent radius (TAR) syndrome, Holt-Oram syndrome (HOS), Fanconi anaemia (FA) and Rapadilino syndrome. A multidisciplinary approach is fundamental to the successful management of pregnancies with fetal anomalies. The present patient was seen by paediatric hand surgeons, geneticists and the maternal fetal medicine team throughout pregnancy and made aware that detailed postnatal radiological and pathological examination would be necessary for accurate diagnosis and prediction of recurrence risks. The baby remained well at the four-week follow-up visit, with a normal platelet count.

Category: Medical ASM2011-MED-035

Congenital diaphragmatic hernia: an antenatal case series

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Introduction: Our study aimed to identify current trends in the diagnosis and management of congenital diaphragmatic hernia (CDH) as well as to audit current medical practices at KK Women's and Children's Hospital (KKH), Singapore, for such pregnancies to aid in evaluation and finding ways of improving on them.

Methods: This was a retrospective review of patients who were antenatally diagnosed with CDH at KKH from 2006 to 2010. Epidemiology, diagnosis, prognostication, follow-up care and outcomes of these pregnancies were investigated.

Results: 22 fetuses with CDH were identified in 21 women at KKH during the study period. The incidence was 3.6/10,000 births. All fetuses had left diaphragmatic hernia, with 14 (63.6%) being diagnosed before 22 weeks of gestation and 18

(81.8%) being diagnosed by the fetal anomaly screening scan. All women were appropriately counselled about the risks, implications and prognosis of their pregnancies; nine women (40.9%) were counselled about the prognosis of their pregnancy based on quantitative factors, such as lung-head ratio. These pregnancies resulted in mid-trimester terminations (n = 10, 45.5%), live births (n = 9, 40.9%) and stillbirths (n = 1, 4.5%). The outcomes of two pregnancies were unknown as they were lost to follow up.

Conclusion: CDH is a challenging problem — almost half of the cases were detected after 22 weeks of gestation and a similar proportion of women chose to terminate the pregnancy mid-trimester. With better awareness and systematic counselling using quantitative measurements, such as lung-head ratio, counselling for this condition can be further enhanced.

Category: Medical ASM2011-MED-036

The 'medial spike' in the displaced supracondylar humeral fracture

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Introduction: The supracondylar humeral fracture (SHF) can sometimes present with a sharp bony spike in the medial aspect of the proximal fragment. This medial spike can buttonhole through muscle and make surgical closed reduction difficult.

Methods: The preoperative radiographs of all surgically stabilised SHFs between 2006 and 2008 were reviewed and patients with medial spike identified. The shortest distance between the tip of the medial spike and the adjacent skin surface (tip-skin distance) was measured. Operative times and rates of open reduction were recorded. Controls were randomly selected for comparison purposes.

Results: 17 patients (3.4%) with a medial spike, among a total of 494 surgeries done for displaced SHFs, were compared with 34 controls. Most patients (n = 15) and the control group

received successful closed reductions; two patients (11.8%) with a medial spike required open reduction. Statistically significant differences were found between the spike and control groups for mean tip-skin distance (spike 6.6 mm, control 17.9 mm, p = 0.003) and mean operative time for closed reduction and percutaneous pinning (spike 28.1 minutes, control 16.6 minutes, p = 0.003). The likelihood of open reduction being necessary was significant when a medial spike was present (p = 0.042).

Conclusion: A medial spike in a displaced supracondylar fracture, with the tip lying close to the adjacent skin surface, is likely to have buttonholed through muscle. Preoperatively, this should be recognised as a sign that surgical closed reduction may be difficult and the operative procedures may last longer. Open reduction may occasionally be necessary for such patients.

Category: Medical ASM2011-MED-038

Use of combined multichannel intraluminal impedance and pH monitoring for evaluation of paediatric gastroesophageal reflux disease

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Introduction: Multichannel intraluminal impedance (MII) has recently gained popularity as a means of evaluating gastroesophageal reflux disease (GERD). The aims of this study were to: (1) analyse the results of combined MII and pH (MII-pH) studies in children with suspected GERD; and, (2) study the characteristics of GERD, with its various presenting symptoms and complications.

Methods: This was a retrospective analysis of data from all MII-pH monitoring studies performed between January 2009 and December 2010 on infants and children ≤ 18 years. Data on medical history, symptoms, complications and treatment were collected from the medical records.

Results: 47 children underwent combined MII-pH monitoring. The mean number of reflux episodes detected over 24 hours by impedance ($n = 43$) was higher than that by pH monitoring ($n = 17$) [$p < 0.01$]. However, pH monitoring detected longer

exposure to reflux (mean reflux index 3.4%) than impedance monitoring (mean total reflux time 1.0%) [$p = 0.002$]. Children with symptomatic GERD predominantly had non-acid reflux (67.4%), although some did present with acid reflux (7.0%) and mixed reflux (25.6%) disease ($p = 0.004$). All seven children who had acute life-threatening events had non-acid reflux ($p = 0.028$). The mean percentage of proximal reflux episodes was significantly higher in infants (32.4%) than older children (12.2%) [$p = 0.036$]. The proportion of proximal reflux episodes was not higher in children with respiratory symptoms.

Conclusion: Although impedance studies detected more reflux episodes, concurrent pH monitoring allowed for the measurement of persistent acid exposure that was not detected by the former, and this may be clinically relevant. Children with symptomatic GERD, especially those presenting with apparent life-threatening events, tend to have non-acid reflux disease when compared with asymptomatic patients.

Category: Medical ASM2011-MED-039

Attitudes of residents and basic specialist trainees toward the new paediatric residency programme

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Introduction: The aim of this study was to evaluate the perceptions of current basic specialist trainees (BSTs) and residents toward the new SingHealth paediatrics residency programme. The new programme, which started in May 2010, recruited 13 new residents. Concurrent to this programme, 26 BSTs continue to complete their paediatrics training.

Methods: A questionnaire survey was conducted with 27 questions for residents and BSTs and additional two questions for BSTs alone. The survey was performed between August and December 2010.

Results: The survey had a response rate of 71.8% (residents 11, BSTs 17). Half of all trainees (53.6%) agreed that the residency programme was more 'structured,' with more frequent and effective feedback (64.3%) being given on performances. Residents were more aware of the six competencies compared to

BSTs and benefited from continuity clinics and better mentorship. Only 64.3% of BSTs could attend mid-day educational activities most of the time ($> 75\%$). The reasons cited for low attendance at mid-day educational activities by BSTs and residents were heavy workloads (60.7%) and shortage of manpower (67.8%). BSTs expressed the following feelings about the residency programme: threatened or short-changed (41.2%), angry (17.6%), bewildered or confused (35.3%) and neutral (47.6%). A majority of BSTs felt that they had to put in more hours to cover for the residents (70.6%) and that residents were given more attention than the BSTs (76.5%).

Conclusion: There are significant differences between the residency and BST programmes, especially with regard to core competencies and standards, graded responsibility, feedback and mentorship for the residents.

Category: Medical ASM2011-MED-040

Psychosocial service utilisation by patients with cancer

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Introduction: The aim of this study was to examine the utilisation of psychosocial services by patients with cancer by determining referrals to psychiatrists, medical social workers and psychologists within the hospital setting.

Methods: A retrospective study of patients' medical records was conducted to examine the utilisation of mental health services by patients with cancer at KK Women's and Children's Hospital over a one-year period in 2008. Patients were identified from the referral registers maintained for new patients at various departments. The case notes were traced and relevant data extracted.

Results: 227 referrals for psychosocial interventions were made by oncologists in 2008; these referrals were to medical social workers (83.3%), psychologists (8.8%) and psychiatrists (7.9%). 124 referrals were made for new patients (n = 764) in 2008, giving a referral rate of 16.2%.

Conclusion: The low referral rates seen in this study for psychosocial interventions among patients with cancer could be indicative of the many barriers that are known to affect the providers, families and patients themselves. Study results have implications for the planning of psychosocial care for this patient population in order to address their hidden psychosocial morbidities.

Category: Medical ASM2011-MED-041

H1N1 influenza infection in paediatric oncology patients on chemotherapy

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Introduction: In April 2009, the influenza A (H1N1) virus emerged as a novel infection. The majority of cases worldwide were mild. However, subgroups of patients, such as children < 5 years and immunosuppressed patients on chemotherapy, are at increased risk of complications.

Methods: This was a prospective cohort study of all paediatric oncology patients on active chemotherapy who contracted H1N1 infection between July 2009 and July 2010. H1N1 was confirmed with real-time polymerase chain reaction subtyping. Data analysed included demographics, clinical signs and symptoms, duration of viral shedding and patient outcome.

Results: 21 paediatric oncology patients on chemotherapy had laboratory-confirmed H1N1. The most frequent presenting symptoms were fever (95%), duration of fever ranging between

< 1 week and a maximum of 28 days (86%), cough (90%) and rhinorrhoea (57%). Chest radiographs demonstrated lower respiratory tract involvement in six of 13 patients. 11 patients presented with febrile neutropenia. The duration of viral shedding, which was followed for 16 patients (range 5–42 days), was not associated with neutropenic status or the continuation of chemotherapy. Three patients were admitted to the intensive care unit — two patients had concomitant bacteraemia and died of septicæmia. The clinical course in the third patient was complicated by pulmonary aspergillosis, right pneumothorax and extensive subcutaneous emphysema.

Conclusion: The H1N1 infection outbreak in immunosuppressed children with malignancies, who were on active chemotherapy, was mostly mild. However, these patients are still at high risk for serious complications, especially from superimposed infections.

Category: Medical ASM2011-MED-042

Enterovirus outbreak among preterm infants in the neonatal intensive care unit at SGH

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Introduction: Neonates have immature immune systems and are at risk for serious complications of infections. Enteroviral disease among neonates may be acquired antenatally, intrapartum or postnatally. It is difficult to evaluate a neonate who presents with mild and non-specific symptoms. Therefore, early diagnosis and treatment is a challenge.

Methods: Data on perinatal history, demography, neonatal conditions and laboratory investigations were retrieved retrospectively from the medical records of five infected patients who were admitted in the intermediate care of the neonatal unit at Singapore General Hospital over two weeks in October 2010.

Results: Five infants were positive for enterovirus. The index case was a set of twins delivered at gestational age 34 weeks. Three singleton newborns (gestational age 25–32 weeks, birth weight 830–1,490 g) were symptomatic within 6–11 days of

contact with the index patients. All infected neonates were lethargic at presentation with poor sucking (40%), apnoea (80%), poor perfusion (40%) and pyrexia (10%). Polymerase chain reaction of stool samples indicated positive enterovirus results for three neonates while one neonate was identified as positive for enterovirus by spinal tap fluid. Four infected neonates required respiratory support, with one needing inotropic support. One neonate, who required high-frequency oscillatory ventilation and inotropic support, died on day 5 of illness. Severe thrombocytopenia was documented in 80% of infected neonates.

Conclusion: Neonatal enterovirus infections can present with sepsis-like symptoms leading to morbidity and even death. Pertinent history of exposure, early recognition, timely intervention and effective practice of appropriate infection control measures is necessary to prevent dissemination of infection in the neonatal intensive care unit.

Category: Medical ASM2011-MED-043

Copy number variations detected by array-CGH in children with developmental delay and/or mental retardation

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Introduction: Chromosomal imbalances have been associated with idiopathic developmental delay/mental retardation (DD/MR), which occurs in 2%–3% of children. Array comparative genomic hybridisation (array-CGH) has been increasingly used for the diagnostic testing of idiopathic DD/MR. We report our experience of array-CGH for 100 children with idiopathic DD/MR in Singapore.

Methods: Children were recruited with informed parental consent by the Genetics Service at KK Women's and Children's Hospital. DNA was extracted from blood and tested by array-CGH. Microarrays from Affymetrix, Nimblegen and Agilent were hybridised and scanned following the manufacturers' instructions. Copy number variations (CNVs) were validated using another array platform, fluorescence *in situ* hybridisation, or quantitative real-time polymerase chain reaction.

Results: Overall, 25% of children were found to have CNVs that were either pathogenic or potentially clinically significant. 11 patients had pathogenic CNVs that overlapped with known microdeletion/duplication syndromes; aberrations varied in size from 160 Kb to 154 Mb. One patient had CNVs in chromosomes 1 and 18, in addition to a duplication of the X chromosome. A further 14 patients had novel and potentially significant CNVs varying in size from 370 Kb to 96 Mb. Parental studies are underway for these patients to determine the significance of the CNVs noted.

Conclusion: Study results confirm that array-CGH is a valuable tool for the diagnostic testing of idiopathic DD/MR. Establishing the diagnosis of DD/MR will improve and assist the clinical management of such patients as well as facilitate genetic counselling for the family.

Category: Medical ASM2011-MED-044

Teenage obstetrics clinic: a two-year experience

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Introduction: Teenage pregnancies have always been a mixed obstetrical and social problem. In 2007, the Department of STI Control (DSC) Clinical Statistics quoted 833 teenage pregnancies, accompanied by 1,363 teenage abortions. Official government statistics indicate an almost 300% increase over the 283 pregnancies that were reported in 2002. This is indeed an alarming trend. This audit aims to present an overview of the outcome of teenage pregnancies and the contraceptive choices of teenage obstetrics patients seen at KK Women's and Children's Hospital (KKH), Singapore, in order to target the at-risk groups for timely medical and social interventions.

Methods: A retrospective audit was conducted of the Teenage Obstetrics Clinics from January 2008 to January 2010 at KKH. Antenatal and postnatal proforma were updated and tabulated as Microsoft Excel databases. Data were subsequently retrieved and analysed.

Results: Medical advice at the initial stages of pregnancy from a dedicated team of medical and nursing staff helped us to follow up with most patients throughout most of their pregnancies. A majority had contraceptive advice during their pregnancy and the majority achieved spontaneous vaginal delivery of term babies. Not all postnatal patients returned to the Teenage Obstetrics Clinics for Pap smears and contraceptive advice. The popular contraceptive choices were condoms, oral contraceptive pills and Implanon.

Conclusion: This review of the two-year experience at the Teenage Obstetrics Clinics provides a general overview of the decisions arrived at by pregnant teenagers seen at KKH. The dedicated clinic hopes to continue to educate such teenagers in improving their knowledge of safe sex and contraception. This not only helps young couples better plan their child bearing but also offers them the option to better manage their social circumstances.

Category: Medical ASM2011-MED-045

Feasibility of testing urine PCR chlamydia and gonorrhoea in the teenage obstetrics clinic

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Introduction: Sexually transmitted disease (STD) is one of the main problems of early sexual exposure among teenagers. Official government statistics show that the number of STDs in teenagers was just under 700 in 2009, marking an almost 300% increase over the cases reported in 2002. These teenagers expose themselves to STD due to various factors without realising its impacts on their future fertility and the baby they could carry should they become pregnant. Chlamydia and gonorrhoea rank among the top STDs to afflict teenagers globally and in Singapore. In teenage pregnancies, STDs may cause blindness, pneumonia, septic arthritis and prematurity. Testing for the presence of STDs to facilitate early treatment is therefore of paramount importance.

Methods: This was a retrospective audit of the Teenage Obstetrics Clinics from January 2008 to January 2010 at KK Women's and Children's Hospital. Antenatal and postnatal proforma were

tabulated into Microsoft Excel databases. Data were subsequently analysed to identify positive chlamydia and gonorrhoea infections and assess acceptability of these tests among teenage patients.

Results: A majority of patients seen at the initial stage declined STD screening, as it involved speculum examination. More patients were agreeable to the testing when the urine polymerase chain reaction (PCR) test was offered, and more teenagers tested positive for chlamydia infection than gonorrhoea. All positive STDs were treated with antibiotics and referred to the Department of STI Control (DSC) for further contact tracing.

Conclusion: This audit aimed to assess the feasibility of routine use of urine PCR as a screening tool for detecting the causative organisms of STDs, such as chlamydia and gonorrhoea, so as to provide early treatment to the target group.

Category: Medical ASM2011-MED-046

Sequencing of the *SHANK3* gene in patients with autism spectrum disorder

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Introduction: The 22q13.3 deletion syndrome, or Phelan-McDermid syndrome, is associated with developmental delay, absent or delayed speech, neonatal hypotonia, autistic behaviour and minor dysmorphism. *SHANK3* is one of the three genes located in the critical region of the 22q13.3 deletion syndrome. *SHANK3* encodes a synaptic scaffolding protein that is important for synapse formation and maturation of dendritic spines. Mutations in the *SHANK3* gene have been shown to be associated with autism spectrum disorder (ASD). This study aimed to sequence the *SHANK3* gene in patients with ASD and/or with severe speech delay.

Methods: Patients were selected from among children who were enrolled in our project on the use of microarrays for investigating developmental delay/mental retardation in Singapore children. 23 exons were amplified by polymerase chain reaction (PCR) using published and redesigned primers.

As some exons were GC rich, a variety of PCR conditions and reagents had to be used to amplify all exons. PCR products were sequenced on the Applied Biosystems genetic analyser 3130.

Results: Synonymous and non-synonymous alterations were seen in the preliminary batch of sequenced patients. Notably, a heterozygous duplication c.4409_4426dup in exon 22, which is predicted to cause a duplication of six amino acids (LASAAG) in the *SHANK3* protein, was seen in one patient. Family members of this patient were sequenced and a homozygous duplication of c.4409_4426dup was seen in the healthy mother.

Conclusion: The duplication seen in exon 22 has been classified as a variant of uncertain significance at present. Sequencing of more ASD patients for mutations in the *SHANK3* gene will help to elucidate the role of *SHANK3* mutations in ASD.

Category: Medical ASM2011-MED-047

Evidence-based clinical practice guidelines for non-immune hydrops fetalis: a rare condition

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Introduction: This study aimed to develop clinical practice guidelines for the approach to postnatal management of non-immune hydrops fetalis (NIHF) through a systematic search of current best evidence.

Methods: Searches were performed on PubMed (clinical queries), the Cochrane Library, Evidence-Based Medicine Reviews (EBMR), National Institute for Health and Clinical Excellence (NICE) and Google Scholar using the following search terms and Boolean operators: (non-immune hydrops fetalis) OR (non-immune hydrops foetalis), (etiology) OR (aetiology), diagnosis, prognosis, NOT (prenatal OR fetus OR foetus). All articles retrieved were critically appraised and collated for the guidelines to suit the needs of the local department.

Results: The search retrieved case reports (n = 8), systematic review of NIHF aetiologies (n = 1), clinical practice guidelines (n = 1) and letters to the editor (n = 1). Except for isolated case reports from Southeast Asia, most of the reported literature was for Western populations.

Conclusion: In view of the rarity of the condition and the limited high-quality evidence available on the approach to be adopted for NIHF management, the guidelines was devised from the reports retrieved following a systematic search of the literature. This is in keeping with the principles of evidence-based medicine. Further research and collaboration in this area, especially from the regional perspective of Southeast Asia, is required to generate higher quality evidence and to facilitate further understanding on the best clinical approach for NIHF.

Category: Medical ASM2011-MED-048

Challenges for achieving international benchmarks in the Early Hearing Detection and Intervention programme at KK Women's and Children's Hospital

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Introduction: Evidence and international experience support Universal Newborn Hearing Screening (UNHS) to detect hearing impairment and promote intervention in a timely manner. This study compared the outcomes of the Early Hearing Detection and Intervention (EHDI) programme at KK Women's and Children's Hospital (KKH), Singapore, with the international benchmarks (IBM) set by the Joint Committee on Infant Hearing and the US Task Force. Other areas of gaps in service provision were identified.

Methods: This was a retrospective study of 88,459 infants screened under the UNHS programme at KKH between 1 January 2003 and 31 December 2009.

Results: Over 99% of eligible newborns at KKH were screened at birth (IBM > 95%). Permanent hearing impairment (HI) was

found in 2.2/1,000 newborns. The median age at HI diagnosis was 4.9 (range 1–24) months [IBM ≤ 3 months]. 30% of infants with HI needed hearing aids that were fitted at a median age of 7.6 (range 2–24) months [IBM ≤ 6 months]. The false positive rate for the UNHS programme was 0.25% (IBM < 3%). Computed tomography was the most commonly performed aetiological investigation (20%). 38% of infants with HI had no appropriate developmental follow up. The default rates for the second stage of UNHS and audiological investigations were 4.8% and 25%, respectively.

Conclusion: This EHDI programme has good UNHS coverage and low false positive rates. However, there were challenges in achieving some of the set IBMS. These service gaps need to be addressed jointly by the service providers involved.

Category: Medical ASM2011-MED-049

Intrathecal analgesia for intractable oncogynaecological cancer pain: a case series

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Pain forms a significant portion of a cancer patient's suffering, resulting in poorer quality of life and impairing cancer treatment. When conservative pain management techniques fail, invasive methods, such as intrathecal analgesia, may prove to be beneficial. Intrathecal analgesia is a key therapeutic option for patients who fail to obtain adequate pain relief or develop side effects to therapy. This report presents three patients with advanced metastatic oncogynaecological cancer and intractable pain, who were on systemic opioids with significant opioid side effects and for whom intrathecal implantable pumps and intrathecal portacath catheter systems were inserted. Two patients had advanced metastatic ovarian cancer with severe visceral pain and severe neuropathic pain from spinal metastasis. Both had inadequate pain relief with severe pain at rest and movement, associated with

nausea, constipation and sedation from oral opioids. Hospital admissions were for acute exacerbation of intractable pain and not relieved despite multimodal analgesia and antineuropathic medications. Synchronised intrathecal implantable pump insertions were performed and led to better pain control and reduction of opioids with significantly lesser side effects. Patient 3 had short-term survival prognosis with intractable visceral pain and had intrathecal portacath catheter system insertion. All patients had good pain control until demise. Intrathecal analgesia is a valuable option for patients with advanced gynaecological cancer. Patients with advanced cancer and severe visceral and pelvic pains from metastasis may benefit from this therapy. Systemic side effects are often decreased and lowered doses can be considered for patients receiving such treatment.

Category: Medical ASM2011-MED-050

Cerebrospinal fluid leak following combined spinal-epidural anaesthesia for caesarean section

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We present a patient with persistent cerebrospinal fluid (CSF) leak following combined spinal epidural anaesthesia. Neuraxial techniques are increasingly popular, but CSF leak is very rare. A 34-year-old woman presented for an elective lower segment caesarean section at 32 weeks of gestation. The indication was for intrauterine growth retardation and breech presentation for twin delivery. The patient had gestational diabetes mellitus requiring diet control. Combined spinal-epidural anaesthesia, not complicated by any obvious accidental dural puncture, was performed. The surgery was completed uneventfully and the epidural catheter was removed immediately after surgery. The patient developed leakage of clear CSF on postoperative day 1, with soaking of the gauze on her back. This was associated with severe postural bilateral shoulder pain in the sitting position.

However, she did not complain of headache, neckache or neurological deficits associated with low intracranial pressure. Computed tomography of the head was unremarkable and fundoscopy did not reveal any abnormalities. Skin suture using 3/0 prolene was performed at the epidural puncture site. The CSF leak ceased and her shoulder ache significantly improved. CSF leak following combined spinal-epidural anaesthesia may not present with symptoms of low intracranial pressure and may occur despite the short duration of epidural catheter placement. This report describes the atypical presentation of postural shoulder ache seen in a patient with CSF leak following spinal-epidural anaesthesia and the patient's successful treatment with a skin suture. Currently, there is no consensus on the treatment of persistent CSF leak following neuraxial anaesthesia.

Category: Medical ASM2011-MED-051

Molecular diagnosis of ewing sarcoma/primitive neuroectodermal tumour: identification of characteristic fusion gene transcripts by real-time reverse transcriptase-polymerase chain reaction

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Introduction: Ewing sarcoma/primitive neuroectodermal tumour (ES/PNET) is a primitive tumour of bone and soft tissue. Pathological diagnosis is challenging because the histology and immunoprofile of ES/PNET is non-specific. 90% of ES/PNET have a translocation — $t(11;22)(q24;q12)$ — in which the *EWS* gene fuses with *FLII*. In 60% of such patients, exons 1–7 of *EWS* fuse to 6–9 of *FLII* (type 1), while the remaining result from a fusion of exons 1–7 of *EWS* to 5–9 of *FLII* (type 2). Other less common translocations include *EWS-ERG* and *EWS-ETV4*. Identification of these genetic alterations is therefore valuable in the diagnosis and prognostication of the tumour.

Methods: Details of patients with ES/PNET were retrieved from the paediatric pathology tumour archives of our department. Tumour RNA was extracted from snap-frozen or formalin-fixed paraffin-embedded (FFPE) tissues. Real-time reverse transcriptase-polymerase chain reaction (RT-PCR) using

appropriate consensus primers and probes was performed to detect the presence and type of fusion products resulting from *EWS-FLII* and other translocations. Samples of patients with identifiable fusion products were sequenced to confirm the translocations.

Results: 11 patients with ES/PNET were identified — *EWS-FLII* type 1 ($n = 4$), *EWS-ERG* ($n = 1$) and *EWS-ETV4* ($n = 1$). Sequencing confirmed the nature of the translocations in these patients. Diagnostic yield was similar in snap-frozen and FFPE tissues. The turnaround time was 1–2 working days.

Conclusion: RT-PCR can be utilised to identify known translocations of ES/PNET. The technique is rapid and easily performed in a histopathology laboratory. RT-PCR provides added diagnostic certainty to the diagnosis of ES/PNET and provides important prognostic information.

Category: Medical ASM2011-MED-052

Determination of *MYCN* amplification in neuroblastomas by quantitative real-time polymerase chain reaction

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Introduction: Neuroblastoma (NB) is a lethal solid tumour of childhood. Amplification of the *MYCN* oncogene correlates with advanced stage disease and poor clinical outcome. *MYCN* amplification is conventionally determined by fluorescence *in situ* hybridisation (FISH). In this study, we evaluated the feasibility of real-time polymerase chain reaction (PCR) as an alternative to FISH.

Methods: Patients with NB were identified from the paediatric pathology tumour archives of our department. Tumour DNA was extracted from snap-frozen and formalin-fixed paraffin-embedded (FFPE) tissues. PCR amplification of *MYCN* was compared to an unaffected reference gene (RG) within the same chromosome, *TGN 46*. Serial dilutions of normal tonsil DNA were used to generate a standard curve for each gene separately. PCR raw data (ct values) were normalised to the standard curve to enable the comparability of PCR data of different genes. The

amplification threshold was defined as a target/reference gene ratio of > 10.

Results: 32 patients with NB were identified. *MYCN* amplification was seen in ten patients on PCR and FISH. 19 patients did not show *MYCN* amplification on PCR and FISH. No patients showed *MYCN* amplification by PCR alone. Three patients showed *MYCN* amplification by FISH, but not PCR. Diagnostic yield was similar in snap-frozen and FFPE tissues.

Conclusion: Real-time PCR can be utilised to determine amplification of *MYCN*. However, FISH appears to be more sensitive in identifying *MYCN* amplification. This may be due to dilution effects of non-tumourous cells present in the sample. PCR can be performed on both snap-frozen and FFPE tissues.

Category: Medical ASM2011-MED-053

Molecular diagnosis of alveolar rhabdomyosarcoma: identification of *PAX3-FOXO1* and *PAX7-FOXO1* fusion gene transcripts by real-time reverse transcriptase-polymerase chain reaction

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Introduction: Rhabdomyosarcomas (RM) are primitive sarcomas displaying limited skeletal muscle differentiation and are classified into alveolar and embryonal subtypes. Most alveolar RM (ARM) have one of two translocations — t(2;13)(q35;q14) or t(1;13)(p36;q14) — that fuse the *FOXO1* locus to either *PAX3* or *PAX7*. Embryonal RM (ERM) lack these translocations. Identification of these genetic alterations is valuable for the diagnosis and prognostication of these sarcomas.

Methods: Details of patients with RM were retrieved from the paediatric pathology tumour archives of our department. Tumour

RNA was extracted from snap-frozen or formalin-fixed paraffin-embedded (FFPE) tissues. Real-time reverse transcriptase-polymerase chain reaction (RT-PCR) using appropriate consensus primers and probes was performed to detect the presence and type of fusion products resulting from the *PAX3-FOXO1* and *PAX7-FOXO1* translocations.

Results: 12 patients with ARM and ten patients with ERM were identified from the archives. Among patients with ARM, the *PAX3-FOXO1* and *PAX7-FOXO1* fusion transcripts were identified in three and four patients, respectively; none of the patients with ERM had

these fusion products. Diagnostic yield was similar in snap-frozen and FFPE tissues. The turnaround time was 1–2 working days. The assays were successful even for FFPE tissues dating back eight years.

Conclusion: RT-PCR can be utilised to identify known

translocations of ARM. The technique is rapid and easily performed in a histopathology laboratory. There is no special requirement for snap-frozen over FFPE tissues. This technique gives added diagnostic certainty to the diagnosis of RM and provides important prognostic information.

Category: Medical ASM2011-MED-056

Digital gangrene: a rare complication of septic abortion

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Bilateral gangrene from concurrent septicaemia is a rare complication in pregnancy. We present a patient who developed bilateral gangrene of the hands from *Staphylococcus aureus* and *Escherichia coli* septicaemia. Inevitably, the pregnancy resulted in miscarriage following sepsis at 21 weeks of gestation. A 35-year-old Chinese woman conceived dichorionic diamniotic twin pregnancies via *in vitro* fertilisation and was admitted for premature rupture of membrane at 21 ± 2 weeks gestation. The twin fetuses aborted secondary to chorioamnionitis. The patient developed *E. coli* septic shock requiring triple inotropic support and was admitted to the intensive care unit. She developed disseminated intravascular coagulation (DIVC), acute renal failure and pulmonary oedema. Eight days after admission, the patient was found to have dusky

bilateral upper limb digits, associated with neuropathic pain; bilateral upper limb pulses were palpable. She was transferred to the Hand Unit following clinical diagnosis of bilateral finger ischaemia secondary to inotropes/septic emboli. The patient further developed distal dry gangrene and duskiness in her index and last fingers, extending to the proximal interphalangeal joint on her left hand. Cloxacillin was administered and she underwent left hand debridement, with full thickness skin graft. The patient was discharged well 6 weeks following admission. Patients who have been exposed to inotrope administration following severe sepsis and DIVC are at increased risk of developing such complications. Physicians should maintain vigilance to identify such rare complications early and initiate timely interventions.

Category: Medical ASM2011-MED-058

Outcome of newborn hearing screening in infants with a family history of hearing loss

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Introduction: A family history of hearing loss (FHHL) is an important risk factor for permanent childhood hearing loss (HL). The aim of this study was to determine the profile of HL in infants with such histories.

Methods: All newborns underwent the Universal Newborn Hearing Screening (UNHS) programme after birth. Those with FHHL received a high-risk hearing screening (HRHS) at 3–6 months. Infants who did not pass the UNHS or HRHS at 3–6 months were referred to otolaryngologists for audiological assessments. Data was collected prospectively between 1 April 2002 and 30 June 2010.

Results: Of 105,648 live births, 1.2% of infants (n = 1,255) had FHHL and 1.4% did not pass UNHS. Of 1,237 eligible infants,

673 (54.4%) underwent HRHS, of whom 76 (11.3%) did not pass. Of the 94 infants who needed further evaluation, 13/18 (72.2%) from UNHS and 9/76 (11.8%) from HRHS had HL (p < 0.05). Patients had sensorineural (n = 13), conductive (n = 7) or mixed HL (n = 2), with the levels being mild (n = 8), moderately severe (n = 9), or profound (n = 5). Eight patients required hearing aids and one patient required a cochlear implant. Five patients were treated with antibiotics and one baby was fitted with grommets; seven babies needed no treatment. The incidence of HL in babies with FHHL was higher (31.7/1,000) compared to the general population (2.91/1,000). 41% of affected infants were detected by HRHS.

Conclusion: The incidence of HL in infants with FHHL was 11 times higher than in the newborn population. UNHS detected a significant proportion of affected infants.

Category: Medical ASM2011-MED-059

Bicycle-related abdominal injuries in children: review of four patients

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Introduction: Abdominal injuries caused by bicycle handlebars in children are potentially serious and can be fatal. This study presents our experience of four such patients who were managed successfully.

Methods: A retrospective review was conducted of the medical records of patients seen at KK Women's and Children's Hospital in the past two years for bicycle-related abdominal injuries. Data collected included mode and nature of injury, management, length of hospital stay and complications.

Results: Four patients with bicycle-related abdominal injuries — liver injury (n = 2), renal injury (n = 1) and pancreatic laceration (n = 1) — were identified. All patients needed initial resuscitation and stabilisation in a high dependency unit. Three children were noted to have imprint/bruise marks of

the handle bar over the abdominal wall. One patient with liver injury presented with shock to the Children's Emergency. She underwent prophylactic embolisation of a pseudoaneurysm of the left hepatic artery and had uneventful recovery thereafter. The patient with pancreatic tail transection developed pseudocyst within five days of injury. She was managed conservatively, but needed prolonged hospitalisation and total parenteral nutrition. The two other patients were managed conservatively.

Conclusion: Bicycle handlebar abdominal injuries in children must be viewed with a high index of suspicion. Preventive measures, such as improved bicycle designs and wearing protective gears, should be encouraged as cycling is expected to continue being a popular sport and mode of transportation in the future. School education on bicycle-related injuries may also be helpful.

Category: Medical ASM2011-MED-060

A review of Singaporean patients in KKH with trisomy X

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Introduction: Trisomy X results from an additional copy of an X chromosome in every cell of the body. The diagnosis is confirmed by a karyotype showing 47,XXX. The aim of this review was to define the clinical phenotypic range of trisomy X in our local population and add to the preexisting knowledge about its clinical presentations.

Methods: The literature on trisomy X was reviewed to prepare a checklist of syndrome features that had previously been described. The syndrome is not typically associated with characteristic physical features although girls tend to be taller than average. Intelligence is expected to fall within the normal range, but may be 5–10 IQ points below their siblings. There is an increased risk of learning difficulties and delayed development in speech and motor skills associated with the syndrome. Emotional and

behavioural difficulties have also been reported. A retrospective review of the medical records of patients diagnosed with trisomy X was conducted for clinical data.

Results: Many individuals are now being diagnosed with trisomy X due to the increased use of prenatal diagnostic tests, such as chorionic villus sampling (CVS) and amniocentesis. The diagnosis was confirmed antenatally in all patients. These patients have been followed up since infancy and the eldest of the group is now ten years old. This article presents details of the group's health and developmental assessment.

Conclusion: The results provide valuable information that can be used for the genetic counselling of couples with a prenatal diagnosis of trisomy X and parents of a child born with trisomy X.

Category: Medical ASM2011-MED-061

Anorexia nervosa and spontaneous pneumomediastinum: a case report

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A 15-year-old girl presented to the hospital with a history of difficulty in breathing, dysphagia, neck swelling and chest tightness for two weeks. There was no associated trauma or past medical history other than a 10-kg weight loss over six months. The patient admitted to restricting her diet and exercising, but denied vomiting. She had secondary amenorrhoea for four months. The patient was examined for weight (28.3 kg), temperature (36°C), pulse (55 beats per minute), respiration (15 breaths per minute), saturation of air (99%), blood pressure (97/67 mm Hg) and body mass index (11.8 kg/m²). The patient looked cachectic and pale, with no evidence of lanugo hair. There were palpable subcutaneous crepitations over the neck region. General examination was otherwise unremarkable. Laboratory findings included slightly low potassium (3.2 mmol/L), albumin (24 g/L) and alkaline phosphatase (24 U/L) levels. Full blood count, erythrocyte sedimentation rate, C-reactive protein,

calcium, magnesium, phosphate and thyroid function tests were all normal. Endocrinological signs of starvation included reduced follicle-stimulating hormone (1 IU/L), luteinising hormone (0.07 IU/L) and oestradiol (37 pmol/L). An electrocardiogram showed sinus bradycardia (46 beats per minute). A chest radiograph revealed evidence of subcutaneous emphysema in the neck region with pneumomediastinum. The diagnosis was spontaneous pneumomediastinum in the background of newly diagnosed anorexia nervosa. A contrast swallow study was performed to rule out oesophageal perforation, which gave normal results. The patient was managed with strict bed rest, cardiac monitoring, supervision of meals and high flow oxygen. Serial chest radiographs showed gradual resolution of the pneumomediastinum. This report presents a novel patient who was diagnosed with spontaneous pneumomediastinum with anorexia nervosa in Singapore.

Category: Medical ASM2011-MED-062

The effects of stress on first trimester outcomes in women with threatened miscarriage

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Introduction: Threatened miscarriage is a common complication of pregnancy occurring in 20% of pregnant women. 15%–25% of these women miscarry. This study aimed to determine the association of stress with miscarriage in early pregnancy and that between serum progesterone levels and the risk of miscarriage in a subgroup of 22 women.

Methods: This was a prospective cohort study of 158 pregnant women (5–10 weeks of pregnancy) who were experiencing per vaginal bleeding. The effect of stress (reported for one month prior to presentation) was measured using the Perceived Stress Scale (PSS) questionnaire on miscarriage. The women were monitored until 16 weeks of pregnancy.

Results: The median stress score was 17. Women with higher stress levels (PSS score > 17) had a significantly higher risk of miscarriage (OR 2.63, 95% CI 1.01–6.82). There was no significant correlation between stress PSS scores and serum progesterone levels (R value 0.036). Women who carried their pregnancy beyond the first trimester had a five-fold higher mean serum progesterone level (92.49 nmol/L) than those who miscarried (16.38 nmol/L; p = 0.06).

Conclusion: Stress during pregnancy is a significant risk factor for miscarriage in women experiencing threatened miscarriage. Stress does not appear to have a significant association with serum progesterone levels, but a low progesterone level is associated with an increased risk of miscarriage following threatened miscarriage.

Category: Medical ASM2011-MED-063

Treatment of ulcerated perineal haemangiomas with simple local wound dressing: a case series of 3 patients with excellent outcome

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Introduction: Haemangiomas are common benign tumours of infancy and childhood and ulceration is a common complication. Treatment of ulcerated perineal haemangiomas can be challenging because of significant associated morbidity, which include pain, bleeding, disfigurement and potential secondary infection with overwhelming sepsis. Various modalities of treatment have been described, including local wound dressing, topical or systemic antibiotics, topical, intralesional or systemic corticosteroids, becaplermin (topical platelet-derived growth factor) gel, pulsed dye laser or surgical excision. However, there is no consensus with regard to the most effective form of treatment.

Methods: We report the successful conservative management of three infants at KK Women's and Children's Hospital between September 2010 and February 2011 who were treated with just

local wound care using occlusive dressing zinc oxide barrier cream, thin hydrocolloid dressing and antibiotics.

Results: Two of three patients required admission for a short course of intravenous antibiotics. Wound dressings were started in the inpatient setting by wound nurses and subsequently performed twice a week at the Children's Surgery Center Wound Clinic. Complete ulcer healing was documented (range 9–13 weeks). There was minimal scarring in all patients after healing, with no deformity.

Conclusion: Local wound dressing is a safe cost-effective treatment for ulcerated perineal haemangiomas, with excellent cosmetic outcomes. We propose that it should be the first-line modality of choice. Nurses and caregivers treating complicated wounds need training in modern wound care techniques that emphasise optimal moist environment for wound healing.

Category: Medical ASM2011-MED-064

Reducing the severity of playground fractures

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Introduction: Despite the establishment of playground safety standards, playground-related injuries are still a significant cause of extremity fractures in Singapore. This prospective study aimed to evaluate various playground risk factors, correlate these with the severity of fractures in an Asian population and arrive at recommendations for future safety standards.

Methods: Children who presented with extremity fractures following a playground injury from June 2005 to 2006 were enrolled in the study and clinical data collected prospectively. A new investigator independently collected relevant playground details on-site. Based on severity, fractures were categorised as major, if they required reduction or operative fixation, and minor, if not.

Results: Supervision at the time of injury, especially from the child's parents or siblings, resulted in a lower likelihood of major fractures ($p = 0.002$). Increased weight of patients was directly related to the severity of fractures ($p = 0.000$); a body mass index (BMI) of $< 19.8 \text{ kg/m}^2$ resulted in a lower likelihood of major fractures ($p = 0.010$). Height of equipment and other playground-related factors were not linked to the severity of fractures.

Conclusion: Supervision at the playground, preferably from the child's parents or siblings, and maintaining a child's BMI within limits, as guided by BMI charts, may potentially reduce the occurrence of severe extremity fractures from playground-related injuries.

Category: Medical ASM2011-MED-065

All the hype about post-abortion syndrome: does it exist?

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Introduction: Psychological sequelae related to pregnancy loss is well recognised. More controversial is the concept of post-abortion syndrome, a condition akin to post-traumatic stress disorder. An audit was conducted of patients with pregnancy loss, such as by miscarriage, induced abortion, stillbirth and early neonatal loss, who were being seen at the Mental Wellness Service since 2006.

Methods: A prospective clinical review was conducted of the medical records of women seen at the Mental Wellness Service at KK Women's and Children's Hospital, Singapore, between May 2006 and February 2011 for pregnancy loss-related issues. Data collected included demographic details, primary psychiatric diagnosis and comorbidity, presence of past psychiatric illness and family history of psychiatric illnesses.

Results: 53 patients were seen at the Mental Wellness Service, with a primary psychiatric diagnosis relating to pregnancy loss issues during the study period. Over 60 other women presented with other psychiatric problems also related to a history of pregnancy loss, with two-thirds of these being related to induced abortion. Only 49 patients consented to participating in the study. Patient management generally involved brief intervention during the acute phase of presentation, in the form of grief work and supportive psychotherapy. Patients with more severe symptoms received medication.

Conclusion: Psychological sequelae related to pregnancy loss, as post-abortion syndrome, are a reality. These issues should be recognised in the maternal healthcare settings, as brief intervention can prove beneficial.

Category: Medical ASM2011-MED-066

Women with synchronous cancers of the endometrium and ovary: a ten-year retrospective cohort study

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Introduction: Synchronous occurrence of endometrial and ovarian tumours is uncommon and they affect less than 10% of women with endometrial or ovarian cancers.

Methods: This retrospective cohort study was conducted in a large tertiary institution in Singapore. The sample consisted of women with endometrial and epithelial ovarian cancers who sought care at the institution and were followed up over a period of 10 years from 2000 to 2009. Patients with borderline or germ cell ovarian tumours were excluded.

Results: 75 patients with synchronous ovarian and endometrial cancers were identified. However, only 46 patients met the inclusion criteria. The median follow up was 74 months.

Synchronous cancers accounted for 8.7% of all epithelial ovarian cancers and 4.9% of all endometrial cancers diagnosed during the study period. Mean age at diagnosis was 47.3 years. The most common symptom was abnormal uterine bleeding (36.9%). 73.9% patients had endometrioid histology for both endometrial and ovarian cancers. The majority of women (78%) presented with early stage disease. There were 6 patients (13.6%) with recurrence and the five-year cumulative survival rate was at 84%.

Conclusion: In the present cohort, a majority of women having synchronous cancers of the endometrium and ovary were younger at diagnosis, had early stage cancer and good survival rates.

Category: Medical ASM2011-MED-067

Epidemiology of childhood cancer, 1997–2010

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Introduction: The Singapore Childhood Cancer Registry (SCCR) was established in 1997 with the aid of training and research funds from Children's Cancer Foundation (CCF) and Singapore Cancer Syndicate. Several changes have been made to the registry database between 1997 and 2010. The current SCCR database was revised in 2008, when the cancer consortium was formed. This enabled all cancer registries in Singapore to maintain a common database. The Internet-enabled database can be found at www.webvpn.nus-cme.org.sg.

Methods: The SCCR database was reviewed for details of paediatric patients diagnosed with cancers between 1997 and 2010.

Results: 61% of patients (n = 1,252) registered in SCCR between 1997 and 2010 were Singaporeans or Singapore permanent residents (age 0–19 years). Patients were categorised according to age as 0–4 years (46%), 5–9 years (25%), 10–14 years

(23%) and 15–19 years (6%). The five-year overall survival of some of the common childhood cancers was as follows: acute lymphoblastic leukaemia (n = 365, 88%), acute myeloid leukaemia (n = 67, 59%), chronic myelogenous leukaemia (n = 17, 68%), neuroblastoma (n = 71, 45%), Hodgkin's lymphoma (n = 12, 91%), non-Hodgkin's lymphoma (n = 52, 62%), Burkitt's lymphoma (n = 18, 70%), astrocytoma (n = 57, 75%), primitive neuroectodermal tumour (n = 67, 43%), ependymoma (n = 20, 59%), glioma (n = 18, 34%), intracranial germ cell tumours (n = 40, 76%), extracranial germ cell tumours (n = 15, 92%), gonadal germ cell tumours (n = 32, 100%), rhabdomyosarcoma (n = 31, 79%) and fibrosarcoma (n = 6, 100%).

Conclusion: Several studies on childhood cancers in Singapore have been based on SCCR data. This study, which was also based on an analysis of SCCR registry data, reviewed the epidemiology of childhood cancers in Singapore between 1997 and 2010.

Category: Medical ASM2011-MED-068

Singaporean parents' knowledge, perception and attitudes toward rotavirus vaccine

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Introduction: Rotavirus is the most common pathogen causing severe gastroenteritis in children worldwide. Currently, two effective vaccines are available. However, as an optional vaccine, its uptake has remained low. This study aimed to determine the cause of poor local uptake by assessing the knowledge, attitudes and practices of Singaporean parents toward the vaccine.

Methods: A questionnaire was designed to establish parents' knowledge of rotavirus infection and vaccine, their attitudes toward rotavirus vaccination for their children and the ways to encourage vaccine uptake among the local population. 100 parents of inpatients at KK Women's and Children's Hospital, Singapore, were interviewed over a one-month period during February 2010. 44 interviewees were parents of patients suffering from gastroenteritis, while 56 were not. The interviewees included Chinese (n = 66), Malays (n = 19), Indians (n = 10) and other races (n = 5).

Results: Over 50 parents either had not heard of rotavirus infection or had misconceptions about it. 54 parents had heard of the vaccine, chiefly through clinic materials. 53 of 83 parents whose children were unvaccinated were keen for vaccination. Their primary reason was to protect their wards. A majority of the 30 parents not keen on vaccination felt that it was unnecessary. Parents suggested measures, such as increased education (n = 57), subsidies (n = 50) and doctor's recommendation (n = 28), to encourage uptake of the vaccine.

Conclusion: Currently, knowledge of rotavirus and its vaccine is far from ideal among Singaporean parents. Public education, targeted vaccination counselling and subsidies would encourage uptake of the vaccine. This could in turn substantially reduce the incidence of rotavirus gastroenteritis among Singaporean children.

Category: Medical ASM2011-MED-069

Retrospective study on tension-free vaginal tape-obturator

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Introduction: This study aimed to report the three-year efficacy and complications of tension-free vaginal tape-obturator (TVT-O) for the treatment of female stress urinary incontinence (SUI).

Methods: The medical records of patients who underwent TVT-O between 1 January 2004 and 31 December 2006 were reviewed. Postoperative evaluations were done at six months, one year, two years and three years. Urodynamic studies (UDS) were repeated six months after surgery.

Results: The number of patients (n = 419) reviewed at six months (n = 332, 79.2%), one year (n = 277, 66.1%), two years (n = 234, 55.8%) and three years (n = 185, 44.2%) showed a decreasing trend. Intraoperatively, two patients (0.5%) had bladder perforation and blood loss ≥ 1 L. Postoperatively, 2.9% patients had significant pyrexia ($\geq 38^\circ\text{C}$), with 1.2% patients

developing voiding dysfunction. Voiding dysfunction (six months: 2.1%, three years: 0.4%) and vaginal tape erosion (six months: 4.8%, three years: 0.5%) decreased from six months to three years. The following trends were also seen in the number of patients who had voiding difficulty (six months: n = 7, 2.1%; one year: n = 3, 1.1%; two years: n = 1, 0.4%; three years: n = 0, 0%), erosion (six months: n = 16, 4.8%; one year: n = 6, 2.2%; two years: n = 4, 1.7%; three years: n = 1, 0.5%) or developed *de novo* frequency, urgency and urge incontinence (six months: n = 21, 6.3%; one year: n = 18, 6.5%; two years: n = 21, 9.0%; three years: n = 7, 7.6%). There was one readmission for acute urinary retention. The objective cure rate at six months by UDS was 93.5%.

Conclusion: TVT-O is an efficacious method for treating SUI in women with minimal complications.

Category: Medical ASM2011-MED-070

How long is enough? Duration of indwelling catheter after vaginal surgery

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Introduction: This study aimed to determine the optimal duration of bladder catheterisation following urogynaecological surgery.

Methods: The medical records of 267 patients who underwent urogynaecological surgeries between 1 September 2008 and 28 February 2009 were reviewed. The number of days of catheterisation till successful voiding was defined as residual urine volume < 150 mL. The bladder catheter is usually removed on postoperative day (POD) 2 for anterior repair (AR) patients and POD 1 for tension-free vaginal tape (TVT) patients.

Results: 95 patients underwent AR, excluding TVT-obturator (TVT-O)/TVT with/without vaginal hysterectomy (VH). 59% of patients could void successfully on POD 2, 77% on POD 3 and 86% on POD 6. 90 patients had TVT-O and two had TVT

without AR with/without VH. 30 patients who received general anaesthesia had a trial voiding on operation day, while 60 patients had a trial voiding on POD 1. 22 patients (73%) among those who had a trial voiding on operation day could void successfully. Of 90 patients with TVT-O/TVT, 88% patients could void successfully by POD 1 and 100% by POD 2. Of 57 patients who had both AR and TVT-O/TVT with/without VH, 70% patients could void successfully on POD 2, 84% on POD 3 and 91% on POD 6. Of 23 patients who had urogynaecological surgery without AR/TVT, 52% patients could void successfully on POD 1 and 96% by POD 2.

Conclusion: For patients undergoing AR with/without TVT-O/TVT, POD 3 is recommended for first trial voiding without a catheter. For patients undergoing TVT-O/TVT, trial voiding is recommended on POD 1. For patients having surgery without AR/TVT, trial voiding is recommended on POD 2.

Category: Medical ASM2011-MED-071

Review of patients diagnosed by expanded newborn screening in Singapore

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Introduction: Expanded newborn screening using tandem mass spectrometry was introduced in Singapore in July 2006. It has allowed screening for more than 40 inherited errors of metabolism with just one blood spot. Such screening allows early diagnosis of patients and the institution of therapy while they are still asymptomatic. Since the programme's institution, 87,263 newborns have been screened. This paper aimed to review the patients who were diagnosed positive by the newborn screening test.

Methods: A review was conducted of the medical records of patients screened using the expanded newborn screening programme.

Results: 28 positive patients (maternal 5) and three carriers were detected using the expanded newborn screening programme. Two positive patients were identified as a result of family history. The incidence was one in 3,789 newborns. Out of 23 positive newborns, 15 infants would have had severe clinical consequences if treatment had not been instituted early. Errors of metabolism

detected included multiple carboxylase deficiency (n = 1), methylmalonic aciduria (n = 1), primary carnitine deficiency (n = 1), citrin deficiency (n = 1), cobalamin C/D defect (n = 1), 6-pyruvoyl-tetrahydropterin synthase deficiency (n = 1), urea cycle defect (n = 1), very long-chain acyl-CoA dehydrogenase deficiency (n = 1), multiple acyl-CoA dehydrogenase deficiency (n = 1), maple syrup urine disease (n = 1), glutaric aciduria type I (n = 2) and medium-chain acyl-CoA dehydrogenase deficiency (n = 3). The clinical course of disease was variable for patients (n = 6) with 3-methylcrotonyl-CoA carboxylase deficiency (n = 4), short-chain acyl-CoA dehydrogenase deficiency (n = 1) and formiminoglutamic aciduria (n = 1). There were also two patients with benign hyperphenylalaninaemia. The clinical outcome of these patients is reported.

Conclusion: The incidence of inborn errors of metabolism in Singapore is similar to that seen in the international arena. Early diagnosis and treatment has improved short-term clinical outcome.

Category: Medical ASM2011-MED-073

Osteosarcoma: the Singapore experience

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Introduction: Survival rates for osteosarcoma in Southeast Asia are dismal. We report our experience of the tumour.

Methods: 79 patients with primary osteosarcoma were seen and treated at the departments of paediatric haematology/oncology at KK Women's and Children's Hospital and National University Hospital, Singapore, from October 1994 to December 2009. All patients received chemotherapy and/or surgery, with varying lengths of therapy (range 6–12 months).

Results: The median age at diagnosis was 11.9 years. 41 patients received the two-drug European Osteosarcoma Intergroup (EOI) regimen, while 35 patients, from 2003 onwards, received multidrug T12-like regimen. 55 patients (70%) had localised osteosarcoma, of which 24 were metastatic. Surgery for primary tumour consisted mainly of limb-salvage or amputation. At the time of last follow up, median age was 2.0 (range 0.1–15.4) years;

41 patients were alive without evidence of disease, 19 were dead of disease, 8 were alive with evidence of disease and 10 were lost to follow up. 41 patients had lung relapses and two patients had local recurrences. The five-year event-free survival and overall survival (OS) rates for the cohort were 28.5% (95% CI 16.3–40.7) and 65.6% (95% CI 51.9–79.3), respectively. The five-year OS rates (based on metastatic status) for localised patients versus metastatic patients were 78.5% (95% CI 64.6–92.4) and 27.6% (95% CI 0.0–55.8), respectively (p < 0.05). The five-year OS rates (based on chemotherapy) for T12-like regimen versus EOI regimen was 73.0% (95% CI 51.4–94.6) and 62.0% (95% CI 43.2–80.8), respectively.

Conclusion: The survival for localised osteosarcoma in children and young adults appears to be significantly better with the institution of multidrug treatment regimen. Survival for metastatic osteosarcoma remains poor.

Category: Medical ASM2011-MED-075

Depression and anxiety in a high-risk pregnancy: case report

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Antenatal depression and anxiety can be harmful to both mother and baby, if left untreated. At the same time, however, pharmacotherapy during pregnancy requires judicious use to produce therapeutic effect in the mother while preventing adverse outcomes in the fetus. This report describes an obstetric inpatient with a twin pregnancy from assisted reproduction. The pregnancy was complicated by placenta praevia major, with persistent antepartum haemorrhage, leading to threatened pregnancy loss at 24 weeks of gestation. While admitted for strict bed rest, she developed marked depression and anxiety with suicidal ideation. She was prescribed dothiepin — a tricyclic antidepressant — up to 50 mg daily and promethazine theoclate — an antihistamine for sedation — up to 37.5 mg daily, in

divided doses. The patient also received regular psychiatric case management, supportive therapy and relaxation training over the two months of inpatient stay. She started feeling calmer after two days of medication and continued becoming more positive and motivated with time. Her bleeds stabilised, allowing the patient to carry her twin pregnancy to 35 weeks of gestation. Her medication was gradually stopped just before undergoing elective caesarean section in order to prevent fetal withdrawal symptoms. The patient delivered small, but healthy twins, and remained well post-delivery without medication. This report indicates that pharmacological and supportive measures may be safely and successfully combined to treat antenatal depression and anxiety in high-risk pregnancies.

Category: Medical ASM2011-MED-076

Malignant ovarian stromal tumours in the paediatric population: a single department's experience

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Introduction: Literature on paediatric ovarian stromal tumours is sparse. Our study examined the department's experience with these tumours in children.

Methods: Following approval from the institutional review board, the medical records of patients ≤ 18 years, who underwent surgery for ovarian stromal tumours between 1 July 1997 and 31 December 2010, were reviewed. Data on demographics, presentation, investigations, surgery, histopathology, follow up and outcomes were analysed.

Results: Five of 62 patients (8.1%) who underwent surgery for malignant ovarian neoplasms had ovarian stromal tumours. The median age at presentation was 5.7 (range 0.5–14.1) years. The commonest presentation was abdominal distension. Two patients had virilising features, one had premature menarche and one had premature thelarche. Preoperative hormonal profiles were deranged in all but one patient. Four patients were evaluated

with computed tomography imaging, while one had magnetic resonance imaging. All patients underwent laparotomy. Two patients had a prior diagnostic laparoscopy. A diagnosis of malignant ovarian stromal tumour was established with intraoperative frozen sections in all but one patient. Complete salpingo-oophorectomy, infracolic omentectomy and iliac nodes sampling was then performed. One patient required a re-laparotomy following conservative surgery elsewhere. Two patients had juvenile granulosa cell tumours, two patients had Sertoli-Leydig cell tumours and one patient had a rare variant of ovarian stromal tumours. The median follow-up period was 52.2 (range 3–85) months. The hormonal derangements resolved postoperatively. All patients were alive without disease at the conclusion of our study.

Conclusion: Ovarian stromal tumours have excellent prognosis. Clinical features of hormonal derangements provide a window for early diagnosis of these tumours.

Category: Medical ASM2011-MED-077

Minimising early loss of implantable central venous access devices: application of Clinical Practice Improvement Program (CPIP) tools

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Introduction: Premature loss of implantable central venous access devices (ports and Hickman lines) is a serious morbidity among children with childhood malignancies. We aimed to assess ways in which the loss of these devices within 30 days of placement could be avoided.

Methods: Patients with childhood malignancies who lost their ports or Hickman lines within 30 days of placement between August 2008 and January 2010 were identified (n = 6). Their clinical charts were reviewed and data, such as the diagnosis of malignancy, absolute neutrophil count (ANC) at device placement, type of device, procedural details and indications for device removal, were noted. A workgroup comprising of an oncologist, a surgeon, an infectious disease physician, an oncology-trained nurse and an operating room nurse manager examined the workflow involved in the device placement. Following the principles of Clinical Practice Improvement

Program (CPIP), potential pitfalls resulting in device loss within 30 days of placement were identified.

Results: Devices lost within 30 days of placement were all related to local wound site complications with/without septicaemia. The lack of alcohol in the existing on-table skin preparation was identified as a correctable pitfall. With effect from May 2010, preoperative skin preparations were changed from cetrimide/chlorhexidine and povidone-iodine solutions to 2% chlorhexidine-70% alcohol solutions. No device has been lost within 30 days of placement following this change.

Conclusion: CPIP tools provide a systematic approach to improve existing clinical practices. Our experience with 2% chlorhexidine-70% alcohol skin preparation solutions, the use of which has reduced the number of implantable central venous access device-related infections, mirrors the evidence in literature.

Category: Medical ASM2011-MED-078

Paediatric hepatocellular carcinoma: has time changed anything?

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Introduction: Paediatric hepatocellular carcinoma (HCC) usually occurs in the background of hepatitis B-related liver cirrhosis. We examined our experience with paediatric HCC at the hospital for any differences from the norm.

Methods: Following approval from the institutional review board, the medical records of patients ≤ 18 years who were treated for paediatric HCC at KK Women's and Children's Hospital between 1 July 1997 and 28 February 2011 were reviewed. Data pertaining to presentations, investigations, histopathology, treatment and outcomes were analysed.

Results: Seven children (boys 6, girl 1), with a mean age of 11.3

(range 6.1–12.7) years, were treated for HCC during the study period. Five patients presented with abdominal complaints. The last patient was a hepatitis B carrier and his tumour was detected on surveillance studies. There was only 1 other hepatitis B carrier. Serum α -fetoprotein levels at diagnosis ranged from 1,719.6 μ g/L to > 176,750 μ g/L. Computed tomography demonstrated multinodular disease in three patients. Two patients had solitary tumours that almost completely replaced their livers. These five patients also had pulmonary metastases. Three patients underwent open liver biopsies, while two received image-guided percutaneous biopsies. One child received chemotherapy for presumed hepatoblastoma, but was found to have HCC only after right hepatectomy. The last child underwent segmental resection

for a 2-cm HCC. He eventually required a liver transplant. Four patients received platinum-based chemotherapy. Two patients underwent transarterial chemoembolisation and two received sorafenib. Two patients have survived.

Conclusion: Paediatric HCC in Singapore was not predominantly seen in hepatitis B carriers. Despite the evolving new treatment strategies, outcome for this tumour remains dismal.

Category: Medical ASM2011-MED-079

Audit of low-level laser therapy for myofascial pain syndrome in women

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Introduction: Low-level laser (LLL) utilises 5 J/cm² energy intensity at trigger points to reduce pain and stimulate healing, muscle regeneration and relaxation. The Women's Pain Centre has been treating women with myofascial pain syndrome (MPS) using LLL, together with multimodal analgesia, since 2008. The pain physician assesses and marks the trigger points and LLL therapy is performed by a trained nurse clinician.

Methods: An audit was performed of 40 women who underwent LLL for MPS at KK Women's and Children's Hospital. Data on the number of sessions, treatment regions, concomitant pain, multimodal analgesic regimens, treatment efficacy and side effects were analysed.

Results: The mean number of LLL sessions performed per patient was 5 ± 4. The common treatment areas were the lower limbs (n = 18, 45%), cervical region (n = 15, 37.5%), scapular region (n = 15, 37.5%), lower back (n = 13, 32.5%), upper back (n =

10, 25%) and knee (n = 6, 15%). The common diagnoses for concomitant pain included osteoarthritis, fibromyalgia and plantar fasciitis. Multimodal analgesic regimens, such as antidepressants (n = 34, 85.0%), gabapentin/pregabalin (n = 32, 80.0%), cyclo-oxygenase 2 inhibitors (n = 11, 27.5%), steroid/local anaesthetic injection (n = 10, 25.0%) and tramadol (n = 5, 12.5%), were used in combination with LLL. Most women (n = 33, 82.5%) reported improvement in pain and function after LLL therapy. Six women reported no effect from LLL therapy; 1 woman, who reported worsened pain, subsequently received steroid/local anaesthetic injection that helped reduce pain. No other adverse side effects, such as burns, redness or skin abrasion, were reported.

Conclusion: LLL is an effective non-invasive therapy for women with MPS. LLL can result in lower pain levels and improved function in these patients. The treatment regions are commonly associated trigger point areas. Multimodal analgesia regimens can be used concurrently to reduce pain generators.

Category: Medical ASM2011-MED-080

Neonatal outcome of extremely preterm infants ≤ 28 weeks gestation over a decade

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Introduction: Gestational age (GA) based outcomes are of great relevance to obstetricians and neonatologists to facilitate formulation of perinatal guidelines and counsel parents. We aimed to assess the mortality and morbidity rates in very low birth weight (VLBW) infants according to GA.

Methods: This was a cohort study that evaluated neonatal mortality and morbidity in VLBW infants born between 23 and 28 weeks GA from 2000 to 2009. Logistic regression models

were used to assess association with GA after adjustment for birth weight and to determine risk factors for mortality or survival.

Results: 709 of 887 infants (80%) survived to discharge and rates of survival increased with increasing GA (0% at 22 weeks to 93% at 28 weeks, p < 0.001); 91% of infants at 22 weeks GA and 47% infants at 23 weeks GA were provided comfort care only. All infants over 26 weeks were actively resuscitated. The rates of antenatal steroid usage (23 weeks: 38%, 28 weeks: 80%)

and lower segment caesarean sections (23 weeks: 2%, 28 weeks: 63%) increased significantly from 23 to 28 weeks. Higher survival was independently associated with increasing birth weight and antenatal steroids, while airleaks, severe intraventricular haemorrhage (IVH) and necrotising enterocolitis (NEC) contributed to increased mortality. Infants at the lowest GAs were at the greatest risk of morbidities. The major morbidities seen were bronchopulmonary dysplasia (BPD; 29%), sepsis (23%), severe retinopathy of prematurity (ROP; 21%), IVH (12%) and

NEC (9%). Composite morbidity, comprising any of the above, was seen in 54% infants and it significantly decreased with increasing GA ($p < 0.001$, OR 0.47, 95% CI 0.42–0.54).

Conclusion: Increasing survival and decreasing composite morbidity were seen with each increasing week in gestation. Active perinatal interventions were instituted beyond 23 weeks GA. Local data is comparable to National Institute of Child Health & Human Development (NICHD) data.

Category: Medical ASM2011-MED-081

Diagnostic accuracy of preoperative α -fetoprotein as an ovarian tumour marker in children

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Introduction: Ovarian germ cell tumours (GCTs) and immature teratomas (ITs) produce an elevation in serum α -fetoprotein (AFP) levels. We evaluated the diagnostic accuracy of preoperative serum AFP levels for predicting the likelihood of malignancy in children presenting with ovarian neoplasms.

Methods: 110 girls, aged ≤ 19 years, were treated for ovarian neoplasms between October 1997 and August 2010. We retrospectively correlated preoperative serum AFP levels with final histological outcome (GCT/IT vs. non-GCT/IT and benign vs. non-benign tumours). The area under receiver-operating characteristic curves (AUC), sensitivity, specificity and likelihood ratios were determined.

Results: Twenty patients (18.2%) had non-benign ovarian neoplasms, of which 12 had GCT/IT (10.9%). An analysis of the selectivity of preoperative serum AFP for a differential diagnosis of GCT/IT versus non-GCT/IT revealed the

following specificity (87.8%), sensitivity (66.7%), positive predictive value (PPV; 40.0%), negative predictive value (95.6%) and AUC (0.853) values. When patients aged < 1 year were excluded to eliminate the confounding effects of raised serum AFP in infants, specificity improved marginally (92.0%), but sensitivity remained identical (66.7%); AUC was 0.926. When AFP cutoffs were increased to twice the upper normal limit, specificity improved to 94.9%, but sensitivity remained at 66.7%. Further increment of AFP cutoff did not improve specificity and sensitivity. For differential diagnoses of benign versus non-benign tumours, AFP had a specificity and sensitivity of 88.9% and 50.0%, respectively.

Conclusion: Preoperative serum AFP had fair discriminating power for detecting GCT/IT ovarian tumours in children, but was limited by poor sensitivity and PPV. Clinicians should be aware of these limitations when counselling patients and caregivers prior to surgery for childhood ovarian neoplasms.

Category: Medical ASM2011-MED-082

Haemophagocytic lymphohistiocytosis with isolated central nervous system reactivation

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Haemophagocytic lymphohistiocytosis (HLH) with central nervous system (CNS) involvement is uncommon. We present an eight-month-old patient with familial HLH and isolated CNS reactivation. A two-month-old girl presented with fever and organomegaly and was confirmed to have familial HLH by genetic studies (c.386G > C;p.Trp129Ser mutation in *PRF1*). There were no clinical features of CNS involvement at presentation. She responded well to HLH-2004 treatment protocol and was on maintenance chemotherapy awaiting transplant when she presented with seizures. Initial magnetic resonance imaging of the brain revealed non-specific changes of diffuse cerebral atrophy, with patchy areas of cortical, subcortical and deep nuclei signal abnormality and leptomeningeal enhancement. She was treated for meningoencephalitis. Recurrent twitching of the right limbs was noted. Electroencephalography (EEG) monitoring revealed no EEG correlates. The patient was started on levetiracetam

for non-epileptic myoclonus. Two weeks later, she developed left upper motor neuron facial nerve palsy and breakthrough seizures. Repeat magnetic resonance imaging of the brain revealed extensive areas of abnormal signal involving bilateral cerebral hemispheres, brainstem, posterior fossa, basal ganglia and cerebellum, with thickened and enhanced left optic nerve. On both occasions, blood markers were not suggestive of active systemic HLH disease. Cerebrospinal fluid became abnormal at the second scan. She was restarted on intensive chemotherapy. CNS involvement in HLH has variable clinical and radiological manifestations. Difficulties in differentiating this condition from posterior reversible encephalopathy syndrome (PRES), as a side effect of chemotherapy, remains a challenge. Early recognition of CNS involvement allows for prompt treatment and better disease control. A baseline cranial imaging should be considered for patients newly diagnosed with HLH disease.

Category: Medical ASM2011-MED-083

Computerised video analysis and quantification of limb movements in automated seizure detection

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Introduction: Many efforts have been made to automate seizure recognition. Most have focused on automated analysis and detection of electroencephalography (EEG) patterns. Systems based on accelerometers or markers have been utilised for adult patients. However, these solutions are unsuitable for a paediatric population. Our objective was to develop a non-intrusive, video-based prototype for seizure onset detection in children.

Methods: Our prototype only requires a patient to wear a pajama with specific colors, without attaching any sensor or marker. Patient activities in an epilepsy monitoring unit are captured using a camera mounted on the ceiling. Epochs of activities are excerpted and subjected to automated video analysis, except for a simple manual initialisation. The position and angle of patient's limbs are first automatically extracted, following which the displacement, velocity and frequency of limb movements are

automatically estimated. Next, distinct characteristics between seizure and non-seizure activities are identified for automated detection.

Results: Seizures in three patients were analysed. The prototype was able to successfully delineate limbs and quantify movements. Computerised analysis of recorded video data during seizure events showed sustained displacement from baseline and presence of strong oscillations during focal motor seizures, which were not present in interictal videos.

Conclusion: Our video-based prototype is able to automatically and non-invasively delineate patients and distinguish between ictal and interictal body movements for the purposes of seizure detection. As it does not require sensors or markers, it is more feasible for paediatric patients.

Category: Medical ASM2011-MED-084

The universal newborn hearing programme at KKH: screening of 100,000 infants

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Introduction: To determine the efficacy of Universal Newborn Hearing Screening (UNHS) programme at KK Women's and Children's Hospital (KKH), Singapore, when compared to international benchmark.

Methods: All newborns were screened using a two-stage automatic auditory brainstem response (AABR) protocol prior to hospital discharge. Those who did not pass the inpatient and a second outpatient re-screening at 3–6 weeks of life were referred to Department of Otolaryngology for audiological assessment. Data on infants born between April 2002 and January 2010 were obtained from a prospectively maintained database.

Results: 100,078 infants (99.8%) among 100,237 eligible newborn babies were screened before hospital discharge, which met the international benchmark of 95% set by Joint Committee on Infant Hearing (JCIH). 3,125 newborns (3.1%) did not pass the inpatient

screening test. 135 newborns (0.1%) missed the inpatient screening appointment and were recalled. Screening was refused for only 24 infants (0.02%). 2,977 infants (93.2%) among 3,196 eligible newborns completed the outpatient screening test. 455 infants (15.3%) did not pass the outpatient screening and were referred for assessment. The referral rate for assessment was 0.5%, which is lower than the JCIH benchmark of 4%. 344 of 519 infants (66.3%) completed their audiological assessments. 280 infants (81.4%) were found to have hearing impairment (HI) — mild (12.9%), moderate (34.3%), severe (17.1%), profound (35.7%), bilateral (56.8%), sensorineural (63.2%), conductive (23.6%), mixed (8.9%) and permanent conductive (4.3%). The incidence of any HI and severe-profound HI was 2.8 and 1.5 per 1,000 newborns, respectively. Follow up was discontinued for 116 infants (22.3%), while 59 infants (11.4%) are awaiting evaluation.

Conclusion: UNHS at KKH was able to successfully screen 99.8% of all newborns prior to hospital discharge.

Category: Medical ASM2011-MED-085

Comparison of two general anaesthetic techniques on postoperative nausea and vomiting in laparoscopic surgery

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Introduction: Target-controlled infusion (TCI) is an alternative form of delivering general anaesthesia, with potential reduction of postoperative nausea and vomiting. However, there may be increased costs involved. The preliminary findings of a randomised controlled trial that compared TCI against inhalational anaesthesia for laparoscopic surgery are reported.

Methods: TCI is delivered using intravenous propofol and remifentanyl through the Alaris Arsenia PK system syringe pump. Inhalational anaesthesia is delivered using sevoflurane anaesthesia. The incidence of antiemetic usage, nausea and vomiting in the postanesthetic care unit (PACU) six hours and 24 hours after operation were analysed.

Results: In the PACU, the incidence of nausea was similar between the TCI (2/10) and inhalational (1/7) groups. None of the TCI group patients vomited, though vomiting episodes were seen for one patient (1/7) from the inhalational group. None of the patients required antiemetics in the PACU. None of the patients from the TCI group required antiemetics six hours after operation unlike two patients (2/7) in the inhalational group ($p = 0.154$) who required medication. Only one patient in the TCI group (1/10) required antiemetics 24 hours after operation compared to five patients from the inhalational group (5/7) [$p = 0.035$].

Conclusion: The preliminary findings suggest that TCI may reduce postoperative antiemetic requirements in women, especially at 24 hours after laparoscopic surgery.

Category: Medical ASM2011-MED-086

Prenatally detected intra-abdominal cystic lesions: postnatal outcomes

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Introduction: Prenatal diagnosis of abdominal cystic lesions is becoming increasingly common with modern ultrasonography. It is important to understand the history and course of these lesions to be able to counsel parents appropriately. This study aimed to determine the postnatal outcomes of all neonates detected with antenatal abdominal cystic lesions over a five-year period between 2004 and 2008.

Methods: Data was prospectively collected. All patients with abdominal cysts and dilated gallbladders were included. Patients with antenatally diagnosed renal cysts and isolated dilated bowel loops were excluded from the study.

Results: Of 48 neonates with antenatally detected abdominal cystic lesions, 25 patients (52%) were lost to follow up, as they were either referrals from other centres or migrated to other countries. There was spontaneous resolution in two of 23 neonates

followed up at our institution. Of the remaining 21 patients, nine neonates (43%) had normal imaging postnatally; a majority of patients had dilated gallbladders (5/9). The remaining 12 patients had ovarian cysts (n = 5, 24%), enteric duplication cysts (n = 2, 9.5%), choledochal cysts (n = 2, 9.5%) and other causes (n = 3; kidney cyst, liver cyst and spleen cyst). All five neonates with ovarian cysts underwent surgery with no mortality. Two of five patients had evidence of torsion and surgery was performed within the first week of life. Two neonates with choledochal cysts and one patient with duplication cyst underwent surgery, with no postoperative complications.

Conclusion: Eight of 21 patients needed surgical intervention in this cohort, with good neonatal outcomes. The presence of gallbladder dilatation appears to be a normal variant with normal imaging postnatally in all patients. This data could prove useful for parental counselling.

Category: Medical ASM2011-MED-087

Early discharge planning for preterm low birth weight infants: a feasibility and safety study

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Introduction: Extended hospitalisation of low birth weight infants increases the risk of medical and psychosocial complications. Earlier planned discharge might be beneficial for the infant, family and healthcare service. Our aim was to assess the safety, feasibility and cost savings of early discharge at 1,900 g compared with the traditional practice of discharge at 2,000 g.

Methods: Preterm infants (birth weight 1,000–1,700 g) were eligible for discharge at 1.9 kg, if they met predefined criteria. Subsequent follow up by nurse specialists was scheduled to record postdischarge weight gain, rehospitalisation and other morbidities.

Results: Of 205 infants identified (birth weight 1.0–1.7 kg), 45 babies (22%) met the discharge criteria. At discharge, the average weight (1,925 ± 18 g), gestational age (37 ± 1.5 weeks) and duration of hospital stay (35 days) were noted. The first

postdischarge weight was taken at seven days (mean weight 2,162 g; average weight gain 35 g/day). Potential cost savings for subsidised patients were \$352–\$792. Three of 45 babies were readmitted due to poor feeding, but there was no major morbidity or mortality. 159 of 205 babies (78%) did not meet the discharge criteria because of poor bottling skills (48%), medical illness (17%), surgical reasons (21%), social reasons (4%) and parental requests (17%).

Conclusion: Early discharge at 1.9 kg was possible in only 22% of babies. The majority could not go home due to poor bottling skills that required earlier speech and language therapist referrals. Safety and cost savings appear to be promising. This study helped us identify the areas that required intervention to facilitate earlier discharge planning and provided the grounds to move forward in planning discharges at 1,800 g for selected babies.

Category: Medical ASM2011-MED-088

Neonatal extracorporeal membrane oxygenation programme at KKH: initial experience

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Introduction: Extracorporeal membrane oxygenation (ECMO), a well-established intervention for refractory respiratory failure in neonates, was introduced recently in Singapore. This series reviews the outcome of neonates who underwent ECMO at KK Women's and Children's Hospital over a three-year period from February 2008.

Methods: Eight patients met the criteria for inclusion in the review. The data collected included maternal and infant characteristics, diagnosis of respiratory failure, age at ECMO commencement, duration of ECMO, complications and duration of hospitalisation. Oxygenation index (OI) and arterial alveolar oxygen tension (A-Ado²) ratios prior to undergoing ECMO were recorded.

Results: Seven patients underwent ECMO for refractory respiratory failure and 1 patient for cardiac reasons. Median birth weight was 3.1 (range 2.5–3.5) kg. Median gestational

age was 38 (range 37–40) weeks. Median OI and A-Ado² ratios were 622 (range 612–641) and 47.8 (range 37–65), respectively, prior to ECMO commencement. Indications for ECMO included congenital diaphragmatic hernia (CDH; 4/8), meconium aspiration syndrome (2/8), flecainide overdose (1/8) and sepsis (1/8). Median duration of ECMO was 9 (range 6–16) days and 3.5 (range 3–6) days, respectively, for CDH and non-CDH indications. Median duration of hospital stay was 33 (range 4–83) days. Main complications included haemolysis (25%), haemorrhage (25%), thrombosis requiring circuit change (25%) and thrombocytopenia (87.5%). Haemofiltration was required for 25% of patients. Overall survival following ECMO and discharge was 62.5%.

Conclusion: ECMO has been shown to be a successful therapy for acute refractory respiratory failure when conventional strategies have failed in term infants. The outcome of infants in this series is comparable to other reported centres.

Category: Medical ASM2011-MED-089

Outcome of neonates with antenatally detected central nervous system malformation and corresponding postnatal correlation

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Introduction: Correlation of antenatally detected central nervous system (CNS) malformations with postnatal imaging is important for quality control and to provide information to families. The aim of this study was to correlate antenatally detected CNS anomalies with postnatal imaging and to assess neonatal outcomes.

Methods: A retrospective cohort study was conducted of patient records collected from Birth Defect Registry between January 2005 and December 2009.

Results: Among the 192 instances of antenatally detected CNS anomalies identified, there were 88 (45%) medical termination of pregnancies (MTPT) and seven (4%) fetal deaths. Anencephaly

accounted for 41 (47%) terminations. Only 21 fetuses (25%) received postmortem evaluation, with 100% correlation in findings. There were 70 live births (36%), with a median birth weight and gestational age of 2 (range 1.2–4.3) kg and 38 (range 33–41) weeks, respectively. Antenatal CNS anomalies were classified as those with a dilated cisterna magna (CM) and those with other structural malformations. 34 fetuses (45%) had dilated CM, with 7 (21%) showing postnatal persistence of the anomaly. Five of seven neonates (71%) had poor neonatal outcomes. 38 fetuses (54%) had other structural malformations, including anencephaly (n = 6, 16%), hydrocephalus (n = 2, 3%), Arnold Chiari malformation (n = 2, 3%), agenesis of corpus callosum (n = 7, 18%) and others (n = 21, 55%). 34 infants (89%) had good correlation between antenatal and postnatal findings. Nine

neonates (13%) died, seven (10%) required ventilatory support and six (8%) needed surgical intervention. 18 infants (25%) needed rehabilitation services and 15 (21%) needed special school placements.

Conclusion: Good correlation was noted between the findings of antenatal and postnatal imaging (89%). Combined death and disability was noted in 27 neonates (38%) for whom CNS anomalies were detected antenatally.

Category: Medical ASM2011-MED-090

Necrotising fasciitis and childhood malignancies

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Introduction: Necrotising fasciitis (NF) is rare among children. We examined our institution's experience with NF in children with coexisting malignancies.

Methods: Following approval by the ethics committee, the medical records of patients ≤ 18 years who were treated for NF, with coexisting malignancies, at KK Women's and Children's Hospital between 1 March 2001 and 31 December 2011 were reviewed.

Results: There were six boys and three girls in the group, with a mean age of 6.8 (range 1.6–13.5) years. Seven patients had preexisting leukaemia, one presented with NF at diagnosis of leukaemia and one patient had parameningeal rhabdomyosarcoma. Fever, local pain, swelling, erythema and necrotic spots were the most common presentations. The affected sites included extremities ($n = 3$), groin and perineum ($n = 2$), head and neck ($n = 3$) and chest ($n = 1$). Seven patients were neutropenic at

admission; three developed NF at site of recent portacath insertion. *Pseudomonas aeruginosa* was the most common pathogen ($n = 7$) and was the sole pathogen isolated from four patients. Five patients had polymicrobial infections. Urgent surgical debridements with/without fasciotomy were performed for all patients, with serial examinations under anaesthesia and repeat debridements. Diagnosis was intraoperative, with additional histological confirmation in eight patients. One patient required local flap closure, one needed delayed secondary closure and three patients required split skin grafts to create diverting stomas for perineal NF. There was one death in the group; the remaining wounds healed by granulation and achieved satisfactory healing by two months (range 17–58 days).

Conclusion: *Pseudomonas* and enteric Gram-negative organisms are seen frequently in immunocompromised children with NF. Childhood NF will become more common as cancer treatment becomes aggressive.

Category: Medical ASM2011-MED-091

Neonatal diagnosis of I-cell disease (mucopolipidosis II): a first in Singapore

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A term infant boy, delivered uneventfully to non-consanguineous parents with no previous history of affected family members, had skeletal deformities of bilateral clubfeet, torticollis and bowing of long bones, which subsequently showed generalised osteopenia and classical rickets-like bone changes on skeletal survey. As serum bone profiles revealed abnormalities suggestive of congenital rickets, the infant was started on vitamin D and calcium supplements. A diagnosis of I-cell disease was eventually made at age 2.5 months, when a repeat skeletal survey revealed periosteal cloaking of long bones — a feature of storage disorders — and

white cell enzyme analysis revealed elevated mannosidase enzyme activity, suggestive of I-cell disease. This patient with I-cell disease is noteworthy due to associated neonatal features of skeletal abnormalities and biochemical features of hyperparathyroidism. I-cell disease, or mucopolipidosis II, is a rare inherited lysosomal storage disorder that is characterised by skeletal abnormalities, coarse faces and growth and psychomotor retardation. Diagnosis is often missed at birth and usually determined within the first year of life, when clinical features become more apparent. Prenatal chorionic villus sampling, amniocentesis and ultrasonography offer diagnosis

in utero, where characteristics such as polyhydramnios, shortened femurs and growth restriction have been detected in affected fetuses. The most striking neonatal features are orthopaedic deformities, such as thoracic deformity, kyphosis, clubfeet and deformed long bones. Additional clues

to early diagnosis include rickets-like radiological features and biochemical abnormalities of hyperparathyroidism. Cardiorespiratory complications usually lead to death within the first decade of life and therefore early diagnosis is essential in optimising the management of affected children.

Category: Medical ASM2011-MED-093

Trends in neonatal deaths over two decades: a single-institution experience, January 1991–December 2009

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Introduction: Neonatal mortality is used as an indicator of health status and provides a measure of the social and public health systems and practices in neonatology. It is thus very helpful especially for the purposes of international comparisons. The aim of this study was to determine trends in neonatal mortality rates over an 18-year period between January 1991 and December 2009 and to identify the cause of neonatal deaths using the modified Wigglesworth classification system and any trends causing specific mortality over the same period.

Methods: This was a retrospective cohort study from a prospectively captured perinatal statistics database.

Results: The total number of live births during the period was 273,399 with 661 neonatal deaths contributing to a neonatal

mortality rate of 2.4 deaths/1,000 live births. The mortality rate for very low birth weight (VLBW) infants was 370/3,525 (104/1,000 live births), while that for extremely low birth weight (ELBW) infants was 276/1,374 (200/1,000 live births). By regression analysis, a significant decline was noted in the mortality rates of VLBW and ELBW populations ($p = 0.00$). Deaths were due to congenital malformations ($n = 271$, 41%), extreme prematurity and related complications ($n = 280$, 42%), birth asphyxia ($n = 70$, 11%) and other causes ($n = 45$, 6.8%). A significant decline in mortality associated with birth asphyxia was noted (from 1.19 to 0.18, $p = 0.12$).

Conclusion: With recent advances in intensive care, there is a significant decline in the mortality rates of VLBW and ELBW neonates and in the number of deaths secondary to birth asphyxia.

Category: Medical ASM2011-MED-094

Use of fluorescence *in situ* hybridisation for validating multiplex ligation-dependent probe amplification and array comparative genomic hybridisation

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Introduction: Multiplex ligation-dependent probe amplification (MLPA) and array comparative genomic hybridisation (aCGH) analyses were introduced in our hospital recently. Both techniques have been proven to be useful for the detection of genetic imbalances in patients with developmental delay and/or multiple congenital anomalies. However, validation of abnormal findings by these

techniques is essential to avoid false-positive results. Fluorescence *in situ* hybridisation (FISH) validation is advantageous as it is performed routinely in our laboratory and ensures the availability of a reliable method to detect and localise chromosomal imbalances. We share our laboratory's experience in validating abnormal MLPA and aCGH results in 11 patients using FISH.

Methods: 11 patients found to have genetic imbalances by MLPA or aCGH were enlisted for the study. Carnoy-fixed metaphase and interphase cells were prepared from peripheral blood lymphocyte cultures. FISH using specific BAC clones was then performed for validation.

Results: All 11 patients were index cases, with deletions (n = 9) and duplications (n = 2). FISH confirmed deletions in all nine patients, with the deleted regions concurring with those seen

during the aCGH/MLPA analyses. However, FISH was only able to confirm the duplication for one patient, whereas two patients were shown to have duplications by aCGH.

Conclusion: We conclude that analysis by FISH is one of the preferred methodologies for validating MLPA and aCGH deletions though it may not be as useful for confirming duplications. FISH can save time and cost in addition to being able to delineate the chromosomal position.

Category: Medical ASM2011-MED-095

Caroli's syndrome and autosomal recessive polycystic kidney disease: conjugated hyperbilirubinaemia and chronic renal impairment in a neonate

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Caroli's syndrome is a rare condition characterised by intrahepatic bile duct ectasia and congenital hepatic fibrosis. It can be associated with autosomal recessive polycystic kidney disease (ARPKD). We report a neonate with Caroli's syndrome and ARPKD, who presented with conjugated hyperbilirubinaemia and chronic renal impairment. The patient was the first child of non-consanguineous parents and there was no family history of renal/liver cystic disease. Antenatal scans were normal and postnatal course was uneventful. The infant was admitted on day 12 of life with neonatal jaundice. Investigations revealed conjugated hyperbilirubinaemia (total bilirubin 379 $\mu\text{mol/L}$, direct bilirubin 297 $\mu\text{mol/L}$), with mild transaminitis and chronic renal impairment (urea 17.4 mmol/L , creatinine 311 $\mu\text{mol/L}$) and severe metabolic acidosis and hyperkalaemia. Abdominal ultrasonography revealed large echogenic kidneys with multiple small cysts bilaterally and

two hepatic cysts. Intraoperative cholangiogram revealed cystic dilatation of the left intrahepatic duct. Liver biopsy showed liver fibrosis with portal tract dysgenesis with mildly ectatic and dilated biliary tract. The patient was started on ursodeoxycholic acid for management of cholestasis. Chronic renal impairment was managed conservatively. Her clinical course was complicated by infections (upper respiratory tract infections and rotavirus infection) and she eventually died of sudden cardiorespiratory collapse. Caroli's syndrome is a rare congenital disorder associated with ARPKD, which is believed to be caused by a *PKHD1* gene mutation. Patients often present with recurrent cholangitis, resulting from biliary stasis and cholelithiasis, and features of hepatic fibrosis. We reported the unusual presentation of conjugated hyperbilirubinaemia and chronic renal impairment in a neonate with Caroli's syndrome and ARPKD.

Category: Medical ASM2011-MED-096

Effect of antenatal Doppler flow studies on neonatal and two-year outcomes of VLBW IUGR neonates

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Introduction: Worsening abnormalities on Doppler velocimetry in intrauterine growth retardation (IUGR) neonates are associated with raised neonatal mortality, morbidity and possibly poor long-term outcomes. Limited data is available for long-term outcome in such infants. This study aimed to determine the neonatal and two-year outcomes of very low birth weight (VLBW) IUGR neonates in relation to umbilical vessel Doppler flow studies.

Methods: A cohort study was conducted of infants born between January 2005 and December 2007. The study population was divided based on antenatal Doppler results into those with normal studies (normal umbilical artery pulsatility index [NUAPI]-Gr I) and abnormal studies (Gr II), with Gr II being further subclassified as Gr IIa (abnormal umbilical artery pulsatility index [AUAPI]) and Gr IIb (absent or reverse end diastolic flow [A/REDF]). Two-year outcome was available for birth weight < 1,250 g.

Results: 125 of 167 VLBW IUGR neonates (74.8%) had Doppler studies done — Gr I (n = 31, 25%), Gr IIa (n = 67, 53%) and Gr IIb (n = 27, 22%). Pregnancy-induced hypertension and lower uterine segment caesarean section were higher in Gr II infants. Neonates in Gr IIb had lower birth weight, gestational age and survival ($p < 0.01$). Respiratory distress requiring surfactant and significant patent ductus arteriosus was higher in Gr IIb. Among 49/63 VLBW < 1,250g, who were followed up for two years, there was no significant difference in the mental index and physical disability index scores between the three groups. However, there was a trend towards low psychometric scores in Gr IIb.

Conclusion: In cases of preterm IUGR VLBW neonates, abnormality of Doppler studies (especially A/REDF) signifies fetal compromise and can be a predictor of adverse perinatal outcome. The possible trend towards lower psychometric scores in Gr IIb infants needs further evaluation.

Category: Medical ASM2011-MED-097

Patients presenting as 'asthma': our experience of four patients

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We report four patients who presented with symptoms of 'asthma,' but were subsequently found to have different diagnoses. Patient 1 was an 18-year-old boy with asthma on intermittent bronchodilators. He had recurrent haemoptysis and persistent left lung atelectasis. Computed tomography (CT) imaging showed a left hilar mass with subsegmental collapse and bronchoscopy confirmed an endobronchial carcinoid tumour. He underwent resection of the tumour and lobectomy and has remained well post surgery. Patient 2 was a six-year-old girl with recurrent severe asthmatic attacks since infancy. She presented with severe stridor and respiratory distress requiring intensive care. CT imaging of the thorax showed an anomalous left pulmonary artery with long segment tracheal stenosis. Her

family opted for surgery in her native country. Patient 3 was a 13-year-old obese boy with moderate persistent asthma and poor lung function tests. History taking during a follow-up visit revealed that the patient had recently coughed up a pencil cap, in whole, that was swallowed four years previously. Bronchoscopy was declined by the patient's family and the patient remains on regular follow-up. Patient 4 was a 14-year-old boy, who was one of twins with 'difficult to manage' asthma. He was recently noted to have early clubbing. Chest radiograph and CT imaging showed evidence of bronchiectasis, for which he is currently being worked up. These patients highlight the importance of physicians maintaining vigilance while managing asthma, as 'not all that wheezes is asthma.'

Category: Medical ASM2011-MED-098

Outcomes of fetal echogenic bowel

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Introduction: To study the fetal and neonatal outcomes of echogenic bowel detected on second trimester screening.

Methods: A retrospective review was conducted of patients for whom echogenic bowels were detected antenatally during the second trimester fetal anomaly scan over a one-year period from August 2009 to July 2010.

Results: 100 patients with echogenic bowel were identified, but 15 were lost to follow up. Among the remaining 85 patients, some had isolated echogenic bowels ($n = 64$, 75%) while others had associated abnormalities ($n = 21$, 25%). Overall, the termination of nine pregnancies was seen due to medical indications ($n = 6$, 67%; hydrops fetalis 3, malformation syndromes 2, trisomy 21 1), social reasons ($n = 1$) or fetal deaths ($n = 2$; hydrops fetalis 1, placental thrombotic vasculopathy 1). Two patients with hydrops fetalis had parvovirus infection. Only two of nine terminated

pregnancies belonged to the isolated echogenic bowel group. Median gestational age at birth and birth weight of all live births were 38 (range 25–41) weeks and 2,635 (range 390–4,380) g, respectively. Among 76 live births, eight infants (11%) were intrauterine growth restricted (IUGR); seven of eight IUGR infants belonged to the isolated echogenic bowel group. Six of 76 infants (8%) had significant meconium inspissation and were all from the isolated echogenic bowel group; only 1 patient (1%) needed surgical intervention, with a postnatal diagnosis of congenital aganglionosis. There were three unrelated deaths within this cohort.

Conclusion: 14 of 63 infants (78%) in the isolated echogenic bowel group had good outcome, but those associated with other abnormalities had significant pathologies. It is important to thoroughly investigate all echogenic bowel cases antenatally to facilitate better patient management and parental counselling.

Category: Medical ASM2011-MED-099

Identifying the incidence and predictors of extubation failure in extremely low birth weight neonates

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Introduction: Improved care for very premature neonates has increased survival rates without substantially reducing respiratory morbidity. This study aimed to identify: (1) the incidence of extubation failure in extremely low birth weight (ELBW) neonates and compare outcomes in babies with extubation failures versus the successful group; and, (2) the predictors of extubation failure and recommend use of modifiable factors to improve outcome.

Methods: This was a retrospective cohort analysis of the medical records and data collected from the very low birth weight (VLBW) database on ELBW neonates born between 2005 and 2007.

Results: Extubation failure in ELBW neonates was defined as failure of extubation within 72 hours of application. 60 ELBW infants were analysed — death prior to attempting extubation ($n = 19$, 31%), successful extubation ($n = 29$, 40%) and failed

extubation ($n = 12$, 20%) were noted in the group. Mean birth weight and gestation was 677 ± 91 g and 25.2 ± 1.84 weeks, respectively, for the cohort. Infants who died had significantly lower birth weight and gestation, though there was no difference between the groups. Median day of extubation was day 17 for the failure group and day 10 for the successful group. Sepsis (3/12), apnoea of prematurity (3/12), pneumonia (2/12), chronic lung disease (2/12) and atelectasis (2/12) were the aetiological factors identified for extubation failure. All neonates except one were discharged home without supplemental oxygen.

Conclusion: Sepsis and pneumonia were identified as modifiable risk factors for extubation failure and these accounted for a majority (42%) of failures. Continued vigilance and strict compliance with aseptic techniques for sick ELBW neonates are of utmost importance in order to reduce the incidence of sepsis and thereby improve extubation failure rates.

Category: Medical ASM2011-MED-100

Neonatal encephalopathy: experience from a district general hospital in Tamil Nadu

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Introduction: Hypoxic ischaemic encephalopathy (HIE) continues to be a major morbidity in developing countries. This study aimed to assess the quality of care and timing of possible asphyxial events for infants with neonatal encephalopathy.

Methods: A prospective descriptive study was carried out over a one-year period. Neonates admitted to Chengalpattu Medical College with evidence of encephalopathy within the first 24 hours of life and gestational age > 37 weeks were included in the study. Data collected included antenatal, natal and postnatal events, risk factors, quality of care in the referral unit and neonatal outcome.

Results: 139 patients with neonatal encephalopathy (stages II and III) were included in the study. Antenatal check ups were

done at PHCs (75%) and GHs (13%). 79% of pregnant women had over six antenatal visits. Data on the use of partograph was not available for analysis. Key risk factors for mortality were male child, meconium stained liquor and apgar score < 3 at 5 minutes of life. The identification of danger signs, early referral, resuscitation and improper transport were the cause of mortality in 60% of patients.

Conclusion: This study highlights the need for early identification of newborns requiring resuscitation and calls for personnel training in neonatal resuscitation in order to decrease the incidence of HIE and related complications. There is also an urgent need to improve skills and facility in referral units to reduce the morbidity due to birth asphyxia.

Category: Medical ASM2011-MED-101

The ice pack test for young infants with myasthenia gravis

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Diagnosis of myasthenia gravis in young infants is challenging as clinical features are often non-specific and include weakness, poor feeding and respiratory difficulty. We review the difficulties of diagnosing myasthenia gravis in a young infant and the importance of the ice pack test in bedside evaluation. A two-month-old infant presented with a one-week history of poor suck and hypotonia. Her birth history was uneventful. Antenatally, her mother was well. There was no significant family history. Physical examination revealed generalised hypotonia with preserved power of extremities and deep tendon reflexes. Bilateral ptosis was noted three days after admission, although photographs of the infant at age one month showed an absence of symptoms. Investigations included full blood count,

blood and urine metabolic screens, karyotyping, methylation study, neuroimaging and test for acetylcholine (Ach) receptor antibodies. An ice pack test was conducted. Improvement of ptosis was taken to constitute a positive response. Blood investigations, neuroimaging and Ach receptor antibodies revealed normal results. The infant demonstrated a positive ice pack test. She was started on pyridostigmine, with excellent response. Within 3–4 days of treatment, feeding improved, hypotonia and ptosis resolved and the infant looked more alert. The ice pack test was supportive in confirming the diagnosis of myasthenia gravis in this young patient. It is a safe and inexpensive procedure and should be considered for the bedside evaluation of young infants with suspected myasthenia gravis.

Category: Medical ASM2011-MED-102

Using Clinical Practice Improvement Program (CPIP) tools to improve referral rates of appropriate paediatric oncology patients to the palliative service

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Introduction: Children with cancer requiring palliative care are often not referred or are referred late to the palliative care service. In these cases, it is difficult to build rapport between the palliative team and families due to the stresses involved. As a consequence, palliative service is not delivered optimally.

Methods: A Clinical Practice Improvement Program (CPIP) project was undertaken in November 2009 with the aim to improve the referral rates of appropriate paediatric oncology patients to the palliative service. The target population were children diagnosed and treated at our institution for poor prognosis cancers, such as those with complete relapse or estimated prognosis of $\leq 20\%$ and progressive or refractory tumours.

Results: Data from the preceding two years showed a referral rate of about 30%. Reasons for non-referral included misconceptions regarding the role of the palliative team and the referral physicians

being too busy, not thinking of it, or judging parents as not ready for intervention. Using the Pareto Chart, up to three root causes of non-referral were identified and possible solutions for these discussed. Palliative 'champions' were assigned in key areas of the oncology unit to both look out for appropriate patients and remind the primary physician about palliative referral. Such patients were also flagged up to doctors at the in-house cancer registry. Workflow and referral processes were established at prominent locations in the unit and all new incoming staff were orientated to the palliative team's role. Referral rates improved from 70% to 100% following these interventions.

Conclusion: There could be several reasons behind the non-referral of appropriate paediatric oncology patients to the palliative service. However, active intervention from key stakeholders could go a long way in improving referral rates for these patients. There are plans to extend the project to non-oncology patients.

Category: Medical ASM2011-MED-103

Occurrence of second malignancies in children treated at a single institution

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Introduction: With improvement in the survival rates of childhood cancer, the incidence of second malignant neoplasms (SMNs) has become a worry. SMN is reported to be associated with female gender, age < 10 years at diagnosis, Hodgkin's lymphoma and soft tissue sarcoma, 11q23 locus, radiation, high-dose anthracyclines and alkylating agents. We aimed to investigate if these factors applied to the local population in Singapore.

Methods: A retrospective review was done of children with SMN who were treated at our institutions from January 1997 to December 2009.

Results: Twelve children developed SMN (girls 8, boys 4). Mean age at diagnosis of primary malignancy was 6.1 (range 0.9–13.6) years. There were six patients with acute leukaemia, five with brain tumours and one with osteosarcoma. Of seven patients

who received radiation, four developed SMN in previously irradiated fields. Among those who were not irradiated, four patients received high-dose anthracyclines, alkylating agents or epipodophyllotoxins. One patient did not receive treatment for the primary tumour. SMN was noted 8.2 (range 0.4–17.6) years after the diagnosis of the primary malignancy. One child developed SMN while still on treatment for primary malignancy; the remaining developed SMN 7.5 (range 0.6–15.4) years after treatment for the primary malignancy had stopped. The commonest SMN was brain tumour. Only 1 SMN was associated with the 11q23 locus. Three patients died; the remaining patients are in remission, with continuing follow up (range 0.3–10.3 years).

Conclusion: Risk factors for developing SMN includes female gender, age < 10 years at diagnosis, acute leukaemia and radiation. Prognosis was good, with a ten-year event-free survival of 75%.

Category: Medical ASM2011-MED-104

New-onset ataxia: acute cerebellar stroke in children

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We report two patients who presented with acute cerebellar ataxia, as a result of an acute stroke involving the cerebellum. Patient 1 was a ten-year-old girl of Chinese-Thai descent who presented with vertigo dizziness, frontal headache, vomiting and diplopia. There was no fever or recent trauma, but she had received a flu vaccine a day earlier. She was alert and oriented but had left fourth cranial nerve palsy signs and clear volitional and truncal ataxia. Magnetic resonance (MR) imaging of the brain showed new infarcts at the cerebellar vermis and left cerebellar hemisphere. Vascular imaging, echocardiography and blood investigations failed to demonstrate a cause. She was given aspirin. By one week, the patient had regained independent ambulation and had a normal examination on

review at 6 months follow up. Patient 2 was a 14-year-old Chinese boy who presented with acute generalised headache, vertigo, vomiting and ataxia. He had no fever or recent trauma. He was alert and oriented, but had clear volitional and truncal ataxia. Later, withdrawn behaviour and selective mutism emerged. MR imaging of the brain revealed acute infarcts in the right cerebellar hemisphere and vermis. He received heparin in the acute phase and aspirin subsequently for stroke prophylaxis. He returned home on a plan of motor and behavioural rehabilitation. Cerebellar stroke is a relatively less common, though important, differential diagnosis in children presenting with new-onset headache and ataxia. Approaches to management and investigations are discussed.

Category: Medical ASM2011-MED-105

Clinical profile of retinoblastoma in a children's cancer centre in Singapore

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Introduction: Retinoblastoma (RB) is the most common primary intraocular childhood tumour. We describe our single-centre experience of the tumour.

Methods: Data were obtained from the medical records available at Singapore Childhood Cancer Registry, hospital and Ophthalmology Service. Patients aged < 15 years with RB who were seen at the hospital from 1997 to 2009 were included in the study. The data collected included demographics, presentation, treatment and outcome.

Results: 47 patients were identified — 27 residents and 20 foreigners. The median follow-up duration was 37.1 months. The male-to-female ratio of the study population was 0.9:1. Mean age at diagnosis was 26 (range 1–96) months. Most patients were Chinese — local (25/27, 93%) or foreign (9/20, 45%). Leukocoria was the most common presenting symptom (74%) followed by squint (17%) and poor vision (17%). Mean duration

of symptoms was 16 (range 1–120) weeks. A majority of the cases were unilateral (32/47, 68%). The proportion of bilateral RB among local and foreign patients was 22% (6/27) and 55% (11/20), respectively. Two patients had pinealoblastoma. Patients (n = 2) with metastases at diagnosis presented with marrow metastasis (n = 1) and metastases to the marrow, spine and liver (n = 1). Only two of 15 patients (13%) with bilateral RB underwent RB gene mutation testing. One patient received radiotherapy. Among local patients, deaths (n = 2, 7%) were from disease in one patient with trilateral RB and due to sepsis in one patient with metastatic bilateral RB. None of the local patients developed second malignancies. Follow-up and outcome data were unavailable for 50% of foreign patients.

Conclusion: This was a small series of RB in a Southeast Asian population. Good outcomes and follow up were achievable for local patients. Most patients did not undergo RB gene mutation analysis due to high costs and lack of availability.

Category: Medical ASM2011-MED-106

Audit on compliance of nephropathy screening to ISPAD standards in children and adolescents with type I diabetes mellitus

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Introduction: Screening for microvascular complications in children with type 1 diabetes mellitus (T1D) is an essential aspect of diabetes care. Microalbuminuria (MA) is an early marker for nephropathy and may be the first sign of microvascular disease. The aims of this study were manifold: (1) to assess compliance of nephropathy screening for children with T1D to International Society for Paediatric and Adolescent Diabetes (ISPAD) standards in 2010; (2) to measure (2a) first screening compliance (percentage screened according to age of commencement standards) and (2b) annual screening compliance (percentage screened in 2010).

Methods: ISPAD standards propose annual nephropathy screening from the age of 11 years for patients with ≥ 2 years of diabetes mellitus and from the age of 9 years for those with ≥ 5 years of disease. All children with T1D (age ≥ 9 years) who

had 1 or more clinic visits in 2010 were included. Data on the duration of T1D and MA testing were collected and analysed.

Results: 233 patients with T1D were ≥ 9 years in 2010. Patients were subdivided into two groups based on age and duration of T1D — group A patients were aged 9–10 years with T1D for > 5 years (7/27), while group patients B were aged ≥ 11 years with T1D for > 2 years (183/206). 85% of patients in group A (6/7) and 95% in group B (174/183) complied with first screening standards. 71% of patients in group A (5/7) and 57% in group B (105/183) complied with annual screening standards.

Conclusion: Although 95% compliance was seen for first screening standards, the annual screening rate in 2010 was only 57%. Our centre will focus on improving the annual screening rate to achieve compliance of at least 95% in 2011.

Category: Medical ASM2011-MED-107

Torsion of a multicystic megaovary as initial presentation of severe undiagnosed hypothyroidism

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Severe untreated juvenile hypothyroidism may manifest as precocious puberty with ovarian enlargement, a clinical triad that was first described by Van Wyk and Grumbach in 1960. However, ovarian torsion as initial presentation is rare. We describe a girl with multicystic megaovaries, presenting with acute torsion requiring unilateral oophorectomy and a subsequent diagnosis of primary hypothyroidism. The clinical, radiological, biochemical and histopathological findings are also presented. A 5-year-old girl presented with vaginal bleeding, abdominal distension and acute abdominal pain. Computed tomography showed bilateral adnexal masses of ovarian origin, with possible neoplasia. Emergency oophorectomy was performed for torsion of the left megaovary. Histopathology showed ovaries containing large luteinised cysts with haemorrhagic infarction of the left tube and ovary. Hypothyroidism was unrecognised at the time,

but general anaesthesia proceeded uneventfully. Endocrine examination showed euthyroidism, absence of virilisation/pubarche and prominent nipple-areola complex without breast buds. Gonadotropin response to stimulation was prepubertal; elevated levels of oestradiol, prolactin and CA-125 normalised after surgery. Thyroid function tests revealed undetectable thyroxine (< 5.2 pmol/L), markedly elevated thyroid stimulating hormone (486.75 mIU/L) and raised thyroid antibody levels. Thyroxine replacement was commenced. Any prepubertal child presenting with ovarian masses should be examined for signs of precocious puberty and evaluated for primary hypothyroidism. Ovarian torsion may be an indication to suspect underlying hypothyroidism. In the absence of torsion, surgery is unnecessary as ovaries can be salvaged and cyst regression will eventually occur after appropriate thyroid hormone replacement.

Category: Medical ASM2011-MED-108

Risk factors in refractory absence epilepsy: a retrospective case-control study

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Introduction: Children absence epilepsy (CAE), described as 'staring spells' in otherwise normal children, usually has an onset during 4–10 years of life, often with characteristic electroencephalography (EEG). This study aimed to review patient characteristics among children diagnosed with CAE as well as to identify adverse risks factors, including ethnicity, that were predictive of seizure outcome.

Methods: The medical records of 41 children who had generalised 3-Hz spike-and-wave on EEG were obtained from the institutional EEG database. 38 children with CAE were eligible for inclusion in the retrospective review. Children were divided into two groups — responsive (< 6 months) and refractory (> 6 months) — based on the time taken to become seizure free. Demographics, risk factors and other data were compared using the Pearson's chi-squared test, independent

t-tests, analysis of variance (ANOVA) and simple regression.

Results: 30 of 38 children had sufficiently long follow-up periods for inclusion. Sodium valproate was the first-line drug of choice. There was a significant difference in age at presentation between the responsive and refractory groups ($p < 0.05$). Responsive children were significantly older at presentation (8.34 ± 2.22 years) than those whose absence seizures were difficult to control (6.81 ± 0.54 years). Age at presentation and time to attain control were also observed to be significantly and negatively correlated ($r = -0.36$, $p = 0.05$).

Conclusion: Age at presentation was the only associated risk factor correlating with time to attain control. No ethnic predilection for CAE was noted. The percentage of refractory absence epilepsy in our study was 33%, though eventually all patients did become seizure free.

Category: Medical ASM2011-MED-109

Risk factors and predictors in epilepsy development and current quality of life: a retrospective cohort study

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Introduction: Childhood epilepsy is common in Singapore (incidence 24/100,000 person-years). This study aimed to: (1) determine the characteristics at presentation and risk factors arising later that might contribute to the occurrence of further seizures; and, (2) understand the quality of life of these children.

Methods: A retrospective cohort study was conducted of children presenting with first afebrile seizures between 2002 and 2004. Standardised telephone questionnaires were administered to patients/caregivers. Patients with only one seizure (1AS) were compared to those with recurrent seizures (RAS) for birth history, risk factors, developmental delay, school status, initial electroencephalography (EEG), neuroimaging and initial seizure episode using chi-squared analysis. Quality of life was screened using a questionnaire and the Impact of Pediatric Epilepsy Scale (IPES).

Results: Of 103 patients, 57 completed the study. Seizures recurred

in 19 patients (34.5%). Initial seizure frequency was yearly in 57.9% of the population. Three had ongoing seizures at review (seizure interval 1 day–9 years). The RAS group had more risk factors ($p = 0.013$) and abnormal initial development ($p < 0.005$), neurological examination ($p = 0.033$) and current development ($p = 0.028$). Quality of life differed with respect to behaviour change ($p = 0.022$) and parental relationship with spouses ($p = 0.004$). Initial seizure frequency and anticonvulsant use were not related to initial seizure frequency, EEG, neuroimaging and development. Chi-squared analysis of the number of initial seizure episodes showed a significant difference between 1AS and RAS groups (Fisher's exact test, $p = 0.037$, OR 6.75).

Conclusion: Seizure recurrence is associated with abnormal development, neurological examination and presence of risk factors at initial presentation. Seizure recurrence is more likely for patients having more than 4 seizures during the initial seizure episode.

Category: Medical ASM2011-MED-110

Comparison of placental growth factor and soluble fms-like tyrosine kinase-1 in pregnant women with and without preeclampsia: a preliminary analysis

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Introduction: The pathogenesis of preeclampsia (PE) is thought to involve placental factors. We aimed to compare soluble fms-like tyrosine kinase-1 (sFlt-1), placental growth factor (PlGF) and the sFlt-1/PlGF ratio between pregnancies complicated by PE and pregnant controls.

Methods: This was a preliminary analysis of data from a case-control study involving pregnant women with and without PE. Each PE patient was matched for gestation with a control. Blood samples were analysed using electrochemiluminescence immunoassay on Cobas e-411 (Roche). Controls included pregnant women without hypertensive disorders. Results were analysed using the Mann-Whitney *U* test and Fisher's exact test.

Results: Ten controls and 26 PE patients were included in the

analysis. Patients in the PE group were older and more advanced in their pregnancies compared to controls. For the control group, median sFlt-1 was 2,712.0 (range 1,334.0–5,964.0) pg/mL, PlGF was 315.2 (range 110.4–1,052.0) pg/mL and sFlt-1/PlGF ratio was 8.275 (range 2.44–23.58). For the PE cohort, median sFlt-1 was 10,256.5 (range 3,389.0–45,899.0) pg/mL, PlGF was 54.185 (range 7.42–409.30) pg/mL and sFlt-1/PlGF ratio was 225.55 (range 11.47–2,157.0). The differences between the PE and control groups were statistically significant for sFlt-1, PlGF and sFlt-1/PlGF ratio.

Conclusion: The preliminary findings of higher sFlt-1, lower PlGF, higher sFlt-1/PlGF ratio in PE patients when compared to controls are in concurrence with previous reports of women at risk of PE.

Category: Nursing ASM2011-NUR-001

Nutritional status and clinical outcomes in advanced stage neuroblastoma patients: a retrospective study in a tertiary hospital in Singapore

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Introduction: Children with advanced stage neuroblastoma (NB-HR) often have preexisting nutritional issues that negatively affect their treatment outcomes. This retrospective study, the first of its kind in Singapore, aimed to report the nutritional status of NB-HR patients and analyse the correlations between nutritional status and delays in treatment, chemotherapy dose adjustment, neutropenia period, infection rate and other gastrointestinal (GI) complications.

Methods: All stage 3 and 4 patients (as per International Neuroblastoma Staging System [INSS] classification) initially diagnosed and treated at Department of Paediatric Haematology/Oncology, KK Women's and Children's Hospital, Singapore, between January 2008 and October 2010 were included. Data on patient demographics, disease and tumour characteristics, type of treatment, patient nutritional data, treatment response and complications were collected at four phases: at the time of diagnosis and after the first, second and third cycles of

chemotherapy. Patient nutritional status was assessed based on American Dietetic Association guidelines.

Results: 13 patients (boys 9, girls 4) were included in the study. None of the patients presented with severe malnutrition at the time of diagnosis. 53.8% of patients presented with GI complications. The number of patients who experienced GI complications reduced after the first, second and third cycles of chemotherapy. All patients had febrile neutropenia after the first chemotherapy cycle. The dates for planned chemotherapy cycles were delayed in 46.2% of patients. 23.1% of patients received chemotherapy drug dose adjustments.

Conclusion: This study provides a better understanding of the prevalence of malnutrition in NB-HR patients in Singapore and its correlation with other clinical outcome. Findings will enable clinicians and nurses to better plan and develop most appropriate nutritional guidelines to assist patients in achieving the best possible outcomes.

Category: Nursing ASM2011-NUR-002

Satisfaction levels of patients and caregivers on Asthma Right Siting Program: a survey

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Introduction: The Ministry of Health Asthma Right Siting Program aims to transfer patients with stable chronic diseases to family physicians (FP), thereby reducing the reliance on hospital specialists. For better transition to the community, the Respiratory Medicine Service at KK Women's and Children's Hospital (KKH), Singapore, has worked with FPs to develop the KKH Partners in Asthma Care programme.

Methods: A telephone survey was conducted by the asthma community nurse 6 months following discharge to determine the satisfaction levels of patients/caregivers on such transition.

Results: From March 2009 to February 2010, a total of 117 of patients/caregivers were interviewed. 80% of children had no record of absenteeism from school and 87% of parents did not

miss work due to the child's asthma condition. Control of asthma without day and night symptoms was achieved in 80% and 76% of children, respectively. 60% asthmatic children were happy with their asthma control and 88% felt that they were physically active after discharge. The overall satisfaction level of parents/caregivers was 82% and 62% parents indicated that they were happy with their FP's care. 68% parents/caregivers also found the location of FP clinics more convenient. However, only 35% mentioned any cost reduction following the transition. Fewer unscheduled visits for an asthma exacerbation were reported (28%).

Conclusion: The favourable outcomes of care and the high satisfaction levels suggest that the transition of care from hospital specialists to FPs has been generally successful in achieving right siting of care among a majority of patients.

Category: Nursing ASM2011-NUR-003

Smoking cessation programme: a pilot project in the paediatric wards

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Introduction: Exposure to cigarette smoke during childhood is associated with childhood diseases. The prevalence of cigarette smoking among young adults (age 18–29 years) in Singapore, especially among women, has risen from 5.2% in 1998 to 6.6% in 2004.

Methods: In July 2008, the Respiratory Medicine Service integrated a smoking cessation programme into the Singapore National Asthma Programme. This has been piloted in two paediatric wards since January 2009, where patients/caregivers are routinely asked about their smoking history and all family members who smoke are offered intensive counselling by a smoking counsellor.

Results: Data from January to December 2009 revealed that 306 patients/caregivers received one-minute cessation counselling.

Smoking histories revealed that 26 patients (8.5%) aged 14–18 years smoked. 32 patients had both parents who smoked (10.5%). More fathers (n = 199, 85%) smoked compared to mothers (n = 13, 4.2%) and 32 had other family members living in the same household who smoked (11%). Some patients (2%) had > 3 family members who were smokers. Ethnic distribution suggested that smoking was more prevalent among Malays (n = 192, 62.7%), followed by Chinese (n = 92, 30%), Indians (n = 18, 5.9%) and other races (n = 4, 1.2%). Although only 6% of patients/caregivers agreed for intensive counselling, 21% of these individuals ceased smoking 6 months after counselling was provided.

Conclusion: The one-minute cessation counselling is a quick and useful tool to identify individuals who may benefit from more intensive counselling.

Category: Nursing ASM2011-NUR-004

Measuring attention patterns and expertise of scrub nurses in the operating theatre for reducing errors in surgical counts

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Introduction: Although the retention of foreign objects in patients' bodies following surgeries has been a long-standing problem, the preventive measure usually adopted — manual surgical count of instruments, etc., by scrub nurses — appears to be rather 'simplistically primitive.' The process of counting is prone to errors especially under stressful environments, such as time pressure, distractions, high cognitive workloads, etc.

Methods: This descriptive observational study was conducted on 20 nurses — 10 experts and 10 novices — assisting in caesarean sections. The ASL Mobile Eye Tetherless Eye Tracking System was used to detect and record eye movements throughout the surgical procedure. This technique is commonly used for human factors in engineering research, for example, for tracking driver attention. Participants were required to complete a NASA multitasking questionnaire after the surgery.

Results: The eye movements recorded suggest that task switching, task prioritisation and situation awareness are latent factors affecting task performance. The workload demands of scrub nurses were found to be the highest, demanding the most attention on the surgical site, from the initial 'knife to skin' till the time placenta is delivered and end of closure time. Results reveal differences in the performances of expert and novice scrub nurses, with the expert nurse generally allocating more attention to the patient.

Conclusion: Relationships were found between performance, attention patterns and expertise of scrub nurses in operation theatres. This information could prove useful for the development of appropriate training for operation theatre nurses to enhance performance and reduce errors.

Category: Nursing ASM2011-NUR-005

Radiofrequency identification enhances patient safety

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Introduction: Gauze or medical instruments retained inside surgical patients can lead to serious problems ranging from bowel perforation, blood infection and even death. Team fatigue, difficult operations, gauzes 'sticking together,' or a poor counting system can account for 'falsely correct' gauze counts. Failure rates for the existing manual counting of gauze and instruments are not well established and ancillary methods, such as radiographs, are also not infallible.

Methods: A radiofrequency identification (RFID) trial was conducted using commercially packed RFID-tagged 32-ply raytex gauze and abdominal swabs tested and registered in the system before the trial. The RFID system tracks and locates the movement of gauzes and instruments, as they move from one antenna to another. The data captured by the antennae is processed

and reflected on the monitor for the scrub team.

Results: 49 patients undergoing caesarean sections were included in the RFID trial. The tagged gauzes used were still absorbent and their function was not compromised. RFID tags welded onto identified instruments did not pose any interference to the users. Based on the information captured by the antennae, the scrub team was able to keep track of the number of gauzes and instruments entering and exiting the operative field. The system proved to be effective in keeping track of the sponges and instruments, but users also provided some suggestions for improvement.

Conclusion: The RFID trial demonstrated effective use of technology for enhancing the safety of operation theatre practices by avoiding gauze and instrument retention.

Category: Nursing ASM2011-NUR-006

Treatment for osteoporosis patients using zoledronic acid 5 mg

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Introduction: Yearly intravenous zoledronate (aclasta) ensures compliance and avoids the gastrointestinal side effects of oral bisphosphonates. This study aimed to establish the adverse reactions, if any, and the effect on renal function of the administration of intravenous aclasta in the Singapore population.

Methods: This was a prospective observational study of patients who received intravenous aclasta 5 mg for treatment of osteoporosis using a standard protocol established at KK Women's and Children's Hospital. Adverse reactions and creatinine clearance were monitored. From March to December 2010, 17 patients (age 56–87 years) were treated with intravenous aclasta. Patients were loaded with oral vitamin D₃ 3,000 IU and elemental calcium carbonate 600 mg daily for one month prior to the intravenous infusion. Preinfusion tests included serum calcium, phosphate, liver function tests and renal function tests. Infusion was done

over 30 minutes and patients were monitored for an hour before being discharged. Adverse reactions were monitored via phone calls on day 3 after infusion. Estimated creatinine clearance was calculated using the Cockcroft-Gault formula.

Results: 29.4% of the patients suffered flu-like symptoms, 35.2% had fever, giddiness, headache with flu-like symptoms, and 6% had joint pain. Most symptoms lasted three days and no disturbances to function were encountered after three days. 29.4% of patients did not report any side effects. 69% of patients, who had post infusion creatinine clearance tests, had normal creatinine levels.

Conclusion: Minor adverse reactions are common in patients receiving intravenous aclasta, but these are shortlived and usually resolve after three days. Monitoring of postinfusion renal function did not show any negative effects.

Category: Nursing ASM2011-NUR-007

Adolescent Medicine Service at KKH

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Introduction: KK Women's and Children's Hospital (KKH) was the first hospital to introduce an Adolescent Medicine Service that specifically aimed to address the medical needs and varied psychosocial issues of inpatient and outpatient adolescents. The aim of this paper was to report on the progress of the service at KKH, which was started in October 2006.

Methods: Data was extracted from the Adolescent Medicine Registry, which tracks all referred adolescent inpatients and those followed up at outpatient clinics, for the period from January 2008 to December 2010. Data collected included demographics, common diagnoses and time of referrals.

Results: 1,034 patients were seen by adolescent medicine doctors in the outpatient clinics at KKH. 378 patients from this group had individual sessions with adolescent medicine resource nurses

for in-depth health education. 80% of patients were internally referred, while the remaining were referrals from general practitioners, polyclinics and schools. 458 referred inpatient adolescents were seen and counselled. Over 50% of patients admitted for somatic symptoms were subsequently found to have psychosocial issues. Referrals for eating disorders rose from 13 in 2008 to 17 in 2009 and 30 in 2010. Admission and readmission rates were reduced in June and December, but peaked for those aged 14–15 years.

Conclusion: There appears to be an increase in referrals with heightened awareness of the Adolescent Medicine Service among members of the medical fraternity. Early diagnosis and intervention is important for adolescents to grow into healthy adults, as they will have access to age appropriate care and management for their medical and psychosocial needs.

Category: Nursing ASM2011-NUR-008

Effectiveness of using pH paper and visual characteristics of aspirates for predicting feeding tube placement in children

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Introduction: Correct feeding tube placement ensures the safe administration of enteral tube feeding. A reliable method should be adopted for verifying the correct placement of feeding tubes, so as to prevent complications. Two international safety and regulatory agencies as well as published studies support the use of pH paper rather than blue litmus paper and auscultation as the more accurate verification methods for correct tube placement. The aim of this study was to compare these two methods in children.

Methods: Patients admitted to KK Women's and Children's Hospital (KKH) were recruited by convenience sampling and aspirates were obtained through feeding tubes. These aspirates

were examined for its visual characteristics and tested with blue litmus paper, pH paper and pH meter.

Results: 359 aspirates were taken from 149 paediatric patients (age 1–2,582 months). Radiographs were taken for 122 patients to verify the true placement of feeding tubes. No cases of misplaced tubes were observed in the patient group receiving radiographic verification.

Conclusion: Results prove that pH paper is more accurate than litmus paper for verification purposes only when the feeding tube is correctly placed. The study was, however, unable to establish the more accurate of the two options when the tube was not in place.

Category: Nursing ASM2011-NUR-009

Comparison of the effectiveness of normal saline versus heparinised saline flushes for maintaining patency of intravenous cannulas in neonates and children

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Introduction: The Ministry of Health (MOH) Nursing Clinical Guidelines suggest the use of normal saline as the flush solution of choice for maintaining patency of intravenous (IV) cannulas in adult patient populations. Well-established evidence suggests that normal saline is as effective as heparin solution for adult patients. However, the current practice in the paediatrics setting at KK Women's and Children's Hospital (KKH) is to flush IV cannulas using heparinised saline before locking. In view of the risks associated with heparin administration, a comparison of the effectiveness of normal saline versus heparinised saline for IV cannula flushes in neonates and children was warranted. The primary aim of this systematic review was to determine the difference in duration of locked peripheral IV cannula patency in the neonatal and paediatric patient populations when using normal saline flushes instead of heparinised saline.

Methods: A detailed review was conducted for studies that satisfied the inclusion criteria. Of the 15 studies that satisfied the inclusion criteria, seven studies were appraised using the GATE checklist. Five studies were ultimately eligible for further comparison.

Results: None of the studies showed any statistically significant difference in the duration of patency of locked peripheral cannulas irrespective of the saline solution used (normal saline versus heparinised saline, regardless of heparin concentration).

Conclusion: This systematic review suggests that the evidence for replacing heparinised saline flushes with normal saline for neonatal patients and children is non-conclusive.

Category: Nursing ASM2011-NUR-010

Embracing diabetes mellitus from adolescence to adulthood

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Introduction: Adolescents with diabetes mellitus struggle to keep diabetes management a priority and to maintain optimal glycaemic control. Adolescents opting out of adult care settings at the hospital usually resurface again with acute diabetes complications.

Methods: The adolescent diabetes transition programme was started with 122 adolescents (age ≥ 13 years) who were being seen by diabetes advanced practice nurses at a designated diabetes joint clinic along with an adult endocrinologist. Patients were voluntarily asked to participate in a diabetes knowledge test and survey to obtain feedback on the transition process, level of support received from the paediatric team and other concerns regarding adult care services.

Results: Survey data from 103 respondents were valid for analysis. Of these, 90% of respondents showed good level of

diabetes knowledge and 93% reported independence in their current diabetes care. Also, 63% of respondents felt that their expectations of transition care were met; 20% respondents stated that the dedicated joint clinic had helped to allay their concerns on transition to adult care services. From July 2010 to March 2011, 32 respondents transitioned to various adult diabetes care settings. Post-transition follow up was conducted via phone calls for five adolescents six months after transition, which revealed strong compliance to adult care follow up.

Conclusion: The programme was well accepted by adolescents and helped to prepare them for a successful transition to adult care settings. With an increasing number of diabetic adolescents reaching adulthood, there is a need for careful coordination and planning of transition care between various healthcare institutions to ensure life-long optimal utilisation by the target population.

Category: Nursing ASM2011-NUR-011

Sexual health for adolescents at risk

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Introduction: According to data from the Department of STI Control (DSC), sexually transmitted infections (STIs) in the adolescent population have tripled from 238 cases in 2002 to 787 in 2008. Adolescent medicine resource (AMR) nurse services include assessment of the psychosocial and sexual health of adolescents, education and counselling on sexual health, promotion of contraception and screening for STIs and PAP smear, referrals to DSC for STI-positive patients and monitoring outcomes for evaluation.

Methods: The medical records of patients seen between 2008 and 2010 were reviewed and analysed.

Results: 217 adolescent patients were referred to AMR nurses for sexual health issues; 185 patients (85%) were referred from

the Clinic for Adolescent PREgnancy (CARE). The commonest age of first sexual intercourse was 15 years — 80% of patients did not use contraception, 49% had more than one sexual partner and 29% were positive for STI, predominantly chlamydia. Responses to sexual health questionnaires administered before and after counselling suggested an increased knowledge of STIs and contraception following counselling. 97% of adolescents did not have a recurrence of a second or subsequent unplanned pregnancy upon follow up, suggesting that the promotion of sexual health was successful and did reduce their risks of STIs.

Conclusion: Focus sexual health counselling has effectively improved the knowledge of high-risk adolescents and empowered them to avoid unprotected sex and teenage pregnancy.

Category: Nursing ASM2011-NUR-012

New initiatives in the operating theatre for better patient care

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This paper reports on care initiatives that were enforced in the operating theatres (OTs) to enhance the safety of patients and staff. These safety initiatives included: (1) introduction of safety needles for use during cord blood taking; (2) provision of an illuminated magnifying lens in each injection trolley in every OT; (3) ensuring 5S of handover during surgery; (4) change of skin cleansing/preparation agents; (5) updating relatives of patients via SMS; and, (6) placement of an acrylic stand at the women's recovery room (RR) to note any special requests from patients or relatives. Initiatives (1) to (3) benefitted the healthcare professionals directly — the use of a safety needle device prevented needle stick injuries among staff intraoperatively; illuminated magnifying lenses in OTs enhanced the vision of nurses and anaesthetists in a dimmed setting and helped prevent medication errors arising from the staff's inability to read the small print on drug labels and avoided the picking up of wrong drugs or incorrect concentrations; and,

systematic communication among OT personnel was achieved by ensuring the 5S of handover during surgery and standardising the manner in which handover was carried out. The latter two initiatives enhanced patient safety by preventing unsafe practices through better communication of important information during surgery. Initiatives (4) to (6) enhanced the service quality for patients and their relatives — updating relatives of patients via SMS provided prompt information on the progress of surgery; and, the acrylic stand in the women's RR served to remind nurses to communicate special requests from patients or relatives prior to discharge from the RR. These initiatives have served to make the complex, secretive and 'behind closed doors' perioperative environment more transparent to, and safer for, healthcare personnel, patients and their relatives. The set of initiatives reported in this article was aimed to enhance the care of patients and the safety of all concerned.

Category: Nursing ASM2011-NUR-013

The Student Health Advisor pilot programme in Singapore

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Introduction: The Ministry of Health (MOH) Adolescent Health Advisory Committee mooted the Student Health Advisor (SHA) pilot programme. The programme commenced in 2010 with eight full-time nurses in eight secondary schools. Stationed full time in the schools, these SHAs provided health advice and counselling to at-risk students regarding smoking, sexually transmitted infections and chronic medical conditions.

Methods: 9,735 students from eight schools participated in the survey over a one-year period from January to December 2010. Data on 400 students from four schools were analysed and are discussed in this paper.

Results: A high response rate of 98% was achieved. All 400 students were provided counselling on a range of health issues.

150 students (38%) were smokers. Of these, 54 students (36%) initiated their first visit voluntarily. The number of students who quit was the same as those who continued smoking (range 42–44, 28%–29%). 64 students (42%) reduced their smoking. A small number of students ($n = 15$) expressed concerns about their sexual health and were found to have risky sexual behaviour, such as underaged sex. A few students ($n = 6$) had eating disorders.

Conclusion: The presence of SHAs created greater awareness about healthy living among students in schools and provided ready access to health advice and early intervention against at-risk behaviour. These findings support the relevance of the SHA programme in sustaining the health and wellbeing of young people in Singapore.

Category: Nursing ASM2011-NUR-014

Women's satisfaction with midwifery led-care versus other models of care: a systematic review

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Introduction: Obstetric-led care has been the preferred choice of women in Singapore. As midwifery-led care is the leading choice of women in many other countries, this systematic literature review intended to examine women's satisfaction levels with midwifery-led care when compared with other models of care.

Methods: Seven databases — the Cochrane Collaboration, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, OVID, EBSCO, Science Direct and Google Scholar — were searched using key words related to 'midwife led care,' 'women's satisfaction' and 'team midwifery.' A manual search of relevant published literature was also conducted. Only randomised controlled trials (RCT) of women with singleton and uncomplicated pregnancies that compared their satisfaction levels of midwifery-led care with other models of care were selected for appraisal and data extraction. Two independent reviewers assessed

the eligibility and quality of trials and the extracted data for outcomes of interest — singleton and uncomplicated pregnancies, women's satisfaction with midwifery-led care and other models of care. Eight relevant articles were identified and reviewed.

Results: 7,216 women reported experiencing higher satisfaction levels with midwifery-led care ($p < 0.01$) when compared to other models of care.

Conclusion: Study findings supported the introduction of midwifery-led care clinics at KK Women's and Children's Hospital, with a view to promoting and respecting individual choice and thus improving patient satisfaction levels. Midwifery-led care was introduced at the hospital in March 2010. The ongoing evaluation of women's satisfaction with such care is essential to ascertain the effectiveness and viability of the new service.

Category: Nursing ASM2011-NUR-015

Human papillomavirus vaccination in Singapore: pre-education on HPV increases the uptake of preventive injections among teenagers

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Cervical cancer is the second most common cancer worldwide among women aged ≥ 15 years and the fifth most common cause of cancer deaths among women in Singapore. The study is intended to explore the need for health education among secondary school students to promote their uptake of human papillomavirus (HPV) vaccinations. A survey of girls (age 12–19 years) studying in local secondary schools, who have not received any previous HPV vaccination, is planned. Students will be asked to complete a questionnaire (pre-education questionnaire) before receiving educational sessions from the research team and then be offered a post-education questionnaire to complete immediately after the session. The questionnaires, of 20 questions each, would be expected to take

no more than 15 minutes to complete. All questionnaires and educational materials will be validated by two nurses — an infection control nurse and an adolescent resource nurse — and piloted on a randomised sample (size 10% of the actual test sample, $n = 100$) prior to full study implementation. Informed consent will be obtained before proceeding from students and parents. Study findings will be analysed using the Statistical Package for the Social Sciences (SPSS). With the liberation of youth, women are having their first sexual intercourses much earlier in their teens. Hence, sexual health promotion and, in particular, awareness of HPV vaccinations and its uptake in girls most at risk of contracting HPV infections become essential for the prevention of cervical cancer.

Category: Nursing ASM2011-NUR-016

Development of the woman-midwife relationship questionnaire

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Introduction: Good midwifery care attends to the physical, emotional and social needs of women and is founded on close supportive relationships. Such relationships may be difficult to achieve in a complex work environment. Despite the importance of the woman-midwife relationship being highlighted in several studies, there has been limited quantitative research in this area. In particular, there has not been any attempt to develop a tool to measure elements of the woman-midwife relationship.

Methods: This study aimed to develop and test a valid and reliable questionnaire to measure women's perceptions of their relationship with the attending midwife. Items of the Woman-Midwife Relationship Questionnaire (WRQ) were constructed from four themes extracted from a comprehensive review of the literature. These themes were technical skills and knowledge, shared responsibility, individualised care and professional friend.

The construct and face validity of WRQ were assessed and pilot tested with 125 women.

Results: WRQ demonstrated good initial internal consistency (Cronbach's $\alpha = 0.95$); three factors (eigenvalue > 1) were extracted from the factor analysis. Women's responses to WRQ were analysed and statistically significant differences in mean subscale scores established. The highest average mean score was for the midwife's technical skills and knowledge (mean 4.33 ± 0.58).

Conclusion: Midwives' clinical competence was a significant factor contributing to the woman-midwife relationship. WRQ shows good psychometric properties for women who have received midwifery care during labour. The instrument needs further testing with diverse samples of women to determine its utility to other maternity services.

Category: Nursing ASM2011-NUR-017

Family members' perception of current visiting policy and visitation needs in the intensive care unit

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Visiting time for patients on critical care is restricted in Singapore hospitals although international studies have reported that families need to be physically and emotionally close to critically ill patients. This study aims to determine the perceived need for visitation among critically ill patients' family members and their views on the hospital's visiting policies. The study will recruit all adult relatives visiting patients in the intensive care units (ICUs) of the hospital over a six-month study period. The nursing staff in ICUs will be briefed on the use of inclusion and exclusion criteria for recruitment and will help to distribute and collect carefully formulated questionnaires from these respondents. The questionnaire will be validated by

the hospital's service quality and corporate communications personnel. Following a pilot study of six adult relatives, actual participants will be invited to complete the structured questionnaire and return it in a sealed envelope. Returned questionnaires will be taken to imply informed consent. The sample size is expected to be around 60. Descriptive statistics will be used to analyse the data generated. Findings will raise awareness among healthcare professionals and policy makers of the visitation needs and desires of families of critically ill patients, so that visiting policies may be reviewed with the aim of supporting flexible and family-friendly visitation rights and responsibilities.

Category: Nursing ASM2011-NUR-019

Interventions to improve hand hygiene compliance among healthcare workers

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Introduction: Hand hygiene is a simple and effective means of reducing healthcare-associated infections (HAIs), thus promoting patient safety in the healthcare settings.

Methods: A series of promotional measures were introduced at KK Women's and Children's Hospital (KKH), Singapore, based on World Health Organization (WHO) multimodal strategies. These measures included staff education, seminars, hand hygiene-related activities, random audits with performance feedback on compliance rates, easy accessibility to hand hygiene products, promoting skin care, posters in the screensaver format and improvements in other clinical areas. From August 2010 to March 2011, hand hygiene audits were conducted by external auditors from other SingHealth (SHS) hospitals. The audit tool was modified based on WHO recommendations.

Results: 704 opportunities were observed for hand hygiene

compliance. The overall hand hygiene compliance rate was 50.1%. Hand hygiene compliance rates were highest for 'after contact with blood and body fluids' (80.4%) and lowest for 'after contact with patient surroundings' (32.4%). Compliance was 57.2% before patient contact, 53.6% after patient contact and 50% before aseptic/clean procedures. Healthcare workers (HCWs) were less aware of the need for hand hygiene following contact with patient surroundings and before aseptic/clean procedures. Lower compliance rates were found among HCWs (50.1%) when compared with KKH infection control nurses (81.2%).

Conclusion: Our goal was to promote hand hygiene as a routine habit for all staff. The overall hand hygiene compliance rate at KKH (> 50%) was comparable to published data. However, there is still room for improvement, especially when it comes to 'after contact with patient surroundings' and 'before aseptic/clean procedures.'

Category: Nursing ASM2011-NUR-020

Management of healthcare workers during pertussis exposure

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Introduction: KK Women's and Children's Hospital (KKH) started using pertussis polymerase chain reaction (PCR) tests to detect pertussis in late 2006 and began offering it as a service in April 2007. With improvement in the methods of detection, the diagnosis of pertussis in patients admitted to KKH has increased between 2007 and 2009.

Methods: This retrospective study of patients admitted to KKH between 2007 and 2009 showed the trends in pertussis detection and delineated the infection control measures that were undertaken at the hospital. The costs incurred from each exposure between June and December 2007 were calculated based on antibiotic costs, the infection control nurse's contact tracing time, the nurse manager's time and the infectious disease doctor's time.

Results: 70 confirmed patients were admitted during the three-

year period to the paediatric wards at KKH. Admission rates show a decreasing trend over the years (2007: n = 36; 2008: n = 19; 2009: n = 8; 2010: n = 7). The total number of staff inadvertently exposed due to inadequate protection was 116 (range 0–21 staff/patient). Almost all staff (96.6%) received clarithromycin as prophylaxis; four staff members (3.4%) did not receive prophylactic medication. The total cost involved in the initial six months of exposure was \$6,903.90. As a result of the study, Tdap vaccine has been offered to all staff with direct paediatric patient contact since 2008.

Conclusion: Offering pertussis vaccines to KKH staff from 2008 has reduced the number of antibiotic courses, amount of time and manpower costs associated with pertussis exposures. The inclusion of Tdap as a booster in primary 5 students has also helped to reduce pertussis admission rates since 2009.

Category: Nursing ASM2011-NUR-022

Parental perception of skin-to-skin contact after delivery: a survey

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Introduction: Several studies support skin-to-skin contact for the successful initiation of breastfeeding and increasing its duration. Skin-to-skin contact facilitates the baby's adaptation by stabilising its temperature, respiration, heart rate and blood sugar level. It reduces crying and enhances the mother-baby interaction and bonding. Skin-to-skin contact is one of ten steps for promoting successful breastfeeding, as recommended by the World Health Organization's Baby Friendly Hospital Initiatives (BFHI).

Methods: A survey of parental perception on skin-to-skin contact was conducted over a four-week period. All term vaginal deliveries, regardless of their feeding method, were included in the survey. Upon admission, a brochure, with information on skin-to-skin contact that explained the procedure and its benefits, was given to couples. Verbal consent was obtained and skin-to-skin contact performed if both the mother and baby were well after delivery.

Data was collected using self-administered questionnaires after completion of the procedure. The questionnaire included assessments of previous knowledge of skin-to-skin contact, information provided, duration of skin-to-skin contact, spousal involvement, parental perception and whether breastfeeding was initiated. Descriptive statistics was used to analyse the data.

Results: Overall, parental perception of skin-to-skin contact was positive and readily accepted even though prior knowledge was lacking.

Conclusion: Skin-to-skin contact is being introduced to all well mothers and babies following vaginal delivery. Posters on skin-to-skin contact are being displayed at the clinics and wards and brochures are being handed out during antenatal visits to increase its awareness.

Category: Nursing ASM2011-NUR-024

Kangaroo care benefits preterm infants and parents: a literature review

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Introduction: Kangaroo care (KC) is skin-to-skin contact between an infant and its parent. The infant is usually clad only in a diaper, held in an upright position and placed chest-to-chest with the parent. Several study findings have identified the multiple benefits of KC for both infants and parents. This study aimed to: (1) evaluate and identify the effects and benefits of KC on preterm infants and parents; and, (2) develop evidence-based KC guidelines for implementation as a standard of care for preterm infants.

Methods: A literature review was conducted of the MEDLINE, OVID, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed and the Cochrane Library databases using the keywords 'preterm infants,' 'kangaroo care' and 'skin-to-skin' to retrieve relevant literature published between 1995 and 2010.

Results: The randomised controlled trials retrieved identified less significant hypothermia, higher mean daily weight gain resulting in shorter hospitalisation days and lower incidences of nosocomial infections in infants afforded KC. Several descriptive, comparison and pretest/post-test designed studies concluded that KC is safe and promotes the stability of the infant's physiological parameters, while enhancing parental satisfaction through positive interactions between the infant and parent.

Conclusion: KC is an intervention that every parent should be able to experience with the infant. Given the evidence-based benefits and simplicity of KC, it should be included as a standard of care for preterm infants in neonatal nursing.

Category: Nursing ASM2011-NUR-025

Clinical outcome of hospital-based versus home-based egg challenges

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Introduction: Oral food challenges (OFC) are resource intensive and are usually conducted in the clinic setting. This study explored the viability and safety of conducting OFC in the home setting.

Methods: Patients who presented between May 2008 and June 2010 with a clinical egg allergy or egg-positive skin prick test were recruited for study. On day 1 of the home egg challenge, a quarter portion of a hard-boiled egg yolk was given twice, followed by a half portion, all served at 15-minute intervals. In the absence of a reaction, the patient was challenged with egg white the next day in similar fashion. The same regimen was performed in the clinical setting over 90 minutes on the same day.

Results: 60 children were recruited for study, with 23 and

37 children undergoing OFC at home and in the hospital, respectively. Seven children (30%) were unable to complete the home challenge due to parental anxiety or other issues. A majority were boys (67%). The percentage of children in the home and hospital groups who presented with allergic reactions to egg was similar (13%). Few children presented with localised cutaneous hives (n = 6; home group 3, hospital group 3), itchy throat (n = 1) and vomiting (n = 1). Antihistamines were prescribed as appropriate to manage the allergic reactions. Egg was eventually reintroduced in the children's diet and tolerated.

Conclusion: Home egg challenges can be performed safely in appropriately selected patients. Follow-up phone calls have been effective in enhancing the confidence of parents for reintroducing egg in their children's diet.

Category: Nursing ASM2011-NUR-026

Comorbidity profiles of patients aged 65 years or more in a gynaecological setting

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Introduction: It is estimated that, by 2030, 1 in 5 Singaporeans will be aged 65 years or more. The average age of patients will therefore increase due to the ageing population, with a consequent change in the comorbidity profiles of patients with chronic diseases. According to Singapore Health Promotion Board, 1 in 4 Singaporeans aged ≥ 40 years has at least one chronic disease(s), be it diabetes mellitus, high blood pressure, high blood cholesterol, or stroke.

Methods: Women ≥ 65 years who were admitted to KK Women's and Children's Hospital, Singapore, between July and December 2010 were assessed for comorbidity and functional and mental status by a family resource nurse.

Results: 332 patients out of 391 admissions were assessed. Mean age of patients was 72.6 years. Other results included findings of hypertension (72%), diabetes mellitus (39%),

hyperlipidaemia (54%), Impaired Abbreviated Mental Test (4%), moderate-to-high risk for osteoporosis (based on Osteoporosis Self Assessment Tool; 89%) and moderate-to-severe ADL (Activities of Daily Living – Barthel Index) impaired status (10%). 81% of patients had at least one comorbidity (hypertension, diabetes mellitus, hyperlipidaemia and stroke), whereas 26% had 3 comorbidities (hypertension, diabetes mellitus and hyperlipidaemia).

Conclusion: Patients admitted for gynaecology-related problems often require surgical intervention. As surgical risk increases with age for patients, health complications from one or more of the abovementioned chronic diseases as well as the high costs of associated medical expenses for women patients should be looked into with an eye to mitigate such expenses. It is therefore essential that the medical status of such patients be optimised before and after operations.

Category: Nursing ASM2011-NUR-027

Evolution of paediatric homecare services: our ten-year journey

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Introduction: Paediatric homecare services started in 2001 and, in its early years, nurses from the children's intensive care unit (CICU) provided informal caregiver training on a voluntary basis. In 2005, a full-time resource nurse was employed to run this service, formalise caregiver training and structure the work processes to smoothen discharge of patients and ensure continuity of care at home. In response to the significant increase in year-on-year referrals in recent years, the team has grown from one to three resource nurses. The service now offers a wider variety of supportive care.

Methods: The evolution of the paediatric homecare services programme at KK Women's and Children's Hospital, Singapore, was traced since its inception in 2001.

Results: 1,016 referrals to the homecare programme were received

over a ten-year period, translating to about 100 patients annually; the increase in the number of referrals, however, has been four-fold from 2001 to 2010. A decrease was seen in the number of readmissions among paediatric patients, which is a testament to the effectiveness of the homecare services programme in facilitating discharge and adaptation/adjustment back into the community. Parents have given favourable feedback and suggestions for improvement. Together with the parents of paediatric patients, the programme has been able to greatly enhance the quality of life of these children in the home setting.

Conclusion: Paediatric homecare service at the hospital has had a fruitful ten years and has expanded to incorporate neonatal and palliative homecare. This expansion has enabled the team to deliver comprehensive and holistic support services.

Category: Nursing ASM2011-NUR-030

Prevention and treatment of pressure ulcers

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Introduction: The likelihood of developing pressure ulcers is known to be higher in bedridden patients and in those with poor nutrition, incontinence, old age and chronic disease (diabetes mellitus or terminal disease). This study aimed to improve care and monitor clinical outcome of patients who were at high risk of developing pressure ulcers.

Methods: Data since April 2004 was collected. Individuals at risk were identified initially using the Braden scale. Patients with a total score ≤ 16 were considered to be at risk of developing pressure ulcers. Interventions included skin care, positioning and moisture control for individuals with score ≤ 16 in order to prevent the development of pressure ulcers. Assessments were carried out every three days to facilitate evaluation of the outcome

of intervention and progress.

Results: 42 patients were admitted with pressure ulcers. 64.2% patients developed stage 1 and 2 pressure ulcers during hospitalisation, 87.7% patients were discharged without any pressure ulcers and 82% patients did not develop pressure ulcers during hospitalisation. The number of patients who developed pressure ulcers during hospitalisation decreased over the years, as nurses became more familiar with the assessment, from 30% in 2004 to 18% in 2008.

Conclusions: Pressure ulcers are an important health issue. The best strategy for these ulcers is prevention. High-risk patients are less likely to develop pressure sores during hospitalisation when early interventions are adopted.

Category: Allied Health ASM2011-AHS-002

Benefits and feasibility of having a pharmacist on the KKH Inpatient Geriatric Service team

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Introduction: The use of multiple medications, comorbidities and age-related changes are risk factors for drug-related problems (DRPs) in the geriatric population. Pharmacists are in an excellent position to educate patients on their medications, reinforce compliance and resolve potential DRPs. The study's primary objective was to qualify the benefits of having a pharmacist on the Inpatient Geriatric Service at KK Women's and Children's Hospital (KKH) by assessing the prevalence of DRPs, extent of patient/caregiver understanding of medication and compliance to regimen.

Methods: This prospective study involved 15 consenting patients aged ≥ 65 years and on five or more chronic medications who were admitted to KKH gynaecology wards from 15 August 2009 to December 2009. Eligible patients were interviewed to evaluate their understanding of medication and compliance and then provided individualised medication counselling. Their medications were assessed for potential DRPs, with documentation of appropriate interventions and outcomes.

Patients were followed up two weeks later by phone to assess improvement in medication knowledge.

Results: Counselling significantly improved patient knowledge of medication ($p = 0.002$) and understanding of indications (19.8%, $p = 0.010$) as well as the frequency of administration (9.5%, $p = 0.010$). 27 DRPs were identified, which highlighted issues of non-compliance (53.8%), incorrect dose/duration/directions (23.1%) and medications ineffective for indications (7.7%). Although 66.7% of interventions, which mainly involved compliance and correct ordering of patients' medications, were accepted, 50% patients did not show improvement in compliance.

Conclusion: Pharmacists' involvement in medication management of our inpatient geriatric patients significantly improved their medication knowledge in areas of indication and administration and reduced DRPs, but did not increase adherence. This suggests the need to further explore the role of pharmacists in developing aids to improve compliance to medication.

Category: Allied Health ASM2011-AHS-003

Effectiveness of paediatric respite care services: a systematic review

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Introduction: The medical and psychosocial needs of children with chronic medical conditions often place high levels of demand on caregivers, as a result of which, caregivers often experience strains in various aspects of their lives. Respite care services are often provided as a form of intervention to enhance the physical and mental wellbeing of such caregivers. This study aimed to evaluate the effectiveness of paediatric respite care services (PRCS) in terms of clinical, psychosocial and cost outcomes through a systematic review of the literature.

Methods: The following electronic databases were searched in January 2011: MEDLINE, the Cochrane Library, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO, Social Work Abstracts, Applied Social Sciences Index and Abstracts (ASSIA), Social Services Abstracts and Sociological Abstracts. The review included informal caregivers of children with chronic medical conditions who received

PRCS. Randomised controlled trials (RCTs) of PRCS that aimed to provide temporary care of children with chronic medical conditions for the purpose of providing relief to caregivers were eligible for inclusion. Titles, abstracts and full texts identified from the databases were evaluated based on the inclusion and exclusion criteria.

Results: No RCTs were identified to have examined the effectiveness of PRCS for informal caregivers of children with chronic medical conditions.

Conclusion: While PRCS appeals to stakeholders for various reasons, its effectiveness is not established in the literature through RCTs. Further studies are required to measure the comparability of outcomes between caregivers who receive PRCS and those who do not. The current level of evidence does not provide strong support for the effectiveness of PRCS.

Category: Allied Health ASM2011-AHS-004

Evaluating the clinical impact of Eczema Action Plan in paediatrics

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Introduction: Successful management of eczema is complicated by problems, such as compliance to therapy. Written action plans have been proposed and demonstrated as one of the effective strategies to improve compliance and adherence in similar chronic conditions, such as asthma. However, few studies have been done on action plans for eczema. This exploratory study aimed to investigate the clinical impact of an in-house formulated Eczema Action Plan (EAP) for paediatric patients with eczema.

Methods: 42 paediatric patients were recruited from KK Women's and Children's Hospital outpatient dermatology clinics from 28 September 2010 to 31 December 2010. Validated questionnaires — Infant's Dermatitis Quality of Life Index (IDQOL), Children's Dermatology Life Quality Index (CDLQI) and Patient Oriented Eczema Measure (POEM) — were used to assess patients' quality of life (QOL) and their perception of

disease severity before and after using EAP.

Results: There was significant improvement in mean scores before and after EAP for IDQOL (8.86 ± 6.27 vs. 5.07 ± 5.44), CDLQI (8.60 ± 5.60 vs. 3.55 ± 3.65) and POEM (13.06 ± 6.19 vs. 7.12 ± 6.17), and also significant correlation between the change in scores for pre- and post-questionnaires. Patients showed significantly greater improvement in perceived severity, mood, itch, participation in sports, sleep and perceived skin condition. 79% of caregivers found EAP useful as a visual aid, which probably contributed to its effectiveness in improving adherence.

Conclusion: Use of EAP brought about improvement in disease severity and patients' QOL, and thus findings support the inclusion of EAP as a part of basic primary care. It has additional roles in facilitating physician-pharmacist communication, patient education and standardising practice in eczema management.

Category: Allied Health ASM2011-AHS-005

Treatment of lymphoedema in patients with breast cancer: what is effective?

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Introduction: Lymphoedema may occur following breast cancer treatments, such as lymphadenectomy and radiotherapy. It is a chronic debilitating condition resulting from the accumulation of fluid within the tissues. Studies have reported a prevalence rate ranging from 7.6%–42%. Patients commonly report a sense of lethargy and disability, swelling, heaviness and pain. This literature review aimed to identify the range of treatment available for such patients, as well as to determine how effective these treatments were.

Methods: A refined search strategy was applied to electronic databases, such as Allied and Complementary Medicine (AMED), British Nursing Index (BNI), the Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE and the Cochrane Library. Literature were also sourced from electronic and printed journals, or snowballed from the reference lists of

relevant journals. Inclusion and exclusion criteria were drafted to extract highly relevant papers.

Results: 18 randomised studies revealed treatments ranging from the use of drugs, such as coumarin and vitamin E with pentoxifylline, to laser therapy, complex decongestive therapy, manual lymphatic drainage, exercise, kinesiotaping and various forms of compression therapy for lymphoedema. Laser may be effective when delivered in multiple cycles or when compared to exercise or pneumatic compression. However, most studies not only failed to demonstrate significant differences but were also limited by methodological inconsistencies.

Conclusion: It was not possible to conclude which intervention was most superior. Evidence on the effectiveness of treatment based on the chronicity of lymphoedema was also inconclusive.

Category: Allied Health ASM2011-AHS-006

Methodological concerns about research for the treatment of lymphoedema in patients with breast or gynaecological cancer

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Introduction: An exploration of the types and effectiveness of treatment in patients with lymphoedema and breast or gynaecological cancer not only provided unconvincing evidence but also exposed methodological inconsistencies in existing literature.

Methods: A critical literature review of 30 current studies was undertaken to assess treatments for lymphoedema in patients with breast or gynaecological cancer.

Results: Only one longitudinal study focused on patients with gynaecological cancer. Methodological concerns included design issues with unspecified randomisation methods, lack of blinding and poor study power. There were also large variations in the inclusion criteria for duration and staging of lymphoedema. Consequently, information on the most effective intervention according to chronicity was inconclusive. Limb size through volumetric or circumferential measurements was the most popular

method used although several other methods were also employed to measure the presence, severity and changes of lymphoedema, making comparisons and pooling of data difficult. Subjective assessments of symptoms and quality of life were increasingly utilised to provide a holistic measure of patients' experiences. However, there was a lack of the use of formally structured and tested tools specifically for patients with lymphoedema. Although subjective symptoms may appear before visible changes in limb sizes, whether such symptoms are sufficient to monitor and justify changes brought about by treatment remains debatable.

Conclusion: More studies on patients with lymphoedema and gynaecological cancer are needed. In view of the shortcomings exposed in the methodological quality of existing literature on the treatment for lymphoedema in these patients, future studies should aim to acknowledge and address these issues. In so doing, they will improve the strength of evidence in this important area of patient care.

Category: Allied Health ASM2011-AHS-007

Artz In Me (AIM): a support group for breast cancer patients using art

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Introduction: Breast cancer is the most common cancer among women in Singapore and its diagnosis often has a profound impact on a woman's life. Psychosocial support is of paramount importance in helping such patients cope with the demands of the illness. Studies have shown that support groups are beneficial for these patients, as they reduce social isolation, increase coping capacities and enhance access to information. Artz In Me (AIM) is a support group that aims to provide a safe space for patients to share their experience of journeying from diagnosis to treatment completion through the use of art and to enhance patients' coping capacities by the provision of psychoeducational information. AIM also offers patients the opportunity to interact and build new support networks.

Methods: The group met fortnightly for six sessions. In each session, patients would create art pieces to reflect the session's theme.

Medical social workers (MSWs) facilitated the patients' sharing for the next hour and psychoeducation was provided at the end of each session. A questionnaire survey was administered to 16 patients.

Results: Results show that patients felt encouraged by sharing with others and felt supported when attending the group sessions. Patients felt that they learnt more about themselves through the art pieces they made.

Conclusion: Survey results confirmed that the support group was well received by patients. Hence, AIM could become an integral part of a holistic cancer care programme for patients with breast cancer at the hospital. To extend support, MSWs could also organise follow-up programmes exploring other themes in the future.

Category: Allied Health ASM2011-AHS-009

Characteristics of adolescents admitted for self-harm behaviour

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Introduction: The phenomenon of self-harm behaviour among adolescents is a significant healthcare concern, as it has physical and psychological impacts on individuals and their family members. There is limited research on adolescent self-harm behaviour in Singapore. Therefore, it is critical to gain knowledge pertaining to the demographics of this population and the characteristics of such behaviour.

Methods: A retrospective study was conducted to examine the characteristics of adolescents who were admitted to the hospital for self-harm behaviours. Data was extracted from the medical records of patients who were referred to the Department of Medical Social Work in 2010.

Results: 27 adolescents (age 13–17 years) were attended to by medical social workers in 2010. Analyses revealed that drug

overdoses were the most common form of self-harm behaviour. The characteristics of incidents that led to these behaviours included conflicts with parents or family members, ending of romantic relationships with significant others, school stressors and conflicts with peers. Of 27 adolescents, approximately 30% chose to disclose the self-harm to others. Three of five adolescents, who were residing in children's homes when they were admitted for self-harm behaviour, were previously assessed for allegations of child abuse.

Conclusion: It is essential to examine the motivations that underlie self-harm and the intrapersonal and interpersonal functions that these behaviours serve. Identification of variables that motivate and reinforce self-harm behaviours could help medical social workers establish prevention and treatment approaches aimed at such adolescents.

Category: Allied Health ASM2011-AHS-011

Evaluation and improvement of therapeutic drug monitoring

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Introduction: Therapeutic drug monitoring (TDM) of amikacin, gentamicin and vancomycin was implemented to accentuate efficacy and attenuate toxicity at KKH. This study aimed to evaluate the appropriateness and accuracy of dose recommendations and to ameliorate the current TDM service.

Methods: An observational study was carried out to analyse the serum amikacin, gentamicin and vancomycin levels of paediatric patients between 2007 and 2010. TDM cases, suggesting a dose change when the initial true peak and trough had been within therapeutic range and where recommendation of a dose was based solely on patient weight, were identified as inappropriate. TDM cases with percentage differences between the predicted peak/trough and measured true peak/trough exceeding $\pm 25\%$ indicated inaccurate dose recommendations, which were then investigated for the possibility of inappropriate dosing regimen.

Results: 53 TDM cases were identified. One TDM case was inappropriate. A majority of dose adjustments were inaccurate. Recommendations postulated to improve TDM service included providing TDM training, counter-checking dose adjustments, making use of closed loop medication management (CLMM), dosing aminoglycosides based on estimated ideal body weight in patients with third spaces, updating the time for sample collection in haemodialysis patients and incorporating the vancomycin TDM recommendations of American Society of Health-System Pharmacists Report into the hospital's TDM guidelines.

Conclusion: This study demonstrated the need to ameliorate the current TDM service. Inaccurate dose recommendations caused by unstable renal function, third spaces and fever are inevitable. Nonetheless, efforts could be put in to abrogate the modifiable causes of inappropriate and inaccurate TDM.

Category: Allied Health ASM2011-AHS-013

Cost minimisation analysis of intravenous zoledronate versus oral bisphosphonates among nursing home residents in Singapore

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Introduction: Osteoporosis is often overlooked and undertreated among nursing home residents. To the best of the authors' knowledge, no published studies have evaluated the cost effectiveness of intravenous (IV) and oral bisphosphonates and their efficacy in nursing home residents. This prospective observational study aimed to determine the annual cost of administration of yearly IV zoledronate versus weekly oral alendronate and risedronate for the treatment of osteoporosis among residents in a local nursing home from the perspectives of the hospital, nursing home and patient.

Methods: Time spent to administer IV and oral bisphosphonates by pharmacists and nurses were captured in self-reports and direct observations at the nursing home and at KK Women's and Children's Hospital (KKH). Drug costs were obtained from KKH. The medical records and medication charts of residents were reviewed for data on demographics and individual risk factors for falls and fractures.

Results: Surprisingly, only 12 residents (7.3%) were diagnosed with osteoporosis and only 3 (1.8%) were treated with osteoporotic medications. From the nursing home perspective, the annual cost of administration for IV zoledronate and oral bisphosphonates were \$8.42 and \$297.45, respectively. The cost incurred by the patient for IV zoledronate, oral alendronate with cholecalciferol, and oral risedronate was \$777.16, \$918.06 and \$884.82, respectively; the corresponding cost incurred by KKH was \$540.43, \$643.50 and \$620.10, respectively.

Conclusion: Results of this cost minimisation analysis, which was conducted with an emphasis on the perspective of nursing homes, found that annual IV zoledronate administration was least costly due to lower nursing time costs. Nursing homes in Singapore should consider switching from the current practice of weekly oral bisphosphonates to annual IV zoledronate.

Category: Allied Health ASM2011-AHS-014

Unsatisfactory ThinPrep Pap test: the KKH experience

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Introduction: The Pap smear is a screening test used to detect premalignant and malignant processes in the cervix for the prevention and early treatment of cancers. The most important factor for result accuracy is specimen adequacy, as liquid-based preparations should have an estimated minimum of at least 5,000 well-preserved squamous cells.

Methods: In 2009 and 2010, the cytology laboratory at KK Women's and Children's Hospital received 82,817 Pap smears, of which 1,664 smears (2.01%) were unsatisfactory. We studied these suboptimal smears to establish their causes and measure for prevention.

Results: Cervical cytology samples classified as 'unsatisfactory for interpretation' represent a potential source of undetected epithelial abnormalities. In our laboratory, these are due to: (1) insufficient cellular material for evaluation (50%); (2) insufficient cellular material for evaluation, with lubricant-like foreign

material obscuring cellular detail (29%); (3) insufficiency of squamous epithelial cells, with mostly inflammatory cells being seen or inflammatory cells obscuring cellular detail (18%); and, (4) insufficiency of squamous epithelial cells, with mostly endocervical cells being seen (3%). 7% of patients (107/1,535) had repeated 2 or more inadequate Pap smears within the study period.

Conclusion: The specimen inadequacy rate of 2.01% seen in this study is at about the 80th percentile of CAP benchmarks and is significantly higher than the inadequacy rate associated with conventional Pap smears (0.86%). As scant cellularity was the primary cause of specimen inadequacy, good sample collection and avoiding the use of lubricants are important. We recommend repeated cervical smear following treatment for infection or a course of oestrogen therapy for postmenopausal women with atrophic smears. Patients with three consecutive unsatisfactory smears should be followed up by colposcopy examination.

Category: Allied Health ASM2011-AHS-015

Effectiveness of phonological awareness therapy administered by trained non-SLTs in improvement of reading

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Introduction: Phonological awareness (PA) is a multi-level skill of breaking words down into smaller units. Research indicates that direct teaching of PA can improve reading and spelling. Direct teaching can be administered by speech language therapists (SLTs; current service provision model at KK Women's and Children's Hospital [KKH]) or by trained non-SLTs. However, it is unclear if intervention provided by trained non-SLTs is as effective as that by SLTs for children with PA difficulties and co-occurring speech or language disorders. Findings from this review may better inform service provision for such children.

Methods: A literature review was conducted comparing evidence for the effectiveness of interventions provided by trained non-SLTs and SLTs. The studies examined children (age 3–7 years) with co-occurring speech or language disorders.

Results: Eight studies met the selection criteria. Four studies describing therapy conducted by SLTs were compared with four studies detailing therapy administered by trained non-SLTs. Three out of four studies from each group suggested PA intervention was effective in improving reading.

Conclusion: Results indicated that some interventions administered by trained non-SLTs are as effective as those provided by SLTs. PA intervention leads to improvements in reading for most children, although some appear not to benefit from it. This result implies that service provision at KKH could include training non-SLTs (e.g. SLT students) to administer some PA intervention, potentially reducing the waiting time of patients booking for SLT appointments. However, further research is necessary to understand the factors influencing efficacy of treatment administered by non-SLTs.

Category: Allied Health ASM2011-AHS-017

Antral follicle count: real-time 2D manual count versus SonoAVC (automated volume calculation)

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Introduction: Antral follicle count (AFC) has increasingly become an important parameter for predicting the success of fertilisation techniques in the management of female infertility. The study aimed to compare the manual counting of ovarian follicles using conventional two-dimensional (2D) ultrasonography with an automated three-dimensional (3D) ultrasonography technique.

Methods: 42 women (age 21–45 years) in the early follicular phase of menstrual cycle were sampled. The equipment used was GE Voluson E8. Two counting techniques were used. In the 2D manual technique, each ovarian follicle was identified and counted manually during real-time ultrasonography. The second technique was an automated 3D ultrasonography technique, where 3D datasets of both ovaries were acquired and analysed using sonography-based automated volume counting

(SonoAVC). Post-processing was performed on the 3D dataset by putting the cursor over the follicle and adding it to the measurement list. To delete non-follicular structures, a cursor was placed over the structure for deletion. Pearson's correlation was used to analyse the data.

Results: The correlation coefficient (r) for 2D manual AFC and 3D SonoAVC was 0.849 with post-processing and 0.501 without post-processing.

Conclusion: There is a strong correlation between real-time 2D manual counting and SonoAVC with post-processing. There is also poor correlation between 2D manual counting and SonoAVC without post-processing. Results indicate that post-processing is an essential step for AFC, in view of the software's limitations in differentiating and identifying all antral follicles.

Category: Allied Health ASM2011-AHS-018

Neurosuit™ for rehabilitation

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Introduction: Neurosuit™ uses compression to increase strength, awareness and function. Other similar suit therapies are ADELI Suit and TheraTogs™. With the help of elastic bungees, the suit provides compression to the joints, thus loading weight through the entire body. This sends messages to the brain and creates body awareness, which improves posture, motor planning and function. The bungees also act as resistance, causing the patients to work harder, thus strengthening muscles at the same time.

Methods: The suits were donned by five patients (age 3–10 years, mean 4.8 years) in two weeks. The group included patients with spastic diplegia ($n = 3$), spastic triplegia ($n = 1$) and dystonia ($n = 1$). All patients were fitted with the vest, shorts, kneepads

and shoes; one patient did not don shoes. Gait was assessed via video recording before and after donning of the suits.

Results: There was a noticeable difference in gait when the suits were donned. All patients had improved trunk control, lesser tiptoeing, increased stride length and width and required lesser support.

Conclusion: Although many studies have shown the efficacy of other suit therapies, none have been done with Neurosuit™. Positive results were noted during our two-week trial with Neurosuit™. We recommend that more patients be included in future studies and clinical gait analysis be used as an outcome measurement tool.

Category: Allied Health ASM2011-AHS-019

Use of Berg Balance Scale for assessing fall risk in elderly women: a report

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Introduction: This report describes the use of the Berg Balance Scale (BBS) as a fall risk assessment tool for elderly women admitted to the hospital for surgery or acute medical problems.

Methods: Between January and September 2010, elderly women aged > 65 years were assessed by a physiotherapist for risk of falls using BBS. BBS comprises 14 items that tests static and dynamic balance, such as sitting, transfers, reaching, picking objects from the floor, turning, tandem and single leg stance. Eligible patients were screened by the ward physiotherapist preoperatively. Patients with minimal time between admission and scheduled operation were screened postoperatively, when ambulant. Medically ill patients were confirmed to be stable before carrying out assessments using BBS.

Results: 525 elderly women were admitted during the study period, with assessments of low fall risk (37%), moderate fall risk (13%) and high fall risk (10%). 33% of women were not screened. 5% patients did not satisfy the inclusion criteria for fall risk assessment using BBS.

Conclusion: The relatively high percentage of elderly women who were categorised as low fall risk in this study is related to the fact that a majority of the hospital's patients are healthy individuals admitted for elective surgeries. However, the influence of surgery on fall risk cannot be ignored and may have a negative impact on performance during subsequent BBS assessments. Changes to the screening process should be considered to reduce the number of patients not screened during such assessments.

Category: Allied Health ASM2011-AHS-020

Hydrotherapy service for neonates in the special care nursery

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Hydrotherapy, a traditional physical therapy treatment modality, can be adapted for use in the special care nursery (SCN) setting for preterm infants to improve the outcome of their development and as an adjunct to other early intervention programmes already in place in the unit. Hydrotherapy has even been proven as an effective preparation for feeding efficiency in neonates with feeding impairment, with benefits such as weight gain and earlier discharge from the SCN setting. Buoyancy-assisted movements of the limbs of infants who have restricted mobility and behavioural state abnormalities, such as lethargy and irritability, will be incorporated into the intervention. Indications for hydrotherapy would be tone, movement abnormalities and joint/muscle range of motion (ROM) limitations. A pilot study is planned for neonates with tone and movement abnormalities,

ROM limitations and behavioural state abnormalities, such as irritability and lethargy. Inclusion criteria would include infant age > 31 weeks and a medically stable condition, with no intravenous lines or ventilators, and the ability to tolerate temperature changes. Heart rate and oxygen saturation will be monitored prior to and after each hydrotherapy session. Two sessions will be conducted per week and neurological assessment will be done before and after two weeks of intervention. Expected results would be an improvement in the infant's neurological assessment and stability of physiological parameters. A group of at least four neonates will be studied. The study will aim to confirm that physiological parameters are stable before and after the sessions, with an improvement in the neurological assessment.

Category: Allied Health ASM2011-AHS-021

Use of mechanical insufflator-exsufflator in paediatric patients with neuromuscular disease: a literature review

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Introduction: While the life expectancy of patients with neuromuscular diseases (NMDs) tends to be reduced overall, many such patients continue to die prematurely or endure long hospitalisations due to respiratory complications caused by underlying morbidities. Weakened or paralysed respiratory muscles lead to insufficient tidal volumes and the inability to produce a sufficient cough to aid the removal of secretions. A build up of secretions within the respiratory tract can lead to infections, poor gaseous exchange and dampened respiratory drive, to name just a few complications that arise secondary to NMD. Use of mechanical in-exsufflation (MI-E) to assist the person in achieving appropriate tidal volumes and clearing secretions has been found to have a positive effect on reducing hospitalisations and maintaining overall respiratory health.

Methods: A search of PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and MEDLINE was undertaken using the search criteria 'mechanical insufflation-exsufflation,' 'cough-assist,' 'mechanical airway clearance' and 'paediatric neuromuscular treatment modalities.' Reviewed articles were selected on the basis of relevance to paediatrics, NMDs and the use of mechanical airway clearance.

Results: The search identified five relevant articles. The insufflation-exsufflation pressure recommended was 20–30 mm Hg for three sets of three cycles.

Conclusion: MI-E use is safe and effective for the clearance of secretions in paediatric patients with NMDs.

Category: Allied Health ASM2011-AHS-022

Importance of cultural competencies in healthcare professionals: a literature review

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Introduction: Globalisation and the influx of migrants, international patients and foreign professionals into Singapore's healthcare system highlight the need for consideration of factors, such as ethnicity, language, customs, beliefs and values in the healthcare settings. Important questions are also being posed about the abilities of healthcare professionals to care for culturally diverse populations and the implications of the new setting for healthcare practices.

Methods: In view of the increasing importance of cultural competencies in patient care, a literature review was conducted to identify factors that promote and hinder cultural competencies in healthcare professionals.

Results: Studies found that factors, such as professionals' receptivity and willingness to acknowledge cultural differences,

understanding of one's own cultural background, ability to self-reflect and self-assess and acquisition of knowledge and skills, promote cultural competency. Prejudice, bias and ignorance were some factors that hindered competency. The lack of cultural competencies also led to perceived unfair treatment and compromised care. Continual education and training is important for increasing cultural competencies in healthcare professionals.

Conclusion: It is important for healthcare professionals to be aware of the differences between various cultures and ethnicities and to harness this knowledge for policies and practices. Cultural competencies ensure that interventions remain relevant, roadblocks to effective patient-centred care are removed, healthcare disparities are reduced and healthcare services enhanced.

Category: Allied Health ASM2011-AHS-023

Retrospective review of the management of lateral patellar dislocation at KKH over a five-year period

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Introduction: Current physiotherapy management for lateral patellar dislocation is unclear and inconsistent, with varying treatments and clinical outcome recommendations. No evidence exists from well-designed randomised controlled trials that provide optimal outcome measures for this patient group. The aim of this study was to review and identify clinically significant outcome measures relevant to the paediatric population for non-operative treatment of lateral patellar dislocation over a five-year period at KK Women's and Children's Hospital (KKH). This study would assist the Department of Rehabilitation at KKH to improve the management of these patients.

Methods: 30 patients were identified by reviewing physiotherapy referrals over the past five years to the Department of

Rehabilitation. All patients treated for lateral patellar dislocation were recruited in the study.

Results: Pain, range of motion and weight bearing status were the most clinically relevant outcome measures used in this population.

Conclusion: The results of this study were similar to evidence in recent reviews on the management of lateral patellar dislocations. Pain, range of motion and weight bearing status were the most clinically relevant outcome measures for this local population. These outcome measures assist clinicians to set clearer management guidelines and discharge goals. Further research is required to improve the management of this population.

Category: Allied Health ASM2011-AHS-024

Conservative management of congenital clasped thumb: a literature review

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Introduction: Congenital clasped thumb is characterised by persistent flexion and adduction of the thumb at the metacarpophalangeal joint after the third or fourth month of life. Passive extension of the joint is present, but active extension is not achievable, which may affect the infant's grasping ability. The aim of this literature review was to investigate the effectiveness of conservative treatment for the management of congenital clasped thumb and link implications of findings to current practice.

Methods: A literature search was conducted using the PubMed, MEDLINE, OVID and the Cochrane Library databases. Search terms used included 'occupational therapy,' 'congenital clasped thumb,' 'congenital flexion-adduction deformity of the thumb,' 'thumb-in-palm' and 'splinting.'

Results: The literature search yielded nine articles, of which

five were relevant to our study. All five articles showed that conservative treatment resulted in complete recovery or an improvement of the clasped thumb, with a success rate ranging from 66%–94%.

Conclusion: Conservative management, where splinting/casting is most commonly used, could be adopted for the management of congenital supple clasped thumb (type I). However, if active thumb extension is not achieved after three years of age, surgery is recommended. As splinting/casting was found to be most effective for type I patients, it may be useful to adopt a classification system to guide the choice of therapeutic intervention. Further research with high methodological quality could compare the effects of a full day versus a night splinting regime and review splint designs to determine the best design for adequate immobilisation while not impeding hand function.

Category: Allied Health ASM2011-AHS-025

Effectiveness of a sensory-motor, cognitive or combined approach for improving handwriting performance: a literature review

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Introduction: Learning to write legibly and efficiently is a major occupation for school-aged children. Difficulties with handwriting tasks in school can negatively affect a child's academic performance and self-esteem. Occupational therapists use various handwriting interventions, ranging from a sensory-motor, cognitive or combination of both approaches. This literature review aimed to investigate the effectiveness of a sensory-motor, cognitive or combination approach for improving handwriting performance in school-aged children.

Methods: An electronic search was performed using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE and Google Scholar databases. Inclusion criteria consisted of limiting the search to only English language literature and journal articles from the last ten years. The target population was school-aged children without any physical impairment or learning difficulties, who presented with handwriting difficulties.

Results: The literature search yielded 24 articles, of which only seven were relevant to our study. Three studies supported the use of a cognitive approach, while one supported the use of a sensory-motor approach for improving handwriting performance. Two articles reported significant improvements in handwriting skills with the use of either cognitive or sensory-motor approaches in comparison with the control group. One article, however, recommended the combined use of both approaches for handwriting interventions.

Conclusion: Occupational therapists should be open to adopting various approaches for the treatment of children with handwriting difficulties. This review showed that handwriting interventions involving the use of cognitive strategies were often more effective than those using a sensory-motor approach alone. Besides providing adequate handwriting practice, effective occupational therapy handwriting interventions should aim to incorporate the use of cognitive-based approaches.

Category: Allied Health ASM2011-AHS-026

Support group for families of children diagnosed with retinoblastoma

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Introduction: Children diagnosed with retinoblastoma (RB) are required to undergo a series of treatment procedures that include enucleating the infected eye, implanting a prosthetic eye and/or chemotherapy. Parents of these children usually experience a range of emotions and they often require considerable encouragement and support to help them cope with their children's diagnoses. A needs assessment was conducted in response to a perceived need for a support group for parents and children with RB.

Methods: A snowballed sample was used; six sets of parents responded to the needs assessment via electronic mail. Data was gathered in the following areas: (1) problems that parents faced regarding their children's condition; (2) suggested topics for discussion during support group meetings; (3) preferred

meeting frequency and duration; and, (4) expectations of the support group.

Results: Findings indicated that parents needed educative information on the medical condition and psychoemotional support. The topics identified for psychoemotional support included coping skills, acceptance, grief and loss issues, parenting a child with special needs and school-related issues.

Conclusion: In May 2010, a support group for parents and children with RB was formally set up at KK Women's and Children's Hospital, providing a platform for discussion and mutual support for parents and children alike. Feedback after the first run showed an overwhelming positive response from parents, indicating that there was a demand for the Retinoblastoma Support Group to continue.

Category: Allied Health ASM2011-AHS-027

Evaluation of a 24-hour pharmacist verification service

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Introduction: The 24-hour pharmacist verification service pioneered in May 2010 aims to capture round-the-clock medication orders. This study evaluated the service qualitatively, by comparing significance of intervention notes before and after, and quantitatively, by determining cost savings from length of stay (LOS) reduction of after office-hours (AOH) interventions.

Methods: The intervention notes, suspended orders and pharmacy notes from 5 April 2010 to 2 May 2010 (pre-24 hours) and 5 July 2010 to 2 August 2010 (post-24 hours) obtained from inpatient medical records were examined. Non-electronic orders and interventions by other healthcare professionals were excluded. Overhage et al's classifications were used to evaluate the significance of intervention notes. A survey of pharmacists' attitude towards intervention documentation — an important confounding factor — was distributed. A senior consultant assisted in estimating the reduction in LOS from 35 AOH interventions. These were extrapolated to cost savings by multiplying with respective ward

costs. Common interventions were also identified.

Results: The significance of intervention notes unexpectedly fell (80.3% vs. 72.3%). However, verification speeds improved drastically (273 minutes vs. 31 minutes) and suspended orders almost doubled (262 vs. 479). Intervention documentation occurred less than 80% of the time. AOH interventions saved more than \$74,000 per annum in LOS. Inappropriate dosage regimens (dose, frequency, duration and route) were the most common interventions.

Conclusion: Vast improvement in intervention timeliness decreased the use of intervention notes while increasing the usage of suspended orders carrying a more urgent intent. Intervention documentation should be further encouraged. Future studies should examine suspended orders and determine cost savings from all intervention types. Also, common interventions can be highlighted to physicians.

Category: Allied Health ASM2011-AHS-029

Live video modelling for teaching learning-related social skills in the kindergarten classroom settings

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Introduction: Video modelling is a technique that involves demonstration of desired behaviour through video representation. It has been used widely as an intervention technique while working on social skills for children with autism. In this study, video modelling was trialled on a child in kindergarten II.

Methods: The occupational therapy intervention took place within the naturalistic classroom environment. A six-year-old boy was referred for therapy due to behavioural concerns. In the first two sessions, he was taught the expected learning-related social skills using comic strips and through a small group teaching. In the subsequent sessions, the boy was videotaped during classroom lessons for ten minutes followed by immediate review of the video clips with discussion and feedback. When reviewing, he received a smiley face for each appropriate learning-related social skill shown and a sad face for each inappropriate learning-related

social skill. The therapist also highlighted positive behaviours displayed by his peers in the video.

Results: The patient demonstrated improvement in his learning-related social skills (e.g. raising hand) at the end of six intervention sessions. Positive feedback was received on the helpfulness of video modelling from the patient's form teacher. The patient enjoyed watching himself in the video and collecting smiley faces.

Conclusion: The study suggests that video modelling can potentially be effective when used with other intervention strategies. When using video modelling, other factors that need to be considered are the comfort level of the teacher for videotaping the session and the child's response to watching himself in the video.

Category: Allied Health ASM2011-AHS-030

Safety of open food challenges in office practice in Singapore

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Introduction: Open food challenges (OFC) are often performed to confirm diagnosis or monitor resolution of food allergy. The risks associated with OFC are unknown and published data on the food-specific skin prick test or food-specific IgE levels that predict the outcomes of OFC have not been validated for our local population. The aim of this study was to examine the safety of OFC administered in an outpatient clinic setting.

Methods: Data on patient demographics, types and outcomes of all OFCs administered at a paediatric allergy-immunology clinic from May 2008 to May 2010 were collected.

Results: 48 patients (boys 71%) underwent 52 OFCs to egg (n = 31), cow's milk (n = 7), peanuts (n = 7), soy (n = 4) and wheat (n = 3). Racial distribution was 77% Chinese, 8% Malays, 6%

Indians and 8% others. Patients' age ranged from six months to 12 years. There were eight positive challenges. Reactions, graded by Muller criteria, were mild-to-moderate in 88% of positive challenges. All positive challenges had cutaneous reactions; two patients had upper respiratory tract reactions together with cutaneous reactions. Interventions for patients with positive challenges included administration of antihistamines (38%) and adrenaline (n = 1) and observation. For patients (n = 40) with negative challenges, the reintroduction of previously allergenic foods into the diet was advised.

Conclusion: OFCs are safe procedures in an office setting equipped with resuscitation facilities and trained staff. Among patients selected from our local population based on history and food-specific IgE approaching negative predictive values, 15% had a positive food challenge.

Category: Allied Health ASM2011-AHS-033

Impact of feed interruptions on nutrient adequacy in the children's intensive care unit

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Introduction: Nutrition support during illness can prevent malnutrition-related complications and may have a positive impact on clinical outcomes. Enteral nutrition (EN) is preferred where the gastrointestinal system is functional. However, one of the challenges to optimising EN is feed interruption. Therefore, the impact of feed interruptions on nutrient adequacy was evaluated.

Methods: Energy and protein intake were recorded in 15 patients (median age 24 months, range 2–180 months) admitted to the children's intensive care unit for ten consecutive days, unless discharged. Patients on mechanical ventilator support with an anticipated stay of longer than 48 hours were studied. Neonates and cardiac patients were excluded. Episodes of feed interruption were recorded. The actual energy and protein intakes were compared with the calculated requirements, expressed as percentage, to determine nutritional adequacy.

Results: Only 6/15 patients were started on EN on day 1. The nutritional adequacies showed an increasing trend from day 1 (energy 12.5%, protein 24%) to day 10 (energy 109%, protein 189%). The commonest cause of feed interruption was high gastric residuals. Patients who had no feed interruptions reached higher percentages of energy and protein intakes by day 10 when compared with those who had interruptions. The difference was significant for energy intake (p = 0.05).

Conclusion: Feed interruptions can compromise nutrient delivery. High gastric residual was the commonest cause of feed interruption. It is used frequently as an indicator of feed tolerance. Guidelines on the threshold for gastric residuals, withholding of feeds, use of prokinetic agents and alternative feeding methods are needed to minimise such interruptions.

Category: Allied Health ASM2011-AHS-034

Evaluation of HE4 assay on the Abbott Architect i2000SR analyser

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Introduction: Ovarian cancer is one of the leading causes of death in women worldwide. Although CA-125 is the most common biomarker for the screening of ovarian cancer, it lacks sensitivity and its use for early detection is limited. A novel tumour marker, human epididymal protein 4 (HE4), is elevated in all stages of endometrial cancer. Combined HE4 and CA-125 is a more accurate predictor of malignancy than either marker alone. The performance of HE4 assay on Abbott Architect i2000SR immunoassay analyzer (AAIA) was assessed in this study.

Methods: The HE4 assay is a two-step immunoassay employing HE4 monoclonal antibodies. The assay was assessed on AAIA for sensitivity (limit of quantitation [LOQ]), linearity and imprecision.

Results: The intra-day coefficients of variation (CV%) were 2.3% (mean 48.4 pmol/L), 1.9% (170.1 pmol/L) and 1.9% (689.7 pmol/L). The inter-day CV% values were 3.7% (50.1 pmol/L), 2.5% (171.7 pmol/L) and 3.2% (710.2 pmol/L). LOQ (< 20 pmol/L) and linearity (analytical range 20.0–1,500.0 pmol/L) were verified. In the linearity study, the slope of the observed versus expected values was 1.00 (intercept = -0.07, $r^2 = 0.99$).

Conclusion: The performance of HE4 assay on AAIA was found to be satisfactorily good within acceptable limits. A clinical study on the combined use of HE4 and CA-125 for the screening of ovarian cancer is presently underway at our hospital.

Category: Allied Health ASM2011-AHS-035

Evaluation of CA 15-3 assay on the Abbott Architect i2000SR analyser

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Introduction: CA 15-3 is a tumour marker that is raised in patients with breast cancer. Serial measurements of CA 15-3 can be used to monitor disease progression and response to treatment in these patients. The performance of CA 15-3 assay on Abbott Architect i2000SR immunoassay analyzer (AAIA) was assessed in this study.

Methods: The CA 15-3 assay is a two-step immunoassay employing two monoclonal antibodies. The assay was assessed on AAIA for analytical sensitivity, linearity and imprecision. A method comparison was also carried out with Roche Cobas CA 15-3 assay from the hospital's referral laboratory, as the assay on AAIA was to be done in-house as well.

Results: The intra-day coefficients of variation (CV%) were 2.8% (mean 38.8 U/mL) and 2.0% (263.2 U/mL). The inter-day CV% values were 3.6% (39.0 U/mL) and 3.4% (263.8 U/mL). The analytical sensitivity (< 0.5 U/mL) and linearity (analytical range 0.5–700 U/mL) were verified. In the linearity study, the slope of the observed versus expected values was 1.01 (intercept = -10.63, $r^2 = 0.99$). A comparison of assay results on AAIA and Roche yielded good correlation ($n = 20$, range 5.8–2,000 U/mL; slope 0.94, intercept = -2.13, $r^2 = 1.00$).

Conclusion: The performance of CA 15-3 assay on AAIA was found to be satisfactorily good within acceptable limits. In-house testing of the assay at the hospital is now being planned.

Category: Allied Health ASM2011-AHS-036

Drug use evaluation of hormone replacement therapy for menopausal and postmenopausal women at KKH

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Introduction: Menopause is defined as the end of a woman's reproductive lifespan and is achieved one year after amenorrhoea. Near menopause, ovarian function and oestradiol production declines, leading to menopausal symptoms, such as hot flushes. This study aimed to: (1) investigate reasons for starting hormone replacement therapy (HRT) in postmenopausal women; and, (2) evaluate the appropriateness of duration of continuing HRTs and its prescribing trends.

Methods: Data was collected on patients (age 50–79 years) on HRTs from July 2009 to June 2010 and analysed using descriptive statistics.

Results: 45.3% of patients continued on HRTs for over 5 years and an alarming 25.7% continued beyond 10 years. However, patients who continued on HRTs for over 5 years complained about the

recurrence of vasomotor symptoms that were intolerable when they attempted to stop HRT. There was no report of unopposed oestrogen therapy to patients with intact uterus. Of all tests, mammograms and bone mineral density tests were routinely performed during patient follow ups. Only 27.1% of patients did not have their regular mammogram checkups.

Conclusion: It is important that doctors convey the risk and benefits of HRT to patients and properly prescribe to patients with specific indications. More emphasis should be placed on the documentation of family histories of patients who are eligible for HRTs. HRTs should not be started for patients aged over 60 years due to the risks involved. It would be ideal to implement a standardised checklist for doctors planning to start patients on HRT.

Category: Allied Health ASM2011-AHS-037

High-grade squamous intraepithelial lesions in cytology as discussed at cytopathology conferences: a review

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Introduction: Since January 2005, the preinvasive and screening unit at the departments of gynaecological oncology and pathology & laboratory medicine at KK Women's and Children's Hospital (KKH) has been conducting monthly cytopathology conferences to discuss selected patients for whom cytological, colposcopic and histological findings were not altogether concordant. The objective of this study was to review patients with cytological findings of high-grade squamous intraepithelial lesions (HSIL), but negative or unsatisfactory colposcopy or negative histology.

Methods: A retrospective data analysis was done of patients reported as HSIL from KKH and other laboratories, who were discussed at cytopathology conferences from January 2005 to December 2009. The follow-up histological and/or cytological findings within 6–12 months after the conference were reviewed.

Results: During the study period, 272 patients with abnormal

cytology were discussed, of whom 99 patients had HSIL. Within six months of the conference, 36 patients (36.4%) showed atypical squamous cells of uncertain significance or worse (ASCUS+), 32 patients (32.3%) showed negative pathological findings and 31 patients (31.3%) had no follow-up pathological findings. This resulted in a positive predictive value (PPV) of 52.9%. The findings after another six months were 44 patients (44.4%) with ASCUS+, 30 patients (30.3%) with negative pathological findings and 25 patients (25.3%) with no follow-up pathological findings. The PPV increased to 59.5%.

Conclusion: According to this review, about 60% of patients with HSIL on cytology would be ASCUS+ in the subsequent 12 months despite their initial negative pathological findings or unsatisfactory colposcopy or negative histology results. Hence, such patients must be carefully followed up and managed.

Category: Allied Health ASM2011-AHS-038

School skills in preparation for primary 1: teachers' perception

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Introduction: Starting school is a major milestone in a child's life. Teachers' perceptions of skills that were important for a child to acquire before proceeding to primary 1 were explored.

Methods: A mixed method research design was adopted. Teachers with minimum 2 years experience teaching primary 1 students rated the importance of two sets of school readiness skills on a scale of 1 to 5. One set of skills related to occupational performance in the school environment and the other to cognitive/academic and language skills. A focus group with four teachers was conducted to explore their perceptions of school readiness skills.

Results: The mean rating for occupational performance skills was 4 (important; teachers: n = 93) and that for cognitive/academic and language skills was 5 (very important; teachers: n = 89). Inspection

of the data indicated a number of skills, such as writing and numeracy, which were deemed more important than others, such as physical education or scissors skills. The focus group revealed communication of needs, adaptability to primary 1 demands and the following of instructions, as priority skills.

Conclusion: Teachers' ratings indicated that most school readiness skills were perceived as relevant and important for primary 1 children to manage school demands. The results provided justification for prioritising intervention for certain skills over others, such as writing over scissors skills and highlighted that certain skills, such as numeracy, should not be neglected for school readiness. These findings can be used to guide healthcare professionals to determine a child's school readiness and prioritise intervention needs.

Category: Allied Health ASM2011-AHS-039

Development of an evidence-based multisensory stimulation protocol for comatose patients

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Introduction: Occupational therapy (OT) at KK Women's and Children's Hospital has been providing services for comatose patients over the past few years. OT services for comatose patients are currently focused on biomechanical components. In order to enhance OT services for these patients, a literature review was done to develop an evidence-based multisensory stimulation protocol for comatose patients in an acute hospital setting.

Methods: A literature search was conducted for articles published from 1986 to 2011 using the Cochrane Library, Google Scholar, MEDLINE, OVID and PubMed databases. Search terms included 'occupational therapy,' 'coma stimulation,' 'sensory stimulation,' 'head injury' and 'coma arousal.' Each treatment study was reviewed and its research design, methodology, outcome measures and results were examined.

Results: Ten articles examining sensory stimulation in comatose patients were identified. The patients in these studies included those with traumatic and non-traumatic brain injuries. Eight studies indicated efficacy when a structured multisensory programme using a coma stimulation kit was administered. The multisensory stimulation provided differed between the studies with respect to duration and administration of stimuli.

Conclusion: Structured multisensory stimulation protocols are beneficial for increasing the arousal, awareness and meaningful behavioural response in comatose patients. A protocol was developed and adapted to the local acute hospital setting based on the findings of the survey, which included the use of auditory, tactile, olfactory, gustatory, visual, kinesthetic, proprioceptive and vestibular stimuli using the coma stimulation kit for about 15–30 minutes daily.

Category: Allied Health ASM2011-AHS-040

Effectiveness of physiotherapy in congenital muscular torticollis

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Introduction: Congenital muscular torticollis (CMT) is a musculoskeletal condition detected during infancy due to shortening of the sternocleidomastoid muscle, which may present with a preference of head tilt and/or rotation to one side, facial asymmetry and/or plagiocephaly. It is a relatively common condition in infants and can lead to morbidities, such as abnormal posture, scoliosis and permanent loss of neck mobility, if left untreated. Physiotherapy, which includes handling, positioning, active and passive movement therapy and parental advice, has been adopted to treat infants with CMT. This review aimed to evaluate the current literature on the effectiveness of physiotherapy for patients with CMT and identify areas in need of further research.

Methods: A search of the English language literature was conducted for articles published from 2000 to February 2011 using the Cumulative Index to Nursing and Allied Health

Literature (CINAHL), PubMed, MEDLINE and the Cochrane Library databases. Keywords used included 'torticollis,' 'congenital,' 'treatment' and 'therapy.' Relevant studies were also snowballed from the reference lists of publications.

Results: Ten studies were found to be relevant — retrospective studies (n = 3), prospective studies (n = 3), non-randomised studies (n = 2) and randomised studies (n = 2).

Conclusion: There is good evidence to indicate that physiotherapy is effective for CMT. Good-to-excellent outcomes were achieved in resolving CMT detected in infants aged < 1 year. However, there is a need for stronger evidence and more randomised controlled trials on the effectiveness of physiotherapy for CMT. Further research is warranted for determining the optimal frequency and duration of physiotherapy for managing CMT.

Category: Allied Health ASM2011-AHS-041

Evaluation of outpatient paediatric epilepsy ambulatory services by pharmacists

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Introduction: Epilepsy is a chronic condition requiring compliance to long treatment regimes. Knowledge of epilepsy can affect compliance. Paediatric epileptic patients need caregivers for their care. However, previous research has revealed inadequate knowledge among caregivers. The outpatient pharmacist epilepsy service was set up in collaboration with neurologists to bridge this knowledge gap and offers counselling to caregivers of paediatric patients with epilepsy. This study aimed to evaluate the service.

Methods: This was a cross-sectional study with follow up. Caregivers were divided into three groups: respondents in set A received the knowledge questionnaire before counselling; respondents in set B were given the perception questionnaire after counselling; for respondents in set C, the knowledge questionnaire was administered over the phone during follow up two weeks after counselling. The mean difference in knowledge scores (C-A) and mean satisfaction scores were calculated.

Results: 11 completed sets of knowledge questionnaires and 14 perception questionnaires were collected between September and December 2010. The mean difference in knowledge scores was 3.27 out of 5. Approximately 63% of knowledge questions (13/21) had higher scores after counselling by the pharmacist. Caregivers were more confident of administering antiepileptic drugs to children after counselling (increase from 3.82 to 4.36). The mean satisfaction score was 4.00 out of 5. Common misconceptions included the need to seek medical attention, if a child was sleepy or confused shortly after seizure episodes.

Conclusion: The service has been well received by caregivers. Future counselling services should focus on the common misconceptions identified by the study. Further studies should be undertaken to identify other possible knowledge gaps in order to improve the quality of service.

Category: Allied Health ASM2011-AHS-042

Evaluation of fluconazole prophylaxis for neonates in the neonatal intensive care unit

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Introduction: Invasive fungal infections (IFI) can cause late-onset sepsis in very low birth weight (VLBW) neonates. Fluconazole prophylaxis (FP) was recently implemented at KK Women's and Children's Hospital to reduce IFI occurrence. This pilot study reviewed its efficacy, safety and prescribing trends.

Methods: A retrospective drug use evaluation was conducted for neonates admitted to the neonatal intensive care unit from May 2009 to August 2010. Neonates were allocated to the fluconazole (received FP) or non-fluconazole (did not receive FP) group. IFI occurrence (defined as amphotericin initiation) was compared between the groups to assess the efficacy of FP. Safety was reviewed in the fluconazole group based on side effects noted, such as diarrhoea, nausea, hepatotoxicity and rash.

Results: 286 neonates were studied. Of 36 neonates who received

FP, 24 were reviewed for side effects. Efficacy wise, the fluconazole group had higher IFI occurrence than the non-fluconazole group ($p < 0.0001$), but study limitations challenged this result. Safety wise, no side effects were observed. FP was initiated in the presence of presumed/proven sepsis, initiation of total parenteral nutrition (TPN), central long-line insertion, positive fungal culture(s), poor skin conditions or a maternal history of candidiasis. It was discontinued in the presence of recovery of sepsis, discontinuation of TPN or long-line, improvement of skin conditions or amphotericin initiation. The dosing regimen of FP was 3 mg/kg q72h for a variable period depending on the neonate's condition.

Conclusion: FP was shown to be safe in neonates, although its efficacy in IFI prevention was debatable. A future prospective trial involving a larger sample size could obtain more statistically accurate results.

Category: Allied Health ASM2011-AHS-043

How effective is the disinfection of vaginal transducers: a prospective study of microbiological assessment

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Introduction: Various methods of disinfecting vaginal transducers (VaTs) have been used, including soaking the transducer in Cidex solution and washing with soap and water. More recently, disinfectant cloths have also been used, which present a simple and effective means of disinfection. Two condoms are used to cover VaTs for every endovaginal ultrasonography scan done at the department. The condoms are discarded after each scan and care is taken to avoid contamination. The transducer is wiped with a dry soft tissue paper to remove any excess gel and then wiped with a piece of Sani-Cloth® HB. The purpose of this study was to assess the effectiveness of the current method of disinfecting VaTs.

Methods: All VaTs routinely used were assessed. The transducers, excluding handles during the first five months of

study and including handles thereafter, were swabbed with sterile-moistened swab sticks before and after wiping with Sani-Cloth® HB. These swab sticks were then sent for culture testing. Samples were taken at the end of the morning or afternoon sessions.

Results: Over a nine-month period, 206 samples were collected. 16 of 103 samples (15.5%) swabbed were positive for bacteria before routine disinfection, but negative after routine disinfection. Only four of 103 samples (3.9%) swabbed after routine disinfection were positive for bacteria, although these were non-pathogenic.

Conclusion: Results indicate that current methods of disinfection are effective for VaTs.

Category: Allied Health ASM2011-AHS-044

Antidotes and guidelines for the management of intravenous chemotherapy overdose

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Introduction: In Singapore, although guidelines for the clinical management of overdose do exist for numerous drugs, they are lacking for chemotherapy drugs. There are also no internationally adopted guidelines for the clinical management of chemotherapy drug overdose. Therefore, it is imperative that local guidelines be developed and the channels for obtaining antidotes be made known.

Methods: A list of intravenous chemotherapy drugs in Singapore was constructed by combining the formularies at KK Women's and Children's Hospital, National Cancer Center Singapore and Singapore General Hospital. Based on the list of drugs, a computerised literature search for all relevant data was conducted on PubMed, Science Direct, Google Scholar, Micromedex, Drug Information Handbook and drug information leaflets. Search terms included various combinations of drug names with keywords, such as 'antidote,' 'management,'

'overdose,' 'toxic,' 'poison' and the signs and symptoms of overdose. The quality of studies was rated and recommendations made were graded according to the classification scheme adopted by the Ministry of Health, Singapore. The guidelines were exchanged and reviewed by at least one other member of the project committee.

Results: 48 chemotherapy drugs were compiled until September 2010. Eight antidotes for the management of overdose of four chemotherapy drugs were found; five of eight antidotes were unregistered in Singapore.

Conclusion: It is suggested that some of these antidotes be brought to Singapore under exemption and be stored in a centralised institution for emergency use. This also calls for more communication and collaborative efforts among institutions, with an aim of achieving greater patient safety.

Category: Allied Health ASM2011-AHS-045

Impact of nutritional practices in very low birth weight infants

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Introduction: Early aggressive nutrition intervention is likely to benefit very low birth weight (VLBW) premature infants (birth weight < 1,500 g) to match intrauterine growth rates. This study aimed to summarise current nutritional practices for VLBW infants and to explore the differences in growth rates according to weight.

Methods: All VLBW infants (n = 165) who received weekly nutrition intervention between 1 January and 25 March 2011 were studied retrospectively. Infants who reached gestational age of 40 weeks were excluded. Data on growth parameters, feed type and nutritional additives used were recorded, and nutritional intake was calculated.

Results: Most infants (70%) received fully fortified expressed breast milk. Protein powder was the most prevalent additive (87%), followed by medium-chain triglyceride (MCT) oil (75%) and glucose polymer (7%). Mean weight gain was

inadequate for infants weighing ≤ 2 kg (14.3 ± 6.4 g/kg/day), but adequate for those weighing > 2 kg (33.8 ± 14.5 g/kg/day). Despite similar fluid intakes in both groups (infants ≤ 2 kg: 166 ± 13.7 mL/kg/day; infants > 2 kg: 166 ± 13.2 mL/kg/day), heavier infants received significantly lower energy (infants ≤ 2 kg: 141 kcal/kg/day; infants > 2 kg: 135 kcal/kg/day; $p = 0.05$) and protein (infants ≤ 2 kg: 3.7 g/kg/day; infants > 2 kg: 3.4 g/kg/day; $p = 0.03$) per kg body weight when compared to lighter infants.

Conclusion: Although the calculated intakes met the recommended nutritional intakes, weight gain was found to be suboptimal for infants with body weight ≤ 2 kg. Infants with body weight > 2 kg appeared to do better on lower levels of nutritional intake, possibly due to higher physiological stability. Although current guidelines are classified according to gestational age, further studies to establish nutritional recommendations according to body weight may prove beneficial.

Category: Allied Health ASM2011-AHS-046

Spelling in school-aged children with non-syndromic cleft lip and/or palate

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Introduction: Preliminary studies on cognitive and language skills in Asian children with clefts have indicated that they have higher learning and language difficulties. Learning difficulties can affect language development, which can then affect literacy development in school-aged children. Specifically, there is limited knowledge of the literacy skills of such children, especially in the area of spelling. Spelling difficulties have been known to affect a child's academic development and are recognised as a predictor of literacy development.

Methods: Patients (age 6–8 years) were matched for age and first language to controls. Experiment 1 compared ten children with non-syndromic clefts (CL/P) with ten children without CL/P (controls). Experiment 2 compared five children with CL/P

and articulation disorders with five children with CL/P but no articulation disorders on measures of spelling, articulation, verbal memory and phonological awareness.

Results: In Experiment 1, the controls performed significantly better on phonological awareness and non-word spelling. There were positive relationships between phoneme isolation and real word spelling in the control group and between phoneme deletion and non-word spelling in the CL/P group. There were no significant findings in Experiment 2.

Conclusion: Overall results suggest that children with CL/P may benefit from speech intervention for phonological awareness to support their literacy skills.

Category: Allied Health ASM2011-AHS-047

Risk factors for preeclampsia: a case-control study

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Introduction: Preeclampsia (PE) is one of the main adverse outcomes in pregnancy. It accounts for about 3% of pregnancies and is associated with severe maternal and neonatal morbidities. This study reports risk factors relevant to our local population that were associated with PE.

Methods: Data for this study was obtained from a case-control study of 1,125 women recruited between 2003 and 2008. Women who had singleton pregnancies with first antenatal visit at < 20 weeks of gestation and who were normotensive at first visit were included in the analysis. Factors evaluated for possible association with PE were socioeconomic, clinical and biophysical factors. Multivariate analysis using logistic regression with a backward fitting technique was applied to determine risk factors, having mutually adjusted for each other.

Results: The final study population involved 718 women, of which 53 women (7.4%) had PE and 665 women (92.6%) had normal pregnancies with no association to hypertensive disorders. Increasing maternal age (OR 1.08, 95% CI 1.01–1.17), singleton pregnancies with partner (OR 4.23, 95% CI 1.98–9.29), family history of PE (OR 5.25, 95% CI 1.09–25.14), positive history of renal disease (OR 25.79, 95% CI 1.48–451.08), increasing body mass index (OR 1.11, 95% CI 1.04–1.18) and arterial pressure (OR 1.09, 95% CI 1.05–1.13) were significant risk factors for PE.

Conclusion: Results show that clinical and biophysical factors are associated with PE and suggest that PE is a multifactorial disorder. This study was significant as it identified locally relevant risk factors associated with PE in pregnant women.

Category: Allied Health ASM2011-AHS-048

Walk me through the *Next Step*: empowering parents using a supportive and informative group approach

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Introduction: Parents whose children are referred to the Early Intervention Program for Infants and Children (EIPIC) by doctors at the Department of Child Development meet up with medical social workers (MSW) individually. These sessions not only give parents support for adjusting to the realities of their child's condition but also provide information about the EIPIC application process. Non-attendance rates for such sessions have been high (50%). A survey revealed that main reasons for non-attendance were parental misconceptions about MSW appointments and the long time lag between the doctor's appointments and those of MSWs.

Methods: Parent education and support in a group setting were identified as approaches for reducing non-attendance rates. The *Next Step* weekly workshop was established to enhance parental understanding of EIPIC and how the programme could empower

them to help their children. It provides a safe platform for parents to share and learn from one another. Following the workshop, individual MSW appointments are offered to those who require further support.

Results: With *Next Step*, the waiting times for MSW appointments were significantly reduced from 1–3 months to 1–2 weeks. Additionally, the non-attendance rate was reduced to 20%. Positive feedback from parents suggests that the workshops are informative and educational and provide a platform to meet other parents. More significantly, many parents reported that it helped them realise that they were not 'alone' in this journey.

Conclusion: The *Next Step* workshop is an innovative way of educating, supporting and providing information to parents whose children are referred for EIPIC.

Category: Allied Health ASM2011-AHS-049

Evidence for early introduction of oral feeding in preterm infants

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Introduction: Successful oral feeding has been described as the most complex task in infancy. It is a major developmental milestone and a key criterion for hospital discharge of preterm infants. However, prematurity is a major cause of feeding and swallowing issues. Recent research and clinical practice indicates that transitioning from gavage to full oral feeding for preterm infants requires a systematic approach through specified protocols. Traditionally, oral feeding in preterm infants is introduced at 34 weeks postmenstrual age (PMA), with the emerging development of suck-swallow-breath coordination. However, there is growing evidence to support introduction of oral feeding for healthy preterm infants as early as 32 weeks PMA.

Methods: A literature review was conducted to compare protocols

that involved the introduction of oral feeding from 32 weeks PMA, including cue-based feeding pathways and traditional feeding pathways.

Results: Compared to non-nutritive suck stimulation, commencement of oral feeding before 34 weeks PMA has a greater positive effect on the attainment of full oral feeding in healthy preterm infants. However, evidence that these infants will discharge from the hospital earlier is weak.

Conclusion: Early introduction to oral feeds before 34 weeks PMA should be considered. The various feeding protocols being used should also be reviewed to formulate a protocol appropriate for the premature population in Singapore.

Category: Allied Health ASM2011-AHS-050

Postmortem fetal imaging: a pictorial poster

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Autopsy rates are declining globally. This poster aims to familiarise doctors with the usefulness of postmortem fetal imaging as an adjunct to autopsy. Numerous cases seen at our department in the last decade are presented, where techniques using conventional non-research equipment, such as plain radiography, computed tomography (CT) and magnetic resonance (MR) imaging, played complementary roles in helping the pathologist arrive at a diagnosis. Plain radiography is still unsurpassed in providing a panoramic evaluation of the skeletal system. Multislice CT has recently added an additional dimension to the imaging of skeletal system by using thin cross-sectional slices, MIP and 3D

reconstructions to allow depiction of fine details. MR imaging provides excellent soft-tissue depiction and is as good as autopsy for identifying gross abnormalities of the central nervous system, muscles and heart. A wide variety of cases, such as osteogenesis imperfecta, thanatophoric dwarfism, alobar holoprosencephaly with cebocephaly, dysplastic renal disease, conjoint twins, meconium peritonitis and others are illustrated. Correlation with autopsy images will be shown. This poster illustrates how imaging could play an increasingly important role in postmortem fetal evaluation and how this can be achieved in a radiological department using conventional non-research equipment.

Category: Allied Health ASM2011-AHS-051

Visual motor integration performance of Singapore preschoolers

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Introduction: Visual-motor integration (VMI) is the ability to coordinate visual perception and finger-hand movements. VMI is important in children's development because many functional skills are associated with it. Deficits in VMI have been linked to difficulties in academic performance and functional tasks. This study aimed to investigate VMI performance of Singapore preschoolers.

Methods: Berry's Developmental Test of Visual-Motor Integration (Berry-VMI) is commonly used by occupational therapists in Singapore to assess VMI abilities in children. Berry-VMI, Fifth Edition, was administered to 385 preschoolers (mean age 63.27 months) from randomly selected schools in Singapore. Performance of preschoolers were compared across gender, age, ethnic group and type of school attended.

Results: Chinese preschoolers (n = 275) performed significantly

better than Malay (n = 59) and Indian counterparts (n = 37) [p < 0.001]. Scores were also significantly different between age groups (p < 0.001), suggesting that Berry-VMI is a valid tool for assessing Singaporean children at different developmental stages. There was no significant difference between gender and types of school attended.

Conclusion: Results suggest that culture has an extensive influence on children's VMI performance. Cultural practices or biological factors may affect the development of VMI. Clinicians should consider ethnic group differences and exercise caution when assessing children using assessment tools that are standardised for other cultures. Berry-VMI is standardised for an American population. This study compared the performance of Singapore preschoolers against standard scores established for an American cohort. Such comparison highlights the need for standardising Berry-VMI for the local population.

Category: Allied Health ASM2011-AHS-052

Does the gym-based BoneFit exercise programme reduce the incidence of falls and fear of falling among elderly women?

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Introduction: Falls in elderly people are often debilitating, with a risk for mortality. Studies worldwide have shown that a combination of strengthening and balancing exercises can reduce the risk of falling in this cohort. This pilot study aimed to investigate the impact of the outpatient gym-based BoneFit exercise programme on reducing the incidence and fear of falling among elderly women at KK Women's and Children's Hospital.

Methods: 29 patients were screened and recruited for this study from among those referred to the Department of Rehabilitation between February 2010 and March 2011 for strengthening exercises, associated with an increased risk of falling or osteopenia. Each participant was assessed for muscle strength and balance. Any history of falls within last 12 months was noted

and the fear of falling rated on a scale of 0–10, with 0 indicating no fear of falling and 10 denoting extreme fear of falling. Each patient underwent ten 45-minute sessions involving warm up, aerobics exercise, weight training, balancing exercises and a cool down period.

Results: Of 29 participants recruited, only 23 completed the programme; six patients have not yet started the programme due to other commitments. Patient age was 57–79 years. The incidence of falling was reduced and fear of falling improved in patients who completed the programme.

Conclusion: Results suggest that the implementation of a supervised gym-based exercise programme may reduce falls in elderly people and mitigate their fear of falling.

Category: Allied Health ASM2011-AHS-053

The importance of late hearing screening in high-risk infants

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Introduction: To determine the usefulness of a late hearing screening test for high-risk (HR) infants who have passed the newborn hearing screening test.

Methods: Universal Newborn Hearing Screening (UNHS) is done for 99.8% of newborns at KK Women's and Children's Hospital. HR infants, that is, those with a risk factor for hearing loss (HL), were rescreened between 3–6 months of life using either the otoacoustic emissions (OAE) test or automatic auditory brainstem response (AABR). Infants who did not pass the re-screening test were referred to the Department of Otolaryngology for follow up. Data on infants born between April 2002 and March 2010 were obtained from a prospectively maintained database.

Results: Of 100,794 newborn infants, 5.6% of infants (n = 5,809)

were HR for HL. 2.5% of infants (n = 143) had HL diagnosed through UNHS. 67.6% of infants (n = 3,927) completed the HR screening test. Of these, 18.3% infants (n = 716) did not pass the test and were referred for audiological assessment. 61.8% infants (n = 442) completed their assessment. The incidence of late-onset HL was 15.1 per 1,000 HR infants, which was 5.4 times higher than the incidence of congenital HL in the general population. HL was sensorineural (n = 17, 19.3%), conductive (n = 66, 75%) or mixed (n = 5, 5.7%). HL was severe-to-profound in 20.4% of infants (n = 18). 60% of infants had bilateral HL. 23.9% of 368 infants with HL in infancy and 38% of 231 HR infants with HL were diagnosed by the late HR screening test.

Conclusion: The late HR screening test is useful for the identification of patients with HL in infancy who may have been overlooked due to negative newborn hearing screening tests.

Category: Allied Health ASM2011-AHS-054

The NICU graduate: importance of routine hearing screening

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Introduction: To determine the outcome of hearing screening of infants managed in the neonatal intensive care unit (NICU).

Methods: Infants managed in the NICU at KK Women's and Children's Hospital, Singapore, underwent newborn hearing screening using a two-stage automatic auditory brainstem response (AABR) protocol prior to hospital discharge. Those who passed underwent a high-risk (HR) hearing screen at 3–6 months of life with either an AABR or otoacoustic emissions (OAE) test. Those who did not pass were referred to the Department of Ear, Nose & Throat (ENT) for audiological assessment. Data was obtained from a prospectively maintained database.

Results: 2,662 infants born between April 2002 and December 2009 survived NICU care. 105 infants were referred to the ENT after failure to pass either the inpatient or outpatient hearing screen. 63 infants (60%) completed their assessments and 47 infants

(74.6%) had hearing impairment (HI). 1,742 (68.6%) of 2,541 eligible infants underwent HR screening. 178 infants (10.2%) did not pass and were referred to the ENT, of which 147 infants (82.6%) completed their assessments; 24 infants (16.3%) had HL. The ENT referral rate was 10.6%. HL was graded as mild ($n = 14$, 19.7%), moderate ($n = 23$, 32.4%), severe ($n = 16$, 22.5%) and profound ($n = 18$, 25.3%) for the 71 infants with HL, with the loss being due to sensorineural ($n = 41$, 57.7%), conductive ($n = 29$, 40.8%) or mixed ($n = 1$, 1.4%) causes. 46 infants (64.8%) had bilateral HL. The incidence of HL among NICU graduates was 26.7/1,000 infants, compared to 2.8/1,000 in the hospital population.

Conclusion: The incidence of HL was almost ten times that of the general population among NICU graduates. Strict adherence to a standard newborn hearing protocol is crucial for detection of HL in this cohort. HR screening with AABR will allow detection of late-onset HL caused by autonomic neuropathy.

Category: Allied Health ASM2011-AHS-055

Enhancing speech and language therapy service quality at the Department of Child Development, KKH

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Introduction: Overwhelming referrals amid limited resources leads to long waiting times between referral and first contact with a speech language therapist (SLT) at our clinic. A pilot project was undertaken between October 2007 and October 2008 to study the effectiveness of caregivers' training sessions (CTS) for optimising utilisation of current resources, reducing waiting time to gain access to SLT services and attaining caregivers' satisfaction with CTS.

Methods: Information was collected on selected patients who met specified criteria following a paediatrician's first consultation. The caregivers of these patients were offered a training programme. Survey forms were handed at the end of the sessions to obtain caregiver's feedback on five preidentified areas of service. A comparison of accessibility with and without CTS was made.

Results: With a staff strength of 3 members, the SLT team was able to serve 755 (71.84%) of the 1,051 newly referred patients between October 2007 and October 2008 following the introduction of CTS when compared to 583 (55.47%) without CTS. The earliest waiting time for first contact with an SLT was reduced from 8 months to 2 months. Based on the surveys collected (164/172, 95.35%; one survey per patient), caregiver feedback on CTS indicated 'agree' and 'strongly agree' to usefulness of information (92.7%), relevant handouts (92.7%), comfortable room (80.5%), presenter's knowledge (98.2%) and presenter communicated information well (97%).

Conclusion: CTS could facilitate earlier parental contact with SLTs and allow better utilisation of limited resources.

Category: Allied Health ASM2011-AHS-056

Seven years' experience with thalassaemia DNA screen: a combination of haemoglobin electrophoresis and DNA test

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Introduction: Thalassaemia is one of the commonest genetic disorders in Singapore, affecting 4% of the population. A comprehensive screening test package, including haemoglobin (Hb) electrophoresis and DNA test, for common α -thalassaemia mutations was launched in December 2003 for screening of thalassaemia carriers. This review summarises the test findings and the increasing requests for the test.

Methods: 2,924 blood samples were received for thalassaemia DNA screen (test code: DNA108) between December 2003 and August 2009. They were subjected to Hb electrophoresis using the BioRad Variant II analyser and detection of HbH inclusion bodies. DNA analysis for five α -thalassaemia deletional mutations was carried out for all samples except for the β -thalassaemia carrier samples received prior to 2010.

Results: The test request has increased from 173 in 2004

to 602 in 2010, by approximately 450 a year in between. Most requests (91.7%) were received from KK Women's and Children's Hospital, Singapore. Majority (98.5%) of in-house requests were for paediatric patients. Screening identified 1,207 α -thalassaemia (41.3%), 434 β -thalassaemia (14.8%), 52 concurrent $\alpha\beta$ -thalassaemia (1.8%), 258 HbE carriers (8.8%) and 18 other Hb variant carriers (0.6%). Slightly raised HbA2 and HbF were detected among 82 patients (2.8%) with no thalassaemia mutation. Normal status was reported for 896 patients (30.6%).

Conclusion: Thalassaemia DNA screen gave a 67.3% pickup rate in patients suspected to have thalassaemia. While HbE and β -thalassaemia are readily identified by Hb electrophoresis, this test confirms α -thalassaemia carrier status unequivocally. An increase of both in-house and external test requests has been noted in the last year.

Category: Allied Health ASM2011-AHS-057

Screening for type 2 myotonic dystrophy (DM) using polymerase chain reaction in symptomatic patients testing negative for type I DM

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Introduction: Myotonic dystrophy (DM) is a chronic, dominantly inherited, multisystemic form of muscular dystrophy commonly found in adults. It can be caused by CTG expansion in the dystrophin myotonia-protein kinase (DMPK) gene (DM1) or CCTG expansion in the zinc finger protein 9 (ZNF9) gene (DM2). DNA analysis for confirmation of DM1 has been available in our laboratory since 1997. This study aimed to use polymerase chain reaction (PCR) to establish the size of CCTG repeats in DM1 negative patients and to determine whether patients previously screened negative for DM1 could be positive for DM2.

Methods: 67 patients aged ≥ 9 years were sent for confirmation of DM diagnosis; 48 were negative for DM1. The DNA samples previously extracted and stored at 4°C were used for analysis. Amplification of CCTG repeats in the ZNF9 gene was carried out using published primers and protocols and electrophoresis of the PCR products was carried out at 55°C on the Spreadex mini gel.

Results: The CCTG repeats in ZNF9 appeared to be very heterogenous, with all 48 samples demonstrating heterozygosity in the normal size range. This indicated that patients were unlikely to have DM2. The analysis of fragment size, however,

was complicated by the presence of heteroduplexes and minor products.

Conclusion: PCR analysis found that all patients who had

clinical symptoms of DM and tested negative for DM1 carried normal CCTG repeats in the *ZNF9* gene. Further studies using the gold standard Southern analysis will be required to confirm this negative finding.

Category: Allied Health ASM2011-AHS-058

Magnetic resonance imaging of the head and spine — an investigation of common artifacts

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Magnetic resonance (MR) imaging is a good choice for imaging of the head and spine because of its superior contrast resolution. However, technologists must learn to reduce the appearance of artifacts through proper selection of technique, as MR imaging is full of artifacts. An artifact is a false signal information and is not a true representation of the patient's anatomy. Artifacts are misleading as they mimic pathology. It is important that technologists learn to recognise artifacts and identify ways to overcome them. The head and spine studies of paediatric patients were reviewed retrospectively. The type of artifact was classified

into three broad groups — physiology, equipment, or the physics of MR imaging — based on underlying cause. Comparison of the imaging parameters was useful for identifying the technique that was applied to reduce the appearance of artifacts present. Data was collected until end April 2011 and is being tabulated to identify the common artifacts encountered in MR imaging. This study aims to alert technologists of the common artifacts seen in MR imaging, so that they are aware and vigilant while performing the scans and make an effort to reduce the appearance of artifacts that may result in false impressions.

Category: Multidisciplinary ASM2011-MD-001

Children with diabetes mellitus and their hospital readmissions

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Introduction: Children with chronic illnesses, such as diabetes mellitus (DM), requiring self-management tend to be readmitted after diagnosis. Readmissions for diabetic ketoacidosis (DKA), hypoglycaemia and sick days are not uncommon. Some of these readmissions are relapser admissions, that is, two or more readmissions for the same patient in a year. The aim of this study was to determine the profile and reasons for readmissions and relapser admissions among children with DM.

Methods: A retrospective study was conducted of the characteristics of DM patients readmitted after diagnosis between January 2007 and December 2009. Steroid- and chemotherapy-induced DM patients were excluded. The reasons for admissions among type 1 and type 2 DM patients and the characteristics of 50 relapser admissions were analysed.

Results: 159 patients (age 2–20 years) with type 1 and type 2 DM were readmitted during the study period. The number of relapser admissions seen was 50. Overall, the percentage of readmissions for girls was higher (57.2%) and patients of Indian origin accounted for 34% of relapser admissions. While the proportion of overall readmissions for Chinese patients was 44.7%, they only accounted for 26% of the relapser readmissions. The mean age of patients in the overall readmissions (13.2 years) and relapser admissions (13.9 years) groups was similar. The main reasons for relapser admissions were DKA (40%) and sick days (40%). The mean time after diagnosis for the overall readmissions group (4.1 years) was lower than that for the relapser admissions group (5.1 years).

Conclusion: The DM patients identified as at-risk for readmissions in this study were adolescents, girls, Indians and those diagnosed with DM 4–5 years previously.

Category: Multidisciplinary ASM2011-MD-002

Attitudes, knowledge and beliefs of parents toward food and asthma

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Introduction: Strong local and cultural beliefs, with little scientific or clinical evidence as support, are often imposed on children with asthma. The objectives of this study were to: (1) compare the attitudes, knowledge and beliefs of caregivers of children with and without asthma towards food and asthma; and, (2) assess the overall nutritional adequacy of children's diets based on Dietary Guidelines for Singapore Children 2007.

Methods: Information on attitudes, beliefs and practices was collected from caregivers attending the specialist outpatient clinics over a six-week period using a self-administered questionnaire. Data on dietary quality was collected using an interviewer-administered diet history form.

Results: 116 caregivers were interviewed. 53% of respondents

had children with asthma, among whom 31.8% gave specific foods to improve their child's condition and 51.9% practiced food restrictions. The top 3 foods believed to trigger and improve asthma were: (1) cold drinks, cold foods and fruit, and (2) cod liver oil, fish oil and vitamin C, respectively. Almost all caregivers reported that nutrition was important. However, only 19% were aware of Dietary Guidelines for Children 2007 and, of these, only 36.4% used the guidelines for meal planning.

Conclusion: Food beliefs and dietary restrictions are common among caregivers of children with asthma. While caregivers are concerned about nutrition, it appears that they do not have much related knowledge. Healthcare providers should play a more active role in providing information and guidance on healthy eating in children with or without asthma.

Category: Multidisciplinary ASM2011-MD-004

Pain audit for post-appendicectomy paediatric patients

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Introduction: Paediatric patients who have undergone laproscopic appendicectomy may have inadequate analgesics. A prospective audit was conducted to determine the satisfaction level of such patients in relation to the adequacy and appropriateness of their postoperative analgesia.

Methods: Paediatric patients who underwent laproscopic appendicectomy at KK Women's and Children's Hospital, Singapore, from June to December 2010 were included in the audit. Data collected included the types of analgesia prescribed for the patient and their pain scores from the time of their admission to the children's emergency to postoperative day 1. The purpose of the audit was to identify possible contributing factors, such as types of analgesics prescribed and mode of administration, for these patients. The factors were compared with their corresponding pain satisfaction levels and the timeliness and utilisation of the administration of analgesics. Discrepancies of pain

assessment between the ward nurses and the pain resource nurse were explicated.

Results: 50 paediatric patients (age 6–18 years) who underwent laproscopic appendicectomy were included. 30 patients were diagnosed with simple appendicitis and 20 with perforated appendicitis. Findings suggest that round-the-clock paracetamol and non-steroidal anti-inflammatory drugs, with pro re nata (PRN) opiates for breakthrough pain, were strongly recommended. For patients with perforated appendicectomy, patient-controlled analgesics and opiates for at least 24 hours may prove beneficial.

Conclusion: Study findings substantiate the fact that administration of inadequate analgesics does occur in this patient group. The importance of accurate pain scores and the timeliness of administration of analgesics for paediatric patients undergoing laproscopic appendicectomy cannot be over emphasised for enhancing patient pain satisfaction levels.

Category: Multidisciplinary ASM2011-MD-005

Use of Modified Checklist for Autism in Toddlers for young children referred to a child development clinic in Singapore: a preliminary report

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Introduction: The Modified Checklist for Autism in Toddlers (M-CHAT) is a parent report checklist that was developed in the United States to screen for possible autism spectrum disorders (ASD) in children (age 16–30 months). This study evaluated the usefulness of M-CHAT in a local clinic sample and with children older than 30 months.

Methods: Caregivers of patients referred to the Department of Child Development were asked to complete M-CHAT as part of the intake process, although its use is not yet validated in the local context. Data were collected from the medical records of paediatric patients (age 0–4 years) referred between February 2009 and July 2010. Data was collected from 767 of 1,279 patients (60%). Caregivers of 446 patients completed M-CHAT (58.1%).

Results: 137 of 446 patients had an initial diagnosis of ASD (30.7%). The sensitivity, specificity and positive predictive value (PPV) of M-CHAT for initial diagnosis by a paediatrician was 0.77 (95% CI 0.69–0.84), 0.65 (95% CI 0.59–0.70) and 0.50 (95% CI 0.43–0.56), respectively. Further evaluation will be done along with the final diagnosis, when patients complete an ASD diagnostic assessment.

Conclusion: Preliminary results suggest that M-CHAT's ability to identify patients with possible ASD (sensitivity 0.77) and exclude those without ASD (specificity 0.65) in the local clinic sample is acceptable. Its sensitivity is lower than those reported in previous research, which may indicate under-reporting of related behaviours by caregivers or an effect of age on M-CHAT's psychometric properties. These will be considered and discussed further in light of existing literature.

Category: Multidisciplinary ASM2011-MD-006

Addressing a widespread medical literature error: the role of chlorhexidine in skin antisepsis

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Introduction: Skin antisepsis is an essential part of medical interventions. It is necessary before surgery, injections, venipuncture and placement of intravascular devices. Its aim is to minimise the risk of infections from such procedures. The three main antiseptic compounds in use today are alcohols, chlorhexidine and povidone-iodine.

Methods: A review of the medical literature related to skin antisepsis over the last 10 years, with an emphasis on large clinical trials, systematic reviews and meta-analyses, was conducted. Applications of interest were presurgical skin antisepsis, central venous catheter insertion and blood culture taking. In addition, infection control websites and postings on professional infection control discussion groups were reviewed.

Results: Several clinical trials and systematic reviews were identified. A majority of these studies involved either a

mixture of alcohol and chlorhexidine (two active ingredients) or aqueous povidone-iodine (one active ingredient). The combination of alcohol and chlorhexidine was found to be superior to povidone-iodine alone in most studies. Several articles concluded correctly that positive results were due to a combination of two antiseptics in the former approach. However, many others concluded that the outcomes were solely due to chlorhexidine, thereby ignoring alcohol, which is a powerful skin antiseptic on its own. Many secondary articles, infection control websites and forums also quoted the effects as being due to chlorhexidine alone.

Conclusion: Conclusions that chlorhexidine *per se* is an effective skin antiseptic and is superior to povidone-iodine are significant medical literature errors. If taken literally and used alone (i.e. chlorhexidine without alcohol), the practice may put patients at risk of serious infections.

Category: Multidisciplinary ASM2011-MD-007

Characterisation of a rhabdomyosarcoma primary cell line: a cell culture and cytogenetics perspective

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Introduction: Rhabdomyosarcoma (RM) is a serious childhood cancer that arises from skeletal muscle (myogenic) lineage. These tumours account for about 5%–8% of all childhood cancers. The two main histophenotypic variants of RM include embryonal RMs (ERMs; accounting for 60%–70% of RMs) and alveolar RMs (ARMs; 20%–25% of RMs). Cell biology and cytogenetics techniques were used in this study to characterise an ARM cell line that was cultured from ARM tumour tissues.

Methods: The ARM-derived cell line was maintained in RPMI 1640 medium supplemented with 10% fetal bovine serum. Subsequently, cytogenetics examinations, such as karyotyping

and fluorescence *in situ* hybridisation (FISH), were performed. These analyses were conducted according to the standard protocols of the cytogenetics laboratory at KK Women's and Children's Hospital.

Results: The ARM cell line was characterised using a combination of cell culture, karyotyping and FISH analyses. These procedures revealed the presence of a complex karyotype and a translocation involving chromosome 2. Although *N-myc* signal was found, no amplification of *N-myc* was observed.

Conclusion: We report the successful culturing and characterisation of an ARM primary cell line.

Category: Multidisciplinary ASM2011-MD-009

Comparison of a novel starch glycosade versus uncooked cornstarch on duration of euglycaemia in two children with glycogen storage disease type I

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Introduction: The aim of dietary treatment in glycogen storage disease type 1 (GSD 1) is to avoid hypoglycaemia and suppress secondary metabolic decompensation. This is achieved through frequent daytime feedings and the use of either uncooked cornstarch (UCCS) or continuous overnight tube feeding during the night. UCCS is currently the preferred option for parents. While easily obtained and economical, its side effects include loose stools, flatulence and bowel distension. Moreover, the duration of euglycaemia varies, thus requiring 4–6 hourly feeds day and night. Glycosade, a novel starch, has been reported to increase the duration of normoglycaemia. This study compared the efficacy of glycosade to that of UCCS in two patients with GSD 1.

Methods: Both children were given a fasting starch load test

consisting of 2 g/kg of starch (UCCS or glycosade) over two consecutive nights. Two hours after the last snack, the baseline blood glucose level (BGL) was taken, followed by either UCCS or glycosade. BGLs were measured hourly till ≤ 4 mmol/L and then half-hourly till ≤ 3 mmol/L. The test was stopped ten hours later or when $\text{BGL} \leq 3$ mmol/L.

Results: Glycosade did not increase the duration of normoglycaemia in either child. One child maintained $\text{BGL} \geq 3$ mmol/L for 6.5 hours on glycosade versus 8.5 hours on UCCS; the other maintained $\text{BGL} \geq 3$ mmol/L for 6.5 hours on glycosade versus 7 hours on UCCS.

Conclusion: Results indicate that glycosade did not improve fasting tolerance in the two patients with GSD 1 tested.

Category: Multidisciplinary ASM2011-MD-010

Challenges in providing palliative care for paediatric patients

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Many challenges are encountered when providing palliative care to children with life-limiting illnesses and threatening conditions. The spectrum of medical conditions occurring in this variable and diverse subset of individuals, such as neonates, children, adolescents and young adults, who have different cognitive functions and may have developmental levels that lack decision-making capacity is wide. Pharmacokinetics and pharmacodynamics of medications is also a problem for this cohort. Some diseases are only specific to children, who may

survive for years with heavy and complex medical needs. For this reason, communication becomes vital and needs to be skillful when relating to children with special needs, their anxious and grieving parents and/or the multidisciplinary teams handling such patients. Such unique aspects of paediatric palliative care, which are determined by age, course of illness, the family unit and its cultural environment, call for extensive skills and resources in order to best support these children and their families.

Category: Multidisciplinary ASM2011-MD-011

Role of standardised parenteral nutrition bags for neonates

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Introduction: Studies have suggested that starting premature neonates on total parenteral nutrition (TPN) immediately after birth may result in better nutritional status. This study aimed to optimise nutritional intake of neonatal patients at KK Women's and Children's Hospital, Singapore, through the use of standardised TPN and evaluate the impact of switching from customised to standardised TPN on the neonate.

Methods: Nutritional status of neonates on standardised TPN was monitored from end November 2010 to February 2011 and evaluated against corresponding data from neonates on customised TPN from July to September 2010. Nutritional status was assessed using the patient's daily calorie and amino acid intakes and the number of combination drips required. This was correlated to the neonate's weight gain. The total number of monthly interventions and wastage of starter bags prepared were also compared.

Results: Patients on standardised TPN showed greater daily calorie intake, started enteral feeds earlier and required less combination drips. However, their mean daily amino acid intake over the first two weeks of life or till the end of TPN, whichever was shorter, was lower. Mean monthly number of interventions was reduced from 114.3 to 0.333. On average, 34 starter bags were prepared every month and 4.3 bags were wasted each month.

Conclusion: Standardised TPN resulted in better calorie intake, earlier initiation of enteral nutrition and less combination drip requirements in neonatal patients. However, amino acid intake remains to be optimised for such patients. Contents of the standardised TPN bags will be reviewed to further optimise the amino acid intake of neonatal patients on TPN.

Category: Multidisciplinary ASM2011-MD-012

First case of maple syrup urine disease detected in Singapore by expanded newborn screening

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Introduction: Metabolic newborn screening (NBS) by tandem mass spectrometry (TMS) aims to identify neonates with inborn errors of metabolism (IEM). Early detection and intervention can prevent mortality and morbidity in this group of patients. Maple syrup urine disease (MSUD) presents with poor feeding, failure to thrive, seizures and opisthotonus. If left untreated, irreversible mental retardation, cerebral oedema and possibly death can occur.

Methods: Each neonate's blood was collected on a Guthrie card by a heel prick at 24–48 hours of life. Dried blood spots (DBS) were processed and analysed using TMS, which detects over 40 IEMs classified as fatty oxidation disorders (FAO), aminoacidopathies (AA) and organic acidaemias (OA).

Results: The proband's DBS results showed marked elevations of branched-chain amino acids (BCAA) and abnormal marker

ratios, suggesting a possible diagnosis of MSUD. The neonate was admitted to KK Women's and Children's Hospital (KKH), Singapore, for immediate evaluation, treatment and monitoring. Follow-up plasma amino acid analysis confirmed increased BCAA and the pathognomonic marker of allo-isoleucine; urine organic acid analysis revealed increased excretions of BCAA hydroxy- and keto-acid derivatives. To date, KKH has screened 87,263 newborns. The current detection rate in Singapore for all IEM (FAO, AA and OA) in the screened population is 1/3,789. Unfortunately, about half of the newborn population during this period was not screened.

Conclusion: Early detection of IEM by TMS and prompt medical intervention affords better treatment opportunity and prognosis for paediatric patients with MSUD and should be employed as the standard of care for Singapore's newborn population.

Category: Multidisciplinary ASM2011-MD-013

Language and behaviour in young children presenting to the Department of Child Development: an exploratory survey

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Introduction: An intake questionnaire, which documents main parental concerns and the child's medical and developmental history, is routinely sent to parents before a child's first appointment at the Department of Child Development (DCD), KK Women's and Children's Hospital. There is little information about the range and severity of emotional and behavioural problems (EBP) that a child may experience. The Child Behaviour Checklist (CBCL) is a standardised broadband screen for children's EBP. This survey sought to determine the usefulness of CBCL in our practice.

Methods: In this pilot survey, consenting parents of children (aged 18–36 months) attending the first appointment at DCD filled the CBCL.

Results: 34 children (boys 71%) were administered CBCL. 87.5% of parents reported speech problems, with more than 70% reporting

that their child couldn't sit still, couldn't concentrate and wouldn't answer. Significant *t*-scores were obtained for the syndrome scales of withdrawal (33%) and attention problems (37.5%) and for American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM)-oriented scales of pervasive developmental disorders (50%). Further analysis is planned to correlate these findings with the children's eventual diagnoses.

Conclusion: Speech and language delays were the predominant concerns for parents of very young children presenting to DCD. CBCL gives the clinician further information about any EBP experienced and may serve as a useful screen as part of intake. The information will assist clinicians in the diagnostic process as well as in deciding on the types of intervention and services that may best serve the child and parent, for example parenting programmes or skills training for the children.

Category: Multidisciplinary ASM2011-MD-014

Family-centred service at the Department of Child Development: a study of our process of care

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Introduction: Having a child with a developmental disability has significant impact on parents and siblings. Family-centred service (FCS) is a service delivery model that recognises the central role of families and is considered 'best practice' in fields concerned with the optimal development of children, such as early intervention.

Methods: The Measure of Process of Care for Service Providers (MPOC-SP) is a validated 27-item self-assessment questionnaire designed to examine what service providers think about the quality of care they provide and to assess the extent to which they perceive these services to be family-centred. The MPOC-SP questionnaire has four subscales, each representing a distinct dimension of FCS. It was administered to the staff at the Department of Child Development (DCD), who had direct clinical contact with patients and their families.

Results: 51 of 56 questionnaires were completed by a range of professionals, including paediatricians, nurses, psychologists, therapists, medical social workers and special educators. Mean subscale scores varied (range 4.18–5.25) on a 7-point scale, with highest scores being seen for the 'treating people respectfully' (5.25) and 'communicating specific information' (5.25) subscales. The lowest subscale score was seen for the 'providing general information' subscale (4.17).

Conclusion: Findings are consistent with previous studies and indicate that DCD staff value FCS and use these core elements regularly in their work with families. Further studies are planned with similarly validated questionnaires (MPOC-20) for families of children receiving services at DCD, so as to identify areas for improvement and move toward providing services that are more family-centred.

Category: Multidisciplinary ASM2011-MD-015

Identifying the Child Behaviour Checklist profile of children with autism spectrum disorder presenting to the Department of Child Development

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Introduction: The Child Behaviour Checklist (CBCL) has traditionally been used to evaluate emotional and behavioural problems (EBP) in children and adolescents (Achenbach, 1991). Recently, CBCL has also been shown to be able to discriminate children aged 4–18 years with autism spectrum disorder (ASD) from similar-aged children with other EBP. In this study, we sought to describe the CBCL profile of younger children with ASD from a sample presenting to the Department of Child Development (DCD), KK Women's and Children's Hospital, Singapore.

Methods: Parents of children (age 18–36 months) presenting for their first visit at DCD were requested to participate in the study. 34 consenting parents have filled in a battery of questionnaires that included CBCL so far.

Results: Doctor's provisional diagnoses were traced for 29 participants. 34.5% of participants were provisionally diagnosed with ASD. Preliminary analysis showed that the ASD group scored higher on the 'withdrawn and the pervasive developmental disorders' scales compared to the non-ASD group. Further analysis is planned with a larger sample size to correlate the scores of these scales with the children's eventual diagnoses.

Conclusion: In addition to being a broadband screener for EBP in children, CBCL may also be used to highlight children at risk of ASD. By being able to differentiate these children early on, CBCL can potentially help doctors in giving a more informed diagnosis and a quicker referral to the necessary services, even before a formal assessment is made.

Category: Multidisciplinary ASM2011-MD-016

Attachment from infancy: a longitudinal study

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Introduction: Infants and young children in Singapore have traditionally been cared for by a variety of caregiver arrangements, which includes maids as well as other short- or long-term fostering arrangements. Little is known about the impact of these practices on the children's social and emotional development. This study aimed to identify the attachment styles of children in Singapore and the outcomes associated with these attachment styles.

Methods: Three cohorts of mothers and their children were planned for the study. Three interviews were planned for mothers when their children were aged four months, 18 months and three years. At each interview, mothers were interviewed about their child's care arrangements and requested to complete questionnaires.

Results: Preliminary findings for the first and second interviews show that infants in the sample were cared for mainly by their grandmothers and mothers. Differences in care arrangements were apparent between Chinese and non-Chinese families at both the four-month and 18-month interviews. Mothers rated their children's temperament as less approaching, less cooperative and more irritable at 18 months as compared to at four months. Ratings on the rhythmicity subscale were similar at the two interviews. Results suggest that attachment security to mothers is not related to whether mothers or others were the main caregivers.

Conclusion: 48 participants from the first cohort will have completed their interviews by May 2011. The paper presents the results of this study and discusses the care arrangement practices identified and their impacts on attachment, temperament and development.

Category: Multidisciplinary ASM2011-MD-017

Translation of Impact of Pediatric Epilepsy Scale questionnaire into Singapore English and Mandarin Chinese: a linguistic validation

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Introduction: The Impact of Pediatric Epilepsy Scale (IPES) is a domain-specific quality of Life questionnaire for paediatric patients with epilepsy and their families. We modified IPES to permit use in the local context, with linguistic validation of the Mandarin version.

Methods: IPES was modified from Canadian English to suit local English speakers and translated to Mandarin Chinese independently by two different Mandarin native speakers. The resulting English version and Mandarin IPES translation were compared and revised. The revised Mandarin translation was back translated by a bilingual non-healthcare individual without access to the source document. The resulting IPES versions were administered to families of patients with epilepsy in the neurology outpatient clinic. Participants were asked for feedback and suggestions on IPES.

Results: 12 families participated and completed IPES (English 4, Mandarin 8). The Singapore English version of IPES was completed without difficulty. The Singapore Mandarin version received mixed feedback, with Chinese parents educated in China/Taiwan accepting the Chinese IPES, but those educated in Singapore requesting a bilingual questionnaire.

Conclusion: We adapted IPES to suit local language and culture. There were no problems with the English adaptation of IPES. However, there are concerns with the Mandarin version of the self-administered questionnaire for our local population, particularly when including simple medical terms, such as 'seizure' or nuanced differences in scale. Innovative adaptation is required to ensure that patients and caregivers understand the questionnaire and to permit accurate collection of data to reflect reality. Malay and Tamil versions are similarly required.

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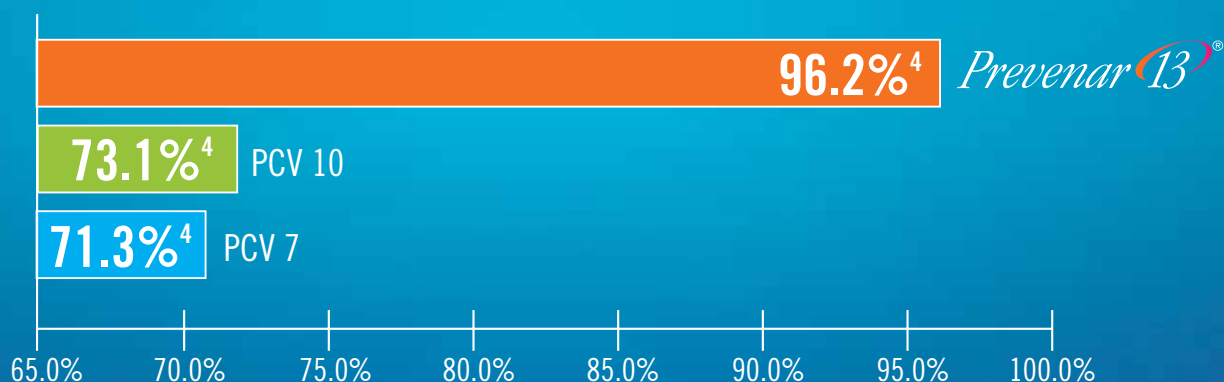
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More information available upon request. For healthcare professionals only.

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