ALEXANDRA HEALTH
FORUM 2012
in conjunction with **AH Nursing Fest**

Theme:
INTEGRATIVE CARE *towards* **BETTER PATIENT OUTCOME**

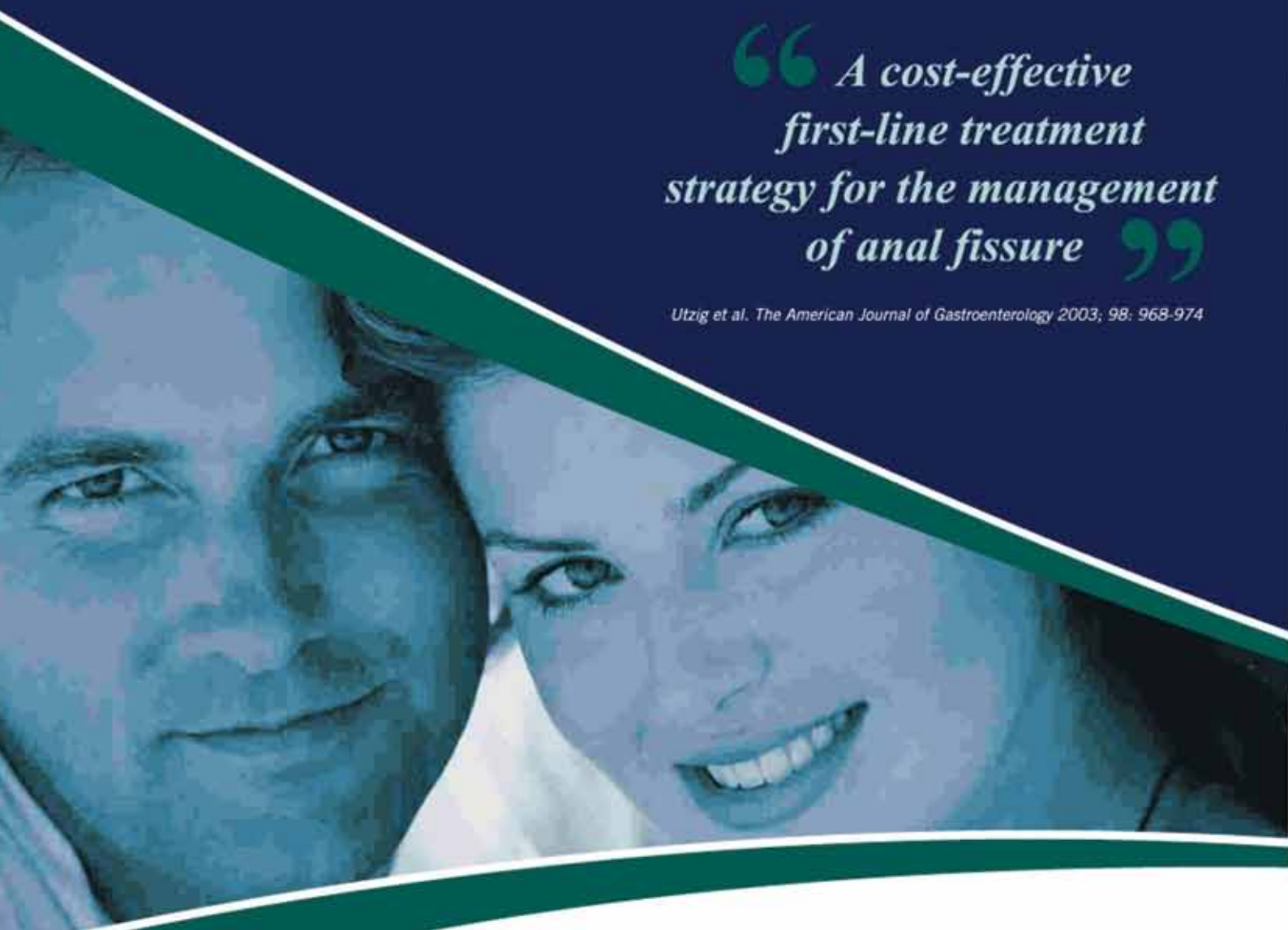30 AUGUST - 1 SEPTEMBER 2012   ⋮   **KHOO TECK PUAT HOSPITAL**

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AH Nursing Fest

Alexandra
Health

*The Journal of the
Singapore Medical Association*

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Message from the Guest-of-Honour

Singapore's healthcare has made good progress over the years but with a rapidly growing and ageing population, we will need to build a good-quality healthcare system that is accessible and affordable for all Singaporeans.

The government is investing heavily in infrastructure and manpower to build more hospitals and elderly-care facilities to cope with the rising healthcare needs. However, building more capacity addresses only a part of the problem. To raise the quality of care, we are changing the way care is structured and delivered. Healthcare delivery has to be well coordinated, well planned and seamlessly provided, so that patients can navigate the various healthcare facilities and services easily and receive appropriate care in the right settings. A well-planned and coordinated healthcare system will also help to maximise the use of resources, raise productivity, and eliminate redundancy and wastage. Everyone in the healthcare system has a part to play in this process. It is only when every healthcare worker from all disciplines steps forward to take ownership of this problem that we can hope to find a long-term solution.

I am thus very heartened to note that the Organising Committee has chosen the theme of 'Integrative Care – Towards Better Patient Outcome', and has brought the various healthcare disciplines together for this very meaningful 2½-day conference. To deliver top quality care for our patients, we need to constantly review and improve the way patient care can be delivered in a well coordinated fashion. The format of having interactive discussions across disciplines within the domains of 'Fast Medicine', 'Cruise Medicine' and 'Slow Medicine' promises to be very interesting. I have no doubt that over the course of the conference, Alexandra Health System will be able to bring the notion and practice of collaborative healthcare to new heights.
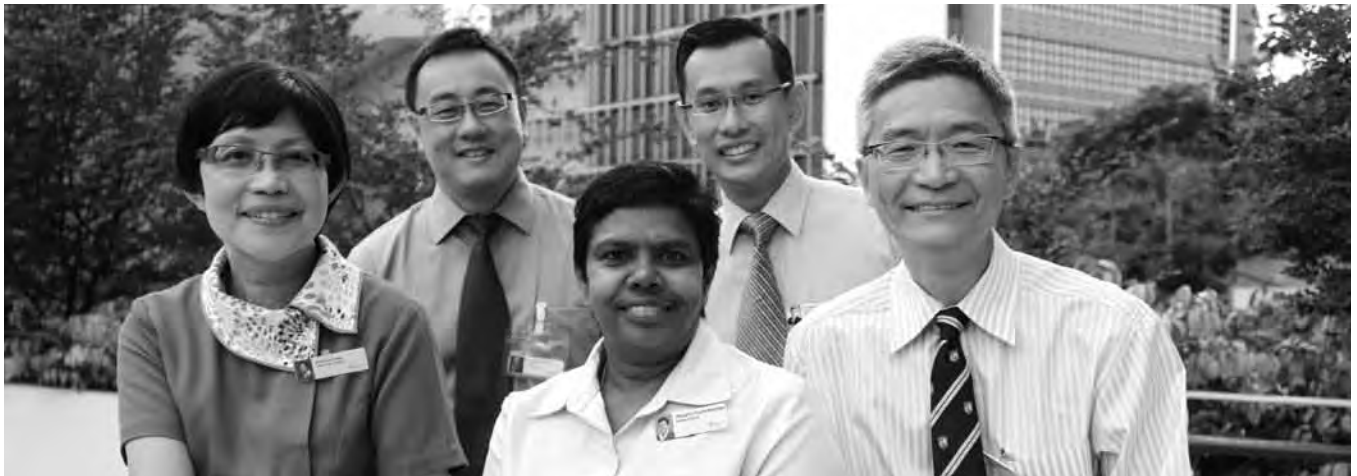

Dr Amy Khor
Minister of State
Ministry of Health and Ministry of Manpower

Welcome Message from the Organising Committees

Dear friends and colleagues,

The combined organising committees of the Alexandra Health Forum 2012 and the Alexandra Health Nursing Fest 2012 (AHF&NF) would like to extend a warm invitation to everyone. We thank you for your participation! Our signature learning and research event this year promises to be even more exciting with the amalgamation of the science and art of medicine. We have chosen the theme of 'Integrative Care – Towards Better Patient Outcome'.

The AHF scientific programme highlights interaction across disciplines and discusses how we aim to assimilate the management of patients with complex medical conditions that require multifaceted care. When healthcare workers from different disciplines care individually for a patient, we achieve multidisciplinary care, but when healthcare workers from various disciplines collaborate as a team to care holistically for the patient, we arrive at transdisciplinary care. If practised well, transdisciplinary care could effectuate better outcomes for our patients. The NF aims to motivate, cultivate and challenge members of the nursing profession to be the key drivers uplifting and transforming patient care standards.

Over 2½ days, the AHF&NF will delve into patient-centric views through transdisciplinary symposia on fast, cruise and slow medicines, innovative collaborations, personalised medicine through genetics, research abstract competitions and hands-on workshops. The conference will feature plenary lectures by key opinion leaders, including Professor Sally Chan and Clinical Professor Rajasoorya.

The amalgamation of AHF&NF is a strong statement by Alexandra Health that we must create the platform and opportunity for further interactions and networking among healthcare providers as well as facilitate further collaboration and research to enhance the care and management of our patients.

Let us learn together; let us discuss; let us collaborate; let us integrate care – towards better patient outcomes!

Warmest regards,

A/Prof Koh Kwong Fah
Chief Convener
Alexandra Health Forum 2012
Alexandra Health Nursing Fest 2012

Ms Velusamy Poomkothammal	**Dr Edwin Seet**
Ms Florence Chng	**Dr Tan Kok Yang**
Chairpersons, Organising Committee	*Chairpersons, Organising Committee*
Alexandra Health Nursing Fest 2012	*Alexandra Health Forum 2012*

Message from the Group Chief Executive Officer & Chairman, Medical Board

Healthcare is at an inflection point.

Technological advances, particularly in the area of genomics, will change healthcare beyond recognition within the next ten years. We will have, at our disposal, better ways to detect and diagnose diseases. We will gain powerful tools to treat many conditions. Yet, in order for our patients to derive benefits from these advances, we will still need to figure out how and where to apply them.

Even as we explore ways to derive maximum benefits from new advances, we need to also make sensible use of what we currently have. There is now increasing evidence that we often over-diagnose, over-investigate and over-treat. In the process, we may be harming our patients as well as wasting precious resources. We need to reinforce basic clinical skills and revive the art of making a good clinical diagnosis from the patient's history, physical symptoms and the results of relevant investigations. We need to affirm the importance of regarding our patients as people worth knowing and caring for. We need to open our minds to explore new ways of doing things, to question established paradigms, and to test existing and new approaches. We need to have the courage to change our practices, so as to continuously improve our model of care while still maintaining our foundation of compassionate patient-centred care.

Research is essentially a systematic approach to finding the right answer to a question, and enough has been said on the importance of proper research methodology. However, we should also pay a bit more attention on how to select the right questions to ask. Asking the right question is often more important than finding the right answer. A good question to ask, at such junctures, is whether the answer would lead to meaningful and impactful change. Would the change help to prevent ill health, reduce waste, or provide a better and safer way to diagnose and treat a condition?

There is much for us to investigate and study. Resources – time, money and manpower – will always be limited. Before we start a research project, we should perhaps ask ourselves, "When we find the anticipated or unanticipated answer to this inquiry, then what? Will it lead to any positive change for our patients?"

If we hope to transform healthcare, we will need to ask the right questions and find the right answers.

Mr Liak Teng Lit
Group Chief Executive Officer
Alexandra Health

A/Prof Kenneth Mak
Chairman, Medical Board
Khoo Teck Puat Hospital

Message from the Scientific Committee

The theme chosen for this year's Health Forum: 'Integrative Care – Towards Better Patient Outcome', is indeed a timely and appropriate one. Given the rapidly expanding as well as ageing population in Singapore, there is a pressing need to integrate the biological, clinical and social sciences, with system-based practices and organisational management principles to achieve the overall objective of improving patient outcomes.

Advances in medical science have enabled healthcare providers to understand the pathobiology of diseases better, possess better tools for diagnosing diseases and enjoy ever increasing choices of preventive and interventional strategies. However, this expansion of knowledge also poses a risk of care-fragmentation since one is unlikely to keep up with all of the rapidly advancing frontiers of medical science. Therefore, it makes sense to seek care-integration so as to harness the collective strength of all relevant disciplines.

Another dimension of integrative healthcare pertains to the need to move beyond a biomedical perspective to that of a 'whole person' approach that stems from a bio-psychosocial standpoint. This not only is pertinent for understanding the basis for illnesses but also, more importantly, contains lessons in holistic care for the person with disease. Medical care must be integrated with the life of the patient for it to be relevant and impactful.

An event like this which brings together our medical, allied health and nursing fraternities is a step in the right direction. We need to strive toward looking beyond conventional boundaries. It is intuitive to call for avoidance of over-specialisation. However, it may be less intuitive to call for avoidance of over-generalisation. The whole is greater than the sum of its parts, and this could not be more true in the practice of medicine.

To facilitate seamless care-integration, we need to embrace the breadth and depth of medical science and to nurture camaraderie and mutual respect, because the stakes are high (our patients' well-being) and the rewards are great (a fulfilled life well lived in history).

We would like to congratulate the organising committees and the secretariat for an outstanding Health Forum. We would also like to sincerely thank our guests, collaborators, sponsors and attendees, for without you, the Forum would not be a meaningful and successful one.

A/Prof Lim Su Chi
Clinical Director
Clinical Research Unit

Dr Philip Yap
Chairman
Scientific Committee

Alexandra Health Forum 2012
in conjunction with Alexandra Health Nursing Fest 2012
Integrative Care – Towards Better Patient Outcome

DAY 1: THURSDAY, 30 AUGUST 2012

Time	Programme	
0730-0800	Registration	
0820-0825	All to be seated	
0830-0915	**Alexandra Health Nursing Fest 2012 Opening Ceremony**	
0830-0845	Welcome Performance	
0845-0850	Welcome Address by the Organising Chairperson *Ms Velusamy Poomkothammal*	
0850-0855	Welcome Address by the Chief Executive Officer *Mrs Chew Kwee Tiang*	
0855-0915	Opening Address by the Chief Nursing Officer *Ms Pauline Tan*	
0915-1030	**Symposium 1: Integrating Education into Clinical Practice** *Chairperson: Ms Shirley Heng*	
0915-0945	Changing the Landscape for Nursing Education *Dr Chow Yeow Leng*	
0945-1015	Engaging Nurses for Life-long Learning in Clinical Settings *Ms Phua Lay Hoon*	
1015-1030	Panel Discussion *Mdm Chua Gek Choo*	
1030-1115	**Morning Tea Break – Exhibition & Poster Viewing**	
1115-1240	**Concurrent Session 1:** **Integrating with Research & Innovation** *Chairperson: Ms Sharon Fun*	**Concurrent Session 2:** **Integrating with Safety & Quality** *Chairperson: Ms Pauline Tan Swee Kim*
1115-1145	Research Made Easy *Dr Janet Choo*	The Human Side of Quality Improvement *Dr Phoa Lee Lan*
1145-1200	Research in Geri Settings *Ms Sujata Rajaram*	Challenges in Sustaining Nursing Quality *Mr Yong Keng Kwang*
1200-1215	Innovate! Innovate! Innovate! *Ms Toh Hai Moy*	
1215-1230	Drip & Dig! *Ms Jessie Tan*	MRSA HAI: Who & Why? *Ms Florence Chng*
1230-1240	Question & Answer Session	Question & Answer Session
1240-1400	**Lunch – Exhibition & Poster Viewing**	
1400-1520	**Concurrent Session 3:** **Integrating with the Community** *Chairperson: Ms Sujata Rajaram*	**Concurrent Session 4:** **Integrating with IT** *Chairperson: Ms Eileen Lilian Cheah*
1400-1430	Vision of an Integrative Healthcare in the North *A/Prof Pang Weng Sun*	Innovative and Creative Use of Technology in Care Delivery *Dr Terence Tang*
1430-1450	Preparing the Challenges and Opportunities for Long Term Care *Ms Lina Ma*	Transformation of Nursing Practice with IT *Ms Audrey Saw Guat Lin*
1450-1510	Critical Geriatric Care = KISS *Ms Cinthia Lim Siew Teng*	IT Supporting Nursing: Good & Bad *Mr Yap Soon Ghee*
1510-1520	Question & Answer Session	Question & Answer Session
1520-1600	**Afternoon Tea Break – Exhibition & Poster Viewing**	
1600-1700	**Talking Point: Challenges in the Current Nursing Era**	
1600-1700	*Moderator: Ms Low Beng Hoi* *Panelists: Dr Janet Choo Dr Chow Yeow Leng Mdm Chua Gek Choo* *Ms Lina Ma Ms Antoinette Sabapathy Ms Pauline Tan* *Mr Yong Keng Kwang*	
1700-2000	**Gala Night**	
2000	**End of Day 1**	

DAY 2: FRIDAY, 31 AUGUST 2012

Time	Programme		
0800-0830	Registration		
0830-0840	All to be seated		
0840-0845	Arrival of the Guest-of-Honour		
0845-0930	**Alexandra Health Forum 2012 Opening Ceremony**		
0845-0900	Welcome Address by the Chief Convener *A/Prof Koh Kwong Fah*		
0900-0915	Opening Speech by the Guest-of-Honour *Dr Amy Khor, Minister of State, Ministry of Health, Singapore*		
0915-0930	Welcome Address by the Group Chief Executive Officer *Mr Liak Teng Lit*		
0930-1010	**Opening Plenary Lecture**		
	Integrating Research into Clinical Practice *Prof Fumio Konishi*		
1010-1030	**Morning Tea Break – Exhibition & Poster Viewing**		
1030-1230	**Forum 1: Fast Medicine** *Chairperson: Dr Tan Kok Yang*		
1030-1140	Integrative Perioperative Surgical Care for the Elderly *Panelists: Prof Fumio Konishi* *Dr Edwin Seet*	*Dr Lee Yian Ping* *Ms Phyllis Tan*	*Ms Sharon Lim* *Dr Terence Tang*
1140-1230	Oral Paper Presentations		
1230-1400	**Lunch – Exhibition & Poster Viewing**		
1400-1600	**Forum 2: Cruise Medicine** *Chairperson: A/Prof Sum Chee Fang*		
1400-1510	Integrative Diabetes Care *Panelists: Dr Babu Suresh Balasubramaniam* *Dr Claude Jeffery Renand*	*Ms Chelsea Law* *Dr Julian Wong*	*A/Prof Lim Su Chi*
1510-1600	Oral Paper Presentations		
1600-1620	**Afternoon Tea Break – Exhibition & Poster Viewing**		
1620-1700	**Plenary Lecture 2**		
	Cultivating the 'T' in Healthcare Professionals *Prof C. Rajasoorya*		
1700	**End of Day 2**		

DAY 3: SATURDAY, 1 SEPTEMBER 2012

Time	Programme	Workshop 1	Workshop 2	Workshop 3
0800-0830	Registration			
0830-0910	**Plenary Lecture 3**			
	Nurturing Nurses for the 21st Century *Prof Sally Chan*			
0910-1010	**Forum 3: Integrative Research & Innovative Collaborations** *Chairperson: A/Prof Lim Su Chi*	**Workshop 1**	**Workshop 2**	**Workshop 3**
0910-0940	Metabolomics – A Journey Towards Understanding Pathophysiological Processes in Diseases *A/Prof Tavintharan Subramaniam*	Designing a Patient-centred Healthcare Experience	Wound and Drain	Spot Diagnosis
0940-1010	Embracing Innovation: Our Journey *Mr Lau Wing Chew*			
10-10-1040	**Morning Tea Break – Exhibition & Poster Viewing**			
1040-1240	**Forum 4: Slow Medicine** *Chairperson: Dr Yong Woon Chai*	**Workshop 1**	**Workshop 2**	**Workshop 3**
1040-1150	Integrative Palliative Care *Panelists: Ms Lynette Ng Shi Quan* *Ms Pamela Wong Hui Lin* *Dr Tan Kok Yang* *Home Hospice Nurse, Singapore Cancer Society*	Designing a Patient-centred Healthcare Experience	Wound and Drain	Spot Diagnosis
1150-1240	Oral Paper Presentations			

DAY 3: SATURDAY, 1 SEPTEMBER 2012

Time	Programme
1240-1300	**Closing Ceremony**
1240-1250	Closing Speech by the Chief Executive Officer *Mrs Chew Kwee Tiang*
1250-1300	Prize Presentations
1300	**End of Forum**

WORKSHOP 1 – DESIGNING A PATIENT-CENTRED HEALTHCARE EXPERIENCE
Venue: C61 Dental Clinic

Time	Programme
0910-1030	Face-to-Face with Design Thinking *Ms Bong Ai Wei* *Mr Ngan Han Siong*
1030-1045	**Morning Tea Break – Exhibition & Poster Viewing**
1045-1100	Elements of Design Thinking *Mr Ngan Han Song*
1100-1145	Deeply Understanding Our Customer *Ms Bong Ai Wei* *Mr Ngan Han Siong*
1145-1240	Case Studies in KTPH Beyond Care in KTPH *Mr Lau Wing Chew* *Ms Woo Wan Ling* *Ms Yvonne Yap* *Ms Yiap Pok Ling*

WORKSHOP 2 – WOUND AND DRAIN
Venue: Learning Centre

Time	Programme		
0910-0915	Introduction		
0915-0935	Catheters, Tubes and Drains Made Simple? *Dr Eugene Lim Kee Wee*		
0935-0955	Negative-Pressure Wound Therapy *Dr Victor Seah Wee Teck*		
0955-1010	Diabetic Wound Care *Ms Chelsea Law*		
1010-1040	**Morning Tea Break – Exhibition & Poster Viewing**		

1040-1240	**Station 1 – Vac Dressing**
	 Trainers: Ms Ang Poh Lian
	     Ms Isabella Chua Xue Bing
		Station 2 – Surgical Drains
		 Trainers: Ms Mary Chan Hin Kiaw
		     Ms Ong Yu Jing
			Station 3 – Wound Care
			 Trainers: Ms Chelsea Law
			     Ms Thenmoli D/O Periasamy

1040-1120	Group A	Group B	Group C
1120-1200	Group B	Group C	Group A
1200-1240	Group C	Group A	Group B

WORKSHOP 3 – SPOT DIAGNOSIS
Venue: Skill Lab

Time	Programme
0910-1010	Communication Matters: SBAR & CSU *Dr Jackson Lim How Kiat*
1010-1040	**Morning Tea Break – Exhibition & Poster Viewing**
1040-1140	Case Study: Heart Rate Matters *Mr Tan Boon Peng Terence*
1140-1240	Breath Sound Matters: Lung Auscultation *Ms Chee Lay Chee* *Mr Tan Boon Peng Terence* *Ms Toh Hai Moy* *Ms Yap Suk Foon*

Disclaimer: While every attempt will be made to ensure that all aspects of the programme will take place as scheduled, the Organisers reserve the right to make appropriate changes should the need arise.

PROFESSOR FUMIO KONISHI
Professor and Chairman, Department of Surgery, Saitama Medical Center, Jichi Medical University, Saitama, Japan
Professor Emeritus, Jichi Medical University, Tochigi, Japan
Emeritus Consultant, Nerima Hikarigaoka Hospital, Tokyo, Japan

Prof Fumio Konishi graduated in 1972 from the University of Tokyo, obtained his doctorate in Medical Science in 1984 and continued his career as a staff surgeon at the Department of Surgery, University of Tokyo. Following this, he has held many educational roles in the Department of Surgery, Jichi Medical School, and is currently the Professor and Chairman of the Department of Surgery, Omiya Medical Centre, Jichi Medical School, Japan.

Prof Konishi's prestigious medical qualifications and experience have made him a Fellow of numerous reputable societies. The Japan Surgical Society, Japanese Society of Clinical Surgery and Japanese Society of Gastrointestinal Surgery are just a few of the many local societies in which he is involved. In addition, he is also active in several overseas and international societies, and is a Honorary Member of Society of Colorectal Surgeons Singapore, American Gastroenterological Association, Association of Coloproctology of Great Britain and Ireland, European Society of Coloproctology, International College of Surgeons and Surgical Research Society.

With much-acclaimed experience in research and academics, Prof Konishi is the Editor of several journals, such as the *Japanese Journal of Coloproctology*, *Japanese Journal of Clinical Oncology* and *Surgery Today*, and sits on the editorial board of *Diseases of the Colon & Rectum*, *Digestive Endoscopy* and *Colorectal Disease*. He has also published many highly respectable and valuable papers.

Prof Konishi's vast research efforts in gastroenterology and coloproctology were recoginsed when he was awarded the Ohio Valley Society Award by the American Society of Colon and Rectal Surgeons in the years 1994 and 2000.

Integrating Research into Clinical Practice
There is a wide range of the types of research in the field of surgery. The most common type is retrospective studies, in which data is collected from patients who have already undergone surgical treatment. It is often used as there are various important subjects of surgical research that cannot be conducted prospectively, thus making retrospective analysis of a large number of patients, sometimes multicentric, essential. However, it is considered that the quality of retrospective study is not as high as prospective clinical research. When designing prospective studies in the field of surgical treatment, there are important points that should be taken into consideration. Firstly, the purpose of the research should be discussed in detail and be determined clearly. This should be followed by statistical analysis of the number of cases required, the volume of the cases in each institution, the quality of the surgical operations when surgical procedures are analysed, ethical aspects, manpower and finance in conducting the research, quality control, etc. In Japan, we conducted a large-scale randomised multicentric controlled study to confirm the non-inferiority of laparoscopic colectomy for cancer to open surgery in terms of overall survival, and short-term outcomes. Eligibility criteria were set and sensitivity analyses were conducted by per-protocol population. A total of 1,057 patients were randomised. This randomised controlled trial (RCT) became possible due to the standardised high quality of the participating institutions, which was established by the activity of lapcolectomy working group and a collaboration with Japan Clinical Oncology Group. Important points of conducting such RCTs in our clinical practice will be discussed.

CLINICAL PROFESSOR C. RAJASOORYA
Senior Consultant, Department of Endocrinology, Khoo Teck Puat Hospital, Singapore
Clinical Professor, Yong Loo Lin School of Medicine, National University of Singapore, Singapore
Adjunct Professor, Duke-NUS Graduate Medical School, Singapore
Senior Consultant, Manpower Standards and Development Division, Ministry of Health, Singapore

Prof Rajasoorya is Senior Consultant in Endocrinology and Internal Medicine at Khoo Teck Puat Hospital as well as Senior Consultant at the Manpower Standards and Development Division of Ministry of Health, Singapore. He concurrently holds appointments as Clinical Professor at the Yong Loo Lin School of Medicine, National University of Singapore, and Adjunct Professor at the Duke-NUS Graduate Medical School, Singapore.

He graduated with MBBS (University of Singapore) in 1980. After obtaining postgraduate qualifications in internal medicine in 1986, he moved to Alexandra Hospital, where he established his career. He subsequently trained as an endocrinologist and spent a year in Auckland under the Healthcare Manpower Development Programme (HMDP), where he developed a particular interest and expertise in the subspecialty of the disorders of the hypothalamic-pituitary-adrenal axis. He has published many landmark and seminal papers with the Auckland group. Upon his return, Prof Rajasoorya continued to practice both internal medicine and endocrinology. In 1986, he obtained a second HMDP fellowship and was a visiting clinician at the Mayo Clinic, Charlottesville and Portland, USA.

Prof Rajasoorya is the recipient of various awards, including teaching excellence and quality service awards. In 1996, he was accorded national honours with the Public Administration Silver Medal. In 2011, he received the inaugural Clinician Educator National Medical Excellence Award. He served as the Honorary Editor of the Singapore Medical Journal during 2000–2004. In 2000, he was appointed as Chairman of the Medical Board and Head of the Department of Medicine at Alexandra Hospital. In 2006, he went back to practising clinical medicine full time, with added responsibilities at the Ministry of Health, advising on matters related to postgraduate training and education.

Prof Rajasoorya has a passion for educating undergraduates and postgraduates, and is an examiner for various national examination bodies. He chairs the Specialist Training Committee in Endocrinology, Transitional Year Residents Advisory Committee and the National Medical Undergraduate Curriculum Committee. He also serves on various other national committees, such as the Singapore Medical Council, Steering Committee for Joint Examinations with American Board of Medical Specialties, Specialists Accreditation Board and Graduate Nursing Advisory Board among others. He has organised and participated in many academic courses and symposiums, and has published extensively. He is a frequently invited speaker, both locally and regionally, on topics related to endocrinology and internal medicine.

Cultivating the 'T' in Healthcare Professionals
The vertical stroke in a 'T' generally refers to the depth of a skill, while its horizontal stroke represents the breadth of skills. Optimal healthcare demands a balance of generalists and specialists.

Healthcare professionals embark on their careers with initial training which births on a broad base that enhances their breadth (learning less about more). This also allows to develop on the concept that healthcare must be practised with the patient as the centre of the focus rather than the disease, in keeping with Hippocratic concepts. However, there is a perception that generalists exist in a nebulous world of non-science that lacks sufficient scientific rigour. The broad scope of knowledge required in general disciplines impedes the uptake of medical practice in a generalist environment.

With experience and time, individuals go deeper into knowledge and skills in specific areas acquiring depth (learning more about less). As skills are acquired, the continuing trend encourages and endorses subspecialisation. However, subspecialisation, with its attendant social, financial and career implications, does upset the balance of generalists and specialists. Subspecialisation has also led to destabilisation, and sometimes, wilting of the broad-based skills acquired. Subspecialisation masks the shortcomings of the reductionist thinking that dominates medical education and specialty medical care, where patients may be perceived as organs or organ systems.

Ongoing debates exist as to whether it is possible to measure the health outcomes and cost-effectiveness of generalist vs. specialist care. The presenter argues and submits that, with regard to an individual healthcare professional,

(i)   the depth and breadth of a skill are not mutually exclusive;

(ii) that an individual healthcare professional can and must maintain, enhance and practise broad-based skills while concurrently practising his or her subspecialty;

(iii) such a concurrent practice will not hamper his or her own professional development; its avoidance will be detrimental to the education of the trainee healthcare professional; and

(iv) a concurrent practice would be in the best interest of the patient and the socioeconomic healthcare scene.

The presentation will also highlight the moves and actions necessary to cultivate the 'T' in healthcare professionals.

PROFESSOR SALLY WAI-CHI CHAN
Head and Professor, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Prof Sally Chan is the Head and Professor at the Alice Lee Centre for Nursing Studies, National University of Singapore, Singapore. Her many concurrent appointments include, among others, Visiting Professor at Sun Yatsen University and Xiamen University, People's Republic of China; Fellow of the Hong Kong College of Mental Health Nursing; Founding Fellow of the Provisional Academy of Nursing; and, Fellow of the Hong Kong College of Education and Research in Nursing. Prof Chan obtained her basic nursing training and nursing education diploma in Hong Kong, her Bachelor's degree in Australia and her Master's degree and Doctorate of Philosophy in the UK. Prof Chan has extensive experience in education and research. Her research work and publications focus on nursing education, mental health, family interventions and quality of life. She has published over 200 academic and professional papers, and has received numerous research grants. Prof Chan serves on the editorial board and reviewer panel for over 20 international refereed journals. She is the Editor-in-Chief for the *Journal of Nursing Intervention* and *Singapore Nursing Journal*.

Prof Chan is the Convener of the East Asia Forum of Nursing Scholar; President of the Upsilon Eta Chapter, Sigma Theta Tau International; Member of Primary Care Consultation Group, Revision of ICD-10 Mental and Behavioural Disorders, World Health Organization; Co-Chair of the Nurses' Shared Interest Group, International Psychogeriatric Association; and, Member of the Executive Council, Singapore Nurses Association. She is also Co-Chair of the Interprofessional Education Committee and Advisor of the Centre for Healthcare Simulation at National University of Singapore, Singapore. Prof Chan teaches undergraduate and graduate programmes and supervises doctoral students. She was awarded the Teacher of the Year award in 1998, 2002, 2003, 2004 and 2006, and received the Master Teacher award in 2007 from the Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong. While she was working in Hong Kong, she provided consultations to the government, social services and health sectors. She has also served as an expert witness in Court proceedings.

Nurturing Nurses for the 21st Century
This could be the best time in the history of the development of the nursing profession – an estimated 35 million nurses make up the greater part of the global healthcare workforce. There has been enormous development in advanced practice nursing, and specialty care nurses have autonomous and collaborative, including prescriptive authority, in many countries. Nurses make a substantial contribution to health-delivery systems in the primary care, acute care and community care settings. However, this may also be construed as the worst time for nursing if the unprecedented demand and shortage of nurses is considered. Current nursing shortage is deeper than in the past and is more resistant to short-term economic strategies, although nurses are being educated at various levels and the pre-service preparation of nurses is much more diverse than 20 years ago.

The development of nursing and nursing education is closely tied to the changing landscape. The explosion in information and technology, the globalisation of healthcare, the complexity of the needs of clients from diverse cultural and socioeconomic backgrounds, and the increasing demand for accountability of professional practice and the effective use of finite resources are all changing the milieu of nursing practice. Yet, the primary goals of nursing education remain the same. Nurses must be prepared to meet the needs of diverse patients, function as leaders, and advance a science that benefits patients as well as the capacity of healthcare professionals to deliver safe and quality patient care. In this presentation, Prof Chan discusses the key challenges and opportunities that impact nursing education and nursing practice development and will analyse strategies for nurturing nurses for the 21st century.

DR JANET CHOO
Deputy Director, Nursing Administration, Changi General Hospital, Singapore

Dr Janet Choo holds a Bachelor's degree in Nursing from La Trobe University, Australia. She was awarded the Academic Excellence Award for her Masters' degree in Health Science Management from the University of Sydney, Australia, and has a Doctorate in Nursing from the University of Melbourne, Australia. She is an Honorary Teaching Fellow at the University of Manchester and was recently appointed a Member of the Singapore Nursing Board. She is also Assistant Treasurer for the Singapore Nurses Association.

Dr Choo has accumulated a wealth of nursing knowledge and experience, with skills extending from clinical nursing to nursing education, including clinical pathway and case management programmes, wound management, nursing quality, nursing research and, most recently, nursing administration. She is a pioneer in case management and clinical pathways and is much sought after for lectures in these areas. She was invited to speak as the Keynote Speaker at the Forum on Modern Hospital Management in Fuzhou, People's Republic of China, in 2002, and at the Integrated Care Pathways Conference in Westminster, UK, in 2004. She was also a Plenary Speaker at the Asian Regional Conference on Evidence-based Nursing in Kuala Lumpur, Malaysia, in 2003. She has been invited twice by the Ministry of Health, Singapore, to deliver talks at case mix seminars.

For her consistent performance in service quality, Dr Choo received the 10,000th Participant Award in Service Quality from the Service Quality Centre in 1992. She also had the honour of passing on the 'flame of service quality' to the 100,000th participant of the Service Quality Centre in July 1999. In recognition of her consistent clinical excellence and professional contributions, Dr Choo was awarded the National Day Efficiency Medal in 2002 and the President's Nurse Award in 2004.

DR CHOW YEOW LENG
Coordinator, Master of Nursing Programme,
Assistant Professor, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine,
National University of Singapore, Singapore

Dr Chow Yeow Leng is a Registered Nurse and Registered Mental Health Nurse. She has a Diploma in Nursing Education and has over 20 years of experience in coordinating, teaching and managing continuing nursing education programmes. Prior to taking up her current position as Coordinator of the Master of Nursing Programme at the Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, she was Deputy Director of Continuing Education and Training at the School of Health Sciences, Nanyang Polytechnic, Singapore.

Dr Chow concurrently holds many positions, including Advisor for the Gerontological Nurses Chapter, Singapore Nurses Association; Council Member of the Gerontological Society of Singapore and a Member of the editorial team for the quarterly newsletter produced by the Gerontological Society; Board Member of the Home Nursing Foundation and Upsilon Eta Chapter, Sigma Theta Tau International; and Member of the National Dementia Network Group, Ministry of Health, Singapore. Her areas of interest include geriatrics and gerontology.

MDM CHUA GEK CHOO
Deputy Director, Department of Nursing Administration, Khoo Teck Puat Hospital, Singapore
Director, Department of Nursing Administration, Yishun Community Hospital, Singapore

Mdm Chua Gek Choo, who is Deputy Director at the Department of Nursing Administration, Khoo Teck Puat Hospital, and Director at the Department of Nursing Administration, Yishun Community Hospital, has been in leadership roles since 1986. She was a lecturer at a nursing polytechnic for four years and has served several restructured hospitals in Singapore since 1974. She holds a Bachelor of Health Sciences (Nursing) from the University of Sydney, Australia, and has a Postgraduate Diploma in Teaching in Higher Education from the Nanyang Technological University, Singapore.

During her service, she has received several awards from the hospital and the Ministry of Health, Singapore. In 2008, she received the President's Nurse Award. She was the workgroup leader for planning, commissioning and migration of Khoo Teck Puat Hospital (inpatient wards). She has recently authored a chapter in the book, *101 Global Leadership Lessons for Nurses – Shared Legacies from Leaders and Their Mentors* (2010). In 2011, she was invited to be a part of a panel on 'Workforce Challenges from a Global Perspective' by The American Organization of Nurse Executives (AONE) in San Diego, USA.

Mdm Chua serves on several committees as a member, advisor or chairperson, and was until recently, the Chairperson of the Education Committee, Singapore Nurses Association (2010–2012). She continues to serve the committee as a member. She was Chairperson and Speaker at the Alexandra Hospital Nursing Conference in 2007 and Chairperson and Speaker for the Alexandra Health Nursing Fest in 2010. In 2011, she was Co-Chair for the Ministry of Health-Singapore Nurses Association and the 16th Joint Singapore Malaysia Nursing Conference held in Singapore.

MS LINA MA
Deputy Executive Director, Lions Homes for the Elders, Singapore

Ms Lina Ma obtained her Registered Nursing Certificate and District Nursing Certificate from London, UK. She has worked in various capacities in different hospitals and also in the community as a District Nurse and Health Advisor for the Elderly, which has helped to hone her skills and knowledge on the specific demands of caring for elderly patients. She holds a Bachelor's degree in Nursing from the University of Sydney, Australia and a Master's degree in Health Science Education from the University of Sydney, Australia. In the years thereafter, she has applied her academic knowledge to work by using conceptual models and system change management in most of her projects.

Ms Ma, who arrived in Singapore in 1995, has held various positions, including that of infection control nurse, community nurse coordinator and health educator. In 2000, she became the Nursing Administrator at the Lions Home for the Elders (Bedok), Singapore, and was later appointed as Manager (Clinical Administration) at the home. She is presently the Deputy Executive Director of two branches of the Lions Homes for the Elders (Toa Payoh and Bedok), and oversees a population of 354 elderly residents who are chronically sick

and/or have dementia. Ms Ma is also a Member of the Singapore Nursing Board, the AIC Medical Advisory Board National Care Assessment Framework for Intermediate and Long-Term Care (ILTC), and the Nursing Home Standards Workgroup for the Ministry of Health, Singapore. She has served as a Member of the National Dementia Care Network and was on the Expert Panel on Nursing Homes convened by the Ministry of Health.

Ms Ma strives to build capabilities and capacity at the aged-care facilities she oversees by constantly scanning, monitoring, forecasting and assessing trends as well as government healthcare policies. This has helped her organisation to respond fittingly to government policies and planning efforts and to a variety of other external forces.

MS ANTOINETTE SABAPATHY
Deputy Director, Continuing Education and Training, Nanyang Polytechnic, Singapore

Ms Antoinette Sabapathy is the Deputy Director of Continuing Education and Training at Nanyang Polytechnic, Singapore. She has degrees in General Nursing and Special and Intensive Nursing Care of the Newborn, and Midwifery. She obtained her Bachelor's degree in Applied Science in Nursing Education, with distinction, in 1989, from Curtin University, Perth, Australia. In 2003, she obtained the Certificate in Limited Obstetrical Ultrasonography and a Master of Science in Women's Health and Midwifery from the University of Pennsylvania, Philadelphia, USA.

Ms Sabapathy is interested in the education and professional development of nurses, midwifery, and research methodology and evidence-based practice. She has rich experience in nursing education, and has held various educational roles at Nanyang Polytechnic, including Deputy Director (Nursing), Deputy Director (Clinical), Deputy Manager in Nursing (Academic) and Assistant Manager of the Midwifery Section.

In addition to her many academic roles, Ms Sabapathy is also an Advisor to the Obstetric and Gynaecological Nurses Chapter, Singapore Nurses Association; and Member of the editorial board of the Transcultural Nursing Society. She was the Chief Expert for Caring Trade at the WorldSkills Competition 2011 in London, UK.

MS PAULINE TAN
Chief Nursing Officer, Ministry of Health, Singapore

Ms Pauline Tan is Chief Nursing Officer at the Ministry of Health, Singapore. She completed her Diploma studies in Human Resource Management at the Singapore Institute of Management (SIM), Singapore, and received a Bachelor's degree in Nursing and a Graduate Diploma in Nursing Administration from La Trobe University, Australia. She obtained her Master's degree in Asia-Pacific Human Resource Management from the National University of Singapore (NUS) Business School, Singapore, as well as a Master of Public Administration from the Lee Kuan Yew School of Public Policy at NUS. She has also trained under the Stanford-NUS Executive Program in International Management.

Ms Tan has served in both public and private healthcare settings in various leadership positions. Her key portfolios have included professional oversight as Director of Nursing, operational responsibilities as Director of Operations, and currently, policy making as Chief Nursing Officer. Presently, she is primarily involved in shaping healthcare policies and regulating the nursing profession to improve health outcomes in the society and for the citizenry.

Ms Tan, who is active in the international scene as a nursing officer, is a member of various global and regional nursing networks and committees. Notable involvements include Advisory Member for the WHO Collaborating Centre for Community Nursing (Hong Kong) and International Nurse Surveyor for the Joint Commission International.

MR YONG KENG KWANG
Director, Nursing, Tan Tock Seng Hospital, Singapore

Mr Yong Keng Kwang started his career as a clinical nurse at Tan Tock Seng Hospital (TTSH), Singapore, in 1996. He moved to nursing administration as a Senior Staff Nurse in 1998 to work on division-wide nursing projects. After four years, in 2002, he was promoted to Assistant Director (Nursing) and has become, in October 2011, Director (Nursing) at the hospital. He has a Bachelor's degree in Nursing (Honours) from the University of Manchester, UK, a Certificate in District Nursing from the University of Manchester, UK and a Master's degree in Business Administration from the University of Warwick, UK.

During his years in nursing administration, Mr Yong, who has worked on multiple projects and in different portfolios relating to strategic planning, manpower development and clinical operations, was most primarily concerned with quality management. He has helped to set up the quality framework within the Nursing Division at TTSH and has played key roles in leading the division in the hospital's quests for ISO, Singapore Quality Class (SQC) and JCI accreditations. He also assisted the Director (Nursing) in planning for and driving efforts aimed at nursing transformation.

Nursing quality management is not embedded in clinical quality alone – quality in terms of service and operational consistency is also paramount. For this reason, besides his administrative responsibilities within the Nursing Division, Mr Yong has also served as an Improvement Facilitator in TTSH's Kaizen Office since January 2008, and is a Member of the TTSH MyCare Taskforce and the TTSH Clinical Practice Improvement Program Faculty. Among the various lean initiatives/quality improvement projects that he has facilitated across the various departments within the hospital is a key project involving the General Surgery Short Stay Ward.

Comparison of results from novice and trained personnel using the Macintosh laryngoscope, Pentax AWS®, C-MAC™ and Bonfils intubation fiberscope: a manikin study

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INTRODUCTION Indirect laryngoscopes offer improved laryngeal view and higher success rates of intubation. However, few studies have compared the various indirect laryngoscopes with the conventional Macintosh laryngoscope or the results of anaesthetists of varying degrees of experience using these laryngoscopes. We hypothesised that (i) the time required for intubation would be shorter, the overall success rates better and intubation easier with indirect laryngoscopes than with the Macintosh laryngoscope; and, (ii) that novices may be able to achieve higher success rates and intubate faster using indirect laryngoscopes.

METHODS This cross-sectional observational study was funded by a peer-reviewed enabling grant. 13 novice trainee doctors and 13 skilled anaesthetists consented to participate in the study. Participants intubated the manikin with all devices for both normal and difficult airway scenarios. The time taken for intubation, success rate and the subjective ease of intubation were analysed to compare the results between skilled and novice anaesthetists, and four different airway devices – the Macintosh laryngoscope, Pentax AWS®, C-MAC™ and Bonfils intubation fiberscope.

RESULTS Skilled anaesthetists intubated faster than novices with Pentax AWS in the difficult airway scenario (22 seconds vs. 33 seconds, p = 0.047). The mean intubation times for C-MAC and Pentax AWS were shorter than for the Macintosh laryngoscope and Bonfils intubation fiberscope in both difficult (C-MAC: 24 seconds, Pentax AWS: 28 seconds, Macintosh: 80 seconds, Bonfils: 61 seconds; p < 0.001) and normal (C-MAC: 17 seconds, Pentax AWS: 19 seconds, Macintosh: 39 seconds, Bonfils: 38 seconds; p = 0.002) airway scenarios. Intubation was found to be easier with all three indirect laryngoscopes compared to the Macintosh laryngoscope (p < 0.001).

CONCLUSION Both C-MAC and Pentax AWS achieved faster intubation times compared with the Macintosh laryngoscope and Bonfils intubation fiberscope for both difficult and normal airway scenarios. Skilled anaesthetists were 33% faster than novices when intubating a difficult airway using Pentax AWS. Indirect laryngoscopes were easier to use than the Macintosh laryngoscope.

Randomised single-blind clinical trial of intradermal methylene blue for pain reduction after open diathermy haemorrhoidectomy

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INTRODUCTION Open haemorrhoidectomy is associated with considerable postoperative pain and discomfort. Perianal intradermal injection of methylene blue has been shown to ablate perianal nerve endings and may provide temporary pain relief after haemorrhoidectomy. The study aimed to assess whether intraoperative perianal methylene blue injection reduced pain after open haemorrhoidectomy.

METHODS A randomised, prospective, single-blind, placebo-controlled trial was conducted of patients undergoing open haemorrhoidectomy. Patients were randomised to two groups – group 1 (methylene blue group) received an intradermal injection of 4 mL 1% methylene blue and 16 mL 0.5% marcaine prior to surgical dissection while group 2 (placebo group) were injected intradermally with 4 mL saline and 16 mL 0.5% marcaine. Patients

were asked to fill in a pain diary using a Visual Analogue Scale after surgery. The primary outcomes measured were pain scores and analgesia use. The secondary outcomes included post-operative complications. A sample size of 38 was required to demonstrate a 40% difference in pain with 95% confidence and power of 80%.

RESULTS There were 29 patients in the methylene blue group and 15 patients in the placebo group. There were no statistically significant differences between the two groups based on gender, grading of haemorrhoids, number of haemorrhoids excised, and the duration of surgery and hospital stay. Mean pain scores of the methylene blue group were significantly lower during the first three postoperative days. However, the use of analgesics between the two patient groups was not significantly different. The risk ratio of acute urinary retention occurring when methylene blue was not used was 3.231 (95% confidence interval 2.057–5.075). Other complication rates were not significantly different.

CONCLUSION Perianal intradermal injection of methylene blue was found to be useful for reducing the initial postoperative pain associated with open haemorrhoidectomy.

CATEGORY: ORAL ABSTRACT (FAST MEDICINE)   OF03

Intravenous sedation reduces fear in patients undergoing phacoemulsification: a randomised, placebo-controlled, double-blind clinical trial

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INTRODUCTION Modern cataract surgery has evolved to the point where every attempt is being made to render it as easy and comfortable as possible. Nevertheless, despite great improvements in surgical techniques, procedures remain associated with a few unwanted experiences, such as frightening visual sensations. We hypothesised that intravenous sedation with midazolam would reduce fear and visual sensations in patients undergoing phacoemulsification with posterior chamber intraocular lens implantation under local anaesthesia.

METHODS Consecutive patients undergoing phacoemulsification surgery under local anaesthesia were randomised into two groups that received either intravenous midazolam (MZ) 0.15 mg/kg (MZ group, n = 109) or normal saline (NS) as placebo (NS group, n = 100), which was administered by an anaesthetist not involved in perioperative discussions with the patient on possible fear and visual sensations. A standardised question-naire was administered postoperatively by a blinded assessor to determine the patient's intraoperative fear and visual experiences (such as perception of light, colours and movements).

RESULTS 209 patients, with a mean age of 64 (range 30–86) years, were enrolled for the study. Patients in both groups reported intraoperative perception of light (MZ: 51.03%, NS: 48.97%), colours (MZ: 51.63%, NS: 48.37%) and movements (MZ: 46.79%, NS: 59%). The *t*-test showed a significant difference in the mean fear scores of patients from the two groups (MZ: 0.83, NS: 1.56 ; p = 0.003).

CONCLUSION MZ appreciably reduces fear during phaco-emulsification under local anaesthesia, but does not significantly reduce a variety of visual sensations.

CATEGORY: ORAL ABSTRACT (FAST MEDICINE)   OF04

Transdisciplinary approach improves nursing outcomes in elderly patients undergoing colorectal surgery

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INTRODUCTION We hypothesised that a transdisciplinary collaborative approach would play an important role in improving nursing outcomes of elderly patients undergoing colorectal surgery.

METHODS The nursing care of 130 consecutive patients aged over 75 years, who underwent major colorectal resections at the hospital between January 2007 and March 2012, were studied and the prospectively collected database reviewed. Nursing failures during the course of care were identified and confirmed by two independent nurse clinicians not involved in the management of these patients. Failures included inaccurate documentation, delayed recognition of deterioration, non-compliance with orders and improper discharge planning. Patients who were managed using a transdisciplinary approach were compared to patients managed according to standard procedures. Statistical analyses were performed using the chi-square and *t*-tests. Multivariate analysis was performed using logistic regression analysis.

RESULTS 41 patients managed perioperatively using a transdisciplinary approach were compared to 89 patients managed under the standard approach. There were no significant differences between the two groups in terms of mean age, American Society of Anesthesiologists (ASA) scores, comorbidity index and Barthel scores. Overall nursing failures were significantly lower in the transdisciplinary group (9.8%) when compared to the standard group (41.6%; $p < 0.001$). Multivariate analysis revealed that the risk of nursing failure was 5.7 times higher for patients not managed perioperatively using a transdisciplinary approach (risk ratio 5.662, 95% confidence interval [95%CI] 1.685–19.027). Nursing failures were independently associated with perioperative complications of grade 2 and above according to the Clavien-Dindo Classification of Surgical Complications (odds ratio 3.136, 95%CI 1.043–9.430).

CONCLUSION A transdisciplinary approach to nursing care improved nursing outcomes in elderly patients undergoing colorectal surgery and reduced nursing failure that was independently associated with morbidity.

CATEGORY: ORAL ABSTRACT (CRUISE MEDICINE)   OC01

Clinical predictors of methicillin-resistant *Staphylococcus aureus* colonisation on admission

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INTRODUCTION Early recognition of methicillin-resistant *Staphylococcus aureus* (MRSA) colonisation allows the timely institution of infection control measures to prevent cross-transmission. This study aimed to evaluate clinical predictors of MRSA colonisation of patients on admission.

METHODS Our institution has implemented universal screening for MRSA on admission since July 2010. Patients requiring admission at the emergency department were prospectively interviewed between September 2010 and October 2010 using standard questionnaires. MRSA screening was performed by swabbing the nares, axilla, groin and wounds for culture. Univariate and multivariate analyses of clinical variables were performed for predicting MRSA colonisation on admission.

RESULTS 1,055 patients completed the questionnaires, of whom 61 patients screened positive for MRSA on admission. According to multivariate analysis, the independent predictors of MRSA colonisation on admission included previous MRSA colonisation within six months (odds ratio [OR] 15.76, 95% confidence interval [95%CI] 1.74–142.75; $p = 0.014$), prior antimicrobial use (OR 9.60, 95%CI 4.84–19.06; $p < 0.0001$), being a nursing home resident (OR 5.33, 95%CI 2.23–12.73; $p < 0.0001$) or recent hospitalisation with-in three months (OR 2.29, 95%CI 1.15–4.56; $p = 0.019$), diabetes mellitus

(OR 2.21, 95%CI 1.11–4.41; p = 0.024), and the presence of nasogastric tube (OR 5.27, 95%CI 1.11–25.07; p = 0.037).

CONCLUSION Variables, such as residents of nursing homes or patients who had a history of antimicrobial use, MRSA colonisation within six months and recent hospitalisation within three months, were found to be strong independent predictors of MRSA colonisation on admission. These clinical variables can be used to stratify the risk of MRSA colonisation in patients on admission and may allow for their pre-emptive isolation prior to the availability of screening culture results.

CATEGORY: ORAL ABSTRACT (CRUISE MEDICINE) **OC02**

Clinical determinants of hospital length of stay in elective surgical patients

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INTRODUCTION Hospital length of stay (HLOS), which determines patient load in a hospital, is predetermined by maximum bed capacity. Available electronic databases were analysed to identify demographic and clinical predictors of HLOS in a cohort of patients who had undergone elective surgery in 2011.

METHODS 19 variables that included demographic predictors and comorbidities were extracted for analysis. Multivariate linear regression model was built using the Statistical Package for the Social Sciences to determine independent predictors of elevated HLOS.

RESULTS There were 5,432 surgical patients in the cohort, with a mean HLOS of 4.1 ± 11.5 days. Independent predictors of longer HLOS included increasing age (p = 0.009), American Society of Anesthesiologists (ASA) physical status (p < 0.001), history of stroke (p < 0.001), orthopaedic surgery (p < 0.001) and general anaesthesia (GA; p = 0.001). The multivariate linear regression model constructed was insufficient to account for the variance in HLOS (adjusted r^2 23.0%). Patients who were aged ≥ 65 years had longer hospital stays than those in the age groups 40–64 years and < 20 years by 1.2 days and 2.1 days, respectively. Patients with ASA scores II, III and IV stayed longer than those with ASA score I by 3.3 days, 9.9 days and 47.1 days, respectively. Patients with a history of stroke stayed 4.7 days longer in the hospital than those with no relevant history. Patients undergoing orthopaedic surgery stayed longer than those admitted for general, otolaryngology, and oral and maxillofacial surgeries by 3.7 days, 4.6 days and 5.3 days, respectively. Similarly, patients who received GA stayed longer in the hospital than those who required regional anaesthesia (RA) alone or received GA with RA by 0.8 days and 2.2 days, respectively.

CONCLUSION An analysis of the records of patients who underwent elective surgery identified five independent demographic and clinical predictors for longer HLOS. However, variables such as psycho-socioeconomic factors and diagnostic-related groups were not taken into consideration in this study, and it is possible that these factors may also have a role to play in determining average HLOS.

CATEGORY: ORAL ABSTRACT (CRUISE MEDICINE)   **OC03**

Changes in HbA1C associated with a six-month exercise intervention programme for patients with type 2 diabetes mellitus

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INTRODUCTION Group exercise classes have been shown to improve adherence to exercise, enhance social support and help obtain optimal glycaemic control in patients with type 2 diabetes mellitus (T2DM). We provided weekly structured exercise sessions to patients with T2DM that were conducted by our physiotherapist and exercise trainer and supported by a diabetes nurse educator in patient education. This study aimed to evaluate the changes in glycated haemoglobin-A1c (HbA1c) in patients with T2DM who underwent a six-month exercise intervention programme.

METHODS Patients with T2DM who completed four introductory exercise sessions and underwent continuous structured exercise sessions for six months were recruited from July 2011 to March 2012. HbA1c was assessed at baseline and within 3–6 months. Data was analysed using the Statistical Package for the Social Sciences version 20.

RESULTS 22 patients, mean age 46.2 years (mean pre-enrollment HbA1c level 8.4%) were recruited for the study. Nine patients underwent continuous structured sessions once weekly for six months while 13 patients completed the four structured introductory sessions. The mean decrease in HbA1c at six months for patients who only completed the introductory classes was 0.43% while the corresponding decrease at six months for patients who continued with the maintenance class was 1.85%. An independent sample *t*-test showed statistical significance (t[14] = -2.635, p < 0.05). The correlation between pre-exercise blood glucose for each session and the changes in HbA1c after three months was also found to be statistically significant (r = +0.706, p < 0.05).

CONCLUSION Sustained structured exercise training with aerobic and resistance exercises is associated with improved glycaemic control in patients with T2DM. However, weekly exercise sessions may not be sufficient for optimal HbA1c control in this cohort.

CATEGORY: ORAL ABSTRACT (CRUISE MEDICINE)   **OC04**

Reliability and validity of skin dermal temperature using a handheld infrared thermometer in detecting vascular insufficiency in the diabetic population

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INTRODUCTION Regular assessment of diabetic foot is recommended to reduce the burden of diabetic foot complications. However, the limited number of objective vascular tests available for such patients in the primary care settings, such as ankle-brachial pressure index (ABPI), poses a problem. This study investigated the validity of the temperature gradient in the lower limbs as a surrogate predictor of peripheral arterial disease (PAD) in the diabetic population using a novel technique of temperature gradient assessment.

METHODS Stratified systematic sampling was performed of 40 diabetic patients with (group 1, n = 20) and without (group 2, n = 20) neuropathy. Ten healthy controls were also recruited. All subjects underwent ABPI, toe-brachial pressure index (TBPI) and temperature assessments of the tibial tuberosity and hallux using an infrared dermal thermometer. Neurological assessments were also conducted for these patients.

RESULTS The intertester reliability of this technique for assessing the temperature gradient in the lower limbs was

shown to be good (r = 0.995, p < 0.01). The overall ABPI (r = −0.20, p = 0.048) and TBPI (r = −0.29, p = 0.004) were negatively correlated with the temperature gradient. Moderate negative correlation was established between TBPI and the temperature gradient in the lower limbs in the control group (r = −0.29, p = 0.07). A significant difference was found between the temperature gradients in the right lower limb between the groups (p = 0.012), with post-hoc analysis showing a significant difference between patients in group 1 and group 2 (p = 0.024).

CONCLUSION The study showed that temperature gradients in the lower limbs can be a novel, easy and objective assessment tool that can be incorporated into a screening algorithm in the primary care setting to help stratify patients at risk of PAD.

CATEGORY: ORAL ABSTRACT (CRUISE MEDICINE)   **OC05**

Safety of simvastatin for patients with hypercholesterolaemia and fatty liver

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INTRODUCTION Statins lower low-density lipoprotein cholesterol (LDL-C) levels, and thereby reduce the risk of cardiovascular events by inhibiting 3-hydroxy-3-methylglutaryl-coenzyme A reductase – an enzyme that is involved in the synthesis of mevalonate, which is a precursor for the synthesis of both cholesterol and coenzyme Q10 (CoQ10) – and causing a reduction in CoQ10. However, higher statin doses are often associated with myopathy and elevations of liver transaminases due to which patients with high risk of cardiovascular disease are usually not prescribed statins. We aimed to determine the safety of simvastatin for patients with fatty liver, with and without CoQ10 supplementation.

METHODS In a double-blind, placebo-controlled study, we enrolled 40 hypercholesterolaemic patients with fatty liver (alanine transaminase [ALT] < 200 IU/L) and treated them with simvastatin 20 mg/day. The patients were randomised to receive either CoQ10 150 mg/day or placebo. The muscle pain questionnaire was administered and fasting blood levels assessed at baseline (0 weeks) and 12 weeks to assess lipid response and markers of liver toxicity.

RESULTS The mean age of patients was 46.2 ± 12.0 years, with a majority Chinese ethnic distribution (Chinese 47.5%, Malay 25%, Indian 22.5%, others 5%). The mean baseline ALT level was 64.9 ± 27.9 IU/L. Simvastatin treatment significantly lowered LDL-C levels in both treatment groups (p < 0.001) and no significant increase in ALT was seen after treatment. ALT (14.2%) and alkaline phosphatase (ALP; 5.15%) were significantly decreased in patients treated with simvastatin and supplemented with CoQ10 (p < 0.01). Muscle ache pain was seen in 45% and 25% of patients treated with placebo and CoQ10 supplementation, respectively (p > 0.05).

CONCLUSION This study demonstrates that simvastatin is effective and safe for patients with fatty liver. Although not clinically elevated in patients receiving placebo, ALT and ALP reduction in those on CoQ10 supplementation suggests that CoQ10 may have some beneficial effects at the molecular level. Future analysis using metabolic and microRNA profiling will explore these areas further.

Testing of interrater reliability of the modified Morse Fall Scale among patients aged 55 years and above in an acute care hospital

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INTRODUCTION A fall prevention programme commonly involves a fall risk assessment tool. However, before adapting such fall risk assessment tools to a specific clinical setting or patient population, it is necessary that their necessity in that particular setting and population be first substantiated via ongoing assessments, testing and evaluation. This study aimed to determine the interrater reliability of the modified Morse Fall Scale in an acute care hospital setting by evaluating the degrees of agreement on the ratings for individual items and overall score between the gold standard assessor and facility assessors.

METHODS A prospective descriptive study, with two raters observing and assessing patients independently on each occasion, was conducted in an acute care hospital in Singapore. The researcher (or the gold standard rater) and the nurses (or the facility raters) underwent training in fall risk assessment. On each occasion, a facility rater and the gold standard rater assessed the same patient independently within the first 24 hours of admission.

RESULTS The simple and weighted K-values were all higher than 0.8, except for the item 'effects of medications' (K and $K_w = 0.63$). The correlation coefficient ($r_s = 0.89$) was significantly high at a significance level < 0.001.

CONCLUSION The modified Morse Fall Scale was found to be a reliable fall risk assessment tool, having a relatively high inter-rater reliability level for the overall score and individual items. Our results provide evidence-based psychometric support for the clinical application of this tool.

Experiences of older Singaporean Chinese women living with chronic conditions and their self-management strategies

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INTRODUCTION We report a qualitative study that aimed to explore the experiences of older Singaporean Chinese women living with and self-managing chronic conditions. The feminisation of ageing has become entrenched in the reality of Singapore, which is one of the fastest ageing societies in Asia. This entails important socioeconomic and health implications for the current cohort of women aged 65 years and above, who tend to have multiple chronic conditions and have to contend with socioeconomic issues unique to their gender. This study is the first of its kind in Singapore in seeking to investigate chronic illness experiences of older Chinese women, who form the majority group in the older adult population.

METHODS The study undertook a qualitative interpretive methodology, where purposive convenience sampling was used to recruit five participants from a community hospital in Singapore. Data were collected from face-to-face semistructured interviews conducted in 2011, which were audio taped and transcribed verbatim. Thematic analysis was then used to analyse the content of these transcripts.

RESULTS Six themes emerged from this study, namely (i) being in the body of illness; (ii) entrusting in Western medicine; (iii) finding relief; (iv) to eat is wealth; (v) not losing face; and, (vi) blood is thicker than water.

CONCLUSION Study results highlight Chinese influences on the chronic illness experiences of chronically ill older women in Singapore, which are not found in women of other cultures. Results also call attention to the need for more culture-sensitive research on women from different cultures in order to enhance the cultural understanding and sensitivity of healthcare professionals toward their patients.

Clinical predictors of established diabetic nephropathy in a large Asian population

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INTRODUCTION Type 2 diabetes mellitus (T2DM) is the leading cause of kidney failure in Singapore. Universal screening for diabetic nephropathy (DN) is recommended annually. However, early DN may progress slowly and may even regress spontaneously. We hypothesised that simple clinical parameters could identify T2DM with established DN and that such patients would require intensive interventions for the risk factors of renal retardation.

METHODS 646 patients with T2DM (men 49.5%) were recruited from a single secondary care centre. Serum creatinine, fasting plasma glucose, lipid profiles, glycated haemoglobin-A1c levels and albumin/creatinine ratio (ACR) were measured for these patients. Established DN was defined as urinary ACR $\geq$ 300 mg/g and/or estimated glomerular filtration rate (eGFR) < 60 mL/minute. Univariate analysis was performed for each potential predictor of established DN and statistically significant factors (p < 0.05) were included in the multivariate analysis using binary logistic regression.

RESULTS After adjusting for potential confounders, such as body mass index (BMI), the following variables were found to be associated with increased risk for established DN: (i) male gender (odds ratio [OR] 1.510, 95% confidence interval [95%CI] 1.062–2.147; p = 0.022); (ii) current smokers when compared to ex- and non-smokers (borderline significance; p = 0.086); and, (iii) age (OR 1.033, 95%CI 1.016–1.051). According to receiver operating characteristic (ROC) curve analysis, the optimal age (C statistics = 0.62) cut-off value for classifying patients as those with established DN was 55 years (sensitivity 70%, specificity 50%).

CONCLUSION Our results suggest that men with T2DM who are current smokers and aged 55 years and above are associated with an increased risk for established DN. Prompt screening for DN and appropriate interventions, such as smoking cessation (if screen results for DN are positive), are recommended for this high-risk group.

The neuropsychiatric profile of patients presenting at a memory clinic in Singapore

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INTRODUCTION Neuropsychiatric symptoms (NS) are central features in persons suffering from dementia. This study aimed to determine the prevalence and severity patterns of NS in patients with dementia and the manner in which it impacted not only the patient's quality of life (QOL) but also the distress and burden of caregivers.

METHODS 762 patients and their family caregivers who presented to a tertiary hospital memory clinic were assessed. Dementia was typed and its severity rated using the Clinical Dementia Rating (CDR) scale. The Neuropsychiatric Inventory Questionnaire (NPI-Q) was used to assess the patient's NS and the corresponding level of distress experienced by

the family caregiver. The patient's QOL and caregiver burden were assessed using the Quality of Life – Alzheimer's Disease (QOL-AD) and Zarit Burden Inventory, respectively. Analysis of variance using a general linear regression model was used to establish whether NS predicted caregiver distress, burden and patient QOL.

RESULTS NS was found to be highly prevalent, with a majority of patients showing severe symptoms (mild symptoms: 19%, moderate symptoms: 31%, severe symptoms: 44%). Agitation (60%), apathy (59%) and irritability (55%) were the most common NS while disinhibition (34%), hallucination (24%) and elation (14%) were the least common. The prevalence of all NS was found to increase with the severity of dementia. NS also significantly predicted caregiver distress ($\eta\rho^2$ 0.73, p < 0.0001), feelings of burden ($\eta\rho^2$ 0.223, p < 0.0001) and patient QOL ($\eta\rho^2$ 0.037, p < 0.001), when controlling for variables such as age, race, gender, marital status, education, and type and severity of dementia. All NPI-Q domains were found to significantly predict caregiver distress and burden. Depression, apathy, appetite, irritation, disinhibition and night-time behaviours were significantly and inversely related to patient QOL.

CONCLUSION Results evidence the high prevalence of NS in dementia. The significant impact of NS on patient QOL and caregiver distress and burden warrants specific interventions that are targeted at patients and their families at each stage of dementia.

CATEGORY: ORAL ABSTRACT (SLOW MEDICINE)   **OS05**

Differential microRNA expression profiles are associated with diabetes mellitus and body mass index

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INTRODUCTION Obesity is a major public health problem worldwide, which also confers substantial excess risk for type 2 diabetes mellitus (T2DM). Therefore, defining the relationship between obesity and diabetes mellitus is critical for a better understanding of its pathophysiological mechanisms. MicroRNAs (miR) are endogenous, non-coding RNAs that are known to modulate gene expression, and regulate both biological and disease processes. We hypothesised that miR expressions may vary according to differences in body mass index (BMI) and that patients with T2DM may possess differential miR expression independent of BMI.

METHODS Anthropometric data was collected and the fasting glucose (FG), lipids and insulin levels measured for 32 Chinese men. Patients were categorised based on FG as T2DM (FG ≥ 7.0 mmol/L) or control (CTL; FG < 5.6 mmol/L), and further stratified based on BMI as lean (BMI < 24.0) or obese (BMI > 27.5). miR arrays were performed and data were analysed using the Statistical Package for the Social Sciences. p-values < 0.05 were considered statistically significant.

RESULTS Significant differences were seen between LeanCTL and obeseCTL in the levels of high-sensitivity C-reactive protein (hsCRP; 0.72 ± 1.05 mg/L vs. 4.33 ± 3.82 mg/L, p = 0.011), homeostasis model assessment-estimated insulin resistance (HOMA-IR; 0.96 ± 0.71 vs. 6.67 ± 17.31, p = 0.001), triglycerides (0.91 ± 0.44 mmol/L vs. 2.17 ± 0.68 mmol/L, p = 0.001) and high-density lipoprotein (HDL; 1.61 ± 0.31 mmol/L vs. 1.14 ± 0.34 mmol/L, p = 0.016), with the expression of five miRs being significantly different in these two groups. Significant differences were seen between LeanT2DM and obeseT2DM in terms of fasting insulin levels (10.50 ± 26.68 μU/mL vs. 27.30 ± 11.88 μU/mL, p = 0.037) and age (50.5 ± 9.8 years vs. 38.0 ± 8.1 years, p = 0.015), with the expression of 16 miRs being significantly different between the two groups. Significant differences were seen between LeanCTL and LeanT2DM with regard to hsCRP (p < 0.005), HOMA-IR (p = 0.043), triglycerides (p = 0.027) and HDL (p < 0.005), with expressions of 11 miRs being significantly different between the two groups. Expressions of 16 miRs were found to be significantly different between obeseCTL and obeseT2DM.

CONCLUSION We were able to identify two sets of miRs – one was associated with BMI and the other with T2DM, independent of BMI. Study findings will lead to a greater understanding of the molecular basis of T2DM, and provide for possible novel diagnostic and therapeutic alternatives.

CATEGORY: POSTER ABSTRACT (DOCTOR)	PD01

Surgical management of perforated peptic ulcer: can we perform better?

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INTRODUCTION This study was conducted to evaluate our experience and the outcomes of surgical management of perforated peptic ulcer (PPU) in our hospital.

METHODS A retrospective analysis was performed of all patients who underwent surgery for PPU between July 2010 and December 2011. Outcome measures were defined based on the length of stay (LOS), postoperative complications and mortality. The Clavien-Dindo Classification of Surgical Complications was used to stratify the severity of postoperative complications.

RESULTS 45 patients (men 37, women 8) with PPU underwent surgery during the study period. The median age was 52 (range 17–92) years. 42 (93.3%) patients required omental patch repair, of which 24.4% of procedures were performed laparoscopically. The overall mortality rate was 8.9%. Of the 11 (24.5%) patients who achieved Clavien scores ≥ 3, 7 (15.6%) patients required

reoperation. The median LOS was 6 (range 3–65) days. Patients aged 70 years and above (odds ratio [OR] 14.57, 95% confidence interval [95%CI] 1.32–161.42) and women (OR 21.60, 95%CI 1.87–250.03) were found to be associated with high mortality risk. Factors that were associated with severe postoperative complications (Clavien score ≥ 3) were patients with preoperative renal impairment (OR 7.11, 95%CI 1.26–40.21) and duration of surgery > 120 minutes (OR 11.07, 95%CI 1.77–69.26). The laparoscopic approach for patients with subcentimeter ulcer perforations was found to be associated with shorter LOS (p = 0.034).

CONCLUSION PPU repair in elderly patients (aged 70 years and above) entails a high mortality risk irrespective of underlying pathology. Therefore, conservative management of PPUs should be considered for such patients. Laparoscopic omental patch repair should be considered as the preferred treatment, especially for younger patients with early presentation.

CATEGORY: POSTER ABSTRACT (DOCTOR)	PD02

Laparoscopic adjustable gastric banding: our 10-year experience at Alexandra Hospital/Khoo Teck Puat Hospital, Singapore

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INTRODUCTION We performed 371 laparoscopic adjustable gastric bandings (LAGBs) for morbidly obese patients in Singapore during 2001–2011. The weight change, resolution of co-morbidities, complications and the rate of follow up over the study period were assessed to determine whether gastric banding was effective in inducing and maintaining weight loss in these patients.

METHODS Patient data was prospectively collected and the patients followed up at the weight management clinic at our hospital. Patients who were lost to follow-up were actively contacted by telephone and electronic means. Variables such as weight reduction or regain after surgery, resolution of co-morbidities, complications and follow-up rates were recorded. The postoperative weight, percentage excess weight loss and body mass index (BMI) of patients over 10 years were plotted to compare between patients in the different obesity classes (I–III).

RESULTS 371 patients, with a mean age of 35 years, underwent LAGBs over a 10-year period. 47.3% of patients were ethnic Chinese (Malay 25.3%, Indian 21.2%, other 6.6%). The mean preoperative weight and BMI were 115.1 kg and 42.0 kg/m^2, respectively. The plot of postoperative weight, percentage excess weight loss and BMI over 10 years revealed a plateau in weight loss from the third year. There was an overall improvement in diabetes mellitus, hypertension and obstructive sleep apnoea. 32.0% of patients developed complications, of which 61.9% complications were band related and the rest were due to tubing and port. There were two mortalities. The follow-up rate at five years was 21%.

CONCLUSION LAGB is a viable bariatric operation for obese patients with short-term weight loss and improvements in comorbidities. However, these patients need lifelong monitoring for complications and regular follow up.

Preoperative assessment with STOP-Bang questionnaire predicts perioperative adverse outcomes

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INTRODUCTION The STOP-Bang questionnaire is a concise eight-point dichotomised-mnemonic used for obstructive sleep apnoea (OSA) screening, which is routinely administered during preoperative assessment. We hypothesised a novel use of STOP-Bang scores for the preoperative risk stratification of patients in order to predict subsequent admission to the high dependency-surgical intensive care unit (HD/SICU) and the occurrence of unexpected perioperative adverse events.

METHODS This cohort study was approved by the Domain Specific Review Board (DSRB) and funded by an Alexandra Health Enabling Grant. We retrospectively extracted data on demographics, comorbidities and outcomes for all patients who had undergone elective surgery under general and/or regional anaesthesia from January 2011 to December 2011 from electronic perioperative records. Two multivariate regression models were constructed using the Statistical Package for the Social Sciences to determine independent predictors of admission to the HD/SICU and unexpected perioperative adverse events.

RESULTS 5,432 surgical patients were analysed, accounting for 6.4% of HD/SICU admissions and 7.5% of unexpected perioperative adverse events. Patients with higher STOP-Bang scores were found to be at greater risk of HD/SICU admissions (score 4: odds ratio [OR] 2.2, 95% confidence interval [95%CI] 1.1–4.6; score 5: OR 3.2, 95%CI 1.2–8.1; score ≥ 6: OR 5.1, 95%CI 1.8–14.9) and unexpected perioperative adverse events (score 3: OR 3.6, 95%CI 2.1–6.3; score 4: OR 3.4, 95%CI 1.8–6.5; score 5: OR 6.4, 95%CI 2.7–15.0; score ≥ 6: OR 5.6, 95%CI 2.1–15.4) than those with STOP-Bang score 0. Other independent predictors of HD/SICU admissions included older age (p = 0.019), American Society of Anesthesiologists (ASA) physical status (p < 0.001), history of OSA (p < 0.001) and presence of asthma (p = 0.023). Other independent predictors of unexpected perioperative adverse events included older age (p < 0.001), ASA physical status (p = 0.006) and uncontrolled hypertension (p = 0.025).

CONCLUSION The STOP-Bang questionnaire, which is a validated OSA screening tool, may be useful for the risk stratification of patients in addition to other recognised independent predictors of perioperative adverse outcomes. A STOP-Bang score ≥ 4 should alert clinicians of increased perioperative risk.

Functional outcomes in elderly patients who have undergone major colorectal surgery

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INTRODUCTION This study reviewed the medium-term functional outcomes of elderly patients following elective and emergent surgical management of colorectal cancer under the geriatric surgical service at our hospital.

METHODS A prospective study was performed of patients aged 75 years and above, who underwent major colorectal surgery and were managed by a collaborative transdisciplinary approach. Assessments of their preoperative functional status was carried out using the Barthel Index and compared with their respective scores taken at scheduled intervals following surgery.

RESULTS 47 patients, with a mean age of 81.9 (range 75–94) years, were studied from February 2007 to November 2011. 11 (23.4%) patients were emergent cases. 13 (27.6%) patients had a Charlson Weighted-Comorbidity Index ≥ 4. Of the 32 patients assessed for frailty, nine (28.1%) patients were identified as frail. The mean preoperative Barthel Index was 89.5 (range 45–100). The mean follow-up period was

91.2 (range 6–249) weeks. At six weeks after surgery, 39 (83%) patients had a Barthel Index similar to or above that prior to surgery, and at the mean follow-up period of 91.2 weeks, 44 (93.6%) patients had an index score not inferior to their preoperative scores. Medium-term functional decline was significantly higher for patients whose comorbidity index score was ≥ 4 (p = 0.004) and those who were frail (p = 0.004).

Functional decline occurred about one year after surgery.

CONCLUSION Attention to functional outcome via a trans-disciplinary approach in elderly patients undergoing major colorectal surgery allows for good medium-term functional outcomes. Patients with a high comorbidity index and those that are frail may need further targeted intervention.

CATEGORY: POSTER ABSTRACT (DOCTOR)   **PD05**

Exploring the public's understanding and perception of dementia in Singapore

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INTRODUCTION Research in preclinical detection of dementia aims to improve treatment outcomes. However, poor perception and understanding of dementia are barriers to its successful screening. We aimed to investigate the public's understanding of dementia and identify variables associated with the different profiles of public perception.

METHODS A custom-designed questionnaire was used to assess the layperson's knowledge and perception of dementia during a health fair at a public hospital in Singapore. From a sample of 370 participants, 28 declined to participate (response rate 91.4%). Latent class analysis (LCA) was used to identify meaningful subgroups within the participants from significant associations with multiple indicators of dementia awareness. Multinominal logistic regression was performed to explore variables associated with each of these subgroups derived from LCA.

RESULTS A majority of participants were women (66.9%), aged ≥ 65 years (71.1%) and ethnic Chinese (88.1%). LCA classified the participants into three subgroups: class 1 (good knowledge, good attitude; 14.28%), class 2 (good knowledge, poor attitude; 63.83%) and class 3 (poor knowledge, poor attitude; 21.88%). Compared to the other classes, participants with good knowledge and good attitude towards dementia (class 1) were more likely to know someone with dementia and understand the effects of the disease, be married, live in private housing, receive higher monthly income, and not profess belief in Buddhism, Taoism and Hinduism.

CONCLUSION The public appears not ready for screening initiatives and the early diagnosis of dementia. Results highlight the need for education efforts targeting the lower socio-economic groups, and persons who are single and those practising certain oriental religions.

CATEGORY: POSTER ABSTRACT (DOCTOR)   **PD06**

Plasma carotenoids and glycosylated haemoglobin in subjects with and without diabetic retinopathy

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INTRODUCTION Diabetic retinopathy (DR), the most common and specific microvascular complication of diabetes mellitus, is the leading cause of blindness in working-age people. Although the exact pathogenesis of DR remains unknown, the role of oxidative stress was proposed in recent years. We evaluated the impact of transient and persistent hyperglycaemia on plasma lutein (L) and zeaxanthin (Z) levels in diabetic patients with and without DR. We present the results of the preliminary analysis of our ongoing study.

METHODS Data collected for each participant included sociodemographics, medical history pertaining to diabetes mellitus, plasma levels of L, Z and glycosylated haemoglobin, and fasting and postprandial blood glucose. Diabetic patients with clinical evidence of DR constituted the test group while patients without DR were treated as controls.

RESULTS 16 patients, with a mean age of 61.46 ± 7.03 years and a slight preponderance of men in the study group, were recruited (test 4, control 12) for the study. An inverse relationship was observed between blood glucose and serum L levels in test patients (fasting glucose: $r^2 = 0.84$, p = 0.00; postprandial glucose: $r^2 = 0.71$, p = 0.00) but not among the controls (fasting glucose: $r^2 = 0.15$, p = 2.88; postprandial glucose: $r^2 = 0.0$, p = 6.91).

CONCLUSION Transient hyperglycaemia in diabetic patients with DR is associated with decreased levels of plasma L, suggesting that postprandial dysmetabolism inducing immediate oxidative stress may play a role in the pathogenesis of DR.

CATEGORY: POSTER ABSTRACT (NURSING)   **PN01**

Reducing turnaround time (TAT) for administration of stat dose medicine

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INTRODUCTION Although it is hospital policy to serve all stat dose medicines within 60 minutes of ordering, a random hospital-wide audit revealed that only 49% of all stat doses were served within this time. We aimed to reduce the turnaround time (TAT) of stat dose medicine in order to achieve a 100% target so that all stat doses were served within 60 minutes.

METHODS The project was conducted in a multidisciplinary subsidised ward. The random audit involved data collection on TAT for stat dose medicine, which was defined as the time between the ordering of stat dose and the time of its administration to the patient. Improvement measures implemented included installing weight sensors and lights for the pneumatic system to alert staff of its arrival, enlisting the help of patient service associates (PSA) to pick up the stat doses from the pneumatic system and handing them over to nurses for administration, assigning designated pharmacists to oversee stat doses, and sticking reminders on inpatient medicine records (IMRs) to remind doctors to inform nurses of such orders.

RESULTS The project resulted in a 24% reduction in the average TAT of stat dose medicine from 78 minutes to 59 minutes. However, only 68% of all stat doses ordered were served within 60 minutes at the end of the project.

CONCLUSION Although the target of 100% stat dose medicine served within 60 minutes was not achieved, the average TAT was reduced by 24%. Limitations that hindered achieving the target of 100% stat doses within 60 minutes included manpower constraints at the pharmacy, lack of electronic IMR systems and the absence of an inpatient satellite pharmacy.

CATEGORY: POSTER ABSTRACT (NURSING)   **PN02**

Practice of regional anaesthesia in perioperative patients: an audit

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INTRODUCTION Regional anaesthesia (RA) is an excellent modality for providing perioperative pain relief to surgical patients. However, limitations that impact its utilisation include time constraints and fear of complications. At Khoo Teck Puat Hospital, the practice of RA has been developed effectively to provide the best care to the patients. We present the results of an audit of RA utilisation in our perioperative population over six months.

METHODS The RA database reflected the usage of RA, and detailed information on the type of block and safety over six months from May 2011 to October 2011.

RESULTS 820 patients out of 3,383 patients received RA in different forms, with the RA utilisation being 24.38%. A total of 894 blocks were performed. The mean age of patients was 54.24 years. The male-to-female ratio was 1.73:1. RA usage was highest in patients undergoing lower limb surgeries (n = 475) when compared to those scheduled for surgeries of the upper limb or abdominal, thoracic, inguinal or perineal surgeries. 420 patients received central neuraxial blocks (CNB) while 382 patients received peripheral nerve blocks (PNB) of different kinds. 18 patients received different combinations of PNB and CNB. Spinal anaesthesia was the most common block used (n = 405). Femoral nerve blocks were the most common PNB (n = 91), followed by those of the supraclavicular brachial plexus (n = 51) and popliteal blocks (n = 40). 61 patients received catheters, mostly femoral, for pain management postoperatively. Ultrasonography was used for 345 (90.31%) patients. No side effects were reported.

CONCLUSION RA is effective and safe, and its usage can be maximised by increasing staff and patient education as well as by streamlining systems and processes to optimise time and reduce delays.

CATEGORY: POSTER ABSTRACT (NURSING)   PN03

Factors associated with hypoglycaemia among inpatients without diabetes mellitus

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INTRODUCTION Hypoglycaemia, generally defined as glucose levels < 4 mmol/L, occurs to a significant extent among general ward inpatients with and without diabetes mellitus (DM) and is usually monitored using the inpatient point-of-care (POC) glucose monitoring system. While hypoglycaemia in inpatients with DM is often associated with the use of insulin secretagogues or insulin, the factors and diagnoses associated with hypoglycaemia in inpatients without DM are unclear.

METHODS The Cobas IT glucose database at our hospital was examined for information on inpatients of the general wards between October 1, 2010 and June 27, 2011 who had low glucose levels (POC glucose < 4 mmol/L). Data collected from the specific admission episode included history of DM, treatment medication, primary diagnosis, other diagnoses, estimated glomerular filtration rate (eGFR), serum creatinine, albumin, alanine transaminase (ALT), aspartate transaminase (AST) and γ-glutamyl transpeptidase (GGT) levels.

RESULTS 303 low glucose readings, with a mean glucose level of 3.3 (range 0.9–3.9) mmol/L, were observed during the study period. Only 72.9% of these low readings were from patients with DM; the remaining 27.1% episodes were seen in patients without any history of DM. There was a significant correlation between glucose and AST ($p = 0.04$). AST was also significantly associated with ALT, GGT and serum albumin. However, correlation was not significant with creatinine and eGFR. Among non-diabetic patients with hypoglycaemia, sepsis was a common diagnosis in 40% of patients, with pneumonia and urinary tract infections as the most commonly identified sources. Other diagnoses included malignancy (15%), renal impairment (15%), liver failure or hepatic encephalopathy (15%), and endocrine disease (9%). Poor intake and malnutrition was identified in 6% of patients.

CONCLUSION 27.1% episodes of hypoglycaemia in hospital inpatients were seen in patients without DM. Common diagnoses in such inpatients included sepsis, malignancy, renal impairment and liver failure.

CATEGORY: POSTER ABSTRACT (NURSING)   **PN04**

Optimisation of hyperglycaemia in patients hospitalised in non-medical-discipline wards by advanced practice nurses

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INTRODUCTION Hyperglycaemia in hospitalised patients is associated with prolonged hospitalisation, morbidity and mortality. Stress induced by surgery, illness and changing nutritional status makes optimisation of glucose control challenging in such patients. The objective of this study was to evaluate the effectiveness and safety of having advanced practice nurses (APNs) in diabetes care collaborating with the medical team in managing hyperglycaemia in hospitalised patients.

METHODS Episodes of hyperglycaemia, defined as point-of-care (POC) glucose readings $\geq$ 20.0 mmol/L, were identified in hospital inpatients from the Cobas IT glucose database at the hospital. Only data from inpatients of non-medical-discipline wards from 1 October 2010 to 27 June 2011 were included for analysis. Data collected included initial (admission day) and subsequent daily glucose readings, endocrinologist consultation referrals and hypoglycaemia episodes (POC glucose $\leq$ 4.0 mmol/L). Data were analysed using repeat measures analysis of variance.

RESULTS 972 episodes of hyperglycaemia were identified in hospital inpatients. The mean glucose levels recorded showed significant steady decline from Days 1 to 6 (Day 1: 19.0 $\pm$ 4.7 mmol/L, Day 2: 15.1 $\pm$ 3.7 mmol/L, Day 3: 13.7 $\pm$ 4.1 mmol/L, Day 4: 12.3 $\pm$ 3.5 mmol/L, Day 5: 11.5 $\pm$ 3.7 mmol/L, Day 6: 9.9 $\pm$ 3.9 mmol/L) [p = 0.001]. Endocrinologist consultations were made for 31.9% of patients. Hypoglycaemia was noticed in only 0.3% of POC glucose readings taken.

CONCLUSION Hospitalised non-medical-discipline patients with hyperglycaemia could benefit from the effective and safe glycaemic management practised by APNs (diabetes care). Hence, there is a potential for APN collaboration with the inpatient medical team for optimising diabetes care.

CATEGORY: POSTER ABSTRACT (NURSING)   **PN05**

Unit-based Patient Safety (UPS) collaboration with clinicians and allied health professionals

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INTRODUCTION The Unit-based Patient Safety (UPS) collaboration model was adapted from the Johns Hopkins Hospital in Baltimore, USA. Primary aims were to empower nurses to speak up to clinicians on patient safety issues and to promote a safety climate on the ground.

METHODS Allied health professionals, nurses from same discipline wards and clinicians met monthly for open discussion. The dialogue sessions were first introduced to the medical wards, followed by other major disciplines in the hospital. A pre- and post-initiative survey was conducted using the Likert scale (ratings A–E), with A being 'excellent' on the left

and E being 'failing' on the right. Ground challenges were identified and followed through to promote better and safer care.

RESULTS The overall patient safety grade across disciplines showed an improvement of 3%. Of the total 140 issues raised in 2011, 51 (36%) issues were considered closed, 77 (55%) were ongoing and 12 (9%) in progress. Ongoing issues were mainly due to human factors and required periodical reiteration by the clinical heads. Some improvements, such as increased support from phlebotomists, new transport nurse service, discharge stamp, reduction in patient transfer to designated disci-

pline ward and safe patient journeys at various service points, were observed.

CONCLUSION UPS collaboration provides great opportunities for nurses to unreservedly voice their concerns on patient safety. Various factors may have acted as limitations to greater improvement in the overall patient safety grade, including the different participants and discipline wards taking part in the survey, the post-initiative survey being conducted between the third and sixth sessions, the dialogue sessions being conducted after working hours and not all issues raised being completely closed.

CATEGORY: POSTER ABSTRACT (NURSING)   **PN06**

New technology in diabetes care: our initial experience with the continuous glucose monitoring system, iPro2

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INTRODUCTION Even with up-to-date medications, optimal diabetes care is difficult to achieve, as patients are prone to wide fluctuations of glucose. Although self-monitoring blood glucose (SMBG) has revolutionised self-care, it has its limitations. The continuous glucose monitoring system (CGMS) was introduced to monitor interstitial fluid glucose over a period of 3–4 days. As earlier systems were cumbersome, a new system, iPro2, which has been designed for professional use was introduced.

METHODS An observational study was conducted from September 2010 to March 2012 to evaluate the use of CGMS at our diabetes centre. CGMS using iPro2 was set up for 77 patients. Complete demographic and clinical data from 71 patients were analysed using the Statistical Package for the Social Sciences version 20.

RESULTS Among the 71 patients, 58% had type 1 diabetes mellitus. The mean age was 46 ± 14 years and the mean duration of diabetes mellitus 20 ± 9 years. Indications for CGMS included the evaluation of hypoglycaemia (72%), uncontrolled diabetes mellitus (18%), mismatched glycated haemoglobin-A1c (HbA1c) and SMBG (6%), and for evaluating change in therapy (4%). In patients with hypoglycaemia, 92% of patients were confirmed to have regular hypoglycaemia, with the mean duration being 5.6 ± 4.7 hours. Patients with repeated CGMS (8.1%) showed a reduction in the mean duration of hypoglycaemia from 6 hours to 3 hours ($p = 0.082$). In patients with uncontrolled diabetes mellitus, mean HbA1c levels improved from 9.5% to 9.0% ($p < 0.001$).

CONCLUSION CGMS using iPro2 is an easy and effective tool that helps patients achieve optimal care of diabetes mellitus. It is suitable for all age groups, provided they are able to perform SMBG in order to calibrate interstitial fluid glucose levels obtained from CGMS.

CATEGORY: POSTER ABSTRACT (ALLIED HEALTH)   **PA01**

Comparative risk of developing serious adverse events in patients with dementia using atypical antipsychotics and non-antipsychotics

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INTRODUCTION Atypical antipsychotics (AAPs), which are frequently used off-label for the management of behavioural and psychological symptoms of dementia (BPSD), are associated with increased mortality and other safety concerns.

METHODS The patient database at the ambulatory dementia clinic at Khoo Teck Puat Hospital was screened over a mean follow-up period of 15.6 months. Patients who were aged ≥ 65 years were included in the study, but those with schizophrenia

or whose clinical data were unavailable were excluded. From a total sample size of 515 patients, 331 patients satisfied the inclusion criteria. Data collected included sociodemographics, clinical characteristics and history of medications. The occurrence of serious adverse events (SAEs) leading to hospitalisation and death among patients using AAPs and non-antipsychotics were analysed. Multivariate regression was used to compare the incidence of admission due to SAE and death between the two groups.

RESULTS Significant differences were seen among patients using AAPs (n = 67) and non-antipsychotics (n = 264) in terms of age, severity of dementia, existence of BPSD, exposure to anticholinergics and psychotropics, and history of fall. 39 (58%) patients using AAPs needed hospitalisation with no deaths being reported, while 138 (52.3%) patients using non-antipsychotics were hospitalised with seven (2.7%) deaths being reported for these patients. The difference in the two groups was not statistically significant. On multivariate analysis, a significantly higher number of falls or fractures was found in patients using AAPs than those on non-antipsychotics (31.3% vs. 11.7%, p = 0.03).

CONCLUSION Although the risk of death or hospitalisation and the incidence of cardiovascular or cerebrovascular SAEs was not significantly increased in either patient group, patients using AAPs did show an increased risk of falls and fractures when compared to those using non-antipsychotics.

CATEGORY: POSTER ABSTRACT (ALLIED HEALTH) **PA02**

Concomitant use of personalised medication lists and inpatient medication counselling design (CUPID)

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INTRODUCTION Inpatients usually do not receive medication counselling until the day of discharge, and this often leads to information overload at discharge and poor recall of given instructions. With the CUPID initiative, we aimed to improve both the patient understanding of medications and patient satisfaction.

METHODS Medical patients on at least three chronic medications who were mentally alert were recruited into either the CUPID or standard care groups and followed prospectively. Patients in the CUPID group received medication counselling and a personalised medication list (PML) during their hospital stay. At discharge, these patients were also provided with a similar PML that contained updated detailed instructions on the administration of medication. The control group received medication as per current practice. The time spent on counselling patients at discharge was measured for all patients. Both groups were assessed on the level of understanding of their medications and satisfaction using standardised questionnaires on Days 2 and 14 postdischarge.

RESULTS 24 and 14 patients were assigned to the CUPID and control groups, respectively. 12 patients completed the study. The difference in the mean age of patients in the two groups was not significant (CUPID: 54.8 [range 43–64] years, control: 51.3 [range 47–58] years; p = 0.347). The time taken for discharge counselling per medication was longer for patients in the control group (CUPID: 1.63 minutes, control: 3.90 minutes). The level of understanding among patients in the CUPID group was significantly higher after discharge than those in the control group (Day 2: 73.3% vs. 38.3%, p = 0.006; Day 14: 75.1% vs. 38.6%, p = 0.007). Patients in the CUPID group also demonstrated higher satisfaction levels.

CONCLUSION The CUPID programme significantly improved patient understanding of medications and shortened discharge turnaround times. Further expansion of the CUPID programme to patients in other wards is now being planned.

CATEGORY: POSTER ABSTRACT (ALLIED HEALTH)	PA03

Association of neutral endopeptidase (NEP) with diabetic nephropathy secondary to type 2 diabetes mellitus in Singaporean Chinese patients

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INTRODUCTION Numerous endothelium-derived vasoactive factors are involved in the pathogenesis of diabetic nephropathy (DN), including adrenomedullin (ADM), which is regarded as an alternative to nitric oxide in the defence against vascular injury. A membrane-bound metalloprotease – neutral endopeptidase (NEP) – cleaves endogenous peptides (including ADM), thereby modulating their plasma concentrations. We aimed to analyse the genetic association between NEP, plasma ADM and DN.

METHODS In a case-control study, 61 haplotype-tag single nucleotide polymorphisms (SNPs) [$r^2 = 1.0$] were genotyped in 960 Chinese patients with long-standing type 2 diabetes mellitus (duration > 10 years) discordant for nephropathy using multiplex genotyping assays. Test patients (n = 510) had spot urinary albumin/creatinine ratio (ACR) > 1,000 mg/g or serum creatinine > 112 uM. Controls (n = 450) had ACR < 30 mg/g and serum creatinine < 112 uM. SNPs that conformed to the Hardy-Weinberg equilibrium in the controls were retained for further analysis.

RESULTS Patients in both groups were similar in distribution for gender, age, duration of diabetes mellitus and glycated haemoglobin-A1c levels. Single locus analysis revealed that three SNPs were significantly (nominally) associated with DN – rs7610758G > A (odds ratio [OR] 0.502, 95% confidence interval [95%CI] 0.305–0.83; p = 0.006), rs3736188G > A (OR 0.738, 95%CI 0.552–0.96; p = 0.024) and rs3773874C > A (OR 0.733, 95%CI 0.573–0.937; p = 0.013). The minor A allele of intronic SNP rs3736188 (dominant model) was found to be associated with increased plasma ADM in controls (carrier: 0.50 ± 0.15 nM, non-carrier: 0.44 ± 0.15 nM; p = 0.004). Haplotype analysis did not reveal additional association signals in the gene region surrounding rs3736188.

CONCLUSION The association between the rs3736188 minor allele, higher plasma ADM concentration (intermediate phenotype) and reduced susceptibility to DN suggests a probable causal relationship between the variant and DN.

CATEGORY: POSTER ABSTRACT (ALLIED HEALTH)	PA04

Distribution of vitamin D levels and its relationship to parathyroid hormone levels in a local population

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INTRODUCTION Vitamin D, a fat-soluble steroid hormone, is involved in the intestinal absorption of calcium and the regulation of calcium homeostasis. Vitamin D status is best reflected by serum 25-hydroxyvitamin D (25[OH]D) levels. Insufficiency is defined by 25(OH)D concentrations below which parathyroid hormone (PTH) levels increase. We studied the distribution of vitamin D levels and its relationship to PTH levels in a local population.

METHODS Serum 25(OH)D and PTH levels were measured on Elecsys e170 and e411 analysers, respectively, by electrochemiluminescence immunoassay. Values above 30 µg/L were taken to indicate vitamin D sufficiency.

RESULTS 102 individuals (men 23, women 79; age range 21–64 years) participated in the study. Mean 25(OH)D levels in men and women were 23.4 µg/L and 21.6 µg/L, respectively (p > 0.05). When grouped based on age into four groups (20–30 years, 31–40 years, 41–50 years and 51–60 years), the mean 25(OH)D levels in women and men were in the range 20.9–22.8 µg/L (p > 0.05) and 17.8–31.2 µg/L, respectively. 85 (83%) individuals had either vitamin D insufficiency (n = 44) or deficiency (n = 41), with four individuals having concomitantly raised PTH levels.

CONCLUSION We found no significant difference in the mean 25(OH)D levels between the two genders and among women aged 20–60 years, suggesting similar lifestyles and/or nutritional behaviour. Results also suggest a need to establish health-based, population-specific reference values for 25(OH)D, as the relationship between vitamin D-deficient states and PTH is indistinct.

Association between pigment epithelium-derived factor (PEDF) and apolipoprotein A-1 (ApoA1) expression using cell culture model

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INTRODUCTION Cardiovascular disease (CVD) is a leading cause of death, especially in patients with diabetes mellitus. As the association between high CVD risk and low high-density lipoprotein cholesterol (HDL-C) is well established, raising HDL-C levels has always been a therapeutic target for reducing the risks of CVDs. The pigment epithelium-derived factor (PEDF) is a multifunctional protein involved in insulin resistance (IR) that has recently been associated with athero-sclerosis. In an earlier clinical study, we found a negative relationship between serum PEDF and HDL-C, suggesting a potential direct link between PEDF and HDL-C metabolism. We hypothesised that there is a direct causality between HDL-C and PEDF expression and explored this using cell culture.

METHODS Differentiated 3T3-L1 adipocytes and HepG2 cells were incubated for 24 hours in Dulbecco's modified eagle medium (DMEM) containing 0.5% foetal bovine serum with different concentrations of isolated human HDL-C and recombinant human PEDF, respectively. Secreted PEDF from 3T3-L1 cells was measured using Western blots while apolipoprotein A-1 (ApoA1) mRNA expression in HepG2 was analysed by real-time quantitative polymerase chain reaction (RT-qPCR).

RESULTS HDL-C supplementation resulted in significantly reduced PEDF secretion by 3T3-L1 cells at 50 μg/mL (24.8% ± 16.9%, p < 0.05) and 100 μg/mL (28.4% ± 13.6%, p < 0.01) levels when compared to control cultures. ApoA1 mRNA expression in HepG2 cells was also reduced when PEDF was supplemented at 5 nM (32.86% ± 22.72%, p = 0.197) and 10 nM (44.77% ± 18.82%, p < 0.01) levels, with the reduction being significant at 10 nM levels.

CONCLUSION In vitro treatment of adipocytes and hepato-cytes suggests that PEDF and HDL-C may negatively regulate each other. To our knowledge, this is the first study demonstrating a link between PEDF and HDL-C metabolism. Further research is needed to understand the mechanisms involved and to explore whether treatment targeted at raising HDL-C levels in patients may allow for additional therapeutic benefits via reduction in IR and atherosclerosis.

The association of myokine irisin with type 2 diabetes mellitus

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INTRODUCTION Irisin, a novel myokine derived from the product of fibronectin type III domain containing 5 (FNDC5) gene, is a downstream molecule activated by the transcriptional coactivator, PPAR-γ co-activator-1α (PGC-1α). Irisin induces the transdifferentiation of white adipose tissue to 'browning' phenotype and increases expression of the uncoupling protein-1 (UCP1), which in turn regulates metabolic efficiency. PGC-1α is known to be downregulated in the skeletal muscle of patients with type 2 diabetes mellitus (T2DM). We hypothesised that T2DM is associated with lower irisin concentrations and aimed to evaluate the association between circulating plasma irisin levels and T2DM.

METHODS 156 patients were recruited for the study (healthy controls, n = 30; impaired fasting glucose [IFG], n = 30; T2DM, n = 96). Anthropometric measurements were carried out and the circulating plasma irisin levels measured using enzyme-linked immunosorbent assays. All data were expressed as mean ± standard deviation. Bivariate correlation and generalised linear regression were used for comparison between groups, with the statistical significance set at p < 0.05.

RESULTS The mean age of patients was 51.7 ± 13.9 years. Correlation analysis revealed that irisin was positively correlated with total cholesterol (p = 0.001) and high-density

lipoprotein cholesterol (HDL-C; p = 0.044), but negatively correlated with the duration of diabetes mellitus (p = 0.007), albumin/creatinine ratio (ACR; p = 0.04) and systolic blood pressure (SBP; p = 0.01). Irisin was significantly lower in patients with T2DM than in controls (20.39 ± 7.26 vs. 24.85 ± 2.52, p < 0.001), and those with IFG (26.46 ± 2.06, p < 0.001). After adjusting for age, low-density lipoprotein cholesterol,

HDL-C, SBP, and gender, the irisin level remained significantly lower in patients with T2DM when compared to the other groups.

CONCLUSION Plasma irisin concentrations were lower in patients with T2DM. It is possible that normalising irisin may have therapeutic implications for diabetes and obesity.

CATEGORY: POSTER ABSTRACT (ALLIED HEALTH)　　　　　　　　　　**PA07**

The Asian study of CLOpidogrel Pharmacogenomics (ASCLOP)

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INTRODUCTION Various polymorphisms in the metabolic pathway of clopidogrel activation and lowered oral absorption have been implicated with variable response to clopidogrel. We report the local prevalence of eight mutations and their associations with response and clinical outcomes.

METHODS 121 patients (Chinese 39, Malay 42, Indian 40) were recruited for the study from January 2010 to March 2011. VerifyNow™ P2Y12 reactivity units (PRU) were used as a measure of clopidogrel response. The primary clinical endpoint was in-stent restenosis or rethrombosis (ISR).

RESULTS The prevalence rates of CYP2C19*2, CYP2C19*3, CYP3A5*3 and PON1 Q192R mutations differed significantly between the various ethnic groups. The average PRU was 255 ± 86 (range 30–425), 208 ± 100 (range 8–431) and 209 ± 74 (range 54–388) for Indians, Malays and Chinese, respectively (p = 0.029, analysis of variance). PON1 mutation, female gender and Indian ethnicity remained significant factors predicting raised

PRU levels on multiple regression analysis. The non-responder rates using PRU ≥ 230 as a cut-off value was 43.8%. According to multiple logistic regression analysis, PON1, CYP2C19*2, 2B6*4, female gender, Indian ethnicity and non-smoker status remained significant predictors of non-responder status. Non-responders had a significantly higher risk of ISR (odds ratio [OR] 7.0, 95% confidence interval [95%CI] 1.4–35.7; p = 0.024). Dihydropyridine (DHP) use predicted ISR even after controlling for confounders (p = 0.041). Carriers of 3A5*3 using DHP also had a significantly increased risk of ISR (OR 4.5, 95%CI 1.1–18.5; p = 0.034).

CONCLUSION The high local prevalence rate of mutation and poor responders bear important implications for guiding antiplatelet therapy. Pharmacogenomic factors have additional predictive value in addition to traditional clinical risk factors and biochemical assessments when predicting the risk of ISR. A larger study should be undertaken to confirm the impact of PON1 Q192R, CYP2C19*2 and CYP3A5*3.

CATEGORY: DOCTORS' ABSTRACT　　　　　　　　　　**AD01**

A prospective observational audit on the intraoperative use of laryngeal mask airways

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INTRODUCTION Laryngeal mask airways (LMAs) have traditionally been used for short duration surgery under general anaesthesia (GA) with good results. Its use with positive pressure ventilation (PPV) has also been reported.

However, there is under reporting of the complications arising during PPV with LMAs as well as the risk factors associated with such complications in adult patients.

METHODS All patients undergoing surgery under GA with LMA in the major operating theatre (OT) at Khoo Teck Puat Hospital from November 2011 to December 2011 were enrolled for a prospective audit. The anaesthetist in charge of these surgeries indicated intraoperative events and outcomes using an ethics board-approved data collection form.

RESULTS 310 patients underwent GA with LMAs during the audit period. LMA ProSeal™ was used for 84% of patients. LMA Supreme™ was favoured for lateral position surgery. Sevoflurane was preferred to desflurane for maintenance of GA. 84% of patients were ventilated using PPV. Problems with insertion were encountered in 7% of patients, who required additional insertion attempts. 23 patients had one or more of the following problems – laryngospasm, bronchospasm, coughing, desaturation and difficulty with ventilation. Intraoperative problems were managed appropriately and did not result in significant morbidity. The presence of problems was not found to be associated with the type of LMA used, anaesthetic gas or ventilation mode. All LMAs were removed uneventfully, and all patients were stable postoperatively.

CONCLUSION LMA use in our major OT is generally safe so long as potential problems are recognised and managed appropriately. Continuous audits with larger sample sizes are required to identify the risk factors for problems associated with the use of LMAs in surgery.

CATEGORY: DOCTORS' ABSTRACT   AD02

Dexmedetomidine sedation for the management of delirium tremens in patients with acute alcoholic pancreatitis

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Acute alcoholic pancreatitis can rapidly progress from epigastric discomfort to multiorgan failure requiring critical care admission. Patient mortality is high (range 2%–8%), and increases further if there is acute alcohol withdrawal that culminates in delirium tremens. Providing optimal sedation for prolonged ventilation is difficult in such patients. We report the successful use of dexmedetomidine, an α-2 adrenergic agonist, for sedation, managing alcohol withdrawal and controlling delirium tremens. A 64-year-old obese Indian man, with a history of obstructive sleep apnoea, type 2 diabetes mellitus, hypertension, and ischaemic heart disease presented with abdominal pain. A diagnosis of acute alcoholic pancreatitis was made after radiological and laboratory investigations. He rapidly progressed to multiorgan failure with acute lung injury and delirium tremens requiring cardiorespiratory support. The patient was sedated with benzodiazepine, propofol and fentanyl, but became haemodynamically unstable and required increasing inotropic support. Although sedation appeared adequate, delirium tremens control was suboptimal, as was exhibited by agitation, hallucination and a hypersympathetic drive. Subsequent weaning from the ventilator proved difficult. Other sedative agents were stopped and a trial dexmedetomidine infusion (0.7 µg/kg/minute) was administered for two days, which was subsequently reduced to 0.2 µg/kg/minute. The patient was successfully extubated two days later. Low-dose dexmedetomidine allowed for haemodynamic and respiratory stability in the context of a cooperative and spontaneously breathing patient. Extubation was possible without requiring further respiratory intervention. Dexmedetomidine may be useful in sedation for critically ill patients with acute alcoholic pancreatitis and delirium tremens. Further scientific research is desirable for its generic use.

Ongoing SICU database established for prospective data collection

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INTRODUCTION Khoo Teck Puat Hospital is a 500-bed tertiary care hospital in northern Singapore, with a rapidly changing and dynamic surgical intensive care unit (SICU) that has 14 beds (high dependency, n = 6, SICU; 8).

METHODS A Domain Specific Review Board (DSRB)-registered database is being maintained in the main ICU to prospectively record the number of patients admitted to the SICU as well as pertinent clinical details of each patient, with data being available for six months currently.

RESULTS From November 2011 till April 2012, the mean admission rates per month were 114 patients, with 70% of patients being admitted to the high dependency unit. The mortality rate was 6.25%, with average length of stay being 2.3 days. The most common causes of admission were post-operative care (25%), sepsis (20%), head bleeds (15%), trauma (15%), bleeding from the gastrointestinal tract (BGIT; 10%), cardiovascular complications/myocardial infarction (CVS/MI; 10%) and airway (5%). Patients were admitted from the operation theatre (50%), emergency (20%) and wards (30%). The rate of shock/sepsis was 19%. 27% of patients were ventilated and 105 patients required vasopressors. The commonest infectious organisms were Gram-negative rods, and antibiotics were used in 55% of patients, with augmentin being used the most. The Acute Physiology and Chronic Health Evaluation II (APACHE II) score was > 20 in 25% of patients. Methicillin-resistant *Staphylococcus aureus* (MRSA) infection rates was 19/1,000 patient days in 2011 and the average rate of ventilator-associated pneumonia was 2/1,000 patient days.

CONCLUSION Continued recording of data on SICU admissions might provide administrative and clinical insights into the SICU patient population and can be used as a basis for future research.

Cerebellar strokes – a clinical outcome review of 79 patients

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INTRODUCTION Cerebellar infarcts and haemorrhages are relatively uncommon, accounting for less than 10% of all strokes. The objective of this study was to: (i) review and quantify the outcome of patients with cerebellar strokes; (ii) compare the differences in outcomes between patients with cerebellar infarcts and haemorrhages; and, (iii) identify risk factors that predict worse outcome for patients with cerebellar strokes.

METHODS We retrospectively reviewed consecutive patients admitted within one week of cerebellar stroke onset to our hospital between 2004 and 2006. Baseline data collected included demographics, concomitant comorbidities, and the presence of brainstem compression and hydrocephalus on neuro-imaging. The Glasgow Outcome Scale (GOS) and modified Rankin Score (mRS) were used to assess outcome at discharge and six months after discharge. Poor outcome was defined as death, vegetative state or severe disability.

RESULTS 79 patients were admitted during the study period with pure cerebellar stroke. Patients with cerebellar haemorrhages were more likely to have poor outcomes compared to patients with cerebellar infarcts, both at discharge (odds ratio [OR] 4.3, 95% confidence interval [95%CI] 1.30–14.1) and six months after discharge (OR 5.2, 95%CI 1.56–17.2). Lesions > 20 cm^3 were significantly associated with poor outcomes (OR 9.6, 95%CI 2.5–36.8; p = 0.001), development of hydrocephalus (OR 7.8, 95%CI 2.0–29.9; p = 0.003) and brainstem compression (OR 35.5, 95%CI 4.0–316.1; p = 0.001).

CONCLUSION Patients with cerebellar haemorrhages have poorer outcomes compared to patients with cerebellar infarcts. Patients with lesions > 20 cm^3 are more likely to have poor outcomes and develop complications, such as hydrocephalus and brainstem compression.

CATEGORY: DOCTORS' ABSTRACT

AD05

Percutaneous pedicle screw fixation for thoracolumbar burst fracture – a local experience

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INTRODUCTION To evaluate the clinical and radiological outcomes, safety and efficacy of percutaneous pedicle screw fixation (PPSF) for the treatment of thoracolumbar burst fractures in a local population.

METHODS A retrospective review was conducted of patients with thoracolumbar burst fractures treated with PPSF in a single hospital from 2010 to 2011. Baseline data included patient demographics, mode of injury, fracture level, neurological status and the number of percutaneous screws inserted. Variables such as kyphotic angle correction, vertebral body height restoration and mid-sagittal canal diameter improvement were used to assess radiological outcome. Parameters used to assess safety and clinical outcome included screw misplacement, operative complications, functional improvement (ASIA motor score) and pain scores on Visual Analogue Scale.

RESULTS 21 patients with 25 thoracolumbar burst fractures (AO type A3) were treated at our unit with 134 percutaneous screws. There was significant improvement in kyphotic angle correction (mean difference 6.1°, p = 0.006), restoration of anterior (mean difference 19.7%, p < 0.01) and posterior (mean difference 6.6%, p = 0.007) vertebral heights and mid-sagittal canal diameter (mean difference 15.6%, p = 0.007) on discharge. The improvement remained statistically significant six months after surgery. Seven (5.9%) screws were misplaced with no neurological sequelae. Two patients had pedicle screw pull-outs due to osteoporosis.

CONCLUSION In this first local review, we show that PPSF is a relatively safe and effective technique for the selective treatment of thoracolumbar burst fractures with satisfactory results. However, the long-term outcome and efficacy of its use need to be further evaluated.

CATEGORY: DOCTORS' ABSTRACT

AD06

The management of ruptured intracranial aneurysms: outcome review of surgical clipping versus endovascular coiling in a Singapore tertiary institution

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INTRODUCTION Results of the International Subarachnoid Aneurysm Trial (ISAT) have significantly influenced the management of ruptured intracranial aneurysms since its publication in 2002. In accordance with ISAT, we aimed to look at: (i) the outcomes of patients admitted for subarachnoid haemorrhage (SAH) secondary to ruptured aneurysms; and, (ii) to compare the outcomes of aneurysms graded World Federation of Neurosurgical Society (WFNS) grades 1, 2 and 3 based on management by either surgical clipping or endovascular coiling at our local institution.

METHODS A retrospective review was performed of patients admitted to our institution for SAH secondary to ruptured intracranial aneurysm from 2005 to 2009. Data collected included demographics, underlying comorbidities, Fisher grading based on computed tomography brain scans and Glasgow Outcome Scores (GOS).

RESULTS 56 patients had grade 1–3 aneurysms based on the WFNS SAH grading scale and had confirmed aneurysms on either computed tomography angiogram or digital subtraction angiogram. Retrospective analyses of our data showed that patients who underwent surgical clipping were 1.5 times more likely to have poor outcomes (p = 0.61) and 1.8 times more likely to require ventriculoperitoneal shunts at the end of six months (p = 0.38). A significant positive association was also found between Fisher grades and the likelihood of developing hydrocephalus.

CONCLUSION Patients with SAH undergoing surgical clipping have poorer outcomes compared to those managed by endovascular coiling. Endovascular coiling should be considered as the first-line option for ruptured intracranial aneurysms. However, in situations where the aneurysm is unsuitable for coiling, surgical clipping remains an effective and viable option.

CATEGORY: DOCTORS' ABSTRACT   AD07

The Andon Board: developing a touch screen sensitive device to facilitate a paperless inpatient workflow

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INTRODUCTION The proliferation of electronic medical records (EMRs) has altered the workflow of clinical staff in inpatient wards. By obviating the need for paper forms and result printouts, EMRs have allowed doctors to directly order tests and review laboratory and radiological results with greater speed. However, one problem that has arisen is that nurses have been cut out of this new informational workflow, and have reduced awareness about the tests that a patient is scheduled for and when the patient's latest results have been published. To address this shortcoming, a touch screen device called the Andon Board, which displayed a summary of pending tasks for each patient and also informed nurses of new results, was implemented in 15 inpatient wards. A survey of nurses was conducted to evaluate the response of users.

METHODS 106 nurses were surveyed to evaluate their satisfaction and perceptions regarding the use of the Andon Board.

RESULTS The overall satisfaction of nurses using the Andon Board was 3.6 on a scale of 5, where 5 was maximum satisfaction.

CONCLUSION Nurses were generally satisfied with using the board. They also felt that the initiative enhanced their efficiency and allowed them to care better for patients.

CATEGORY: DOCTORS' ABSTRACT   AD08

A retrospective review of 9,178 elective surgery patients at Khoo Teck Puat Hospital in 2011

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INTRODUCTION Preoperative evaluation clinics were introduced in Singapore in the 2000s. Assessments led by anaesthesiologists risk stratified, medically optimised and counselled patients before elective operations. However, pertinent local demographic and health status data is unavailable.

METHODS We retrospectively studied all patients who underwent preoperative evaluation prior to elective surgery at Khoo Teck Puat Hospital from January 2011 to December 2011. Data on demographics, operation type and clinical correlates were retrieved from a computerised database, and descriptive analysis performed using the Statistical Package for the Social Sciences.

RESULTS 9,178 patients were found to have undergone preoperative evaluation prior to elective surgery, with 60% men and 40% women in the group. The mean age of patients was 48 ± 21 years. Elderly patients constituted 27% of the study population. 40% of patients had body mass index (BMI) > 25 kg/m^2; BMI was > 40 kg/m^2 in 1% of the study population. Hypertension (33%) was the commonest coexisting disease, with uncontrolled hypertension being seen in 1% of the patients (mean systolic blood pressure, 164 ± 18 mmHg; mean diastolic blood pressure, 90 ± 14 mmHg). Other histories present at the time of assessment included diabetes mellitus (14%), asthma (7%), stroke (3%) and smoking (22%). Patients elected for surgery most frequently for ophthalmology (25%), general surgery (23%) and dental surgery (18%) related procedures. 14% of the total cohort of elective surgeries were constituted by high-risk patients (American Society of Anesthesiologists [ASA] physical status III and IV). Perioperative pain relief was provided during surgery using general anaesthesia (60%), regional anaesthesia (11%), combined general and regional anaesthesia (4%), and monitored anaesthesia care (25%).

CONCLUSION Hypertension and smoking were the most prevalent concerns in our preoperative evaluation clinic. One in seven patients posed challenges for anaesthesia and the same proportion of surgical patients had ASA physical status of III or above.

CATEGORY: DOCTORS' ABSTRACT   AD09

Intraoperative assessment of sentinel lymph node in breast cancer using frozen sectioning with haematoxylin and eosin staining – good enough in 2012?

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INTRODUCTION Sentinel lymph node biopsy (SLNB) is the standard of care in breast cancer staging and varied intra-operative assessments tools are available for these nodes. The aim of this study was to compare the various tools available with frozen sectioning and to determine if haematoxylin and eosin staining could replace immunohistochemistry in the assessment of sentinel lymph nodes (SLNs).

METHODS This was a prospective study done between April 2010 and April 2012 that used conventional haematoxylin and eosin staining for the frozen sections and immunohisto-chemistry to evaluate the nodes later. The frozen sections were evaluated by three pathologists.

RESULTS 56 patients had successful SLNB over the study period. Dual localisation (via isotope and blue dye) was used for 34 patients while the blue dye alone was used in 22 patients. 138 SLNs were assessed, with 95 SLNs being localised using the dual method and 43 using the blue dye alone. Of the 95 SLNs harvested by dual localisation, immunohistochemistry was used to assess 95 SLNs and frozen sectioning done for 89. Only one false negative result was seen with frozen sectioning. The mean time taken for reporting on frozen sections was 35 (range 15–75) minutes.

CONCLUSION Frozen sectioning is not only accurate in predicting SLN status but also does not cause delay in completing the operative procedure. Frozen sectioning prevented a second surgery in all but one patient. We suggest that immunohisto-chemistry be used selectively for the intraoperative assessment of SLNs in breast cancer rather than routinely, as is the current practice.

CATEGORY: DOCTORS' ABSTRACT   AD10

Gallbladder perforations successfully managed without emergency cholecystectomy

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INTRODUCTION Gallbladder perforation is a rare complication of acute cholecystitis. With high mortality and morbidity being associated with the lesions, prompt surgical intervention is the standard of care for perforated gallbladders. We reviewed our experience of gallbladder perforations successfully managed without emergency cholecystectomy.

METHODS 14 consecutive patients were diagnosed with gallbladder perforation on radiological or intraoperative findings from July 2010 to December 2011. The mean follow-up period was 3.5 months. Data analysed retrospectively included patient demographics, clinical presentation, radiological findings, operative data, length of hospital stay, and morbidity and mortality rates. Gallbladder perforations were divided into three types using the Neimeier's classification system.

RESULTS 11 men and three women, with a mean age of 67 years, had gallbladder perforation. The commonest presenting symptoms were abdominal pain and fever, and the mean length of hospital stay was 15 days. A majority of patients had elevated white blood cell counts (92%) and deranged liver function tests (69%). Nine patients required emergency cholecystectomy, with a postoperative morbidity rate of 11% and no mortality reported. The four remaining patients were managed without emergency cholecystectomy and all received intravenous antibiotics; two patients underwent elective cholecystectomy at a later date – one patient had a percutaneous cholecystostomy and one patient underwent endoscopic retrograde cholangiopancrea-tography for a common bile duct stone retrieval. These four patients had type 2 perforations, with no morbidity or mortality from conservative treatment.

CONCLUSION Early diagnosis, recognition and emergency surgical intervention are of crucial importance in the treatment of perforations of the gallbladder. There may, however, be a select group of patients with gallbladder perforations who can be treated successfully without emergency cholecystectomy.

Contribution of nursing home patients to the overall methicillin-resistant *Staphylococcus aureus* burden in a medium-sized acute care hospital in Singapore

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INTRODUCTION Methicillin-resistant *Staphylococcus aureus* (MRSA) remains prevalent in acute care hospitals despite efforts to control its transmission. We examined the contribution of nursing home patients to the MRSA burden in our institution.

METHODS Since June 28, 2010, our institution has implemented a policy of universal MRSA screening for all hospital admissions, where three-site nasal, axillary and groin (NAG) swabs are obtained and processed as one specimen for each patient. ChromAgar cultures were used during the first year of screening, which was subsequently replaced by batch processing of weekday specimens using molecular detection techniques and ChromAgar culturing for specimens obtained on the weekends.

RESULTS There were 26,169 admissions from January 1, 2011 to December 31, 2011. MRSA screening was done for 24,253 admissions, of which 1,594 (6.6%) admissions screened positive for MRSA. Among these MRSA-positive patients, 358 (22.5%) admissions were from nursing homes. In a cross-section surveillance of MRSA on admission between September 2010 and October 2010, 24 out of 63 (38%) nursing home residents requiring admission were found to be positive for MRSA colonisation compared to 37 of 992 (3.7%) patients from the community (odds ratio 15.88, 95% confidence interval 8.67–29.10; p < 0.001).

CONCLUSION Results showed that, on admission to an acute care hospital, a high proportion of nursing home residents were colonised with MRSA. Although much attention and effort has been focused on controlling and reducing MRSA in acute care facilities, our results emphasise the need for similar efforts in intermediate- and long-term care (ILTC) facilities.

Patient-controlled femoral nerve block for postoperative analgesia in total knee replacement: a retrospective audit

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INTRODUCTION Adequate analgesia after total knee replacement (TKR) is important for early rehabilitation and recovery. Various modes of analgesia include systemic parenteral and oral analgesia, epidural analgesia and continuous femoral nerve blocks (FNBs). The use of continuous FNB has been established to improve pain scores and knee function. Patient-controlled analgesia is associated with improved patient satisfaction, reduced total drug consumption and, consequently, reduced potential adverse effects. Some studies examining the use of patient-controlled FNB have shown promising overall results. We reviewed the results of patient-controlled FNB for postoperative analgesia in patients requiring TKR at our hospital.

METHODS 18 patients undergoing TKR in the major operation theatre at Khoo Teck Puat Hospital from February 2012 to April 2012 received patient-controlled FNB for postoperative analgesia. Perineural infusion with patient-controlled bolus supplementation was provided using the CADD®-Solis infusion pump. The anaesthetic charts, pain management records and

physiotherapists' records of these patients were reviewed retrospectively.

RESULTS Successful nerve blockade was achieved in all 18 patients. The most common regime used was 0.1% ropivacaine infusion (5 mL/hour), 10 mL of bolus dose and a lockout period of two hours. Pain control was adequate, with more than ten patients having resting pain scores of zero in the first two days. Pain scores on movement ranged from 3–6. Apart from the five patients who had nausea and vomiting, there were no serious adverse effects in the group. Expected rehabilitation was achieved in all patients, who were either satisfied or very satisfied with the results.

CONCLUSION The use of patient-controlled FNB is potentially an efficacious and safe technique for postoperative analgesia in patients undergoing TKR. However, further retrospective audits or prospective trials would be required to gather more conclusive evidence of its superiority over other analgesic techniques for these surgeries.

CATEGORY: DOCTORS' ABSTRACT   **AD13**

What makes a faculty member a role model for trainees?

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INTRODUCTION Role models are important for trainees in their formative years. Faculty members have a challenging time balancing their time and energy between their service commitments and addressing the needs of trainees. We attempted to identify characteristics of faculty members that determined their selection as role models by trainees.

METHODS All junior staff, ranked registrar and below, in the Department of Anaesthesiology at Khoo Teck Puat Hospital were asked to anonymously nominate up to three seniors as role models. Data was also collected from senior staff by way of a questionnaire.

RESULTS Nine out of 18 faculty members received at least one vote from junior doctors, who listed teaching, approachability and providing feedback as the common reasons for choosing a role model. In our small sample of 18 faculty members, variables such as age, gender, academic rank, and the number of degrees or awards were not relevant to trainees when making this choice. Interestingly, faculty voted as role models by junior doctors tended to rate themselves lower when self-rating for being a role model in comparison to those who were not voted thus (Pearson correlation 0.023). When teaching methods were evaluated by logistic regression analysis for student appeal, direct teaching methods that addressed the needs of the learner rather than a generic approach or one that tackled psychosocial aspects appeared to be judged as more effective for trainee education.

CONCLUSION Role models tend to rank themselves lower than faculty members not chosen by trainees as role models. Directing teaching efforts toward the needs of the learner is the most effective method of teaching.

CATEGORY: DOCTORS' ABSTRACT   **AD14**

Glycaemic control after sleeve gastrectomy in morbidly obese patients with diabetes mellitus: an Asian experience

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INTRODUCTION Glycaemic control following sleeve gastrectomy has been advocated as a major advantage of performing bariatric surgery in morbidly obese patients with diabetes mellitus (DM). We retrospectively reviewed the resolution of DM in patients who underwent sleeve gastrectomy at our hospital.

METHODS This was a retrospective review of 57 consecutive patients undergoing sleeve gastrectomies from June 2006 to September 2011. Only 12 patients had pre-existing DM confirmed by the oral glucose tolerance test (fasting $\geq$ 7.0 mmol/L, at 120 minutes $\geq$ 11.1 mmol/L, or glycated haemoglobin-A1c [HbA1c] > 6.0%). DM was considered to have resolved if the patient had random glucose $\leq$ 5.6 mmol/L or HbA1c < 6.0%, or if glycaemic control was achieved without the use of oral hypoglycaemic agents.

RESULTS Using these criteria, eight patients showed resolution of DM following surgery. Two patients were lost to follow up, one patient had borderline results three months after surgery and one patient achieved glycaemic control through diet before surgery. The median time to resolution of DM was 301 (range 71–743) days, and 66.7% resolution was seen in these patients following sleeve gastrectomy. Six of seven (85.7%) patients were not on oral hypoglycaemic agents.

CONCLUSION Our results suggest that sleeve gastrectomy is effective in correcting obesity-related DM in the short term, which is consistent with current international data for metabolic outcomes following the surgery. Longer followups are, however, necessary to determine if the procedure confers enduring normoglycaemia without medications.

CATEGORY: DOCTORS' ABSTRACT   AD15

Complications of laparoscopic adjustable gastric banding: ten-year experience

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INTRODUCTION Laparoscopic adjustable gastric banding (LAGB) is associated with a unique set of complications. During 2001–2011, we performed 371 LAGBs for morbidly obese patients in Singapore. We describe the management of complications arising from this surgery.

METHODS Patient data was prospectively collected and the patients followed up at the weight management clinic at Khoo Teck Puat Hospital. Patients who were lost to follow up were actively contacted by telephone and electronic means. Operative data was collated from operative notes and interviews with surgeons.

RESULTS 26.0% of patients who underwent LAGB developed complications, which included dilated oesophagus (27.6%), band prolapse (22.4%), tubing/port-related problems (22.4%), band erosion (19.4%), infectious complications related to the band/port (11.2%), band leak (9.2%) and gastric leak (2.0%). There were two (0.5%) mortalities. 31 (31.6%) patients needed a second operation for related complications, which included Roux-en-Y gastric bypasses (n = 3), laparoscopic sleeve gastrectomies (n = 5), laparoscopic biliary-pancreatic diversion (n = 1) and other minor procedures (n = 22) such as band removal, new band insertion, suturing of band, change of port and trimming of lap band tubing. Overall, 51% of patients who underwent LAGB had a band in place on long-term follow up (including reinserted bands).

CONCLUSION LAGB is associated with complications that require subspecialty management to ensure minimal long-term sequelae and continued weight loss. This would ensure that patients achieve their intended weight loss outcomes despite complications during the initial surgery.

Glycaemic control after gastric bypass surgery in morbidly obese patients with diabetes mellitus: an Asian experience

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INTRODUCTION Glycaemic control following gastric bypass surgery is advocated as a major advantage for performing bariatric surgery in morbidly obese patients with diabetes mellitus (DM). We retrospectively reviewed the resolution of DM in patients undergoing gastric bypass surgery at our centre.

METHODS This was a retrospective review of 22 consecutive patients undergoing Roux-en-Y gastric bypass between August 2008 and July 2011. 14 patients had pre-existing DM that was confirmed using the oral glucose tolerance test (fasting $\geq$ 7.0 mmol/L, at 120 minutes $\geq$ 11.1 mmol/L, or glycated haemoglobin-A1c [HbA1c] > 6.0%). DM was considered to have resolved if the patient had random glucose levels $\leq$ 5.6 mmol/L or HbA1c < 6.0%, or if glycaemic control was achieved without the use of oral hypoglycaemic agents.

RESULTS Using the above criteria, resolution of DM following surgery was seen in six patients. Two patients achieved glycaemic control through diet prior to surgery. The median time to resolution of DM was 110 (range 35–332) days, with resolution following gastric bypass being seen in 50.0% (6/12) of patients. Although two of six (33.3%) patients used oral hypoglycaemic agents at least once after bypass surgery, all six patients were off all oral hypoglycaemic agents within one year of surgery.

CONCLUSION Results show that gastric bypass is effective for correcting obesity-related DM in the short term, consistent with current international data for metabolic outcomes following such surgeries. Nevertheless, studies with longer follow ups are necessary to determine if the procedure would confer enduring normoglycaemia without medications.

An electronic Andon Board solution to improve nursing care

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INTRODUCTION Extensive use of electronic medical records (EMRs) has obviated the need for paper forms and result printouts in hospitals. Although EMRs have allowed doctors to directly order and review tests with greater speed, nurses, who have been left out of this new informational workflow, have reduced awareness about what tests a patient is due for and when the patient's latest results are returned. To address this problem, an Andon Board – a software application integrated into our hospital's EMR – was implemented, which runs on touch screen computers placed in the wards and displays a summary of orders, results and pending tasks for each patient. We describe here the designing of the Andon Board and its impact on nurses as gathered from a survey of board users.

METHOD 106 nurses using the Andon Board were surveyed to determine its impact on users.

RESULTS System usage statistics revealed that the Andon Board improved work efficiency by eliminating over a thousand phone calls between nurses and radiology staff in the first two months of implementation. The top benefit cited by many survey respondents was that the system had improved their awareness of important orders and results. Overall, the satisfaction reported by nurses using the board was good, achieving scores of 3.6 out of 5, where 5 stood for maximum satisfaction.

CONCLUSION Andon Boards, when integrated with a hospital's EMR, can enhance nursing efficiency and improve care quality.

CATEGORY: DOCTORS' ABSTRACT   **AD18**

Phlebotomy computer on wheels: developing a trolley for streamlined blood collection

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INTRODUCTION With the implementation of electronic medical records (EMRs) in the inpatient wards, the ordering of blood tests by doctors is now paperless. However, this change has necessitated the design of a closed loop, end-to-end workflow for the collection, correct labelling and dispatch of blood specimen tubes.

METHODS We developed a specialised trolley called the phlebotomy computer on wheels (COW) to centralise the different tasks of assembling blood tubes, verifying the ordered tests on the EMR and printing the correct patient labels. The phlebotomy COW consists of a trolley, with an attached laptop and a dedicated label printer.

RESULTS The phlebotomy COW has been deployed in all 17 inpatient wards at Khoo Teck Puat Hospital since its opening in 2010. The process of collecting blood is now less time consuming.

CONCLUSION The use of the phlebotomy COW has streamlined the process of blood collection for phlebotomists and doctors, by providing a mobile one-stop centre for verifying, collecting and dispatching blood samples. This initiative has not only made blood collection more efficient but also afforded the hospital savings in manpower costs.

CATEGORY: DOCTORS' ABSTRACT   **AD19**

Vascular iodine distribution maps, a novel application of dual-energy computed tomography – how useful are they in detecting pulmonary embolism?

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INTRODUCTION This study aimed to evaluate the usefulness of wedge-shaped perfusion defects (WPDs) in dual-energy computed tomography (CT) imaging vascular iodine distribution (VID) maps that are used in the detection of pulmonary embolism (PE).

METHODS 150 consecutive patients who underwent CT pulmonary angiograms (CTPAs) since December 2010 were included in the study. Patients were scanned using Siemens dual-energy CT, with two tubes operating at 100/140 kVp. Reconstruction was done using 1 mm for angiographic images and 1.5 mm for VID maps of the lung parenchyma. VID maps were obtained using the perfused blood volume (PBV) application on the Siemens workstation.

RESULTS Of these 150 patients, 43 had PE with classical WPDs. PE was detected in 26 patients by CTPA alone, and in 17 patients by VID maps along with a review of CTPA images. Most of these 17 patients had subsegmental thrombi and many had underlying lung pathology. The sensitivities, specificities, positive predictive values (PPVs) and negative predictive values (NPVs) of using CTPA alone (sensitivity: 60.5%; specificity: 96.2%; PPV: 86.7%; NPV: 85.8%) and of using VID maps with CTPA (sensitivity: 91.5%; specificity: 95.1%; PPV: 89.6%; NPV: 96.1%) showed that the detection of PE was much improved when using VID maps along with CTPA. The average radiation dose as per the computed tomography dose index (CTDI) for patients was 6.49 mGy when compared to 7 mGy from single-energy thoracic CT using the same machine.

CONCLUSION We found that characteristic WPDs described in VID maps correlated well with PE. The detection of PE was significantly improved when VID maps were used in combination with CTPA.

Are patients being subjected to long fasting times – an audit

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INTRODUCTION Anaesthesia-related aspiration events are life threatening and preoperative fasting guidelines aim to reduce this risk. However, recent literature has tended to move away from the 'fast from midnight' approach to a more liberal fasting regime, as extended hours of fasting times have been associated with poorer postoperative outcomes. Current American Society of Anesthesiologists (ASA) guidelines recommend fasting of six hours for solids and two hours for clear fluids. We sought to investigate the average fasting times of our perioperative patients in both elective and emergency settings.

METHODS An audit form was created and distributed to the reception desks of the major operating theatre and nurses were enrolled to help complete the forms. After two pilot runs, all patients who underwent surgery over the duration of one week between March 26, 2012 and April 1, 2012 were recruited for the study. All elective and emergency surgeries requiring general or regional anaesthesia were included.

RESULTS 53 patients for elective surgeries and 51 patients for emergency operations were surveyed. For elective surgeries, the fasting time for solids was 13 hours 57 minutes ± 3 hours 1 minute while that for liquids was 11 hours 20 minutes ± 4 hours 56 minutes. For emergency surgeries, the fasting time for solids was 15 hours 21 minutes ± 11 hours 11 minutes while that for liquids was 11 hours 58 minutes ± 5 hours 52 minutes. A majority (61%) of patients were unaware of why they needed to fast. Only 48 (46%) patients complained during fasting, with hunger and thirst being the most common complaints (52%). Overall satisfaction levels remained high among the patients (93.3%).

CONCLUSION Results reveal that our patients underwent preoperative fasting for a longer time period than is currently recommended. A multidisciplinary approach is therefore needed to align our fasting policy to international guidelines.

Minimally invasive McKeown oesophagectomy in a prone position – a case series

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Since its introduction in the last decade, minimally invasive oesophagectomy (MIO) has become a safe and feasible alternative to the open approach, even surpassing the latter in terms of mortality, morbidity and lymphadenectomy in select clinical trials. We describe four patients who underwent minimally invasive McKeown oesophagectomy at Khoo Teck Puat Hospital, with particular emphasis on operation time, blood loss, return to feeding and length of hospital stay. We also elaborate on our surgical technique, and the innovations and pitfalls encountered during our practice. The mean values for key parameters were as follows: operation time (777 minutes), blood loss (1.475 g), length of stay in the intensive care unit (3.5 days), return to feeding (5.5 days) and duration of hospital stay (11 days). The mean American Society of Anesthesiologists (ASA) score was II for our patients, in spite of including patients with histories of chronic obstructive pulmonary disease and significant smoking. This series suggests that MIO holds much promise as a viable surgical option for oesophagectomy.

Management of bacteraemia at Khoo Teck Puat Hospital

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INTRODUCTION Bacteraemia is considered a medical emergency. It has been shown that best outcomes occur with appropriate antimicrobial therapy within the first few hours of such episodes. To ensure the best outcome, appropriate empirical therapy and prompt acknowledgement of reports followed by targeted therapy are needed. The aim of this audit was to evaluate the above three components at Khoo Teck Puat Hospital over a one-month period.

METHODS Patients with bacteraemia were investigated and managed based on the team physician's decision. A microbiologist reviewed the patients when culture and antimicrobial susceptibility results were made available, and again after 24 hours to record any change in therapy. The microbiologist intervened by discussing with the team to change therapy only if the patient remained on therapy proven ineffective by susceptibility results after 24 hours.

RESULTS 80 episodes of culture-proven bacteraemia were reviewed. Empirical therapy was not targeted for the expected organism(s) in 25 (31.6%) episodes. Unnecessary antibiotics were prescribed in 14 (17.5%) episodes while indicated antibiotics were inadvertently withheld in 14 (17.5%) episodes. The initial therapy was changed in 41 (51.3%) episodes. 26 opportunities for a de-escalation of antibiotics were observed. However, actual de-escalation occurred in only 33.3% of the above opportunities. Six bacteraemic patients remained on suboptimal therapy 24 hours after susceptibility results were made available.

CONCLUSION We found that a significant portion of antibiotic usage in patients with bacteraemia was in excess and not targeted, and this highlights the need for evidence-based guidelines for empirical and definitive therapy of common infections.

Universal screening for methicillin-resistant *Staphylococcus aureus* by molecular detection at Khoo Teck Puat Hospital

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INTRODUCTION Methicillin-resistant *Staphylococcus aureus* (MRSA) is known to cause hospital-acquired infections leading to increased costs per patient day. As part of a national initiative to reduce MRSA transmission, universal screening for MRSA was put in place at Khoo Teck Puat Hospital since its opening on June 28, 2010 for admission. As universal screening became a significant proportion of the workload, molecular detection was seen as a solution that could reduce both the manual labour required as well as the turnaround times involved in MRSA screening.

METHODS All patients admitted to the hospital were screened on admission during the study period as per hospital policy. Two swabs were collected – one from the patients' axilla and groin for culture as well as another from the patients' nasal vestibules for culture and molecular detection. Molecular detection was done using the Roche LightCycler MRSA Advanced Test, and swabs were collected using the Amies media swabs. Screening swabs were inoculated onto MRSAselect media.

RESULTS Using the nasal, axilla and groin swab screening culture as a reference method, the results of all three individual methods – axilla-groin swab culture, nasal swab culture and nasal swab molecular detection – were compared. The sensitivities of these screening methods were 63.1%, 68.4% and 63.1%, respectively. They had similar specificities – 100%, 100%, 98%, respectively – and similar numbers of false negative tests.

CONCLUSION The sensitivity of molecular detection was not superior to that of nasal screening culture, as seen in reports from overseas test centres. In its current iteration, the molecular test can only be recommended in outpatient settings.

Utilisation of workflow-optimised software tool in medical imaging: a comparison study between advanced medical image visualisation tools and the picture archiving and communication system

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INTRODUCTION To compare the duration of loading time and autoscroll time between advanced medical imaging visualisation tools and the standard picture archiving and communication system (PACS).

METHODS 100 patients who underwent computed tomography (CT) [CT brain, n = 20; CT thorax, n = 20; CT abdomen and pelvis, n = 20; triphasic CT liver, n = 20; CT urogram, n = 20] were analysed. The average times taken to load and to complete a single autoscroll cycle in a workflow-optimised software tool (SyngoVIA) and standard PACS were obtained and compared for statistical significance.

RESULTS Across all individual groups of patients undergoing CT, the workflow-optimised software tool was faster in time to load (range 65.0%–80.3%) and time to scroll (range 15.1%–54.9%) when compared to standard PACS (p < 0.05). The mean times to load for advanced medical imaging visualisation tools were also shorter than for PACS (brain scan 3.69 seconds vs. PACS 10.5 seconds, p < 0.05; thorax scan 10.65 seconds vs. PACS 42.20 seconds, p < 0.05; abdomen/pelvis scan 10.87 seconds vs. PACS 34.60 seconds, p < 0.05; triple-phase scan 16.98 seconds vs. PACS 86.20 seconds, p < 0.05; CT urogram 23.14 seconds vs. PACS 84.30 seconds, p < 0.05). The results of a comparison of the mean autoscroll times (at 8 fps for standard 3-mm slices) for advanced medical imaging visualisation tools and PACS were also similar (brain scan 7.13 seconds vs. PACS 13.00 seconds, p < 0.05; thorax scan 16.66 seconds vs. PACS 34.80 seconds, p < 0.05; abdomen/pelvis scan 24.56 seconds vs. PACS 28.90 seconds, p > 0.05; triple-phase scan 20.57 seconds vs. PACS 30.30 seconds, p < 0.05; CT urogram 19.20 seconds vs. PACS 42.60 seconds, p < 0.05).

CONCLUSION Advanced medical imaging visualisation tools increase workflow efficiency with faster viewing and reading times than PACS, and permit greater diagnostic accuracy.

Can breast sentinel node biopsy using intraoperative gamma probe be performed effectively within or less than 30 minutes after the radioisotope injection using gamma planar imaging as a predictive measure?

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INTRODUCTION Sentinel lymph node biopsy (SLNB) has been shown to be an effective technique for the management of early breast carcinoma that avoids unnecessary axillary lymph node dissection. Radioisotope tracer (Tc Sulfur colloid) and blue dye injections are accepted techniques for sentinel lymph node (SLN) localisation, with the radioisotope technique having a better detection rate when the blue dye technique is used alone. In this study, we aimed to determine the radioisotope transit patterns based on the time of first visualisation of SLN(s) on planar imaging as well as the optimal timing for SLN surgery.

METHODS 51 patients who underwent radioisotope lymphoscintigraphy at our institution from May 2011 to April 2012 were evaluated from a prospectively collected database.

The SLN detection rates were calculated at ten minutes, 30 minutes, one hour and two hours after the Tc99m colloid injection.

RESULTS SLNs were visualised in a majority of patients undergoing radioisotope lymphoscintigraphy in the first ten minutes (76.5%, 39/51) and 30 minutes (94.0%, 48/51). Two hours after isotope injection, SLN visualisation was noted in 96% (49/51) of patients; the technique failed to visualise SLNs in two patients at two hours.

CONCLUSION The optimal timing for SLN surgery for breast carcinoma should range between 30 minutes and two hours after radioisotope injection, when planar imaging is being used as a standard, as in current routine practice.

CATEGORY: DOCTORS' ABSTRACT   **AD26**

Transanal endoscopic microsurgery: an initial experience

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INTRODUCTION Transanal endoscopic microsurgery (TEM) is a modality employed for local resection of rectal and low sigmoid tumours. We report our experience with patients who underwent TEM at our hospital.

METHODS 19 consecutive patients underwent TEM between 2005 and 2011 at our hospital. Data collected included preoperative and postoperative histologies, operative duration, early and late complications, and surgical margins and survival duration of patients with malignancies.

RESULTS There were 12 women and seven men in the study group. All excised lesions were in the rectum, located 4–12 cm from the anal verge. The mean operative time was 210 minutes, and a cumulative sum (CUSUM) curve of operative times depicted consistent improvement. The average postoperative stay was 7.1 days. There were two major complications in the group – intraperitoneal perforation and secondary bleeding. There were three positive margins and two close margins. Five malignant lesions were excised, including gastrointestinal stromal tumour (GIST; n = 1), carcinoma in-situ (CIS; n = 1), T1 (n = 1) and T3 (n = 2) tumours. One patient with T3 tumour received adjuvant chemotherapy and is currently disease free at 33 months. There were two local recurrences, including in a patient in whom a T3 tumour had been excised with palliative intent and in another patient where an excised adenoma recurred as a CIS tumour.

CONCLUSION TEM is a safe procedure that achieves clear resection margins and low recurrence rates. TEM can also be used as a palliative measure in more advanced T-staged tumours in conjunction with adjuvant therapy. The steep learning curve associated with TEM, however, is a deterrence to its more widespread adoption.

CATEGORY: DOCTORS' ABSTRACT   **AD27**

Imaging features and percutaneous management of complex liver abscess with special focus on abscesses caused by *Klebsiella pneumoniae*

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INTRODUCTION To analyse the imaging features of liver abscesses and to describe the difficulties and outcomes of their percutaneous management.

METHODS A retrospective analysis was conducted of 47 patients with liver abscesses who received image-guided percutaneous management. Clinical presentation, imaging features and management methodology were reviewed for all patients. Outcome measures included changes in the size of the abscess on imaging and/or clinical improvement.

RESULTS 74% of abscesses (n = 35) were caused by *Klebsiella pneumoniae*, and there were 36% non-*K. pneumoniae* abscesses (n = 12). The mean size of abscesses was 7.5 (range 3–17) cm.

34 of 35 *K. pneumoniae* abscesses were complex, with solid areas, thick septae and multiple loculations. Only seven of 12 non-*K. pneumoniae* abscesses were multilocular. Eight patients with *K. pneumoniae* abscesses had thrombophlebitis of the portal venous branch of the hepatic vein. 33 patients underwent drainage alone (mean size, 8.3 cm) while 14 needed aspiration (mean size, 5.4 cm). 12 patients who underwent drainage needed additional procedures, such as upsizing of catheter, or adjustment or insertion of multiple drains, and seven patients among these had scanty fluid initially following the placement of the drainage catheter due to the solid nature of the abscess. Although technically successful, three patients who underwent aspiration eventually needed drainage. Clinical success was achieved in all patients and the 30-day mortality rate was zero.

CONCLUSION *K. pneumoniae* liver abscesses appear more often as solid or multiloculated liver abscesses and may be associated with thrombophlebitis. Complex liver abscesses can be effectively managed by percutaneous drainage using catheters. Aspiration may also be effective.

CATEGORY: DOCTORS' ABSTRACT   **AD28**

Is SPECT/CT breast lymphoscintigraphy using the volumetric technique useful for accurate scoring of sentinel node: a comparison with intraoperative gamma probe findings

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INTRODUCTION Current practice for breast lymphoscintigraphy for sentinel lymph node (SLN) detection using planar gamma camera imaging designates the first and hottest tracer localisations in the axilla as SLN(s) and terms the less intense tracer localisations as echelon nodes or second-level nodes. We aimed to assess the usefulness of the single photon emission computed tomography/ computed tomography (SPECT/CT)-based volumetric technique of SLN scoring, where the hottest node and all nodes with more than 10% tracer localisation of the hottest node are designated as SLNs, against that of the surgical standard of categorising SLNs using intraoperative gamma probes.

METHODS 23 patients who underwent SLN imaging at our hospital were recruited for the study. Data were collected and analysed prospectively.

RESULTS Both SPECT/CT and planar imaging detected SLNs in all 23 patients similar to intraoperative localisation. The blue dye staining technique failed to localise in five of 23 patients (failure rate 21.7%). Accurate scoring of SLNs (range 1–4) was possible using the SPECT/CT volumetric method in 12 of 23 patients. In the remaining 13 patients, underscoring by one node was seen in five patients and overscoring by one node noted in six patients.

CONCLUSION The SPECT/CT technique allows for accurate scoring of SLNs in breast lymphoscintigraphy.

| CATEGORY: DOCTORS' ABSTRACT | AD29 |

Percutaneous dilatational tracheostomy versus open surgical tracheostomy: an institutional experience

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INTRODUCTION Although tracheostomy is commonly performed for patients in intensive care units (ICUs), there is no consensus on the superiority of either percutaneous dilatational tracheostomy (PDT) or open surgical tracheostomy (ST). We aimed to compare the procedural length and short-term outcomes of PDT and ST in our hospital.

METHODS This was a retrospective review of intubated patients in two ICUs who underwent an elective tracheostomy from August 2010 to April 2012. 84 patients were studied (PDT, n = 17; ST, n = 67). A multidisciplinary team consisting of general surgeons and anaesthesiologists performed all PDT procedures.

RESULTS The most common indication for tracheostomy was prolonged intubation due to pneumonia. A statistically significant shorter median time was taken to perform PDT compared to ST (21.5 minutes vs. 45.0 minutes, p < 0.05). The time from creation of tracheostomy to weaning off mechanical ventilation was shorter in the PDT group (PDT 3 days vs. ST 8 days), which also saw fewer bleeding complications (PDT 5.88% vs. ST 7.46%). The difference in the number of bleeding complications between the two groups, however, was not statistically significant. There were also no significant differences in the rates of desaturation, infection, accidental decannulation or pneumothorax.

CONCLUSION PDT appears to be superior to ST with respect to procedural length but comparable in terms of patient outcomes. As PDT may be more cost effective in terms of utilisation of resources due to both shorter procedural lengths and a lesser need for operating theatre facilities, the approach should be considered as a viable alternative to ST.

| CATEGORY: DOCTORS' ABSTRACT | AD30 |

Breast disease – patient demographics and workload at KTPH over two years. Is a Breast Unit @ KTPH feasible?

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INTRODUCTION Cancer is the leading cause of death in Singapore, accounting for 28.5% mortalities, with breast cancer having the highest incidence (age standardised rate [ASR] 60.0/100,000 population per year). We aimed to ascertain the value of the breast unit at Khoo Teck Puat Hospital (KTPH), and discuss patient demographics and the workload of breast disease at our hospital since April 2010.

METHODS Demographics, workload and procedural data were collected from April 2010 to April 2012 using an information management system (AIMS).

RESULTS The number of patients with breast disease being seen at our hospital has steadily increased since 2010, when we relocated from Alexandra Hospital. Clinics were restructured into two categories – one-stop first visit clinics and routine review clinics. The average patient lead-time prior to seeing doctors was five days. 3,609 imaging procedures and 295 biopsies were performed at the hospital's Department of Diagnostic Radiology. 232 surgical procedures (benign tumours 124, malignant tumours 108) were related to breast disease.

CONCLUSION Services rendered to patients with breast disease at KTPH – a relatively new hospital – were comparable in volume and waiting time, with all complex investigations being available in-house. As all public-restructured hospitals in Singapore except KTPH have a specialised centre to treat breast disease, we suggest that the breast service at KTPH be taken forward too with a strong identity – 'Breast Unit @ KTPH' – so as to instil confidence in patients, the public and general practitioners alike in north Singapore. Breast services at KTPH would be comprehensive when oncology facilities are on track.

CATEGORY: DOCTORS' ABSTRACT   **AD31**

Introduction and implementation of a wound infection protocol reduces wound infection rates

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INTRODUCTION We hypothesised that the implementation of a multimodal wound infection protocol would reduce wound infections after colorectal resections.

METHODS Patients undergoing colorectal resections at the colorectal service from October 2010 to April 2012 were studied for wound infection rates. The outcome measure was wound infection, which was defined as purulent collection requiring drainage. Cumulative sum (CUSUM) scores were used to track the success or failure of consecutive patients. Factors that were adjusted in CUSUM calculations were high body mass index (BMI), laparoscopic surgery and emergency surgery.

RESULTS 86 consecutive patients were studied in total. A multimodal wound infection protocol was implemented for patients undergoing colorectal resections after 22 patients in the series (74.4%, n = 64). The wound infection rate, which was 40.9% (9/22 patients) prior to protocol implementation, decreased to 28% after implementation (18/64 patients). Among patients for whom the protocol was implemented, the wound infection rate was 22% (11/50 patients) with complete compliance to the protocol compared to 50% (7/14 patients) with non-compliance (p = 0.039). The CUSUM graph showed a trend towards lower infection rates after protocol implementation although episodes of non-compliance were also evident.

CONCLUSION The wound infection protocol effectively decreased wound infection rates after colorectal resections. However, it is necessary that complete compliance to the protocol be ensured at all times.

CATEGORY: NURSING ABSTRACT   **AN01**

Daily observation of cognitive functioning by geriatric-trained nurses in patients hospitalised in two acute geriatric wards

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INTRODUCTION The cognitive function of patients admitted in two acute geriatric units at Khoo Teck Puat Hospital is observed by nurses on a day-to-day basis. We report the findings of a survey of these geriatric nurses conducted to determine the reasons behind such practices and to explore nurses' understanding of the concept of cognitive functioning.

METHODS A survey was conducted and a questionnaire with open-ended questions administered to a sample of nurses working in these geriatric units. Data collected from the survey were analysed.

RESULTS The questionnaire was completed by 20 registered nurses. A categorisation of the many objectives reported by nurses as the reason for their daily observation of patients' cognitive functions revealed four recurrent themes: to tailor nursing interventions (51%), to determine discharge arrangements (46%), to support medical diagnosis and therapy (43%), and to map specific elements of functional capacity (34%). Only 73% of the domains earmarked by nurses as the many different domains to observe were actually cognitive domains. The most commonly mentioned cognitive domains were psychomotor behaviour (63%), executive function (48%), language (37%), attention (33%), thinking (25%) and consciousness (20%).

CONCLUSION Geriatric-trained nurses made daily observations of their patients' cognitive functions to not only support medical diagnoses but also guide nursing interventions and determine discharge arrangements. The assessment domains were found to vary fairly widely, as the nurses' understanding of the concept of cognitive functioning was vague, incomplete and often incorrect. As the content of any assessment is likely to be determined by its objective, we recommend that the objectives behind practices, such as daily observations or assessments of patients, be clearly and explicitly stated.

CATEGORY: NURSING ABSTRACT	AN02

Self-care management and risk factors of depressive symptoms among geriatric patients admitted in two geriatric units at Khoo Teck Puat Hospital, Singapore

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INTRODUCTION Depression in elderly people has become a serious healthcare issue worldwide, but studies on self-care strategies and risk factors of depressive symptoms in this population are limited. This study aimed to determine the self-care strategies and risk factors of depressive symptoms among patients in two geriatric units in our hospital.

METHODS A cross-sectional study design was used. Inclusion criteria included patients from two geriatric units who were aged ≥ 78 years old and without severe cognitive deficit (n = 20).

RESULTS A majority of participants (53%) were classified as depressed by the Geriatric Depression Scale (GDS). Most participants (93%) used self-care strategies to manage their depressive symptoms, with the most frequently used strategy being 'taking a walk/stroll'. Self-learning was the main information source for self-care strategies in this cohort. Analysis indicated that cognitive function, perceived health status and functional decline were significant predictors of depression among the participants.

CONCLUSION As older people tend to engage in activities and interact with others to manage their depressive symptoms, healthcare providers in the acute setting should consider the arrangement of sufficient activities and people-to-people contact for such patients. As the number of healthcare providers in geriatric units is limited, augmenting the knowledge of healthcare providers and patients about depression and self-care management strategies is recommended.

CATEGORY: NURSING ABSTRACT	AN03

Identifying factors affecting willingness to participate in clinical research trials at Khoo Teck Puat Hospital

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INTRODUCTION Patient recruitment is a significant factor that determines the success of clinical trials. Understanding factors that affect the willingness of patients from a local population to participate in clinical trials could provide the research team with insights on their views toward clinical research. It could also serve as a guideline for feasibility studies of future research trials. We report the results of a survey conducted to identify factors affecting patient willingness to participate in clinical research trials at Khoo Teck Puat Hospital (KTPH).

METHODS The study, which was conducted in the outpatient clinics at KTPH over a three-month period between October 2011 to January 2012, had a target sample size of 100 respondents. Simple random sampling was undertaken for patients and visitors. The survey used a Likert scale-based questionnaire (options were 'definitely not', 'probably not', 'not sure', 'probably yes' and 'definitely yes') to measure the willingness of respondents to participate in clinical research trials conducted at the hospital. 33 questions in the questionnaire were categorised into four domains: (i) patient demographics; (ii) patients' prior participation in clinical trial; (iii) types, aims and nature of the trial; and, (iv) perception of clinical trial.

RESULTS 61% of participants were willing to participate for the benefit of future generations. 63% of respondents were willing to participate in a trial if the principal investigator (PI) was their primary physician. Among respondents who indicated willingness to participate in trials, most were trial naive (50%) and only 13% had participated in trials earlier (p = 0.02).

CONCLUSION Respondents are more willing to participate in clinical research trials if the PI is their primary physician. We recommend that research coordinators approach patients under the care of physicians who are PIs for improved patient recruitment. Results also call attention to the need for improvement in public awareness of research trials.

Evolution of total knee replacement surgeries using continuous peripheral nerve block devices

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INTRODUCTION Effective pain management is the key to fast recovery and early rehabilitation in postoperative patients. In attempting to achieve safe and effective pain management, our strategies for analgesia have evolved over the years from intramuscular opioid injections to patient-controlled devices delivering intravenous opioids, then from nerve blocks to continuous nerve block catheter infusions, and now finally to the use nerve block infusions with patient-controlled options via the CADD®-Solis infusion pump. Studies have indicated that the use of nerve stimulators has caused unacceptably high rates of secondary block failure because the catheter tip was unknowingly misplaced during insertion. We present that, with advanced use of ultrasound guidance, this approach can provide reliable analgesia and decrease insertion-related discomfort and insertion time.

METHODS Since the year 2000, all patients undergoing total knee replacement (TKR) at our hospital have had peripheral catheters inserted under the guidance of ultrasonography, which is connected to a prefixed rate multirate drug device that was initially a bottle but has now been replaced by the CADD®-Solis infusion pump. The pump can deliver the drug continuously or as a patient-controlled analgesia (PCA) bolus. During a three-month trial between February 2012 to April 2012, 19 patients undergoing TKR received PCA boluses via the CADD®-Solis infusion pump for postoperative analgesia. Patient perceptions of the PCA device were reviewed retrospectively.

RESULTS 17 patients indicated that the pump was a personalised pain-controlling device due to its PCA function. Many patients considered the pump portable and good during movement. However, patients perceived no difference in pain management perhaps due to knowledge deficit.

CONCLUSION Ultrasonography is a safe choice for the insertion of peripheral catheters during TKR surgeries. When used with continuous peripheral catheters, it can reduce side effects due to opioid use and promote early ambulation, thus reducing the length of hospital stay of postoperative patients.

Revising ventilator-associated pneumonia bundle measures for preventing ventilator-associated pneumonia in the surgical intensive care unit

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INTRODUCTION There were three episodes of ventilator-associated pneumonia (VAP) in the surgical intensive care unit (SICU) at Khoo Teck Puat Hospital between October 2010 and April 2011. VAP bundle measures were consequently reviewed by comparisons with the literature and the common practices of other institutions. The results of our review are presented in terms of the number of VAPs reported.

METHODS Four measures in the VAP bundle were revised following review: (i) frequency of oral toilet was changed from three times daily to every four hours; (ii) deep vein thrombosis prophylactics were strictly applied for every patient on ventilation; (iii) use of above-cuff suction endotracheal tube was enforced; and, (iv) weekly VAP bundle compliance audits were scheduled by the ICU infection control team. All endotracheal tube sputum culture results were reviewed by the SICU team.

RESULTS No VAP episodes were reported during a 12-month period from May 2011 to May 2012 following the revision of the VAP bundle measures at the SICU.

CONCLUSION The revised four measures were effective in reducing or preventing VAP in the SICU.

CATEGORY: NURSING ABSTRACT   **AN06**

Differences in attitudes among staff nurses and supervisors towards incident reporting related to falls

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Electronic hospital occurrence reporting (EHOR), which was implemented in 2002, plays a significant role in identifying unsafe practices and lapses in hospital systems. Events that lead to corollary figures in EHOR are investigated and corrective actions taken, so that the pledge of hospital administrations to create a work environment conducive for the optimisation of the quality of care rendered to patients is realised through various policy implementations. However, many of these strategies form the basis of barriers to incident reporting, as 86% of hospital incidents remain unreported despite a legal requirement to do so, perhaps due to the possibility of unintended work-related stress. With hospital-related falls in mind, which accounts for 40% of hospital incidents reported in Australian hospitals, we aim to explore the difference in attitudes among staff nurses and supervisors to incident report writing related to hospital-acquired falls in Singapore and how these results could have a potential effect on the morale of nursing staff. A qualitative approach employing questionnaires will be used for the study. Differences in attitudes towards incident reporting related to falls could suggest the presence of an undesirable culture that translates to a widening gap between the goals of the hospital administration and those of staff nurses in spite of continuous efforts aimed at improving corrective preventive measures that can reduce the number of hospital-related falls. Results may assist in strategies that promote a more positive organisational culture as well as the morale of nurses, which would translate to improved quality of care in the long run.

CATEGORY: NURSING ABSTRACT   **AN07**

Reducing discharge lead-times from the ward

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INTRODUCTION Monthly patient satisfaction surveys (PSS) indicate that long waiting times for discharge from the ward remain a chronic yet highly pressing issue in the hospital environment. Waiting is a muda of no value add, and should therefore be eradicated. It is not uncommon to see patients waiting for a few hours before leaving the hospital even when declared as fit for discharge. Personnel involved in patient discharge unanimously agreed to work to reduce discharge lead-times from the wards to ensure patient value-add experiences.

METHODS A process map that depicted the inpatient discharge flow and also mapped the value stream was constructed. The time taken per stakeholder in the discharge process was captured. Ward B65, a 32-bed subsidised medical ward, was selected for the pilot study and, in total, 37 sample discharges from the ward were captured over the period of a week. Corrective measures were targeted at enhancing patient discharge by prioritising discharge medication and issuing medical certificates, if needed by the patient.

RESULTS A cause-and-effect analysis of the process map constructed found the root causes of delays to be: (i) the doctor being unaware of the time when the patient needed to go home; (ii) pharmacists being unaware of the presence of caregivers; (iii) pharmacists being unaware of the patient's time of discharge; and, (iv) performance of discharge activities on the day of discharge. The primary outcome was an increased number of discharges before 1400 hours. The secondary outcome was decreased pharmacy and discharge waiting times, as evidenced by the PSS reports. Phased implementation of the corrective measures was practised and the process improvements were finally rolled out in all wards. Intangible benefits were many for all stakeholders.

CONCLUSION The inpatient discharge process stream was streamlined and improved as a result of the measures instituted.

Compressed workweek for scrub scouts in the major operating theatres at Khoo Teck Puat Hospital

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INTRODUCTION Although they are eight operating rooms (ORs) in the major operating theatre at Khoo Teck Puat Hospital, the ORs are at times overrun until evenings, stretching both manpower and other resources. OR staff work overtime and stay back to support on such days.

METHODS All scrub and circulating nurses were asked whether they were willing to trial a compressed workweek of 84 hours for two weeks with three off days. Under the new arrangement, scrub and circulating nurses would be required to complete the housekeeping lists for ORs 1, 3, 5 and 7, and ORs 2, 4, 6 and 8, respectively. They would also attend the monthly departmental meeting and training sessions on Saturdays. The scheme would be terminated if scrubs scouts were unable to fulfil the above criteria.

RESULTS Although each OR had two scrub scouts – one from 8 am to 5 pm and another from 8 am to 6 pm – many staff were required to stay back with six ORs in the major operating theatre being overrun. Many scrub scouts, who were not used to longer working hours, expressed dissatisfaction over the new scheme, with only two scrub scouts viewing the scheme positively. Two scrub scouts opted out of the new scheme without trial. Scrub scouts were unable to complete the housekeeping lists of two ORs, and 13 scrub scouts did not turn up for the departmental meeting in April 2012.

CONCLUSION With six ORs in the major operating theatre running after 6 pm, it was difficult for scrub scouts looking for time to perform all OR housekeeping tasks. Results suggest that the compressed workweek may be ideal only for specialty nurses in the ORs.

Ambulance trolley board for faster, safer and hassle-free transportation of critically ill patients

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INTRODUCTION Over 20 patients have been transferred from Khoo Teck Puat Hospital to National University Hospital/National Heart Centre for cardiac, thoracic and vascular surgery services, of whom six patients required extracorporeal membrane oxygenation (ECMO) support. Transferring a critically ventilated ill patient, with intra-aortic balloon pumps, ECMO support, multiple intravenous inotropics support, and haemodynamic and defibrillator monitors, make transportation to other institutions tedious and hazardous for the staff accompanying the patient. Staff needed over 30 minutes to merely prepare the patient and equipment. We aimed to achieve faster, safer and hassle-free transportation of critically ill patients to other hospitals.

METHODS The team at the Interventional Cardiovascular Suite at KTPH designed an ambulance trolley board to make the process of transporting critically ill patients, with various supporting equipment, easier. Liaising with transport officers, measurements were taken of the ambulance trolley, and an ambulance trolley board fashioned out of fibreglass material, which is lightweight, extremely strong and robust. A foldable design, with straps to secure the equipment, resulted in a compact size that required only minimal storage space.

RESULTS The ambulance trolley board was used to transport five patients, for whom the time taken to prepare the patient was less than 15 minutes. The infusion pumps and the haemodynamic monitor could be easily loaded on top of the board without being placed in between the patient's legs, thus reducing patient discomfort as well as the risk of the machine falling off during a speedy journey. Nurses were also able to easily and continuously monitor the patient's haemodynamic condition.

CONCLUSION The innovative design of an ambulance trolley board has enabled our hospital to achieve the safer, faster and hassle-free transportation of critically ill patients to other institutions.

CATEGORY: NURSING ABSTRACT   AN10

Error-proofing boards in inpatient wards to ensure that patients are served the prescribed diet after general surgery

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INTRODUCTION The diet regime of patients plays a pivotal role in ensuring nutritional support in the patient's treatment plan. It is essential that nurses serve the correct prescribed diet to patients during meal times. However, in a general surgical ward, diet regimes could rapidly change according to the patient's condition, and frequently the wrong diet is served to the patient. The need to account for such changes was observed and an initiative launched with the aim of providing healthcare providers with an easy-to-refer centralised location for diet changes.

METHODS An error-proofing board was introduced to compile the menu forms that were faxed to the kitchen in case of changes to a patient's diet regime. Healthcare providers clipped the diet orders that were recently faxed to the kitchen at a convenient location near the AVG machine. To evaluate its efficacy, data were collected before and after the introduction of the error-proofing board based on observation of the meal services for a period of five days.

RESULTS The error-proofing board acted as a reference point and led to greater awareness among healthcare providers of the diet changes of patients when serving meals. However, other factors that could possibly cause an error in the serving of appropriate diets to patients were found.

CONCLUSION Findings suggest that the error-proofing board was a reference point for changes to patients' diet regimes during meal times. Further exploration of additional factors that may influence the inpatient meal service is warranted.

CATEGORY: NURSING ABSTRACT   AN11

The efficacy of negative pressure wound therapy in stage IV wound therapy pressure ulcer

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INTRODUCTION Pressure ulcer is a common complication in bedridden patients and a serious problem for the older population, as it is associated with pain, sepsis, suffering and mortality. Sacral sores and ulceration, which develop due to pressure, shearing and friction as the skin covers bony prominences, are associated with a number of risk factors. We used negative pressure therapy for a patient with a stage IV sacral pressure ulcer with the bone exposed.

METHODS A 75-year-old woman, with a history of stroke, developed a stage IV sacral pressure ulcer at home, with an unhealthy wound bed and 90% necrotic tissue measuring 12 cm³ × 10 cm³ × 2 cm³. The initial wound was managed with hydrocolloid dressing for two weeks. The wound was continuously evaluated and managed in preparation for negative pressure wound therapy, which was in turn continued for three months to promote granulation.

RESULTS Over a period of three months, effective use of negative pressure wound therapy accelerated wound healing in the recovery stage and improved the patient's quality of life. There was a decrease in nursing time and cost as well as reduced suffering and pain for the patient. Dressing was good enough for 2–3 days, with the hydrocolloid preventing contamination of the wound. Good support from the family and the medical team during the healing process and the many dressing changes were emotional encouragement for the patient.

CONCLUSION Negative pressure wound therapy may be effective for the wound therapy of stage IV pressure ulcers.

Identifying the 'point of missing surgical instruments'

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INTRODUCTION Instruments are essential tools used in surgery and the aetiology of missing instruments is of vital importance to patient safety. Instances of missing instruments often come to light when instruments are found missing following surgeries in the decontamination room or when sets are sent to the Central Sterile Supply Department (CSSD) for decontamination. We present the results of an audit of scrub nurses who counted instruments using a circulator before, during and after operation and also counted them before sending them to the CSSD.

METHODS This was an observational randomised audit conducted by PeriOperative Patient Quality Improvement members in the major operating theatre at Khoo Teck Puat Hospital. Data was collected for six months for a sample size of 15–20 per discipline and subsequently followed up for three months and one month. Our work processes were improved further by sending a nurse every morning to count instruments in the CSSD. The root cause of the 'point of missing instruments' was determined after ten months of continuous auditing and enhancing of the process.

RESULTS For six months, the median proportion of instruments counted using a circulator before sending to the CSSD was 98%. The median proportion of successfully counted instruments with the circulator was 100% during the three-month follow-up period, with instruments still missing. For the one-month data in April 2012, with further improved counting with the CSSD staff, the median proportion of successfully counted instruments was 100%, with no instruments being reported missing.

CONCLUSION The effect of counting instruments using a circulator prior to sending them to the CSSD for decontamination and counting them again with CSSD nurses proved to be the most efficacious way of identifying the point where instruments went missing.

Evaluation of a diabetes group patient education programme: 'Skills for Life'

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INTRODUCTION Group education programmes are often a challenge to sustain. For a decade now, our clinic has consistently faced and managed logistic and funding issues to keep such programmes going. In 2011, the monthly 'Skills for Life' (SFL) clinic at Khoo Teck Puat Hospital was redesigned once again, accommodating patient feedback. We aimed to evaluate the effectiveness of the revised SFL.

METHODS A retrospective study was conducted of the first ten sessions of the revised SFL from April 2011 to February 2012. Parameters studied included the attendance rate, profile of attendees and their responses to clinic activities.

RESULTS Of 80 patients registered for SFL, only 47 (59%) attended the clinic. The mean default rate per session was 38%. The average number of attendees per programme was 4.7. The mean age of attendees was 48 ± 13.5 (range 18–74) years The mean duration of diabetes mellitus was 6.0 ± 6.5 (range 1–20) years, with 28% of attendees having the disease for over ten years. Glycated haemoglobin-A1c levels in the attendees decreased from 8.5% to 7.8% ($p = 0.84$). Five of 47 attendees eventually started self-monitoring of blood glucose, and four signed up for another programme on group exercise after SFL.

CONCLUSION SFL continues to be a viable alternative for the delivery of education and the inculcation of lifestyle modification behaviours. Further efforts are needed to encourage attendance and post-programme behavioural change.

Unit-based quality improvement activities to enhance nursing quality

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INTRODUCTION Unit-based quality improvement (UBQI) committees were formed in 2011 to address issues related to nursing quality. Applying the concept of 'users would know what the problem is and how best it can be improved', UBQI activities were initiated at the Khoo Teck Puat Hospital.

METHODS The various units were grouped into two main groups for the efficient and effective use of time and the promulgation of initiatives. The units included were wards, intensive care units, perioperative services, infection control unit, acute and emergency care, diagnostic radiology and interventional cardiac service, the renal unit and specialist clinics. These groups met the co-chairperson of the nursing quality improvement (NQI) committee every alternate month to work on UBQI activities that focused on four key areas: (i) unit-specific key performance indicators; (ii) creating a new or revised standard work instructions; (iii) enhancing unit-based competencies; and (iv) working on initiatives to promote safer, better, faster and cheaper healthcare.

RESULTS The teams met regularly to achieve the objectives of the UBQI committee and shared information on the activities with the main NQI committee. On issues, collaboration was sought among the participating units, and initiatives developed, completed and shared for replication. Unit-based competencies were identified and skills improved. New work instructions were written and improvement initiatives undertaken. A repository of these unit-based initiatives was stored for reference purposes and for further promulgation.

CONCLUSION UBQI activities that engaged primary users of facilities and sought solutions for the improvement of nursing quality were effective. Factors such as team dynamics, engagement strategy, and the follow up and promulgation of initiatives were important cogs for progress. Leadership was also pivotal in the continuous cycles necessary for quality improvement.

Using ambassadors to improve compliance rates with hand hygiene in surgical wards

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INTRODUCTION Hand hygiene prevents cross-infection in hospitals, but adherence among healthcare workers to hygiene guidelines is often poor. This study aimed to improve compliance rates with hand hygiene in two surgical wards, B85 and B86, by constantly reminding stakeholders through ambassadors.

METHODS The ambassadors, who were nurses from nursing administration and infection control, were present in the wards each morning between March 2011 and April 2011 reminding healthcare workers to comply with hand hygiene practices. Duties included reminding doctors during their ward rounds and procedures. Hand hygiene data were collected through direct observations in the two wards. Compliance with five items of hand hygiene was checked twice a week by hand hygiene auditors, who were trained by infection control personnel. Compliance data were stratified by location and job type to include nurses, physicians and ancillary staff. An Excel spreadsheet was used to input data and calculate the compliance rate among healthcare workers.

RESULTS The compliance rate with hand hygiene in ward B85 improved from 48% to 81%. The compliance rate among doctors in the ward improved from 15% to 67% and that

among the nurses rose from 65% to 88%. In ward B86, the compliance rate with hand hygiene improved from 60% to 71%. The compliance rate among doctors in the ward improved from 40% to 46% and that among ward nurses improved from 58% to 87%.

CONCLUSION Ambassadors helped to improve compliance with hand hygiene guidelines in both surgical wards involved. Results may suggest the presence of peer pressure to comply with hand hygiene practices when all stakeholders are reminding everyone else.

CATEGORY: NURSING ABSTRACT   **AN16**

Electronic vital signs to enhance patient safety and increase nursing efficiency

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INTRODUCTION The frequency of measuring vital signs for a patient and performing nursing assessments varies depending on the patient's needs and the doctor's orders. Nurses spend a considerable amount of their time collecting essential information to provide patient care. With paper documentation, nurses are often required to repeatedly transfer data from the point of initial documentation to various forms, such as flowsheets, nursing notes and patient charts. Such repetitive transcription of documentation may not only give rise to errors while transcribing and omission of data but also significantly reduces productive nursing care.

METHODS We converted the manual charting of vital signs to electronic means, now called 'eParameters'. Transcription of data was totally eliminated by directly capturing recorded infor-

mation from the physiological machine and uploading them into the hospital electronic medical records. Vital signs were automatically charted into the patient's flowsheet upon login by the nurse.

RESULTS eParameters was implemented in all 18 inpatient wards at Khoo Teck Puat Hospital. The process of measuring the vital signs of patients is now less time consuming. eParameters is readily accessible to doctors, nurses and other allied health professionals anywhere in the hospital at any point in time.

CONCLUSION The introduction of eParameters has significantly reduced documentation errors and increased the efficiency of doctors, nurses and other allied health professionals in making clinical decisions.

CATEGORY: ALLIED HEALTH ABSTRACT   **AA01**

Angiotensin II receptor I blocker, losartan, but not angiotensin-converting enzyme inhibitor, quinapril, increases circulating α-klotho in individuals with type 2 diabetes mellitus and albuminuria

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INTRODUCTION The ageing suppressing gene, α-klotho, is a potential renal protector. Results from animal studies suggest that angiotensin II may be a negative regulator of α-klotho expression. We hypothesised that renin angiotensin system antagonism may increase α-klotho secretion in patients with type 2 diabetes mellitus (T2DM).

METHODS In this randomised crossover study, 33 Asian patients with T2DM and albuminuria were recruited and randomised into two groups: group 1 received losartan 50 mg daily while group 2 received quinapril 20 mg (both 50% of maximal dose) for four weeks with a four-week washout period in between. Circulating α-klotho levels were measured using enzyme-linked immunosorbent assays.

RESULTS Intervention using either losartan or quinapril for four weeks did not affect levels of fasting blood glucose, glycated haemoglobin-A1c, serum potassium, serum creatinine and lipid profiles in patients. Losartan significantly increased circulating α-klotho levels by 23% (before: 542 pg/mL, after: 668 pg/mL; p = 0.001), while quinapril did not affect the level of circulating α-klotho. Linear regression revealed that besides different modes of treatment, changes in α-klotho were associated with a reduction of systolic blood pressure (SBP) and amelioration of urine albumin excretion (SBP: β = 0.227, p = 0.043; urine albumin/creatinine ratio: β = 0.281, p = 0.026).

CONCLUSION Losartan, but not quinapril, increased circulating α-klotho in patients with T2DM and albuminuria. This finding may have clinical implications for the prevention and treatment of diabetic nephropathy.

CATEGORY: ALLIED HEALTH ABSTRACT AA02

A comparative study of formulae for deriving estimated glomerular filtration rates based on the measurements of enzymatic serum creatinine, urine creatinine and serum cystatin C in an Asian population with suspected renal disease

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INTRODUCTION The utility of creatinine for the assessment of renal disease is narrowed by the preanalytical and analytical limitations of the Jaffe method. With the implementation of isotope dilution mass spectrophotometry-traceable enzymatic estimation of creatinine, we adopted an additional indicator – estimated glomerular filtration rate (eGFR) – to assess renal function. We also revisited the role of cystatin C in screening for renal disease.

METHODS Cystatin C, serum creatinine and 24-hour urine creatinine were measured on the Cobas c501 analyser. The creatinine clearance test (CCT), and eGFR using Modification of Diet in Renal Disease (eGFR-MDRD) and cystatin (eGFR-cystatin) were calculated. As the measured empirical values are not commutable, each finding was graded positive or negative based on their respective cut-off values. The specificities, sensitivities, positive predictive values (PPVs) and negative predictive values (NPVs) were calculated by comparison with a reference.

RESULTS The study population comprised 178 persons of Asian origin with suspected renal disease (men 99, women 79; age range 17–103 years). Using MDRD as reference, CCT (n = 178) yielded a sensitivity and specificity of 92% and 32%, respectively, while the sensitivity, specificity and PPV of cystatin C (n = 128) was 66%, 82% and 3.70, respectively. eGFR-cystatin (cut-off value > 60 mL/minute) yielded a sensitivity, specificity, NPV and PPV of 55%, 93%, 0.48 and 7.90, respectively. The sensitivity and specificity of eGFR-cystatin (cut-off value > 90 mL/minute) was 79% and 71%, respectively.

CONCLUSION Results indicate that CCT was more sensitive than cystatin C, especially in women, although cystatin C had superior specificity. We recommend that MDRD and CCT be used jointly as parameters when screening patients for suspected renal disease for a better overall perspective on renal function.

Implementation of a massive transfusion protocol at Khoo Teck Puat Hospital

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INTRODUCTION On average, Khoo Teck Puat Hospital (KTPH) caters daily to about 290 accident and emergency attendances, 45 ambulance patients and 80 inpatient admissions. The massive transfusion protocol (MTP) was introduced at KTPH in 2010 to standardise the procedure for the management of patients requiring massive transfusions by releasing the required blood and blood products within an acceptable response time frame.

METHODS Data collection was done by extracting details of patients who needed massive transfusions and the time stamps on MTP forms/checklists provided by the blood services group or obtained from the KTPH blood bank system, Traceline. The time taken between activation of MTP and the issue of MTP pack or, in some cases, the start of transfusion was calculated in order to identify the proportion of patients for whom the required turnaround time of 30 minutes was met.

RESULTS As of June 2011, 19 MTP calls were activated at KTPH. On measuring the time taken between the start of MTP activation to the manual issuing of blood, we found that first-level MTP blood requirements were released within 30 minutes in 100% (10/10) patients. In patients where time of issue was not available, the time between activation and the start of transfusion was measured. Transfusion was initiated within 30 minutes in all but one such patient (7/8), for whom the time taken was 35 minutes.

CONCLUSION MTP has improved the overall management of patients requiring massive transfusions. However, human factor barriers, such as activation abuse or false alarms, were also observed during the project's implementation.

A medication-use evaluation of etoricoxib

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INTRODUCTION Etoricoxib, a non-formulary medication, is increasingly being consumed in our hospital. A medication-use evaluation (MUE) was therefore conducted to evaluate if the use of etoricoxib in the management of postoperative pain was appropriate.

METHODS A retrospective review was conducted from July 2010 to June 2011. Patients who underwent appendectomy during the study period were divided into two groups: those given etoricoxib 120 mg once daily (n = 91) and those prescribed naproxen 550 mg twice daily (n = 42). Baseline characteristics for both groups were analysed using *t*-test and chi-square test. Pain reduction after appendectomy was measured at six-hourly intervals for 24 hours (time points T1–T4). A repeated measures analysis of variance (ANOVA) was conducted to determine if there was any significant difference in pain score reductions between the two groups at the four time points.

RESULTS The mean age of patients in the etoricoxib and naproxen groups was 35 years and 30 years, respectively (p = 0.01). There was no significant difference between the two groups for any of the other baseline characteristics: gender (p = 0.134), ethnicity (p = 0.126), surgery type (p = 0.252) and financial class (p = 0.127). Etoricoxib reduced pain significantly better than naproxen at T1 (p = 0.019). There was no statistically significant difference at the other time points (T2–T4).

CONCLUSION Naproxen appears as effective as etoricoxib in the management of postappendectomy pain and also provide substantial cost saving due to price difference between naproxen ($3.64/week) and etorcoxib ($18.48/week).

Prevalence of pigment epithelium-derived factor gene polymorphisms in Singapore Chinese patients with abnormal fasting glucose

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INTRODUCTION Type 2 diabetes mellitus (T2DM), the most common metabolic disorder, is characterised by high glucose in the context of insulin resistance (IR). *PEDF* is a known potent endogenous antiangiogenic and neurotrophic agent. Increasingly, evidence is showing a correlation between *PEDF* and IR in human and animal models. The association of *PEDF/SERPINF1* polymorphisms with various diseases, such as age-related macular degeneration and osteogenesis imperfecta, has also been reported. To the authors' knowledge, no study has reported the prevalence of *PEDF/ SERPINF1* polymorphisms in patients with IR. We aimed to identify the prevalence of polymorphisms in the *PEDF/SERPINF1* gene in Chinese patients with abnormal fasting glucose (AFG) levels.

METHODS Chinese patients (n = 51) were categorised into the control (fasting glucose [FG] < 5.6 mmol/L; n = 20) and AFG (FG ≥ 6.1 mmol/L; n = 31) groups. DNA was extracted from the blood of these patients, and exons 2, 3 and 4 of the *PEDF/SERPINF1* gene were sequenced by polymerase chain reaction-based cycler sequencing. Polymorphisms were identified using the SeqScape software version 2.7. Allele frequencies were analysed using relevant statistical tests.

RESULTS No polymorphisms were identified in exon 2. Four single nucleotide polymorphisms (SNPs) were identified in total, in exon 3 (rs150899084, rs1136287 and rs149768643) and exon 4 (rs8074840). The minor allele frequency of rs1136287 T > C and rs8074840 T > C was lower in patients with AFG compared to controls (0.43 vs. 0.48, p > 0.05; 0.34 vs. 0.4, p > 0.05). Non-significant trends in the levels of FG (CC: 5.6 ± 1.2 mmol/L, CT: 6.5 ± 2.8 mmol/L, TT: 7.1 ± 2.9 mmol/L; p = 0.575) and serum *PEDF/SERPINF1* (CC: 11.62 ± 2.98 μg/mL, CT: 12.72 ± 2.63 μg/mL, TT: 13.22 ± 2.59 μg/mL; p = 0.506) were observed in patients with the three genotypes CC, CT and TT (rs1136287).

CONCLUSION Four SNPs in the *PEDF/SERPINF1* gene were identified in Singaporean Chinese patients. However, further studies with larger sample sizes are needed to determine whether these SNPs are relevant to blood glucose and *PEDF/SERPINF1* levels in patients with T2DM.

Workload measurement of inpatient pharmacists – a pilot study

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INTRODUCTION Inpatient pharmacists contribute significantly towards inpatient care. There is uncertainty, however, over the precise manpower distribution needed to optimally meet pharmacists' workload demands. This study aimed to quantify the workload of inpatient pharmacists and identify areas of inefficiencies when delivering inpatient services.

METHODS A daily time log was created for pharmacists to self-capture the various types of work-related activities performed and their duration. The time log was administered to nine inpatient pharmacists over 15 working weekdays. Data on workloads were collected and descriptive statistical analysis performed.

RESULTS Pharmacists worked 7.9 ± 2.6 hours daily on average, with activities including ward reviews (3.3 ± 1.2 hours), discharge-related duties (2.5 ± 1.1 hours), meetings and projects (0.6 ± 0.5 hours), administrative duties (0.6 ± 0.3 hours), teaching and supervision (0.4 ± 0.3 hours) and miscellaneous tasks

(0.4 ± 0.3 hours). Collectively, pharmacists worked 3.9 hours in excess of their daily requisite of 7.5 work-hours, which over the 15-day study period translated to employing 9.5 full-time pharmacists. Pharmacists with over one-year experience (n = 4) made as many interventions as pharmacists with less than a year's experience (n = 5) despite spending over twice as much time on administrative duties, meetings and projects, and in spite of spending nearly 70 minutes less daily performing ward reviews. Over 15 days, pharmacists collectively spent 3.0 hours providing warfarin counselling (6 patients) and 6.6 hours supplying controlled and exemption drugs (11 occasions).

CONCLUSION The results of this study helped to establish baseline time requirements for performing specific inpatient pharmacist duties. We suggest that the minimum manpower requirements of inpatient pharmacists be increased. Activities such as warfarin counselling and the supply of controlled and exemption drugs may be reviewed to increase efficiency.

| CATEGORY: ALLIED HEALTH ABSTRACT | AA07 |

Association of lutein and zeaxanthin with statin in patients with hypercholesterolaemia

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INTRODUCTION Carotenoids (lutein and zeaxanthin) are found in the macular region of retina and lens. Their functions include antioxidation, anti-inflammatory roles and immune regulation. Lutein and zeaxanthin, which are fat soluble, form a carotenoid-lipoprotein complex by incorporating into lipoproteins and are transported to different tissues. Age-related macular degeneration (AMD) is a multifactorial disease caused by both genetic and environmental factors, where low carotenoid levels are associated with an increased risk of AMD. While changes in plasma lipids may affect carotenoid levels, it is not known whether statin treatment affects lutein and zeaxanthin concentrations. We hypothesised that decreased lipoprotein levels as a result of statin treatment may be associated with lutein and zeaxanthin concentrations.

METHODS 20 untreated hypercholesterolaemic patients were treated with simvastatin (20 mg/day) for 12 weeks. Fasting blood was obtained at 0 and 12 weeks for lipid profiles, and lutein and zeaxanthin evaluations performed using high-performance liquid chromatography.

RESULTS The mean age was 49.2 ± 12.1 years, with a majority of patients being Chinese (Chinese 45%, Malay 20%, Indian 30%, other 5%). Total cholesterol, low-density lipoprotein cholesterol (LDL-C) and triglycerides decreased significantly by 26.2%, 31.7% and 26.9%, respectively, after 12 weeks of simvastatin treatment (p < 0.005). Lutein and zeaxanthin levels were reduced by 58.2% (p = 0.008) and 29.5% (p = 0.055), respectively. Zeaxanthin levels positively correlated with triglycerides (p < 0.05), but there was no correlation between lutein and LDL-C or triglycerides.

CONCLUSION We report an adverse association between simvastatin treatment and lutein and zeaxanthin levels in hypercholesterolaemic patients. As a literature review did not reveal any association between statin use and an increased risk of AMD, our results indicated that, if replicated, it may be necessary to study incident AMD as an important secondary endpoint in future long-term studies on the use of statins.

CATEGORY: ALLIED HEALTH ABSTRACT   AA08

Evaluation of the predictive values of the Streck ESR-Auto Plus analyser

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INTRODUCTION Erythrocyte sedimentation rate (ESR) is a useful screening test for the detection of acute phase response in inflammation. It measures the sedimentation rate of red blood cells when allowed to stand for an hour. We evaluated the use of the predictive values recommended by the manufacturer against actual ESR values, as the former has not been validated in the local population.

METHODS ESR was measured on the Streck ESR-Auto Plus analyser using the QuickMode method, which allows the reading of ESR after 30 minutes and mathematically converts the reading to an equivalent Westergren result (mm/hour). The analyser reads samples by scanning the tube with infrared light.

RESULTS 43 samples (men 21, women 23; age range 26–90 years) were randomly chosen for the study. Actual ESR readings ranged from 2 mm/hour to > 120 mm/hour, and seven samples had results within the reference range. The predictive ESR values at 15 minutes, 20 minutes and 25 minutes were compared against the actual ESR values at 30 minutes. The correlation coefficients were 0.986 (y = 1.023x + 6.429) at 15 minutes, 0.997 (y = 1.020x + 4.430) at 20 minutes and 0.999 (y = 1.055x + 2.255) at 25 minutes.

CONCLUSION A satisfactory correlation was seen between predictive ESR values and actual ESR values, with the correlation being better at 25 minutes when compared to 15 minutes. Further studies need to be done to establish the relationship of ESR values with gender and age.

CATEGORY: ALLIED HEALTH ABSTRACT   AA09

Evaluation of the Statspin Express 3 centrifuge

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INTRODUCTION The Statspin Express 3 centrifuge reduces centrifugation time and provides faster turnaround times when processing coagulation specimens. At 4,400 × g for three minutes, satisfactory platelet-poor plasma (PPP) – which according to the Clinical and Laboratory Standards Institute is defined as a plasma sample having a platelet count < 10 × 10^9/L – is usually achieved.

METHODS 120 specimens were randomly selected over a period of three months. The specimens were centrifuged in the conventional centrifuge (at 2,500 × g for 10 minutes) and analysed for prothrombin time (PT) and activated partial thromboplastin time (APTT). The specimens were then placed on a roller mixer to ensure homogeneous mixing. After five minutes, these specimens were centrifuged again in the

Statspin centrifuge. A plasma volume of 0.2 mL was carefully removed from each specimen and the platelet counts measured on a XE-5000 analyser. The specimens were processed for PT and APTT again. Four haemolysed, lipaemic and icteric specimens were excluded from the study.

RESULTS The platelet count in all 116 specimens was < 10 × 10^9/L, except for four specimens that had platelet counts of 10 × 10^9/L. PT and APTT results from both runs showed good correlation of 0.980 and 0.996, respectively.

CONCLUSION PPP is essential for coagulation assays. The Statspin centrifuge produces consistent PPP specimens that are suitable for coagulation assays at a shorter turnaround time.

Impact of a preconsultation geriatrics pharmacist clinic service in a local hospital

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INTRODUCTION A preconsultation geriatrics pharmacist clinic (GPC) runs in conjunction with the doctors' geriatrics clinic at Khoo Teck Puat Hospital. We aimed to determine: (i) the acceptance rates of medication interventions done by pharmacists and cost savings therefrom; (ii) if follow-up telephone calls were effective as means of earlier detection of adverse drug reactions (ADRs); and (iii) the patients' level of satisfaction with the GPC.

METHODS Patients were recruited over a three-month period. The pharmacists' interventions were categorised and assessed for acceptance, and the resulting direct cost savings calculated. Follow-up phone calls were made on Days 2 and 8 following medication changes to determine the incidence of ADRs. Data were compared with that from the standard-care group attending the doctor's clinics only, with no follow-up phone calls. A ten-question patient satisfaction survey was filled out by caregivers.

RESULTS 18 GPC patients were compared against 20 standard-care patients. 14 GPC patients had medication changes, and the pharmacist proposed 15 interventions for 12 of these 14 patients. All interventions (dosage adjustments: 60%; reduction in number of medications: 33.3%; addition of new medications: 6.7%) were accepted by the patients. The projected net annual cost savings was S$386.52. 93% of 14 patients recruited for ADR detection were successfully contacted and 14.3% of patients reported ADRs when compared to just 5% of the 20 standard-care patients. All 15 patients surveyed agreed that the pharmacist was thorough, able to clarify doubts and collaborated well with the geriatrician.

CONCLUSION Preconsultation GPC services coupled with follow-up phone calls had demonstrable cost savings and was well received by patients. As the number of GPC patients increases, longer term benefits may be assessed and reported in future studies.

Evaluation of bio-intact parathyroid hormone (PTH 1-84) immunoassay on the Roche Elecsys analyser

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INTRODUCTION Parathyroid hormone (PTH), an 84-amino acid polypeptide hormone, is involved in the regulation of bone and mineral metabolism. Measurement of PTH levels is useful in the differential diagnosis of hypercalcaemia and hypocalcaemia, and the assessment of parathyroid function in patients with renal, bone and mineral disorders. We evaluated the Roche bio-intact PTH immunoassay (third-generation assay), which specifically measures the biologically intact PTH molecule, against the second-generation intact PTH immunoassay.

METHODS Serum samples were concurrently assayed for both bio-intact PTH and intact PTH on the Roche Elecsys e411 analyser. Both assays were based on electrochem-iluminescence. Data were analysed using regression analysis and Bland-Altman bias plots. Each finding was graded as positive or negative based on cut-off values. The specificity and sensitivity of the assay for bio-intact PTH were calculated by comparison against the intact PTH assay.

RESULTS 75 samples, with PTH values in the range of 1.82–147.50 pmol/L, were included. Precision studies using quality control materials at PTH concentrations of 3.9 pmol/L and 11.6 pmol/L gave coefficients of variation of 3.38% and 3.39%, respectively. A correlation of $0.535x + 0.587$ ($r = 0.9908$) was obtained. The bio-intact PTH assay consistently gave lower results and yielded a diagnostic sensitivity and specificity of 86% and 100%, respectively, when compared to the intact PTH assay.

CONCLUSION Our data suggests that the third-generation bio-intact PTH assay correlates well with the second-generation PTH assay. The bio-intact PTH assay also meets the desirable imprecision of < 13%. The lower results observed with the bio-intact PTH assay suggest minimal cross-reactivity with PTH fragments, making it a superior option over the previous method.

Correlation between coagulation tests on the CA-1500 coagulation analyser and the ROTEM system

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INTRODUCTION The basis of ROTEM analysis is in the management of patients with acute bleeding. We evaluated the performance of coagulation tests performed on the ROTEM analyser against routine laboratory coagulation tests, namely prothrombin time (PT), activated partial thromboplastin time (APTT) and fibrinogen (FIB).

METHODS Samples were analysed on both the CA-1500 and ROTEM analysers. In the ROTEM system, the sample is placed in a cup and a pin that is immersed is rotated by a spring. As soon as the blood clots, the movement of the pin is restricted. The firmness of the clot is proportional to the restriction of pin movement.

RESULTS A total of eight specimens (normal 4, abnormal 4) were analysed. PT, APTT and FIB were compared against ROTEM's EXTEM, INTEM and FIBTEM, respectively. The four samples with normal PT and APTT results showed normal EXTEM and INTEM results. Only one of the four abnormal specimens produced an abnormal INTEM result; the EXTEM results were all normal. FIB could not be compared to FIBTEM, as it did not have an expected value, and therefore, had no basis for comparison.

CONCLUSION Although both the CA-1500 and ROTEM analysers measure clotting time, our preliminary results suggest that there is little correlation between the two methods. Despite the small study size, our results affirm the complexity of the coagulation pathway and recommend that both methods be used in tandem in the management of patients with acute bleeding.

Clinical outcomes of ineffective empiric antimicrobials for urinary tract infection in non-critically ill patients

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INTRODUCTION We compared the clinical outcomes of non-critically ill patients with urinary tract infections (UTIs) receiving susceptible-empiric (SE) antimicrobials with patients receiving non-susceptible empiric (NSE) antimicrobials.

METHODS A retrospective review was performed of patients admitted to our institution with UTI from June 2010 to June 2011. Patients who were critically ill, required intensive care or had concurrent non-UTIs were excluded from the study. Data on clinical response from Day 3 to Day 5 following the initiation of empiric antimicrobials, in-hospital mortality and length of stay (LOS) were compared between the SE and NSE groups.

RESULTS Of 447 patients, 273 patients received SE antimicrobials while 174 patients did not (NSE group). Baseline demographics were similar in the two groups except that NSE patients were more likely than SE patients to have urinary tract abnormality (30.5% vs. 18.3%, p = 0.003), history of recurrent UTI (17.2% vs. 10.3%, p = 0.032) and higher Charlson's comorbidity

index (5.4 vs. 4.3, p < 0.00001). *Escherichia coli* and *Klebsiella pneumoniae* were the commonest uropathogens isolated. Despite the use of different empiric antimicrobials, there was no significant difference in the resolution of symptoms, serum white blood cell counts and C-reactive protein levels between the two groups. The average LOS was longer in the NSE group (16.5 days vs. 12 days, p = 0.006). However, after adjustment for the comorbidity index, LOS was found to be only marginally prolonged in the NSE group (odds ratio 1.02, 95% confidence interval 1.00–1.03; p = 0.012). There was no difference in mortality.

CONCLUSION Delay in effective antimicrobials for UTI in non-critically ill patients is not associated with adverse clinical outcomes and increased mortality. The initiation of antimicrobials in non-critically ill patients with UTI could be deferred until culture results become available.

CATEGORY: ALLIED HEALTH ABSTRACT   **AA14**

Circulating undercarboxylated osteocalcin correlates with body composition in patients with type 2 diabetes mellitus

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INTRODUCTION Increasing data suggest that bone, fat tissue and skeletal muscle interact with each other through endocrine regulation. Bone-derived undercarboxylated osteocalcin (ucOCN) enhances insulin sensitivity by stimulating adiponectin secretion in fat tissues. We hypothesised that circulating ucOCN levels may be associated with body composition. We aimed to explore the relationship between circulating ucOCN levels and parameters of body composition in patients with type 2 diabetes mellitus (T2DM).

METHODS 39 patients with T2DM were recruited in this cross-sectional study (men 24, women 15; mean age 59 ± 7 years). Body composition was measured by Inbody S20 and the plasma ucOCN quantified using enzyme-linked immunosorbent assays.

RESULTS There was no correlation between age, gender, duration of diabetes mellitus and ucOCN levels. In addition, ucOCN was not correlated with body mass index (BMI), fat, visceral fat area and whole body protein mass. However, ucOCN was negatively correlated with osseous mineral mass (r = −0.38, p = 0.024) and skeletal muscle mass (r = −0.418, p = 0.013). The correlation remained significant even after normalising the osseous mineral mass and skeletal muscle mass against BMI. Further analysis revealed that 17.5% of changes in plasma ucOCN levels were explained by skeletal muscle mass.

CONCLUSION Circulating ucOCN levels were associated with body composition in patients with T2DM. The clinical implications of our findings in this patient cohort warrants further investigation.

CATEGORY: ALLIED HEALTH ABSTRACT   **AA15**

Effect of user perception and feedback on satisfaction with the electronic medical record system

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INTRODUCTION Realisation of the potential benefits of the electronic medical record (EMR) system depends on clinicians' satisfaction with the system and their continuous use of it. This study analysed clinicians' satisfaction with EMR usage with respect to their expectations of the system and the feedback given after using it.

METHODS User satisfaction data on EMR was collected in 2011 from doctors and nurses at Khoo Teck Puat Hospital and analysed separately using the recursive partitioning method. The level of overall user satisfaction was a dependent variable while system quality indicators, such as reliability, flexibility and speed, were independent variables.

RESULTS Prior to using EMR, doctors (n = 105) felt that system reliability was the most important contributor of overall satisfaction from the perspective of expected system quality (likelihood ratio chi-square, G^2 = 26.1). Feedback after using EMR indicated, however, that speed was judged as the most important contributor of overall satisfaction by doctors where expected system quality was concerned (G^2 = 63.1). For nurses (n = 185), reliability of EMR was the most important contributor of overall satisfaction prior to using EMR (G^2 = 30.7), where expected system quality was concerned, while ease of use was the most important contributor of overall satisfaction after EMR usage (G^2 = 106.3).

CONCLUSION Recursive partitioning analysis revealed discrepancies between user expectations and feedbacks of the EMR system. Timely user feedback will therefore be necessary to understand challenges faced by users of EMR in the future. System design should be made flexible to incorporate changing user needs. This will not only help save the cost of buying and implementing new systems but also promote users to realise the full potential of the system at hand.

CATEGORY: ALLIED HEALTH ABSTRACT   **AA16**

Role of renal coordinator in educating patients on home blood pressure monitoring

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INTRODUCTION Blood pressure measurement in the clinic and home settings can be different. Educating patients on home blood pressure monitoring (HBPM) allows for a better understanding of blood pressure control and medication titration. It also empowers the patients participating in self-care. The objective of this study was to determine the proportion of patients performing HBPM after counselling by a renal coordinator.

METHODS A prospective study was carried out of patients who attended the integrated renal optimisation management clinic (IROM) from August 2010 to March 2012. Patients were instructed on HBPM and recording by a renal coordinator. Data on demographics and clinical parameters were obtained and analysed using the Statistical Package for the Social Sciences. The outcome measure was change in the proportion of patients doing HBPM before and after counselling by the renal coordinator.

RESULTS 157 patients attended the IROM clinic (men 49.7%; Chinese 66.2%; mean age 64.1 ± 10.6 years). Comorbidities included diabetes mellitus (77.1%), hypertension (97.5%), hyperlipidaemia (82.4%) and cardiovascular disease (18.5%). A majority of patients had stage 3 chronic kidney disease (61.8%) and diabetic nephropathy (53.5%). The number of patients monitoring blood pressure at home increased significantly after counselling at the IROM clinic (before: 22.9%, after: 65%; p < 0.01). However, only 34.1% of patients achieved target blood pressure control, which was defined as clinical blood pressure ≤ 140/90 mmHg.

CONCLUSION There was a significant improvement in the number of patients performing HBPM after counselling by a renal coordinator, although a significant number of these patients did not obtain optimal clinical blood pressure from HBPM. Further studies will be performed to assess the likelihood of 'white-coat phenomenon' playing a role in our findings.

NOTES

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