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ACADEMY OF MEDICINE  
SINGAPORE



*22<sup>nd</sup> Gordon Arthur Ransome Oration*

**L1 Is Medicine Still an Art?**

**James Best**

Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore

Advances in science and technology over the past 50 years have transformed medical practice and we are on the threshold of an era of precision medicine using genetic and molecular profiling. There is no doubt about the great progress in medicine as a science which now distinguishes the capabilities of doctors from those of other healing professions. But what about the art of medicine? Do observational and clinical diagnostic skills remain important in the scientific age? Are the roles of the doctor as confidante, advisor, comforter and even friend redundant in this computerised world? Furthermore, are the interpersonal skills that have underpinned medicine as a caring profession innate or can they be learned? What is the role of a medical school in imbuing our students with the traditional values of the medical profession? What innovative approaches can we take to achieve this goal in the context of modern society? These are all questions that are important to defining and maintaining the art of medicine. My contention is that the attributes that make a “good doctor” still include the human skills and the humane ethos demonstrated by Dr Gordon Arthur Ransome.

*18<sup>th</sup> Rumme Shaw Memorial Lecture*

**L2 Scientific Basis of Cancer Care**

**Soo Khoo Chee**

National Cancer Centre, Singapore

(Abstract not available at time of publication)

*25<sup>th</sup> Seah Cheng Siang Memorial Lecture*

**L3 Genes & the Brain: Changing the Clinical Paradigm**

**Tan Eng King<sup>1,2,3,4</sup>**

<sup>1</sup>National Neuroscience Institute, Singapore

<sup>2</sup>Duke NUS Graduate Medical School, Singapore

<sup>3</sup>Lee Kong Chian School of Medicine, Singapore

<sup>4</sup>National Medical Research Council, Singapore

It has taken millions of years for the evolution from primitive human ancestor to modern day humans. The structure and complexity of the human brain represent one of the most striking last frontiers of modern medicine. Despite technological advances, much is still unknown on

the exact mechanisms how brain cells communicate with each other within the most intricate biological systems and the variable presentation of brain dysfunction and disorders.

Historically, much of the clinical discovery in neurological disorders has been based on astute identification of neurological signs and symptoms and iconic neurological syndromes have served as maxims for neurological education. However, advances in molecular science and genetics have challenged the classification of neurological syndromes based on clinical symptoms and signs, and many clinical diagnostic criteria need to be redefined. Genetics have and will continue to influence treatment options and change the clinical paradigm for many neurological disorders. In future precision medicine, genetic testing will offer quicker and better diagnosis and potential therapeutic opportunities. We need to prepare and equip ourselves with the appropriate scientific knowledge within the context of the larger ethical, social, legal and psychological considerations in embracing these changes in our clinical practice.

*12<sup>th</sup> College of Physicians Singapore Lecture*

**L4 Acute Medicine – Past, Present and Future**

**Derek Bell**

The Royal College of Physicians of Edinburgh, UK

Acute Medicine initially developed in the United Kingdom and was established as a specialty in 2003. Since then, it has become the largest growing specialty within the United Kingdom and has spread throughout parts of Europe and internationally. Acute medical care was established to ensure the patients admitted as a medical emergency were managed in a well staffed and well equipped environment that could provide prompt assessment and treatment to improve outcomes for patients.

Several reports have been produced based on acute medical care; the most influential of which was the Royal College of Physicians report published in 2007. This made a number of key recommendations particularly in relation to patient safety with a major recommendation to establish and deliver a unified national early warning scoring system to assess illness severity. In addition to this, the acute medical unit is a specific geography and recommendations were made into appropriate facilities and equipment which should support the infrastructure of a dedicated acute medical unit.

Importantly, the acute medical team in an acute medical unit were identified as an essential part of undergraduate and postgraduate medical education and should have an appropriate training environment as well as consultant supervision.

Acute Medicine is therefore a thriving specialty within the United Kingdom which is continuing to grow. For this to develop further, the evidence base and academic content of Acute Medicine must become firmly established.

## *Neurological Emergencies Update*

### **S1 Evaluating Transient Ischaemic Attacks in the Emergency Department**

**Latha Ganti**

University of Florida College of Medicine, USA

Transient ischaemic attack (TIA) is a common presentation in the emergency department (ED), and is a high stakes diagnosis, as the risk of subsequent cerebral infarction (stroke) is significant and is highest during the first 48 hours following a TIA. As a leading cause of death and disability, acute stroke is a problem whose management deserves special attention. The crucial step occurs at emergency department arrival; recognition of TIA symptoms is essential, or else the patient does not get further workup. This lecture will deliver a concise summary of the management of TIA in the acute setting, and include an algorithm for performing the entire evaluation in an emergency department with or without an observation unit. Dr Ganti is a recognised neurologic emergencies expert with dual training in emergency medicine and vascular neurology, and has served on the ACEP Clinical Policies committee as one of the lead authors of the ACEP Clinical Policy on Acute Stroke.

### **S2 Update on Initial Stroke Management**

**Ang Shiang-Hu**

Changi General Hospital, Singapore

Stroke is amongst the top 5 leading cause of death in Singapore, and by far the biggest cause of long-term disability in adults. Acute stroke can be ischaemic or hemorrhagic in origin, and the immediate management for both differs. This talk will discuss some of the recommendations from the latest published guidelines in both ischaemic and hemorrhagic stroke. In acute ischaemic stroke (AIS), the only so-called proven first line therapy for AIS in the past 20 years has been intravenous rTPA. This year, we have added endovascular stent retrievers in addition to rTPA in the early management of AIS, with proven mortality and functional outcome benefits across several major RCTs published this year. The recently published (online) 2015 AHA/ASA Guidelines focused update of the 2013 Guidelines for the early management of AIS, dwells mainly on recommendations for endovascular stroke treatment. Intravenous rTPA still remains the mainstay for early treatment in AIS. However, to date, this therapy is not without controversy. The American College of Emergency Physicians (ACEP) revised their 2013 clinical policy on the use of intravenous rTPA in AIS, just published in June this year. The UK Medicines and Healthcare Products

Regulatory Agency (MHRA) had also announced a review to the use of rTPA in the treatment of AIS since last year. Hemorrhagic stroke guidelines were also updated last month. Key recommendations include lower blood pressure targets, deep venous thrombosis prevention, as well as use of a stroke severity score.

### **S3 Role of Biomarkers in Evaluation of Traumatic Brain Injury**

**Latha Ganti**

University of Florida College of Medicine, USA

Each year, on average, traumatic brain injuries (TBIs) are associated with an estimated 1.35 million emergency department visits, 275,000 hospitalisations, and 52,000 deaths in the US. This does not account for those who sustain a head injury and receive no care. TBI is a contributing factor to a third (30.5%) of all injury-related deaths in the US. Roughly three-quarters of TBIs that occur each year are concussions or other forms of mild TBI. TBI is a significant burden to our healthcare system. For any disease, biomarkers can provide useful guidance for both diagnosis and prognosis. This lecture will review the utility of clinical markers such as symptomatology, laboratory (blood) markers and radiographic markers with respect to diagnosis and outcomes such as post concussion syndrome, hospital admission and presence of traumatic bleed. Dr Ganti runs a TBI research programme at the Veterans Affairs Medical Center, and held the UF Toral Family Foundation Endowed Professorship in Traumatic Brain Injury.

## *Initial Management of Sepsis*

### **S4 Making a Diagnosis of Sepsis in the Emergency Department**

**Sohil Pothiawala**

Singapore General Hospital, Singapore

Severe sepsis and septic shock are medical emergencies that require aggressive, time sensitive interventions. Most patients with sepsis initially present to the emergency department (ED). Distinguishing sepsis from non-infectious systemic inflammatory response syndrome (SIRS) is difficult, but of significant importance for provision of timely and appropriate therapy.

Although the clinical diagnosis of sepsis spectrum can be made on relatively simple criteria laid out in international consensus guidelines, physical examination, routine blood and radiological investigations, these are neither sensitive

nor specific. Also, in early stages, source of infection may be unclear. Consequently, clinicians often miss or delay the diagnosis.

An ideal “gold standard” is not available for sepsis diagnosis. Biomarkers play a pivotal role in early diagnosis, risk stratification and prognostication of therapy. Some of the most widely studied biomarkers are c-reactive protein (CRP), serum lactate, procalcitonin (PCT), neutrophil lymphocyte count ratio (NLCR), soluble form of the urokinase plasminogen activator receptor (suPAR), presepsin, etc. Recently, molecular assays, like the SepsisTest and MagicPlex Sepsis Test, can be used for pathogen detection from whole blood and can be considered a valuable tool in addition to blood cultures. Also, the use of sepsis severity scoring systems like Mortality in Emergency Department Sepsis (MEDS), Sequential Organ Failure Assessment (SOFA) and Predisposition, Insult/Infection, Response, and Organ (PIRO) aid early identification and risk stratification.

As sepsis is not a single disease but a highly heterogeneous syndrome, we need a combination of good clinical history and examination, appropriate investigations, use of risk prediction models and sound clinical judgment for early identification of sepsis in ED.

## **S5 Initial Management of Sepsis – The Evidence**

**Irwani Bte Ibrahim**

Emergency Medicine Department, National University Hospital, Singapore

The initial management of sepsis has evolved rapidly. The traditional role of emergency physicians treating sepsis with initial empirical fluids and antibiotics have been transformed to a multi-pronged approach with definite goals of resuscitation. The session will highlight the latest recommendations of the Surviving Sepsis Campaign pertinent to emergency physicians, discuss the controversy of protocolled management citing findings from EGDT, ARISE, ProCESS and ProMISE trials and suggest future direction.

## **S6 Sepsis Care Bundles in the Emergency Department**

**Kuan Win Sen**

Emergency Medicine Department, National University Hospital, Singapore

Since its inception in 2002, the Surviving Sepsis Campaign has recommended care bundles for the management of patients with severe sepsis and septic shock. Some principles from the landmark paper on Early Goal Directed Therapy

were initially incorporated. With new evidence regularly emerging worldwide, refinement of care bundles have been performed periodically. The latest guidelines updated in April 2015 take into account results from 3 large multi-centre trials by the ProCESS, ARISE and ProMISE investigators.

However, not all healthcare systems are similar. Depending on resource availability and workflow, emergency departments function differently in various hospitals. Certain components of the 3-hour and 6-hour bundles may not be performed in a timely manner. Therefore, examining the evidence behind the bundle as well as its components is essential to understand measures that can be easily performed in the busy and crowded emergency department to achieve the best outcome. As technology progresses, there will also be novel devices on the horizon that can assist emergency physicians in managing their patients in a quick and efficient manner without being too cumbersome or invasive.

## *Surgical Residency Training: "Winds of Change? Quality vs Quantity"*

### **S7 Duty Hour Rules**

**Chong Tze Tec<sup>1</sup>, Isaac Seow<sup>2</sup>**

<sup>1</sup>Singapore General Hospital, Singapore

<sup>2</sup>Singapore Health Services (SingHealth), Singapore

Do duty hour restrictions really improve patient safety and resident quality of life? Should we let sleeping docs lie? A new take on the same old debate.

### **S8 Starting Residency at PGY1 or Later. Which is Better?**

**Ng Jing Yu<sup>1</sup>, Iyer Shridhar Ganpathi<sup>1</sup>**

<sup>1</sup>National University Health System, Singapore

The changing landscape in Singapore’s healthcare has made the introduction of the residency programme necessary. This has resulted in a shift in focus to churning out competent but not highly experienced specialists who can alleviate the strain on public institutions. This, of course, means lesser training, greater stress on the trainee and the development of less well rounded doctors.

Medical and surgical training are however inherently different and a successful formula for medical training may not work for surgery. Surgery training is an apprenticeship and most of our significantly longer training hours are devoted to honing procedural skills. Initiation of surgical training from Post Graduate Year 1 will inevitably mean a further compromise in a proper broad-based grounding

in clinical and ward work. There will almost certainly be a price to pay in terms of operative experience as well.

Young medical students are also compelled to declare a life speciality when they're just Year 4-5 students. What compounds this further is the existing policy of penalising residents who decide to switch speciality training midway. This makes the inertia of deviation from the path ahead tremendous. The end result may be a group of jaded and disillusioned young surgeons simply trudging along in their training.

I feel that the additional year of internship prior to proper surgical training is a small price to pay in the training and development of a committed, safe and competent surgeon.

## **S9 Five Years Training to Become a Competent General Surgeon – Adequate?**

**Junice Wong Shi Hui<sup>1</sup>, Glenn Tan Wei Leong<sup>2,3</sup>**

<sup>1</sup>National Healthcare Group (NHG), Singapore

<sup>2</sup>Department of General Surgery, Tan Tock Seng Hospital, Singapore

<sup>3</sup>Vascular Diagnostic Laboratory, Tan Tock Seng Hospital, Singapore

The shift from a UK-type training system to an American residency styled one since 2010 has created much furore as to whether a shorter training programme can result in similarly competent general surgeons. This has brought to the fore issues such as the definition of what constitutes a general surgeon, and the standards to which competency are pegged to.

As a general surgical resident in the midst of this 5-year programme, it is of personal interest as to whether I will be ready to exit the training system as a decent specialist. This talk will focus on my personal thoughts regarding the impact of shortening the training period, some musings about the evolving role of a general surgeon, and reflections on how this radical shift in training style/duration has translated to changes on the ground.

Finally, the primary question regarding the adequacy of a 5-year training programme will be discussed, with some degree of optimism that the current 5-year programmes that I am enrolled in would perhaps be sufficient.

## ***Care of Persons Lacking Capacity – Ethical/Legal Issues***

### **S10 Understanding the Mental Capacity Act**

**Daniel Koh**

Office of the Public Guardian, Singapore

The Mental Capacity Act addresses the need to make decisions for persons who are 21 years or older when they lack mental capacity to make those decisions for themselves.

Life can be unpredictable, a stroke or an accident can render us with diminished capacity and thus, the ability to make our own decisions.

As a proactive safeguard, individuals can plan for such unexpected eventualities with a Lasting Power of Attorney (LPA). It is a legal document which allows persons who have mental capacity to voluntarily appoint 1 or more persons (donee(s)) to make decisions and act on their behalf if and when they lack mental capacity in the future.

Learn about how the Mental Capacity Act and LPA work in practice. Understanding the Mental Capacity Act is crucial in upholding the best practises to protect persons lacking mental capacity.

### **S11 Understanding Capacity in the Clinical Situation**

**Ooi Chun How**

Changi General Hospital, Singapore

Mental capacity is the ability to make a specific decision at a specific time. An overview of assessment of capacity will be presented. The common causes of incapacity will be covered. Having established the lack of capacity, the types of incapacity need to be considered, as they have different implications, which will be discussed. The duties of a clinician, including writing a mental capacity report, will be mentioned. There will be some case discussions, based on real cases. Finally, a suggested practical approach to capacity will be presented.

### **S12 Understanding the Best Interests Principle – Application in the Clinical Situation**

**Calvin Fones Soon Leng**

Gleneagles Medical Centre, Singapore

Serving the best interests of the patient is a fundamental tenet of the doctor-patient relationship and a key principle in medical ethics. However, deciding on what is in the patient's best interests in the clinic is not always straightforward in clinical practice. Patients do not always agree on what the doctor feels is in their best interests, or they may sometimes lack the capacity to make voluntary and informed decisions.

The Mental Capacity Act (MCA), including the appointment by the patient, of a proxy decision-maker under a Lasting



Power of Attorney (LPA) applies to situations where the patient lacks capacity. A proper formal assessment should be conducted and all practicable steps should be taken to assist the patient to make their own decisions before they are deemed to lack capacity.

There needs to be careful consideration of various factors in order to determine what is in the patient's best interests. Doctors may consult with relatives, caregivers or donors/deputies to ascertain the patient's past/present wishes, feelings, beliefs and values, as part of the decision-making process. Where it concerns treatments to prevent serious deterioration of health, or for life-sustaining treatments, the doctor is always the primary decision-maker.

The physician's primary duty of care is to act in the patient's best interests. Clinical decision-making that incorporates the determination of best interests is an essential aspect of good clinical practice.

### *Sports Medicine Symposium on Platelet Rich Plasma*

#### **S13 An Overview of Platelet Rich Plasma Applications in Sports and Musculoskeletal Medicine**

**Patrick Goh**

Camden Medical Centre, Singapore

Platelet rich plasma (PRP) treatments has been used in sports and musculoskeletal medicine for nearly 15 years. Its usage and popularity is increasing rapidly worldwide, fuelled by reports (both in scientific and popular press) of its effectiveness, excellent safety profile, "natural" basis, and usage among star athletes. Indications have included tennis elbow and other forms of tendinosis, muscle strains, osteoarthritis, and ligament strains.

PRP is best regarded as a treatment procedure with many possible variations, rather a specific drug with a specific action. The variations in PRP preparation and administration have been cited as a reason for differing results in different studies. These variations include the concentration of platelets above native levels, whether the PRP is leucocyte rich (LR-PRP) or leucocyte poor (LP-PRP), whether the PRP includes or excludes RBC, and whether it is activated before administration.

In recent years, much focus has been on defining and understanding the variations associated with optimal results for different indications. For example, LP-PRP containing no or little RBC, at concentrations below 5 times native levels, appear to be ideal for osteoarthritis. Leucocyte-rich

PRP may be associated with increased inflammation and are possibly detrimental to joint cartilage. However, the phagocytic and cell signalling properties of WBCs may be beneficial in chronic tendinopathy.

#### **S14 Platelet Rich Plasma for Muscle Injury**

**Mohamad Shariff A Hamid**

Geriatric Medicine, Khoo Teck Puat Hospital, Singapore

Platelet rich plasma (PRP) is defined as plasma with a concentration of platelets above baseline value (peripheral blood). In addition to its main function in securing haemostasis, our understanding of platelets involvement in tissue healing have expanded over the last 2 decades. Platelets participation in tissue healing occurs via the release of various bioactive molecules (cytokines and growth factors) stored within the  $\alpha$ - and dense-granules that occurs upon activation. These substances are found to influence cellular migration, mitosis, matrix production, and angiogenesis. Moreover, these bioactive molecules also signal cells to proliferate and influence maturation, differentiation and ultimately tissue repair. More recently, administration of biological substances rich in platelets and growth factors has gained a lot of attention. Substances such as autologous blood and blood products including autologous condition serum (ACS), PRP and platelet rich in fibrin matrix (PRFM) are currently used for their potential benefits in accelerating soft tissues healing including muscles, tendons and ligaments. However, at present there is lack of consistency in the preparation, application and dosing methodology in the use of PRP. Therefore the current evidence is insufficient to recommend for or against routinely using PRP in muscle injury. More studies using robust clinical design are needed to evaluate the efficacy of PRP for the treatment of muscle injury.

#### **S15 Treatment of Tendinopathies with Platelet Rich Plasma**

**Kelvin Chew**

Changi General Hospital, Singapore

Tendinopathies form a significant proportion of musculoskeletal injuries. With repetitive stress injuries, tendon collagen fibres develop micro tears, eventually leading to tendinopathy. Tendon healing in tendinopathies tends to be slow compared with other soft tissues due to poor intrinsic healing properties. Growth factors may play a significant role in promoting healing in tendinopathies. By binding to receptors on local and circulating cells,

various growth factors initiate a sequence of intracellular signalling that results in the expression of proteins important in regulating cellular chemotaxis, matrix synthesis and proliferation. Platelet rich plasma (PRP) has been used as a biological strategy to modulate tissue response to damage by the peculiar action exerted by different growth factors contained in PRP. Numerous studies of growth factor effects on tendon have shown enhanced collagen gene expression, tenocyte proliferation, greater maturation in tendon callus, and enhanced mobilisation of cells from the circulation. From available clinical trials, good outcomes are seen with different PRP formulations and injection protocols. Coupled with appropriate rehabilitation protocols, the available evidence suggests PRP as an option for management of tendinopathies not responsive to first-line conservative treatments. Further high level trials are needed to identify the optimal PRP properties and delivery protocols for various tendinopathies.

## *Pain Management and Medicine Symposium*

### **S16 Difficult Pain Management Conditions and their Possible Solutions**

**Yoong Chee Seng**

Changi General Hospital, Singapore

Pain is one of the most common reasons patients seek medical care. Chronic pain, which is pain that lasts beyond the normal healing period, or longer than 3 to 6 months, is often considered difficult to manage. Chronic pain can cause significant physical disability, psychological distress, and reduced quality of life. Its negative impact on society includes reducing productive work time, and billions of dollars in healthcare costs.

There are many reasons why chronic pain is difficult to treat. Firstly, it may be difficult to ascertain the exact cause of pain. Low back pain, for example, may be caused by pathologies of the intervertebral discs, facet joints, and adjacent muscles/ligaments. Unfortunately, imaging scans may not improve the diagnostic process, as abnormal findings are often detected even, in asymptomatic individuals.

Secondly, a significant proportion of chronic pain is due to neuropathic pain. These are particularly difficult to treat. Examples include postherpetic neuralgia, diabetic neuropathy and post-stroke pain. Even common pain conditions, e.g. osteoarthritis, may have a neuropathic component which needs to be identified and treated. Furthermore, many pain conditions with unknown origins, for example fibromyalgia, may actually be caused by

abnormalities in the peripheral and central nervous systems.

Thirdly, chronic pain is a biopsychosocial disease. Other than the biological aspect, psychological, social and cultural factors impact, the aetiology and maintenance of chronic pain, and elucidating these factors are crucial to allow a better understanding, and treatment of the pain.

Treatment begins with comprehensive clinical assessment, establishing a diagnosis, defining the extent of disease, identifying psycho-social contributing factors, and clarifying the goals of treatment. This requires a multimodal and multidisciplinary approach, including pharmacological and non-pharmacological treatments (e.g. patient education, physiotherapy and psychological support). Percutaneous invasive procedures, and to a lesser extent, surgery, may play a complementary role in the management of complex pain conditions.

### **S17 Pain Management of Common Neuropathic Conditions**

**Alvin Yeo**

Khoo Teck Puat Hospital, Singapore

Neuropathic pain can be a debilitating condition and can have a significant effect on the quality of life of patients inflicted with the problem. There are a large variety of causes and it can be a challenging condition to manage. Management of some of the common neuropathic conditions will be presented.

### **S18 Pain Management and the Use of Opioids**

**Choo Chee Yong**

Mount Elizabeth Novena Specialist Centre, Singapore

Opioids have been used to treat acute pain and cancer-related pain for many years. Evidence supporting such treatments is tremendous. Opioid therapy has become the standard of care for these patients in most countries. However, the use of opioids for chronic non-cancer-related pain conditions remain controversial.

There has been a paradigm shift in thinking regarding the use of opioids for chronic non-cancer pain. A carefully selected group of patients with chronic non-cancer pain may benefit from long-term opioid therapy and improve their quality of life. However, vigilant screening and monitoring is essential during opioid prescription. There may be significant issues of opioid-related side effects, opioid induced hyperalgesia, opioid tolerance, diversion and misuse.

We will discuss the evidence for patient selection, risk stratification, use of opioid treatment agreements, monitoring of opioid therapy, adverse effects, opioid rotation, opioid misuse and other opioid-related prescription guidelines. A multidisciplinary approach is best for achieving a safe and beneficial outcome in the use of opioids for chronic non-cancer pain.

## **S19 Evidence for Interventional Pain Management**

**Alex Yeo Sow Nam**

Mt Elizabeth Medical Centre, Singapore

In many cases of intractable pain, interventional pain management becomes a very useful treatment modalities. Such options carried out with guidance of fluoroscopy, ultrasound and various nerve and muscle stimulators and needles offer safe and effective treatment for patients needing some urgent and prolonged relief. Evidences from literature and various guidelines will be elucidated in various areas of pain management.

### *Medico-Legal Symposium*

## **S20 The Current Law of Consent in Singapore**

**Lek Siang Pheng**

Rodyk & Davidson LLP, Singapore

The right of a patient to make decisions about his treatment rests on the bedrock of the doctor's respect for the patient's autonomy. Respect for the patient's autonomy is one of the fundamental principles of clinical ethics.

In order for a patient to be able to make a decision about a proposed course of treatment, both the law and medical ethics impose a duty on the doctor to provide sufficient information to the patient by way of advice. This is to enable the patient to make an informed decision, whether or not to consent to the proposed treatment.

This talk focuses on the law of consent to treatment (commonly described as "informed consent") in Singapore. The law relating to consent is an aspect of the tort of negligence. A doctor's failure to advise and provide sufficient information to his patient for the latter to be able to make an informed decision would be a breach of his duty of care.

Currently, with the judgment of the Court of Appeal (our highest court) in the case of *Khoo James v Gunapathy d/o Muniandy* (2002), it appears that the Bolam test applies to the medical advice required to be given to a patient.

However, the Court of Appeal also qualified that the *Khoo James* case was not the occasion for a definitive ruling on the merits of the doctrine of informed consent.

In some other common law countries, their courts already have held that the Bolam test is not applicable to the matter of medical advice; notably, the very recent decision of the UK Supreme Court in the case of *Montgomery v Lanarkshire Health Board* (2015). Will the Singapore courts soon adopt the Montgomery test? This talk discusses how the nature of doctor's legal duty has been redefined by the Montgomery case and also its merits.

## **S21 Role of Medical Experts in Medical Negligence**

**Bertha Woon**

Gleneagles Medical Centre, Singapore

Medical negligence cases are increasingly in the news. As academicians, some of us will be called upon from time to time to act as medical experts in court cases. I will briefly go through the duty of an expert, the code of conduct and regulations for medical experts. I will discuss the different skills sets required in the scenarios that medical experts can expect to encounter (such as interpreting lawyers' instructions and expert's briefs, writing reports and undergoing cross examination). I will attempt to address concerns doctors may have about agreeing to act as an expert and share what professional support and assistance is available. As time permits, I will discuss recent developments and high profile cases.

## **S22 The Medico Legal Challenge in Hong Kong**

**Donald KT Li**

Hong Kong Academy of Medicine, Hong Kong

The Hong Kong Academy of Medicine is the only statutory body in Hong Kong to train, assess and accredit specialists. The Medical Council of Hong Kong (MCHK) serves as the regulator of doctors in Hong Kong. Its composition includes the Preliminary Investigation Committee, Licentiate Committee, Education and Accreditation Committee, Ethics Committee, and Health Committee.

There are numerous ways for the public to lodge a complaint against a doctor in Hong Kong. It can be through the MCHK, Hospital Authority, Department of Health, or even through the legislative councillors and the media, to name a few. The MCHK is the body with the disciplinary power to perform sanctions if a registered medical practitioner is found guilty of professional misconduct. Like other

places in the world, Hong Kong has seen an increase in medico-legal cases involving patients who are unhappy with doctors' clinical decisions or dissatisfied with the treatment received among different specialties. The presentation will look at the challenges and role of the regulator of doctors in Hong Kong.

There will be discussions on ethical dilemmas faced by practising doctors in Hong Kong and medical negligence. The decline of the Bolam test had implications and warranted a more "patient-centred" care. The first step to providing competent healthcare lies in open doctor-patient communication which is crucial. Besides having the necessary knowledge and skills, being able to gain the patient's trust is also essential for doctors in practising medicine. There will be suggestions on how to establish such desirable doctor-patient relationships.

### *Borderline Personality Disorder Symposium*

#### **S23 Epidemiology, Signs and Symptoms and a Case of Borderline Personality Disorder (BPD)**

**Roger Ho**

Department of Psychological Medicine, National University Hospital, Singapore

Borderline personality disorder is a common psychiatric condition but it is under-recognised. Patients are usually young adults and present with unstable emotion, feeling of emptiness, transient psychotic feature and multiple suicide attempts. Dr Roger Ho will present case vignettes of borderline personality disorder and discuss pharmacological management.

#### **S24 Dialectical Behaviour Therapy and its Use in the Treatment of BPD**

**Sharon Cohan Sung**

Duke-NUS Graduate Medical School, Singapore

Dialectical behaviour therapy (DBT) is an evidence-based psychotherapy that was originally developed by Dr Marsha Linehan (1993) to treat adults with borderline personality disorder (BPD). DBT blends change-oriented techniques from cognitive behavioural therapy with acceptance-based strategies from Zen mindfulness practice. DBT is a multi-component treatment that consists of individual therapy, group skills training, skills coaching, and a therapist consultation team. There is a robust and growing literature evaluating the efficacy of DBT, with 30 randomised controlled trials conducted in 8 different countries. The treatment is designed for complex, multi-problem patients

BPD and other conditions characterised by severe emotion dysregulation. Adaptations exist for substance use disorders, eating disorders, behaviour problems in adolescents, incarcerated individuals with antisocial personality disorder, and victims of domestic violence. This presentation will introduce attendees to the DBT approach for treating patients with problems such as suicidal and self-injurious behaviour, interpersonal difficulties, and pervasive problems with emotion regulation.

#### *Intensive Primary Care: Managing Patients with Complex Needs Outside the Hospital*

Intensive primary care is the new mission for family physicians in response to a rapidly ageing society and the inadequacy of a hospital centric healthcare system to meet the new challenge. The workshop will give participants a framework to practise intensive care outside the hospital. It will also provide an exercise in practical applications using a case scenario.

#### **S25 Intensive Primary Care: Managing Patients with Complex Needs Outside the Hospital**

**Lee Kheng Hock<sup>1</sup>, Matthew Ng Joo Ming<sup>1</sup>, Ng Lee Beng<sup>1</sup>**

<sup>1</sup>Department of Family Medicine and Continuing Care, Singapore General Hospital, Singapore

Intensive primary care is the new mission for family physicians in response to a rapidly ageing society and the inadequacy of a hospital centric healthcare system to meet the new challenge.

Intensive primary care can be defined as primary care that is provided to patients with complex care needs that are characterised by high utilisation of hospital resources with frequent and serious exacerbations of underlying chronic diseases. The level of care is high and requires the primary care physician to work as part of an integrated practice unit which coordinates the care provided by the different stakeholders in the health and social care system.

The physician providing this service will require all the competencies expected of a family physician. The physician must have a high level of expertise in interdisciplinary collaboration. Competency in system-based practice is essential and the clinician needs to be aware of the different types of services in the health system that are available and can be activated to care for the patient.

This workshop will give participants a conceptual

framework of intensive primary care. It will also provide an exercise in practical applications using a case scenario. The participant will gain awareness of areas of competency enhancement that are needed before embarking on providing such services.

## **S26 Intensive Primary Care: Managing the Complex Patient Outside the Hospital**

**Matthew Ng<sup>1</sup>, Ng Lee Beng<sup>1</sup>, Lee Kheng Hock<sup>1</sup>**

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Singapore's population is rapidly ageing and living longer, with an increasingly complex chronic disease burden. The traditional model of delivering primary care will need to be remodelled and increased in intensity to take care of this group of high-risk patients and keep them safe in the community. Intensive Primary Care is providing care to the sickest, highest-utilising patients in the practice to improve their health outcomes and satisfaction, far beyond what is being offered in traditional primary care practices by enhanced coordination of medical and social care and providing comprehensive care across the entire cycle of care. This can be achieved by being connected to the health system and resources, additional efforts in providing care coordination to navigate the health system, and optimising clinical social care around the patient's needs through a 3-step approach:

- A) Defragment Care: Assessment and identification of care issues that must be resolved urgently;
- B) Integrate Care: Develop a comprehensive care plan and optimise the medical and social care; and
- C) Link: Muster resources to support continuing care in the community.

### *Defining the Art of Counselling Within the Consultation: Brief Integrative Personalised Therapy (BIPT)*

A system of integrating counselling within the usual consultation has been developed. The consultation is extended by increasing the repertoire of therapeutic roles assumed by the doctor and by using extended relating and inquiry skills. A formulation of the reason for encounter can hence be arrived at in addition to the diagnosis of the presenting complaint. The patient can then be managed holistically using the usual treatment modalities plus psychological approaches. Some techniques would be demonstrated in two workshops following an overview.

## **S27 Defining the Art of Counselling Within the Consultation: Brief Integrative Personalised Therapy (BIPT)**

**Cheong Pak Yean<sup>1</sup>, Goh Lee Gan<sup>1</sup>**

<sup>1</sup>Division of Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore

Within the usual clinical consultation several tasks are completed: taking the chief complaint and history, doing relevant physical examination, ordering pertinent investigations, generating the differential diagnoses and finally deciding on the management. Often, doctors would have also picked up psycho-social issues like worry, anxiety and fear that may impact on the treatment outcome. Many of these issues can be addressed by including in an extended consultation, relating and inquiry skills derived from counselling. The 'Open Johari Window'<sup>1</sup> which is the psychological space that both the doctor and patient are aware of, is thus enlarged so they can work on this shared arena collaboratively. Based on the extended understanding that may be represented by genograms and timelines of significant life events, the doctor makes a formulation of the precipitating, predisposing, perpetuating, and protective factors of the presenting problems to complement the diagnosis. Appropriate psycho-social interventions viz problem, pattern, presence or positive work can then be integrated into the usual biomedical management. The practice of extended relating, inquiry, formulation and integrative interventions as extended skills in the consultation will be demonstrated by video clips in the presentation.

### REFERENCE

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## O1 ED-GAIT: Emergency Department—Geriatric Assessment in a Team

**Juliana Poh<sup>1</sup>, Sheela James<sup>2</sup>, Jennifer Liaw<sup>3</sup>, Ng Wai Yee<sup>4</sup>**

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**Introduction:** We conducted a multidisciplinary assessment of the elderly after a visit to ED related to a fall, to prevent future falls and re-attendance.

**Methods:** Geriatric ED patients presenting after a fall from September 2012 to August 2013 were evaluated. Those not requiring admission were risk-stratified using the 6-question Triage Risk Screening Tool (TRST). High-risk patients (TRST >2) were randomised into intervention and control groups. The intervention group had geriatric assessment by a trained nurse and ED-GAIT, involving a physiotherapist, an occupational therapist and a nurse from the Agency for Integrated Care. The nurse reviewed fall risk, mobility, continence issues, cognition, mood, vision and hearing. The physiotherapist assessed gait, stability and need for walking aids; the occupational therapist assessed function and home safety with home visits with the AIC nurse. Follow-up with outpatient clinics were arranged. Follow-up was carried out 3-monthly for 12 months by telephone call. The end points were: basic and instrumental activities of daily living scores, ED re-attendance, hospitalisation, falls-related ED attendance and hospitalisation.

**Results:** There were a total of 40 intervention, 40 control; baseline characteristics were similar. No significant differences at follow-up w.r.t. end-points. An increase in time and number of falls in the past year leads to decrease in BADL score. As time increases, IADL decreases. An increase in time and falls in the past year lead to higher odds of falls after the last visit to the ED. For Timed-Up-And-Go, those requiring >20s are more likely to fall and revisit ED. An increase in time, age and falls in the past year leads to higher odds of visiting ED. Those taking <4 medications are less likely to revisit the ED. An increase in time leads to higher odds of re-attendance. Increase in time and falls in the past year leads to higher odds of admission to hospital. Increase in age and falls in the past year leads to higher odds of rehospitalisation.

**Conclusion:** ED-GAIT can identify risk factors for falls, but single-point intervention may be adequate for preventing future falls and decrease in function.

## O2 Plasma Galectin-3, a Marker of Myocardial Fibrosis, is Associated with Plasma NT-proBNP, a Marker of Volume Overload in Chronic Kidney Disease Patients

**Gek Cher Chan<sup>1</sup>, Rui Shian Ao<sup>2</sup>, Jialiang Li<sup>3</sup>, Qi Chun Toh<sup>3</sup>, Adonsia Yang<sup>3</sup>, Boon Wee Teo<sup>1,3</sup>**

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**Introduction:** Heart failure patients with myocardial fibrosis have elevated plasma galectin-3 (pG3), a beta-galactoside-binding lectin regulating inflammation and fibrosis. Chronic kidney disease (CKD) patients may develop myocardial fibrosis from chronic volume overload. The association of myocardial fibrosis with volume overload in CKD patients remains unknown. We hypothesise that pG3 is related to B-type natriuretic peptide (NT-proBNP), a marker of volume overload in CKD patients. We assessed the relationship of NT-proBNP with pG3 in a population of CKD patients and healthy controls.

**Methods:** We retrieved prospectively collected frozen plasma samples from 228 stable CKD patients and 105 healthy individuals without CKD, and assayed for pG3 and NT-proBNP. By univariate analysis, we assessed pG3 for associations with age, gender, ethnicity, systolic (SBP, mmHg) and diastolic (DBP, mmHg) blood pressures; body mass index (BMI, kg/m<sup>2</sup>), previously diagnosed diabetes, hypertension, and coronary artery disease; and estimated glomerular filtration rate (eGFR, mL/min/1.73 m<sup>2</sup>). Skewed variables were natural log-transformed for analyses. We put all significant variables in a multiple linear regression model including age, gender, and ethnicity, and by backward elimination arrived at a final model. Significance was taken at  $P < 0.05$ .

**Results:** Population averages: Age = 53.5 ± 15.2 years; BMI = 26.8 ± 5.2; eGFR = 70 (IQR: 35 to 100), pG3 = 20.3 (IQR: 15.2 to 30.4) ng/mL, NTproBNP = 31 (IQR: 11 to 84) pg/mL. Age, ethnicity, presence of previous disease diagnoses, SBP, DBP, BMI, Ln eGFR, and LnNT-proBNP were associated with Ln pG3 by univariate analysis. Using multiple linear regressions with backward elimination, the best model included BMI, Ln eGFR, and LnBNP.

**Conclusion:** In stable CKD patients, NT-proBNP is associated with plasma galectin-3.

### **O3 Efficacy and Safety of Intra-Articular Ketolorac in the Treatment of Inflammatory Arthritis—A Report of the Initial Experience with 40 Patients**

**Yoon Kam Hon<sup>1</sup>, Iver Maureen Katma Nava<sup>1</sup>**

<sup>1</sup>El Shaddai Arthritis & Rheumatism Specialist Medical Centre, Singapore

**Introduction:** While oral and intra-muscular non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used in the treatment of arthritis pain, they are sometimes ineffective and associated with side effects. Intra-articular (IA) NSAIDs usage has been reported in animal experiments and post-arthroscopy settings. We are the first to report our experience in 40 patients who were treated with IA ketolorac for the management of inflammatory arthritis.

**Methods:** IA ketolorac has been offered in our clinic for patients with inflammatory arthritis since January 2015. Those patients who received IA ketolorac between January 2015 to March 2015 were identified. Their records were reviewed with reference to the arthritis diagnosis, treatment and response to therapy and follow-up. The data were collated and analysed.

**Results:** A total of 40 patients were reviewed. Demographic data: mean age 63 years. Male – 8, female – 32; racial distribution: 29 Chinese, 3 Malays, 8 Indians. Diagnosis: inflammatory osteoarthritis (OA) 80%, rheumatoid arthritis 12.5%, gouty arthritis 18%. A total of 33 patients had previous treatment with steroids/and/or NSAIDs while 92.5% of patients had synovitis on ultrasound. Joints injected – 39 knees; 3 wrists; 2 shoulders; 2 ankles; and 1 finger. Response rate: 42.5% complete recovery; 55% improvement; 10% had recurrence; 2.5% had persistent knee pain. There was no adverse events noted. Mean duration of response and follow-up ranged from 1 week to 4 months.

**Conclusion:** IA ketolorac is a useful and safe therapeutic modality for the treatment of inflammatory arthritis with over 90% response rate and for those who have persistent or recurrent inflammatory joint pain despite steroid injection.

### **O4 Low- vs High-Dose Aspirin in Percutaneous Coronary Intervention: A Systematic Literature Review**

**Kundan R Saripalli<sup>1</sup>, Jonathan Yap<sup>2</sup>, Tian Hai Koh<sup>2</sup>**

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**Introduction:** Aspirin forms the crucial backbone of anti-platelet pharmacotherapy in patients undergoing percutaneous coronary intervention (PCI). However, there

is uncertainty regarding the optimal dose to be prescribed. We aim to perform a systematic literature review on studies comparing treatment with low- and high-dose aspirin in patients undergoing PCI.

**Methods:** A comprehensive literature search was performed by 2 independent reviewers utilising MEDLINE, EMBASE and Cochrane databases, selecting for trials comparing low- and high-dose aspirin in patients undergoing PCI. Low-dose was defined as <162 mg and high-dose as ≥162 mg. Outcomes measured included major adverse cardiovascular events (MACE) and bleeding. A fixed-effect method in RevMan 5.3 was used after ruling out heterogeneity based on the I<sup>2</sup> test (I<sup>2</sup> <40%) to obtain hazards ratios for the outcomes.

**Results:** Five studies with 27,456 patients were selected. Two studies evaluated outcomes at 30 days and 3 at 1 year. No significant difference was found in MACE rates at all comparable endpoints when evaluating low- against high-dose aspirin (HR [95% CI] 1.03 [0.93 to 1.15]). The combined endpoint of bleeding favoured low-dose aspirin, demonstrating a significant decrease in bleeding rates compared to high-dose aspirin (HR [95% CI], 0.64 [0.50 to 0.83]). The incidence of stent thrombosis in 2 studies showed no significant difference between either group although further analysis could not be done due to the limited data.

**Conclusion:** With regards to MACE, there is no significant difference between low- and high-dose aspirin. However, there appears to be a significantly increased risk of bleeding with high-dose aspirin, lending evidence to the use of low-dose aspirin in patients undergoing PCI.

### **O5 Does Gastrectomy with Systemic Chemotherapy Improve Survival Benefits in Patients with Metastatic (Stage 4) Gastric Cancer? A Propensity Score Matched Case Control Study**

**Aung Myint Oo<sup>1,2</sup>, Young Suk Park<sup>2</sup>, Dong Joon Shin<sup>2</sup>, Do Hyun Jung<sup>2</sup>, Sang Yong Son<sup>2</sup>, Sang Hoon Ahn<sup>2</sup>, Do Joong Park<sup>2,3</sup>, Hyung Ho Kim<sup>2,3</sup>**

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**Introduction:** The aim of this study is to investigate the survival benefits of gastrectomy with systemic chemotherapy over chemotherapy alone in patients diagnosed with metastatic gastric cancer.

**Methods:** Patients with newly diagnosed metastatic stage 4 cancer were divided into the gastrectomy with systemic chemotherapy group (n = 136) and the chemotherapy-alone

group (n = 407). In view of potential selection bias and confounding effects between the 2 groups, propensity score matching was used to reduce the bias. After matching of age, gender, body mass index, performance score, albumin, peritoneal metastasis, distant lymph node metastasis, liver metastasis, lung metastasis, bone metastasis, ovary and other organs metastasis, number of organs/system metastasis, 120 patients in each group were selected for final analysis.

**Results:** The median overall survival in matched cohort was 18.13 months (95% CI, 13.088 to 23.17) versus 11.8 months (95% CI, 9.528 to 14.072) in the surgery group and the chemotherapy-alone group respectively. The 2-year overall survival rate was also higher in the surgery group (42% versus 30%). The 30 days mortality was zero and morbidity rate was 18.3% (22/120) in the surgery group. Multivariate analysis of the surgery group showed that poor differentiation of tumour, vascular invasion, and metastatic lymph node ratio are factors associated with poor survival outcomes in the surgery group.

**Conclusion:** The gastrectomy with chemotherapy can improve overall survival in selected patients with newly diagnosed metastatic gastric cancer. Surgery can be performed safely with acceptable morbidity and mortality in experienced centres. Well designed prospective clinical trials are still needed to confirm our observations.

## O6 Systematic Review and Meta-Analysis of Complications and Outcomes of Diabetic Patients with Burn Trauma

**Andrew Arjun Savampanathan<sup>1</sup>, Philip H Chang<sup>2,3,4</sup>**

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**Introduction:** Diabetes has been commonly associated with numerous micro- and macrovascular complications, reducing the outcomes of patients when they experience other forms of comorbidities and diseases. We thus aimed to understand the effect diabetes plays on the extent of complications and patient outcomes in burn trauma.

**Methods:** We searched MEDLINE, Science Direct and the Cochrane Review Database for 571 articles. Eventually, through our selection criteria, 12 articles were selected for systematic review and meta-analysis. Data was analysed via Review Manager 5.3, using Mantel-Haenszel statistics and random effect models.

**Results:** The odds of a diabetic patient getting a wound

or local infection was 2.55 times higher (95% CI, 1.21 to 5.36,  $Z = 2.47$ ;  $P = 0.01$ ), with a low heterogeneity ( $\text{Tau}^2 = 0.00$ ;  $I^2 = 0\%$ ). Diabetics also had a higher odds of urinary tract infections (OR 3.32; 95% CI, 1.92 to 5.73;  $Z = 4.31$ ,  $P < 0.001$ ), low heterogeneity ( $\text{Tau}^2 = 0$ ;  $I^2 = 0\%$ ). Through our systematic review, we also found that diabetic patients are also more prone to nosocomial wound infections (OR 2.26; 95% CI = 1.10 to 4.64), cellulitis (OR 2.69; 95% CI, 1.85 to 3.91), bacteraemia (OR 2.91; 95% CI, 1.48 to 5.73), sepsis (OR 4.36; 95% CI, 2.20 to 8.64), a higher number of burn-related operations (OR 3.94; 95% CI, 1.94 to 7.90), longer period of wound closure (MD = 26.8; 95% CI, 8.52 to 45.1), respiratory complications (OR = 2.91; 95% CI, 1.35 to 6.28) and a higher number of days on ventilator (MD = 8.70; 95% CI, 3.51 to 13.89).

**Conclusion:** We postulate that our significant findings are due to the triad of vasculopathy, neuropathy and immunopathy typically found in diabetic patients. This data is useful in allowing us to predict outcomes of diabetic patients and thus plan proper for their inpatient management so as to maximise patient outcomes.

## O7 Systematic Review and Meta-Analysis of Complications and Outcomes of Obese Patients with Burn Trauma

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**Introduction:** Obesity has been described as a factor that contributes to poorer outcomes and more severe complications in burn patients. We thus aim to meta-analyse the literature present currently regarding the extent to which obesity contributes to the prevalence of various complications in burns.

**Methods:** We searched MEDLINE, Science Direct and Web of Science for 363 articles. Eventually, we selected only 11 articles for our analysis. Data was analysed with Review Manager 5.3, using Mantel-Haenszel statistics and random effect models.

**Results:** Length of stay and mortality rates were significantly different for obese patients compared to non-obese patients at a mean difference (MD) of 2.16 (95% CI, 0.42 to 3.87;  $I^2 = 0$ ;  $P = 0.01$ ) and odds ratio (OR) = 1.97 (95% CI, 1.07 to 3.46;  $I^2 = 65\%$ ;  $P = 0.03$ ) respectively. Number of wound infections, number of burn operations and length of ICU stay were not found to be statistically different.



**Conclusion:** We postulate that our significant findings are due to the proinflammatory state and poorer glycaemic control in obese patients. More studies should look into the effects of obesity on outcomes of burn patients.

## **08 Liver Resection and Transplantation Are Safe in Patients with Hepatocellular Carcinoma (HCC) Previously Treated with Selective Internal Radiation Therapy (SIRT) Using Y-90 Resin Microspheres: The P4s Study**

**Pierce K Chow<sup>1</sup>, Bruno Sangro<sup>2,3</sup>, Michael Schön<sup>4</sup>, Rheun-Chuan Lee<sup>5</sup>, Derek Manas<sup>6</sup>, Rohan Jeyarajah<sup>7</sup>, Georgios Katsanos<sup>8</sup>, Geert Maleux<sup>9</sup>, Antonio D Pinna<sup>10</sup>, Lourens Bester<sup>11</sup>, David L Morris<sup>12</sup>, David Iannitti<sup>13</sup>, Richard Stubbs<sup>14</sup>, Paul J Gow<sup>15</sup>, Irene Bargellini<sup>16</sup>, Kevin T Fisher<sup>17</sup>, Wan-Yee Lau<sup>18</sup>, Konstantinos Kouladouros<sup>4</sup>, Vincent Donckier<sup>8,19</sup>, Georgio Ercolani<sup>9</sup>, Fernando Pardo<sup>2</sup> and the P4S Investigators**

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**Introduction:** Selective internal radiation therapy (SIRT or radioembolisation) is increasingly used for the treatment of patients with hepatocellular carcinoma (HCC). It has been postulated that by inducing perihepatic or peritumoral fibrosis, causing or worsening portal hypertension, and/or by inducing subclinical lung damage, SIRT could make liver surgery more hazardous. The aim of this study was to evaluate the safety of liver surgery after SIRT.

**Methods:** P4S is an international, multicentre retrospective analysis of outcomes associated with liver resection (LR) or transplantation (LT) following SIRT using Y-90 resin microspheres (SIR-Spheres, Sirtex Medical). Primary endpoints were perioperative and 90-day postoperative morbidity (Clavien-Dindo scale) and mortality. Analysis used standard statistical methods. Data were captured on SIRT, surgery (between August 1998 and May 2014) and follow-up.

**Results:** The outcomes of 49 patients with HCC treated by

LR (n = 23) or LT (n = 26) were analysed. Patients were mainly cirrhotics (LR 61%; LT 92%). Nearly one-fourth (24%) had been previously submitted to other procedures including TACE (18%), resection (4%) or ablation (2%), 9% had chemotherapy pre- or post-SIRT, and 8% had portal vein thrombosis or occlusion. Regarding SIRT, 18% of patients received  $\geq 2$  sessions and 27% received SIRT to whole liver. Before surgery, 20% had total bilirubin CTC grade  $\geq 2$ , 74% had comorbidities (mostly diabetes, hypertension and cardiopathy). Median ASA score was 3 (ASA  $\geq 3$ : LR 61%; LT 81%). LR included minor (35%), major not extended (48%) and extended resections (17%); 8% of LT patients had living-related donor LT. Median time from last SIRT to surgery was 8.0 (LR) and 7.4 (LT) months, respectively. Median postoperative stay [IQR] was 8.0 [4.0] (LR) and 11.0 [8.0] (LT) days, respectively. The incidence of complications grade  $\geq 3$  was 4% (LR) and 15% (LT). Pulmonary-specific complications occurred only in 1 patient (grade 2) in the LT group and was not potentially related to prior SIRT. Any grade liver failure was observed in 0% (LR) and 3.8% (LT; 1 grade 2). Ninety-day readmission rates were 4% (LR) and 27% (LT) while no 90-day all-cause mortality was observed in either group. Median survival from the time of surgery has not been reached in any group with median post-surgery follow-up of 28.5 (LR) and 23.7 (LT) months, respectively.

**Conclusion:** SIRT using Y-90 resin microspheres does not increase morbidity or mortality after liver resection or transplantation. A beneficial effect of SIRT before liver resection of HCC warrants further research.

## **09 A Family Physician-led Integrated Practice Unit and Post-Discharge Virtual Ward for Patients at Highest Risk of Readmission Findings of a Randomised Controlled Trial**

**Low Lian Leng<sup>1</sup>, Lee Kheng Hock<sup>1</sup>, Matthew Ng Joo Ming<sup>1</sup>, Ng Lee Beng<sup>1</sup>, Tay Wei Yi<sup>2</sup>, Tan Shu Yun<sup>2</sup>**

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**Introduction:** We aim to evaluate if a family physician hospitalist-led integrated practice unit (IPU) and a post-discharge virtual ward programme can reduce acute hospital utilisation of complex patients at high-risk for readmission.

**Methods:** We conducted an open label, assess or blinded pragmatic randomised controlled trial on patients with 2 or more unscheduled readmissions in the prior 90 days and LACE score  $\geq 10$ . A total of 838 patients were randomised in 1:1 ratio and blocks of 4 to the intervention programme (n = 418) or control (n = 420). Patients in the

intervention group received inpatient medical management and intensive discharge planning. Post-discharge, patients were enrolled into a virtual ward for close monitoring that included a telephone review within 72 hours of discharge, a comprehensive assessment in the home setting, regular telephone reviews to identify early complications and early review clinics for patients who destabilise. The IPU meets daily to coordinate care for patients in the virtual ward and reviews all readmissions to provide further discharge planning and care coordination. Patients in the control group received usual hospital care.

**Results:** Patients in the intervention group had a lower rate of 30-day readmission, odds ratio 0.67 (95% CI, 0.58 to 0.84,  $P < 0.001$ ) and 30-day emergency department rate, odds ratio 0.60 (95% CI, 0.47 to 0.76,  $P < 0.001$ ) than those receiving usual care. The effectiveness was sustained at 180 days.

**Conclusion:** A combination of family physician hospitalist-led IPU and post-discharge virtual ward monitoring reduced acute hospital utilisation in high-risk patients with complex care needs.

## O10 Pen-torch Transillumination: Shedding Light on Difficult Venepuncture

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**Introduction:** Our novel technique of pen-torch transillumination (PTI) uses a cheap and easily available instrument (Penlite-LP212<sup>®</sup>, Energizer<sup>®</sup>, Missouri, USA) to visualise superficial veins invisible to the naked eye. We evaluate the efficacy of PTI in improving venepuncture success rate (SR) for patients with poor venous access.

**Methods:** This prospective randomised controlled trial looked at adult patients ( $n = 48$ ) aged 21 to 90 with difficult venous access (history of  $\geq 3$  consecutive attempts required for successful cannulation during the current admission) requiring non-emergent venepuncture. Patients underwent venepuncture over the upper-limb using one of the following: conventional venepuncture (control); Veinlite<sup>®</sup> (TransLite<sup>®</sup>, Texas, USA), a commercial transillumination device; PTI. Outcome measures were: successful cannulation within 2

attempts; duration of each successful attempt. Fisher's exact and Kruskal-Wallis tests were performed.

**Results:** Venepuncture using Veinlite<sup>®</sup> (first attempt SR:  $n = 16/16$ , 100%) and PTI (first attempt SR:  $n = 7/16$ , 44%; second attempt SR:  $n = 9/9$ , 100%) were more likely to be successful within 2 attempts, compared to the controls (first attempt SR:  $n = 3/16$ , 19%; first attempt SR:  $n = 3/13$ , 23%) ( $P < 0.001$ ). There was no significant difference in duration of each successful cannulation. First attempt, median duration: 120s, 240s, 300s, for control, Veinlite<sup>®</sup> and PTI respectively ( $P > 0.05$ ). Second attempt, median duration: 240s, 180s, for control and PTI, respectively ( $P > 0.05$ ).

**Conclusion:** Akin to a hand-held angiography device, PTI directs users to veins of sizeable calibre. Thrombosed/tortuous veins, branch points and valves, are easily identified and avoided. It has comparable efficacy to Veinlite<sup>®</sup>, is cheaper (Veinlite<sup>®</sup> SGD 405.60 vs Penlite-LP212<sup>®</sup> SGD 9.00), and more easily available. PTI improves patient care, especially in developing regions where costs are a concern.

## O11 Which Marker of Fluid Overload is Best Associated with Serum Troponin in Chronic Kidney Disease Patients?

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**Introduction:** Chronic kidney disease (CKD) patients often have elevated serum troponin I (hsTnI) concentrations, which may be due to myocardial stretch injury from fluid overload. Overload is detected using plasma B-type natriuretic peptide (NT-proBNP) or body water assessments using bioimpedance spectroscopy (BCM). The estimate of overload best associated with hsTnI is unclear. We assessed the associations of NT-proBNP and BCM volumes with hsTnI in CKD patients.

**Methods:** We prospectively recruited 82 CKD patients (52% men, Chinese 76.8%), who underwent BCM for total body water (TBW, L), extracellular water (ECW, L), and intracellular water (ICW, L). We looked for associations of hsTnI with age, gender, ethnicity, systolic (SBP) and diastolic (DBP) blood pressures (mmHg), body mass index (BMI, kg/m<sup>2</sup>), previously diagnosed diabetes, hypertension, and coronary artery disease; and estimated glomerular filtration rate (eGFR, mL/min/1.73 m<sup>2</sup>). Skewed variables were natural log-transformed for

analyses. All significant variables were put into a multiple linear regression model, and by backwards elimination arrived at models by comparing  $R^2$  and Aikake Information Criterion (AIC). Significance was taken at  $P < 0.05$ .

**Results:** Population averages: age =  $59.1 \pm 12.6$  years; BMI =  $26.8 \pm 5.2$ ; SBP =  $136 \pm 18$ , eGFR = 44 (IQR: 26 to 79), TBW =  $33.9 \pm 7.7$ , ECW =  $15.9 \pm 3.4$ , ICW =  $18.0 \pm 4.5$ , hsTnI =  $5.35$  (IQR: 3.29 to 8.20) ng/L, and NT-proBNP = 33 (IQR: 18 to 78) pg/mL. Age, SBP, BMI, Ln eGFR, and Ln NT-proBNP were associated with Ln hsTnI. By backwards elimination, the best models included Ln eGFR ( $P = 0.177$ ) and Ln NT-proBNP ( $P = 0.383$ ) ( $R^2 = 0.335$ , AIC = 175,  $P < 0.001$ ); and Ln eGFR ( $P = 0.0009$ ) and ECW/ICW ( $P = 0.240$ ) ( $R^2 = 0.342$ , AIC = 174,  $P < 0.001$ ).

**Conclusion:** In CKD patients, serum troponin I is associated with plasma NT-proBNP, and the only significant bioimpedance-determined volume measure, ECW/ICW.

## O12 Which Bioimpedance Spectroscopy Measure Best Detects Fluid Overload as a Contributory Factor to Hypertension in Asian Non-Dialysis Chronic Kidney Disease Patients?

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**Introduction:** Bioimpedance spectroscopy measures (in litres, L) overhydration (OH), total body water (TBW), extracellular water (ECW), and intracellular water (ICW). These measures guide hypertension management in non-Asian dialysis patients. It is unclear if fluid overload detection is associated with blood pressure in Asian non-dialysis chronic kidney disease (CKD) patients. We examined the cross-sectional association of bioimpedance measures with systolic (SBP, mmHg) and diastolic (DBP, mmHg) blood pressures in Asian non-dialysis CKD patients.

**Methods:** We prospectively recruited 306 patients (58.2% male, Chinese 66.0%, mean age  $62.6 \pm 10.8$  years; 52% and 85% with previously diagnosed diabetes, hypertension, respectively). They underwent bioimpedance spectroscopy with the Fresenius Body Composition Monitor. Standard univariate statistical tests and multiple linear regression models were used to assess SBP and DBP (mmHg) with bioimpedance. Including standard adjusters of age, gender, and ethnicity, multivariate models were built, and

bioimpedance measures substituted in turn. Predictive performance was compared using the  $P$  value,  $R^2$ , and Aikake Information Criterion (AIC). Significance was taken at  $P < 0.05$ .

**Results:** Overall averages were: SBP =  $139 \pm 20$ , DBP =  $74 \pm 11$ , TBW =  $33.1 \pm 7.4$ , ECW =  $15.9 \pm 3.5$ , ICW =  $17.2 \pm 4.4$ , and median OH was 1.0 L (IQR: 0.1-1.9). SBP was associated with OH, ECW/TBW, and ECW/ICW by univariate analysis. The best model ( $R^2 = 0.121$ , AIC = 2684) included ECW/ICW ( $P = 0.004$ ), followed by models including ECW/TBW ( $R^2 = 0.114$ , AIC = 2687;  $P = 0.014$ ) and OH ( $R^2 = 0.108$ , AIC = 2689;  $P = 0.045$ ). ICW was insignificant in its model. DBP was associated with TBW, ICW, ECW/TBW, and ECW/ICW by univariate analysis. The bioimpedance variables were insignificant in the DBP models.

**Conclusion:** In Asian non-dialysis CKD patients, bioimpedance spectroscopy measures are associated only with SBP.

## O13 Endovascular Salvage of Arteriovenous Fistulas for Hemodialysis in an Asian Population

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**Introduction:** We aimed to determine outcomes of endovascular therapy (ET) for haemodialysis arteriovenous fistula (AVF) salvage, and to identify patients at risk for early AVF failure by elucidating factors associated with shorter patency periods.

**Methods:** A single centre retrospective cohort study was performed for 238 patients (mean age, 64.5 years, 61.7% male) who underwent ET starting from January 2011 to August 2012. Fistuloplasty images were graded by 2 radiologists via consensus. AVF technical characteristics, medical comorbidities, antiplatelet/anticoagulant usage and demographic factors were statistically tested for bearing on AVF patency using SPSS 20.

**Results:** A total of 522 ET procedures were reviewed, yielding a technical success rate of 91.6%, a clinical success rate of 95.7%, and a complication rate of 3.06%. Kaplan Meier survival analysis of primary patency at 6, 12 and

24 months postintervention was 67.3%, 50.5% and 40.3% while primary assisted patency was 87.7%, 79.9%, and 67.7%, respectively. Multivariate Cox regression models adjusting for age, race, and AVF maturation revealed that AVF thrombosis (hazard ratio 2.63,  $P < 0.0001$ ), lesion lengths  $> 2$  cm (hazard ratio 1.54,  $P < 0.015$ ) and cephalic arch stenosis (hazard ratio 2.31,  $P < 0.033$ ) were significantly associated with shorter primary patency. Secondary analysis using binary logistic regression showed that juxta-anastomotic lesion sites (odds ratio 5.98,  $P < 0.004$ ), hyperlipidaemia (odds ratio 2.90,  $P < 0.028$ ), and lesion lengths  $> 2$  cm (odds ratio 1.16,  $P < 0.043$ ) were in turn associated with AVF thrombosis.

**Conclusion:** AVF thrombosis is most strongly associated with early AVF failure. Patients at risk with juxta-anastomotic lesions, hyperlipidaemia and lesion lengths  $> 2$  cm should undergo proactive surveillance for timely ET to avert AVF thrombosis.

#### O14 Epidemiology of Non-Alcoholic Fatty Liver Disease (NAFLD) in Patients with Cholelithiasis

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**Introduction:** We aimed to establish the change in prevalence of NAFLD over 2 cohorts spaced 10 years apart in patients with cholelithiasis, and to establish risk factors associated with the change in prevalence of NAFLD.

**Methods:** A single-centre retrospective study was performed on 244 patients of similar demographic characteristics (age, race, gender) divided into 2 cohorts ( $n = 141$ , November 2001 to November 2004, vs  $n = 103$ , November 2011 to November 2014). These patients underwent cholecystectomy for gallbladder calculi and have no history of chronic alcohol consumption. Diagnostic scan reports comprising 1) ultrasound, 2) CT, and 3) MRI were reviewed for fatty liver changes. The 2 cohorts were statistically tested for changes to the proportion of NAFLD patients and its associated risk factors using SPSS 20.

**Results:** Two-tailed Z tests confirmed that patients in the November 2011 to November 2014 cohort had a significantly higher proportion of patients with NAFLD (57.3% vs 39%,  $P < 0.005$ ) and proportion of patients with hyperlipidaemia (43.7% vs 17.7%,  $P < 0$ ) than the November 2001 to

November 2004 cohort. Binary logistic regression revealed that BMI  $> 30$  (odds ratio 6.71,  $P < 0.021$ ), BMI 25 to 30 (odds ratio 2.04,  $P < 0.037$ ) and hypertension (odds ratio 2.3,  $P < 0.031$ ) were factors positively associated with NAFLD.

**Conclusion:** There is a significant increase in the proportion of cholelithiasis patients comorbid with NAFLD and hyperlipidaemia over the span of 10 years. BMI  $> 25$  and hypertension are the main factors which need to be more aggressively controlled in these patients so as to stem the increasing prevalence of NAFLD, before it progresses to more advanced liver disease.

#### O15 Effect of Care Coordination on Hospital Readmission in Patients with Multimorbidity

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**Introduction:** The multimorbidity patient is prone to repeated hospital admissions, each time discharging with a sum of complex adjustments in care plans to keep track of. Care coordinators play an integral role in supporting the care of these patients post-discharge to ensure these management plans are followed through. They are key in identifying factors that prevent patient from adhering to care plans. These when addressed promptly can potentially reduce preventable causes for readmissions.

**Methods:** We sampled a population in St Luke's Hospital to review the readmission rates at 15 and 30 days from May 2014 to April 2015. The population was stratified into patients with a history of multiple admissions, those with known dementia, and the rest into simple and complex cases. Complex cases were identified by a criteria including those with 3 or more comorbidities.

**Results:** During May 2014 to April 2015, there were a total of 1614 patients followed up by care coordinators in St Luke's Hospital. Readmission rates at 15 days averaged at 4.6% in 2014 and 2.8% in 2015, while that at 30 days was 7.7% in 2014 and 7.2% in 2015.

**Conclusion:** Care coordination is an integral component of individualised and integrated healthcare for the multi-morbidity patient. Beyond decreasing the rates of preventable hospital readmissions post-discharge, there is a role for care coordinators to step in even for those being seen outpatient to ensure care plans are duly followed through at home. This could effectively reduce overall hospital admission rates in this group of patients with complex healthcare needs.

## O16 Accident and Emergency Services in Singapore

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**Introduction:** The accident and emergency (A&E) department is an important department as it is the “front door” to the hospital, providing a 24-hour emergency medical service. Each year, the A&E service attends to thousands of patients in the emergency care setting. This study aims to compare the A&E department waiting time in government restructured hospitals and private hospitals and to study the contributing factors. This study also aims to make recommendations to improve the services of the A&E departments in Singapore.

**Methods:** A structured questionnaire was sent to the healthcare respondents of 2 government restructured hospitals and 2 private hospitals. Data collected were analysed and compared with other national data from the Ministry of Health.

**Results:** The average waiting time is significantly longer in government restructured hospitals (peak: 120 mins, non-peak: 30 mins) compared to private hospitals (peak: 30 mins, non-peak: 10 mins). The range of bill size of all the 4 hospitals is S\$100 to S\$200. The percentage of patients' complaint due to long waiting time is higher in government restructured hospitals (30%) compared to private hospitals (10% to 20%). Some of the main contributing factors are high patient load, shortage of medical healthcare workers, misuse of A&E services and lack of patient education.

**Conclusion:** The A&E services in government restructured hospitals remained strained and overwhelmed. Multidisciplinary approach to address this problem is the best approach to improve the A&E services. It ranges from improvement in healthcare policies in recruitment of healthcare workers, public education, ambulance services, as well as new concepts in optimising front-end operations.

## O17 The Extended Consultation in Treatment of Depression in Primary Care

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**Introduction:** Major depressive disorder (MDD) is a complex disabling condition that is common in primary care. The example of Mr X\* illustrates that MDD may

manifest as somatic complaints. Mr X was previously diagnosed with MDD but had defaulted treatment. It was through an extended consultation that we could unmask the diagnosis and initiate the therapeutic process. We aimed to determine if a different approach using the model of an extended consultation led by a primary family physician (FP) to explore a patient's psychosocial history and the use of psychological techniques can be adjuncts to pharmacotherapy in management of MDD.

**Methods:** We used a series of consultations consisting of extended relating and inquiry to evoke hidden emotions, bring forth the unknown Johari<sup>1</sup> window, and convert to the open and free window. An example of an extended consultation with Mr X was videotaped with his permission. The video demonstrates various forms of narrative therapy<sup>2</sup> e.g. reframing, as well as various counselling techniques that were employed, including the “empty chair”.

**Results:** Mr X gained insight into his condition, proceeded to reframe, reauthor and remember his past. Some challenges faced during the therapeutic process include the disjoint in the doctor(s)-patient relationship and fragmentation of care. This was highlighted when Mr X visited another physician who gave him conflicting advice. Being an active participant in his own therapy, he sought a second opinion, thereby preventing a severe relapse.

**Conclusion:** The primary FP-led extended consultation can be used to uncover therapeutic opportunities when engaging patients with MDD, and to complement pharmacotherapy for holistic management.

\*X was used to protect patient confidentiality.

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## O18 Comparing Attrition Rates of BST vs Residency for Family Medicine Postgraduate Training

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**Introduction:** Attrition from training and high failure rates of examinations under the Basic Specialist Training

(BST) framework led the Ministry of Health Singapore to implement the more structured residency training framework under ACGME-I accreditation to increase the efficiency and effectiveness of postgraduate training for all specialties. This study aims to study the effect of implementation of the residency framework on attrition rate for Family Medicine postgraduate training.

**Methods:** BST was a national programme with trainees rotating through different hospital departments in the first 2 years and completing the third year of training in one of the 2 clusters of polyclinics. For the new residency training framework, residents apply to and are matched to a sponsoring institution for the entire 3 years of training. Attrition rates for Family Medicine BST was examined for the 2006 to 2010 cohorts and compared to that for Family Medicine residency for SingHealth, one of the 3 sponsoring institutions, for the 2011 to 2014 cohorts.

**Results:** Attrition ranged from 24% to 54% under BST for the 2006-2010 cohorts. The figures for SingHealth Family Medicine residency were 0% and 5% for the 2011 and 2012 cohorts which have completed the 3-year training programme. For the 2013 and 2014 inflight cohorts, interim attrition rates are 0% and 6% respectively.

**Conclusion:** The residency training framework has greatly reduced attrition rates from training. It will be important to study the reasons for the reduction and retain them to strengthen the training framework in subsequent reviews of postgraduate training.

### O19 Natural Resistance-associated Macrophage Protein 1 (NRAMP1) and Bladder Cancer Immunotherapy in Asian Patients

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**Introduction:** NRAMP1 has been postulated to modulate the induction of macrophage functions in response to BCG immunotherapy and NRAMP1 single nucleotide polymorphisms (SNPs) have been implicated in susceptibility to tuberculosis and to *Bacillus Calmette-Guerin* (BCG) response in murine models. In this study, we evaluated the predictive role of all NRAMP1 SNPs in the context of Asian patients with non-muscle invasive bladder cancer (NMIBC) recurrence and BCG immunotherapy outcome.

**Methods:** Peripheral blood DNA was prospectively obtained from 122 evaluable EORTC intermediate to high

risk NMIBC patients, who underwent post-transurethral resection intravesical regimes of BCG or BCG with interferon alpha. A total of 15 NRAMP1 SNPs spanning the gene were evaluated using high resolution melt (HRM) analysis followed by DNA sequencing. Kaplan-Meier together with Log-Rank test and Cox regression methods were used to analyse the data.

**Results:** Kaplan-Meier analysis indicated that individuals carrying 3 NRAMP1 genotypes rs2695343 (13672A/A) ( $P=0.047$ ), rs2279015 (A/A) ( $P=0.038$ ) and rs1059823 (18093 A/A) ( $P=0.044$ ) were associated with lower recurrence-free survival after BCG therapy overall. On Cox regression analysis, patients carrying genotypes rs2276631 (C/C) (HR = 37.02,  $P=0.024$ ), rs3731865 (G/C) (HR = 13.38,  $P=0.049$ ) and rs2695343 (A/A) (HR = 33.01,  $P=0.012$ ) were more likely to have shorter time to recurrence. No association of NRAMP1 genotypes with progression-free survival was found.

**Conclusion:** Our findings suggest that polymorphisms in the NRAMP1 gene correlate with response to BCG therapy in NMIBC patients and may be used as predictive markers of response to BCG immunotherapy.

### O20 Efficacy of Intra-articular Chondroitin Sulphate in Combination with Hyaluronic Acid for Moderate-to-Severe Knee Osteoarthritis – A Report of Initial Experience in 18 Patients

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**Introduction:** Oral chondroitin sulphate (CS) has been shown to be an effective disease-modifying osteoarthritis drug (DMOAD) for knee osteoarthritis (OA). Intra-articular hyaluronic acid (HA) viscosupplementation is also an established treatment for OA. However, there is no previous report on the efficacy of intra-articular (IA) CS in combination with HA for the treatment of knee OA. We report our initial experience with 18 patients treated with IA CS+HA for moderate-to-severe OA knee.

**Methods:** A total of 18 patients with moderate-to-severe knee OA who failed or had partial response to previous VS were recruited between February and July 2013. A single intra-articular injection of 6 mL of CS 30 mg/mL and HA 20 mg/mL (Arthromac<sup>®</sup>+) was administered into the affected knee. Patient follow-up was done at month 1, 3 and 6 using the Western Ontario and McMaster Universities Arthritis Index (WOMAC) questionnaire and Visual Analogue Scale (VAS) pain score.

**Results:** All patients completed 6 months of follow-up. Average patient age was 62.4 years; 11/18 (61%) patients were females. VAS pain score was reduced by 36.8% at 6 months, with a significant 40.4% reduction at 1 month post-treatment; 44.4% had a  $\geq 50\%$  reduction in VAS pain score from baseline; 66.7% patients reported a positive improvement in WOMAC scores. Overall response rate was 72.5%. IA CS plus HA was well tolerated; no adverse effects were reported during the 6 month follow-up period.

**Conclusion:** Intra-articular administration of a combination of CS plus HA is an effective and safe therapeutic modality for patients with moderate-to-severe OA knee.

### **O21 Efficacy of Soft Tissue Adapted Biocompatible Hyaluronic Acid (STABHA) Injection in the Treatment of Tendinopathies: An Experience in 60 Patients**

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**Introduction:** Soft tissue rheumatism including tendinopathies are commonly encountered in clinical practice. Traditional treatments include physiotherapy, NSAIDs and steroid injections with variable results. STABHA represents a new therapeutic approach that can be used in severe, chronic or recurrent cases. We report our experience with 53 patients treated in our clinic with STABHA.

**Methods:** All patients from the period of August 2014 to April 2015 that had injection treatment with STABHA were reviewed. The diagnosis, treatment indications, outcome, adverse effects, and outcomes were analysed and summarised.

**Results:** A total of 60 patients were reviewed and analysed. Demographic data: 15 males, 45 females, with age range 32 to 91 years including 57 Chinese, 1 Indian and 1 Others. Sixty-two sites were injected: Cervical – 1; trapezoid tendinitis – 7; bicep – 2; shoulder – 4; elbow – 5; wrist – 4; trigger finger – 5; thoracic and lumbar paraspinal tendinitis – 8; iliotibial – 1; thigh – 1; calf – 1; knee – 15; ankle – 5; achilles tendon – 4; heel – 1. Complete recovery – 21; improved – 37; relapsed – 3; no benefit – 1; 2 relapsed responded to 2<sup>nd</sup> course of STABHA. No adverse effects were observed in 98% of patients. Duration of follow-up ranged from 2 weeks to 8 months.

**Conclusion:** STABHA is a new, effective and safe therapeutic tool that can be used for treatment of tendinopathy and soft tissue inflammation that have failed the standard treatment with a reasonable duration of benefit.

## P1 A Risk Score Based on Clinical Parameters Can Predict Mortality in Patients with Infective Endocarditis

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**Introduction:** Infective endocarditis carries significant mortality, but remains difficult to prognosticate. We aim to identify predictors of in-hospital mortality in patients with infective endocarditis and develop a risk score for prognostication.

**Methods:** Patients admitted to our institution over a 10-year period from 2001 to 2011 meeting the Modified Duke's criteria for definite infective endocarditis were studied. Demographic, clinical and laboratory features were evaluated. Univariate and multivariate analyses were performed to identify predictors of in-hospital mortality. A risk score was developed from the multiple logistic regression model.

**Results:** Of the 233 patients meeting the criteria (133 (57%) males, mean age 50 (SD 19 years)), mortality was 23%. The commonest organism was *Staphylococcus aureus* (112 cases, 48%). The independent predictors of mortality obtained by multivariable logistic regression analysis were: systolic BP <90 mmHg at presentation ( $P = 0.001$ ); heart failure ( $P = 0.012$ ); age ( $P = 0.001$ ); renal function (raised serum creatinine;  $P = 0.001$ ); nosocomial pneumonia ( $P = 0.009$ ); elevated peak CRP ( $P = 0.015$ ); non-intravenous drug abusers ( $P = 0.027$ ). The SHARPEN risk score stratified patients into low (<5% mortality), moderate (5% to 35% mortality) and high-risk categories (>35% mortality). The risk score predicted mortality well with the area under receiver operating characteristic (ROC) curve of 0.86, and had good negative predictive value in the low-risk group (NPV 100%).

**Conclusion:** Infective endocarditis remains an important disease with high mortality. The SHARPEN risk score based on clinical parameters allows early identification of high-risk patients for closer management and possible surgical intervention. Further studies are warranted.

## P2 Improving Door-to-Needle Time for Patients with Acute Ischaemic Stroke Receiving Thrombolysis via the Telestroke Service

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**Introduction:** The study hospital facilitates the use of thrombolytic therapy for eligible patients presenting to its emergency department with acute ischaemic stroke via the telestroke service. Continuous efforts have been made to improve the door-to-needle (DTN) time based on the model for rapid-cycle improvement. The primary objective of this study was to explore the impact of this approach on the median DTN time for patients receiving thrombolysis.

**Methods:** The adopted approach involved 1) understanding process flow to identify opportunities for reducing DTN time, and 2) applying relevant change concepts for testing. These were achieved through several Plan-Do-Study-Act cycles over an estimated 4-month period from 25 October 2012 to 1 March 2013. Records of all patients receiving thrombolytic treatment for acute ischaemic stroke between 9 April 2012 and 31 December 2013 were analysed. Median DTN times before and after completion of testing cycles were compared and the difference analysed for significance with the Mann-Whitney U test. Secondary outcome measures for the total study population included: changes in National Institute of Health Stroke Scale (NIHSS) score from presentation to 24-hour post-thrombolysis, presence of haemorrhagic conversion and outcome of admission episode.

**Results:** A total of 104 patients received thrombolysis, with the median age of 66 years. There was a decrease in median DTN time from 96 minutes (range, 61 to 154) to 78 minutes (range, 44 to 144;  $P = 0.003$ ) following targeted initiatives. Improved clinical outcomes were also seen. There was a greater proportion of patients with NIHSS score improvement at 24 hours post-thrombolysis, from 40.6% in the pre-intervention period to 62.7% ( $P = 0.039$ ) in the post-intervention period. The proportion of patients with symptomatic haemorrhagic conversion decreased from 24.2% to 8.7% ( $P = 0.033$ ). There was no difference in outcome of admission episode ( $P > 0.077$ ).

**Conclusion:** The median DTN times for patients receiving thrombolysis have improved by undertaking initiatives



based on the model for rapid-cycle improvement. The DTN times achieved post-intervention were also comparable to those in other centres utilising telemedicine technology for acute ischaemic stroke.

### **P3 The Association between Demographic Factors, Health and Physical Activity Levels among Community-Dwelling Elderly in Singapore**

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**Introduction:** Physical activity (PA) in the elderly is widely promoted, due to its role in reducing frailty and cardiovascular risk, while maintaining emotional wellness. As part of a larger study examining the built environment and PA among community-living elderly, we studied PA in relation to mental and physical health, and psychosocial characteristics.

**Methods:** A total of 245 community-dwelling elderly (65 years and above, Mage = 71.5 years; 67% female) participated in this cross-sectional study. They completed the International Physical Activity Questionnaire (IPAQ), Geriatric Depression Scale (GDS) and a sociodemographic survey. The level of PA was determined by summing up the time spent walking in the past week. Mann-Whitney U tests and bivariate correlations were conducted.

**Results:** Total walking time (Mean = 12.5h ± 12.4) in the past week was significantly negatively correlated with depression scores ( $r = -.213, P < .01$ ), though there was no significant correlation with BMI ( $r = -.103, P < .05$ ). Males walked more than females ( $U = 3315.5, Z = -1.806, P < .05$ ), and more educated participants had longer walking times ( $\chi^2[4] = 10.714, P < .05$ ). Though marginally significant, walking time was associated with arthritic knee pain ( $U = 3555, Z = -1.806, P < .10$ ).

**Conclusion:** Demographic factors—being male and higher educational attainment—and lower depressive symptoms were linked to PA level. Apart from arthritic knee pain, the lack of associations with medical conditions in this cross-sectional study may indicate the relevance of longitudinal methods to ascertain PA benefits.

### **P4 A Longitudinal Examination of the Protective Effects of Hope and Optimism on Body Image Distress in Breast Cancer Patients**

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**Introduction:** Previous research in psycho-oncology has focused on the psychopathology of body image distress (BID) in breast cancer patients without referencing their effects across the cancer journey or the protective effects of psychological resources. Such resources, like hope and optimism, have also been shown to improve distress, depression, and anxiety. This prospective study thus sought to explore the dynamics between trajectories of BID and hope and optimism across time.

**Methods:** A total of 56 breast cancer patients receiving outpatient treatment at a cancer centre in Singapore completed self-reported measures of BID (Body Image Scale), hope (Adult Hope Scale), and optimism (Revised Life Orientation Test) at baseline (within 3 months of their cancer diagnosis) and follow-up (6 months post-baseline). Trajectories of intra-individual change (improved, stable, and declined) for BID were calculated based on the minimal clinically important difference ( $\pm 0.5$  baseline SD).

**Results:** BID, hope and optimism remained stable at follow-up. Repeated measures analyses of variance revealed significant interactions between BID trajectory groups and time on hope, but not optimism, suggesting that patients experiencing improvements in BID reported higher levels of hope than those who had stable or deteriorating levels of BID ( $F[2,53] = 6.11, P < .01$ ).

**Conclusion:** The findings of this exploratory study suggest that psychosocial coping resources like hope may also reduce BID across time in a sample of breast cancer patients, although the mechanisms of interaction require further examination. Supportive care could perhaps lend greater focus to improving patients' hope to alleviating consequent psychiatric sequelae.

## P5 Caregiver Distress through the Crisis of Cancer

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**Introduction:** Cancer caregivers experience high levels of distress which frequently manifest in a variety of psychological symptoms. However, there is a paucity of research on quality of life (QOL). A literature review (1990 to 2014) yielded 107 articles, of which 12 were from Asian countries. We analysed baseline data from an interventional study for cancer caregivers (NHG DSRB Ref: 2013/00662) to determine the impact of psychological variables on QOL.

**Methods:** Cancer caregivers completed a questionnaire on demography, Hospital Anxiety-Depression Scale (HADS), Caregiver Quality of Life-Cancer (CQOLC) scale, Perceived Stress Scale (PSS) and Basic Psychological Needs Scale (BPNS).

**Results:** Respondents (n = 121) were mostly female (63%), Chinese (55%; Malay 17%, Indian 17%, Others 10%), mean age = 44 years, and almost half had tertiary education (48%). A total of 47% of care recipients were in Stage IV, with the following top cancer types: GIT 25%, breast 24%, blood 19%. The mean score on the CQOLC was 118.96 (range, 71 to 169). Higher CQOLC scores (indicating better QOL) were correlated with fewer depressive symptoms ( $r = -.628, P < .01$ ) and anxiety symptoms ( $r = -.638, P < .01$ ), lower levels of stress ( $r = -.0661, P < .01$ ), a greater sense of autonomy ( $r = .456, P < .01$ ), competence ( $r = .402, P < .01$ ) and relatedness ( $r = .298, P < .01$ ). Caregivers of care recipients in advanced cancer stages had a poorer QOL, higher stress levels and poorer sense of relatedness.

**Conclusion:** The results parallel studies amongst other ethnic groups, that psychological needs are amongst the most frequent unmet ones and cause the greatest distress. The impact on caregivers varies during different stages of the disease and can become a crisis if undetected.

## P6 Salvia Divinorum and the Psychiatric Risks of “Legal Highs”: A Literature Review

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**Introduction:** Salvia divinorum is a hallucinogenic sage plant with leaves that produce a psychoactive high. Used for many years for its psychomimetic effects in religious rituals in South America, it is now readily available through Internet purchases where it is unfortunately marketed for a safe and “legal high”. The main psychoactive compound is salvinorin A, a potent k-opioid and dopamine D2 receptor agonist. Intense psychoactive effects are experienced when salvia leaves are smoked. It is believed to have low addictive potential and toxicity, making it popular with adolescents and young adults for recreational use.

**Methods:** We present a brief literature review that raises serious concerns of psychiatric sequelae.

**Results:** Physical symptoms are widely reported, but psychiatric sequelae are isolated. The first, an 18-year-old female presented with acute agitation, disorganisation and hallucinations after smoking cannabis spiked with salvia. A second case with risk history of schizophrenia, developed an acute psychosis with paranoia. A third case involved a 15-year-old with mental state changes of paranoia, blunted affect, thought blocking and slow speech. There is also a single case report of withdrawal symptoms appearing 2 days after stopping salvia which had been used for 3 to 4 months. A case reported locally presented with short-lived vivid visual and auditory hallucinations.

**Conclusion:** Recreational users are treating salvia as an alternative to illicit drugs. As it influences dopamine levels, it poses a psychiatric risk that clinicians need to be aware of and consider when forming diagnoses for recreational substance users presenting with altered mental states.

## P7 Revisiting the Link between Hypertension and Hemifacial Spasm

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**Introduction:** The relationship between hypertension and hemifacial spasm (HFS) has been debated. Microvascular decompression surgery is effective in some HFS patients with uncontrolled hypertension. To address current gaps in knowledge, we conducted a meta-analysis of case-control studies that have examined the prevalence of hypertension in HFS patients compared to non-HFS controls. We also evaluated the implications and limitations of the pooled studies.

**Methods:** We identified 62 studies from PubMed, The Cochrane Library, Web of Science and Scholar.google.com and 5 studies that fit our inclusion criteria were included. A random-effects model was used to derive the pooled estimate of the odds ratio. The data was plotted on a forest plot.

**Results:** A pooled analysis involving 1149 subjects showed that HFS patients had a higher chance of developing hypertension (OR 1.76, 95% CI, 1.05, 2.48),  $P < 0.01$ ). The prevalence of hypertension was higher in HFS patients as compared to non-HFS patients.

**Conclusion:** This meta-analysis highlights a positive correlation between hypertension and HFS. Blood pressure should be closely monitored during the follow-up of HFS patients. Preliminary links between ventrolateral medullary (VLM) compression and HFS should be further evaluation in future studies.

## **P8 Reasons for Referral to the Department of Palliative Medicine in the National Cancer Centre of Singapore**

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**Introduction:** Palliative medicine is steadily becoming a permanent fixture in supporting patients towards their end of life. There has been a growing number of inpatient referrals made to the Department of Palliative Medicine (DPM) in the National Cancer Centre of Singapore (NCC). We aim to find out the main reasons for referral, and whether they vary between different departments.

**Methods:** A retrospective study of the blue letter referrals to the NCC DPM consultation team over January 2015 to March 2015 was done.

**Results:** A total of 389 referrals were reviewed, where some referrals had multiple reasons stated. Most referrals were made by the oncology (180), followed by internal medicine (118) and general surgery (60) departments. Out of the 587 reasons identified, the most common reasons were for symptom control (404; 69%), end-of-life care (93; 16%), and psychosocial support (38; 6%). Within symptoms management, pain was the most common symptom (166), followed by breathlessness (90). In particular, 55% of the referrals made by the oncology department for symptom control were for pain, whereas for the other departments, the percentage varied between 23% to 37%. Nonetheless,

the above reasons mentioned were the top few regardless of specialty. Interestingly, the internal medicine and general surgery departments had a higher percentage of non-specific referrals (14% and 20% respectively) compared to oncology (3%).

**Conclusion:** Referrals made to palliative medicine do not only focus on the medical management of the patient's symptoms; they also addressed other issues pertaining to the patient's overall wellbeing. This would include psychosocial support, placement and discharge issues.

## **P9 Referrals to the Department of Palliative Medicine (DPM) in the National Cancer Centre of Singapore (NCCS): Do They Value Add to Patients' Management?**

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**Introduction:** There has been a growing demand for palliative medicine consult for patients with life-limiting illnesses. With more referrals to NCCS DPM, we have not infrequently come across cases where palliative consult had no significant recommendations made to patients' management. This begs the question: Does a palliative medicine referral value add to patients' management? We aim to find out the reasons and proportion of referrals in which changes were suggested by the palliative team in patients' management.

**Methods:** A retrospective study of the blue letter referrals to the NCCS DPM consultation team and the corresponding input from the palliative team over January 2015 to March 2015 was done.

**Results:** A total of 389 referrals were reviewed with a total of 587 reasons for referral identified. Out of these, 79% of the reasons had a change in management suggested. Of the top 3 reasons, end-of-life care and psychosocial support were addressed more than 95% of the time, while symptom control was addressed 67% of the time. Pain was addressed in 74% of the pain referrals while shortness of breath in 73%. Other issues that were recommended to improve patient's care although they were not requested in the referrals include discharge planning, general care of patient, psychosocial support, and other symptoms previously not identified.

**Conclusion:** Most patients are appropriately referred

to the palliative team. Palliative consult has substantial recommendations for specific reasons stated in referrals and other care issues. This is especially so for referrals not made for symptom control.

## **P10 Trends in Health Screening and Lifestyle Behaviours in a Singaporean Rental Flat Community from 2008 to 2014**

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**Introduction:** We aimed to evaluate the impact of an access-enhanced intervention on screening adherence in a rental flat community.

**Methods:** Health screening adherence and health behaviours amongst residents (aged  $\geq 40$  years) of a multi-ethnic public rental flat community in Singapore were observed from 2008 to 2014; comparing against residents of owner-occupied flats within the same precinct. Simultaneously, we ran a free, access-enhanced multimodality screening programme in the rental flat community.

**Results:** A total of 478 rental and 505 owner-occupied flat residents participated from 2008 to 2014. Amongst rental flat residents, hypertension baseline screening rates improved from 18.3% (24/131) in 2008 to 2009, to 61.2% (52/85) in 2010 to 2011 and 44.2% (34/77) in 2012 to 2014 ( $P < 0.001$ ). For diabetes, rates improved from 26.2% (43/164)  $\rightarrow$  47% (54/115)  $\rightarrow$  49.5% (45/91) ( $P < 0.001$ ). For dyslipidaemia screening, rates improved from 18.2% (31/170)  $\rightarrow$  39.6% (38/96)  $\rightarrow$  47.5% (38/80) ( $P < 0.001$ ). For cervical cancer screening, rates improved from 2.6% (2/76) in 2008 to 2009, to 30.8% (16/52) in 2010 to 2011 and 20.5% (9/44) by 2012 to 2014 ( $P < 0.001$ ). Colorectal cancer screening rates (4.4%  $\rightarrow$  8.5%  $\rightarrow$  11.6%) and breast cancer screening rates (8.8%  $\rightarrow$  5.6%  $\rightarrow$  16.2%) generally showed an increasing trend. Comparing against the owner-occupied community ( $n = 505$ ), screening rates largely remained stagnant (hypertension: 52.2%  $\rightarrow$  75%  $\rightarrow$  54.5%,  $P = 0.059$ ; diabetes: 66.0%  $\rightarrow$  56.5%  $\rightarrow$  66.7%,  $P = 0.434$ ; dyslipidaemia: 53.1%  $\rightarrow$  50%  $\rightarrow$  57.1%,  $P = 0.818$ ; colorectal cancer: 17.0%  $\rightarrow$  22.7%  $\rightarrow$  23.8%,  $P = 0.315$ ; cervical cancer: 43.2%  $\rightarrow$  43.8%  $\rightarrow$  39.4%,  $P = 0.914$ ). Only breast cancer screening had an increasing trend: 10%  $\rightarrow$  34.3%  $\rightarrow$  24.5% ( $P < 0.001$ ). In the rental flat community, unhealthy behaviours increased from 2008

to 2014, with higher proportions of overweight 30.4%  $\rightarrow$  24.8%  $\rightarrow$  52.1% ( $< 0.001$ ), smoking 11.7%  $\rightarrow$  36.9%  $\rightarrow$  32.5% ( $P < 0.001$ ) and drinking 1.4%  $\rightarrow$  0.7%  $\rightarrow$  8.1% ( $P < 0.001$ ). Similarly, the owner-occupied community reflected higher proportions of overweight and drinking ( $P < 0.001$ ).

**Conclusion:** In the rental flat community (intervention conducted), baseline screening rates improved while screening rates stagnated in owner-occupied flats. Unhealthy behaviours increased in both communities.

## **P11 A Tale of Two PNETs**

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**Introduction:** This retrospective study is meant to show the disease at presentation and its natural history, bearing in mind its known aggressiveness. We have had 2 cases in the first quarter of 2014, which had displayed a great contrast.

**Methods:** Two cases were studied. The first patient, a 68-year-old lady, presented with shortness of breath and growth at her anterior chest for 2 months, associated with constitutional symptoms. Contrast-enhanced CT thorax showed a large anterior chest wall tumour likely carcinoma with mediastinal involvement and extensive bony involvement. Tru cut biopsy revealed PNET. She passed away before initiation of treatment due to late presentation with advanced stage of her disease. Second, was a 42-year-old gentleman, with superior vena cava (SVC) obstruction. He had initially presented with diffuse neck swelling, cough, hoarseness of voice, dysphagia, facial puffiness, dyspnea and constitutional symptoms. Contrast-enhanced CT neck and thorax showed a mediastinal mass with superior vena cava obstruction and mediastinal lymphadenopathies, with impression of anterior mediastinal tumour causing SVC obstruction and tracheal narrowing. CT-guided biopsy revealed PNET. He had a central venogram done, showing total occlusion of distal right subclavian, bilateral brachiocephalic vein and SVC with multiple collaterals. SVC stenting wasn't performed due to patient unable to lie supine and unavailability of the stent. Patient is tolerating vincristine, adriamycin and ifosfamide.

**Conclusion:** Radiation and chemotherapy plays an important role in treating PNET. Chemotherapy provided a better outcome for one of our patients. General condition, remain a stumbling block prior to initiation of treatment. First patient was not fit at presentation for treatment. Radiation has its drawbacks; Kutttesch et al reported that 20% of

patients receiving radiation more than 60 Gy developed secondary malignancies, compared to 5% in those who received 48 Gy to 60 Gy. A case-by-case approach is vital in treating PNET.

## P12 Multiple Gunshot Injuries—Survived

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**Introduction:** We aim to share an experience of treating a patient with multiple gunshot injuries at the head, neck and thoracic region.

**Methods:** A middle-aged gentleman presented with multiple gunshot injuries, shot from approximately 1 to 2 metres away. Multiple shots were triggered and most of the bullets took a trajectory within the head, neck and thoracic region. Upon arrival to the emergency department, patient was in stable condition with full GCS. After appropriate resuscitative measures, he was transferred to the ICU and CT scan was obtained. It was reported as multiple gunshot wounds over the chest with embedded foreign bodies (bullets) at right infraclavicular region, left subscapularis muscle, superficial to the body of the sternum, associated with open fracture of right scapula; closed fracture of the spinous process of the T4 vertebrae; open fracture base of right fifth metacarpal bone; gunshot wound over the right mandibular region with comminuted fracture of the body of the right mandible. Multidisciplinary surgery was carried out to remove the bullets. However, 2 bullets in thorax, 1 at right infraclavicular and the other 1 at left subscapularis muscle were not removed due to the potential harm caused if removed, and they were not abutting vital structures.

**Results:** Patient recovered well in ward. After being subjected to physiotherapy and occupational therapy, he got back to his previous functional status.

**Conclusion:** Conservative management can be the mainstay and yield good outcome in an appropriate situation. Imaging plays a vital role. Follow-up is important as migration and fistulation of bullet to adjacent structures is not uncommon.

## P13 A Longitudinal Examination of the Protective Effects of Hope and Optimism on Body Image Distress in a Mixed Cancer Population

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(Withdrawn)

## P14 The Professional for Tomorrow's Healthcare: A Model for Healthcare in the 21<sup>st</sup> Century

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**Introduction:** Healthcare systems worldwide face unprecedented challenges, necessitating a change in healthcare education and delivery. The objective of this study was to gain an understanding of the key capabilities required to function in reformed healthcare systems in the future.

**Methods:** Small group discussions were held with various education stakeholders in the National Healthcare Group (NHG) Singapore. Participants were asked to list attributes which would be important in an ideal healthcare worker of the future.

**Results:** The various capabilities were grouped and distilled to 5 components. These are similar to the components in an equation developed by Sir Michael Barber, in 2009.<sup>1</sup> The equation developed by NHG describes the capabilities of the ideal Professional for Tomorrow's Healthcare (PTH), and is shown below:

$$PTH = E [(K1 + K2) \times F \times L]$$

where E represents ethical conduct as well as professionalism (not just for physicians); K1 and K2 stand for core (professional) and systems (teamwork and collaboration) knowledge respectively; F represents future-oriented thinking, and L stands for engaging leadership skills. The PTH in the model is defined as any person working in healthcare: clinicians and frontline staff, support and administrative staff.

**Conclusion:** The PTH equation will be a useful aid to align education and service goals in healthcare institutions, and will form an important part of an ongoing discourse on articulating the important skills that will serve healthcare in the 21<sup>st</sup> century.

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## P15 A Review Comparing the Effectiveness of Ultrasound-guided vs Landmark-guided Corticosteroid Injection in Carpal Tunnel Syndrome

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**Introduction:** The objectives of this review are to evaluate the existing evidence and assess the effectiveness and safety of ultrasound-guided versus landmark-guided corticosteroid injection in adults with carpal tunnel syndrome.

**Methods:** A literature search using the key terms 'corticosteroid, glucocorticoid, steroid, carpal tunnel, ultrasound, and sonography' combined in appropriate algorithms was conducted from earliest available date to March 2015 using PubMed and CENTRAL databases. Articles were evaluated according to predetermined criteria to compare the effectiveness and safety of ultrasound-guided versus landmark-guided injection. The characteristic and outcomes of the included studies were extracted. A qualitative analysis of symptom severity score, functional status score, cost effectiveness and adverse effects was performed.

**Results:** Three single blinded randomised prospective studies involving 154 patients were reviewed. There were 110 ultrasound-guided and 88 landmark-guided corticosteroid injections performed by the physician. The improvement of symptoms severity score at 12 weeks was higher and the duration to symptom relief was shorter in the ultrasound-guided group. There was no significant difference in adverse effects between both groups. Cost effectiveness was demonstrated only in responder in a hospital outpatient setting.

**Conclusion:** This review suggested that there may an advantage in ultrasound-guided corticosteroid injection in adult with CTS for earlier and better improvement in symptoms. However, the difference may not represent clinically significant differences. This current review is limited by a small sample size. Further research in the cost effectiveness of the intervention in different clinical settings should be considered.

## P16 Should Both High-sensitivity Cardiac Troponins (hs-cTn) and CK-MB be Tested for Evaluation of Acute Chest Pain in the Emergency Department (ED)?

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**Introduction:** The third universal definition of myocardial

infarction (MI) of 2012 re-affirmed the preference of hs-cTn as the biomarker of choice. In addition, learned societies have indicated that CK-MB testing is no longer needed. However, many hospitals in Singapore, including Changi General Hospital, continue to offer both CK-MB and hs-cTn as part of its MI panel in the ED.

**Methods:** We conducted a review of all MI results with both hs-cTnT and CK-MB requested by the ED for 2014.

**Results:** A total of 14,538 results available in the LIS were stratified thus:

Group	A	B	C	D	All
Result	High CK-MB	Normal CK-MB	High CK-MB	Normal CK-MB	Total
Categories	High hs-cTnT	High hs-cTnT	Normal hs-cTnT	Normal hs-cTnT	
Number	2037	6126	347	6032	14,538
Percentage (%)	14.0	42.1	2.4	41.5	100

When gender-specific CK-MB reference ranges were applied to Group C the discordance between CK-MB and hs-cTnT narrowed to 2.1% (n = 299) i.e. less than 1 case per day in a year.

**Conclusion:** The results of CK-MB and hs-cTnT were 55.4% concordant. A further 42.1% of results with normal CK-MB and elevated hs-cTnT were attributed to the greater sensitivity of hs-cTnT for myocardial necrosis or damage. Thus, over 97.5% of the ED CK-MB results may not be needed in decision-making. It may be timely to review our MI test ordering practice.

## P17 The Role of Intervention Radiology in Management of Post Liver Transplant Complications

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**Introduction:** We aimed to understand the role of intervention radiology (IR) procedures in the management of vascular (arterial, venous and portal venous) and biliary complications post liver transplantation.

**Methods:** We review the current medical literature for the latest data and techniques in the management of post liver transplant complications, with a focus on IR procedures.

**Results:** We illustrate the role of IR in management of post liver transplant complications by describing real case examples (in pictures) of patients treated at the Department of Diagnostic Imaging, National University Hospital, Singapore.

**Conclusion:** With advances in endovascular techniques and devices, and the advantage of a minimally invasive approach avoiding the need for major surgery, there is increasing role of IR procedures in the management of post liver transplant complications.

### **P18 Bullous Skin Lesions of *Vibrio Vulnificus* Infection**

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**Introduction:** *Vibrio vulnificus* infection has been associated with cutaneous manifestations, as a result of handling contaminated seafood or exposure to brackish water.<sup>1</sup> Here we present a patient with bullous skin lesions resulting from *Vibrio vulnificus* bacteraemia.

**Methods:** A previously healthy 76-year-old man presented with acute 2-day onset of swelling and rash over the posterior aspect of his right calf and fingers. He described the pain as severe and associated with fever (39.6°C) and chills. He had handled raw crabs 2 days prior to the onset of his symptoms. He did not sustain injuries nor ingested the crabs.

**Results:** Physical examination revealed erythematous plaques over dorsum of his right palm, inter-phalangeal areas of right index, middle, ring finger, left index and ring finger, and bilateral ankles. Bullae developed over the posterior aspect of his right calf and lateral aspect of left elbow. Blood cultures grew *Vibrio vulnificus*. White cell count was 9.65 x 10<sup>9</sup>/L, C-reactive protein 151 mg/L, and procalcitonin 7.6 µg/L. Aspiration of the right calf bulla did not yield any organisms. Magnetic resonance imaging of his right leg revealed cellulitis, with no evidence of necrotising fasciitis. He developed septic shock and required inotropic support in the high dependency unit. Treatment with ceftazidime was started and inotropes was stopped after 5 days. His skin lesions resolved over a 6-week course of intravenous antibiotic treatment; and he was discharged well.

**Conclusion:** *Vibrio vulnificus* infections can present as bullae, pustules, petechiae, purpura, and fulminant cellulitis,<sup>2</sup> with a rapid onset of 12 to 24 hours. Septic patients can develop large bullae on extremities and trunk, and progress to necrotising fasciitis.<sup>3</sup> Our patient did not

ingest crabs, suggesting that *Vibrio vulnificus* infection is capable of invading and producing disease through micro injury of the skin. Case fatality has been reported to be more than 50% in primary sepsis. It is important to recognise the cutaneous manifestations of *Vibrio vulnificus* such that timely treatment can be administered to decrease mortality and morbidity.

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### **P19 Increasing Percentage of Chronic Lung Disease Patients with Valid Influenza Vaccine in Geylang Polyclinic: An Audit Project**

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**Introduction:** Influenza vaccination is indicated in patients with chronic lung diseases. The percentage of these patients with valid influenza vaccine in Geylang Polyclinic was suboptimal and we aim to improve this.

**Methods:** A root cause analysis revealed a lack of awareness about the vaccine amongst patients, and secondly healthcare providers forgetting to counsel patients for vaccination, as the top reasons. Regular electronic mail reminders with educational information on influenza vaccination were sent to staff. Electronic clinical records were reviewed for documentation of counselling for influenza vaccination. The percentage of these patients with valid influenza vaccine during this intervention period was charted.

**Results:** Baseline percentage of patients counselled for influenza vaccine averaged 26% over 8 January to 15 January 2014, and the actual percentage of patients who received influenza vaccine averaged 18% over 8 January to 15 January 2014. After intervention, the percentage of patients counselled for influenza vaccine increased to 61% and the percentage of patients with valid influenza vaccine increased to 39%.

**Conclusion:** Regular electronic mail reminders with education information seem to be an effective way of increasing rates of influenza vaccination among patients with chronic lung diseases.

## **P20 Chronic Pain and its Association with Health Behaviours in a Singapore Rental Flat Population—A Cross-Sectional Study**

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**Introduction:** We aimed to determine the prevalence of chronic pain in a public rental flat community of low socioeconomic status in Singapore, and its association with health behaviours.

**Methods:** Chronic pain was defined as pain  $\geq 3$  months. From 2009 to 2014, residents in 5 public rental flat enclaves were asked if they had chronic pain; sociodemographic factors and participation in health screening were also measured. Subsequently, to determine if functional status, mood, and social isolation were associated with chronic pain in the elderly, we further studied the elderly (aged  $\geq 60$ ) in 2 public rental flat enclaves in 2012. We compared against residents from adjacent owner-occupied public housing.

**Results:** Prevalence of chronic pain in rental flat population was 14.2% (133/936); compared with 14.4% (158/1101) in the owner-occupied population ( $P = 0.949$ ). The most common site was knee/ankle pain (29.3%, 39/133). Amongst rental flat residents, unemployment was associated with chronic pain (aOR = 1.56, CI, 1.03 to 2.38,  $P = 0.023$ ); amongst the elderly, instrumental activities of daily living dependency was associated with chronic pain (aOR = 2.38, CI, 1.11 to 5.00,  $P = 0.025$ ), female gender, being single, and higher education (all  $P > 0.05$ ). Amongst rental-flat population, chronic pain was associated with higher participation in diabetes (aOR = 2.11, CI, 1.36 to 3.27,  $P < 0.001$ ), dyslipidaemia (aOR = 2.06, CI, 1.25 to 3.39,  $P = 0.005$ ), colorectal cancer (aOR = 2.28, CI, 1.18 to 4.40,  $P = 0.014$ ), cervical cancer (aOR = 2.65, CI, 1.34 to 5.23,  $P = 0.005$ ) and breast cancer (aOR = 3.52, CI, 1.94 to 6.41,  $P < 0.001$ ) screening; this association was not present in owner-occupied population.

**Conclusion:** Amongst rental flat residents of low socioeconomic status, chronic pain was associated with unemployment and functional limitation in the elderly. While there was no significant difference in chronic pain prevalence

between the rental flat population and adjacent owner-occupied precincts, amongst rental flat residents chronic pain was associated with higher screening participation across numerous disease modalities.

## **P21 Surveillance and Pharmacogenomics Initiative for Adverse Drug Reactions (SAPhIRE)**

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**Introduction:** The SAPhIRE programme is funded by the BMRC to foster a scientific, clinical and regulatory community to work collaboratively to use pharmacogenomic information to reduce the burden of adverse drug responses (ADRs) in Singapore. This programme will provide pharmacogenomic information that is relevant to the local populations, which are under-represented in the published studies.

**Methods:** A broad-ranging translational research programme was established to pursue 3 linked goals: 1) Conduct observational clinical research studies to discover and validate pharmacogenomic biomarkers of highest relevance to Asian populations; 2) Develop robust pharmacogenomic diagnostic tests through a College of American Pathologists-certified laboratory that can be implemented to provide relevant information in the clinic to reduce ADR incidence; and 3) Establish a national active surveillance network that leverages electronic medical record (EMR) capabilities to identify patterns and early indications of ADRs in Singapore.

**Results:** All 3 aims were successfully initiated: 1) Retrospective and prospective studies have been set up at 2 sites (NCIS and NCCS) to assess anthracycline- and trastuzumab-induced cardiomyopathy. Clinical studies are underway at the NUH and NHCS to investigate muscle-related toxicity following use of statins; 2) Diagnostic assays have been developed and validated for *SCLO1B1* and other genetic markers are under development; 3) The HSA is actively investigating the suitability of different methods for screening EMRs for evidence of ADRs.

**Conclusion:** Multiple stakeholders must be engaged to create the infrastructures for effective use of pharmacogenomic information to improve health outcomes and reduce unnecessary hospital expenditures due to ADRs in Singapore.



## P22 Perspectives of Singaporean Caregivers of Patients with Dementia (PWD) towards Lasting Power of Attorney (LPA) and Mental Capacity Act (MCA)

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**Introduction:** Our study aims to 1) assess LPA awareness amongst Singaporean caregivers of PWD, 2) their likelihood of appointing LPA, 3) examine correlation between dementia severity of PWD and caregiver's decision to appoint LPA, and 4) discover enablers and barriers towards LPA appointment. We hypothesised that LPA awareness would be poor but being caregivers would increase participant's likelihood of appointing LPA.

**Methods:** Caregivers were recruited via convenience sampling from PWD followed-up at Singapore General Hospital. A cross-sectional, interviewer-administered questionnaire-based survey was conducted. Univariate analysis was performed using SPSS. Chi-square and non-parametric tests were used to obtain *P* values for categorical and continuous variables respectively. *P* value <0.05 was considered statistically significant.

**Results:** A total of 51.3% of participants were aware of LPA. Of these, 11.5% had appointed LPA. Factors affecting awareness include educational level (*P* = 0.002), socioeconomic status (*P* = 0.028), living arrangement with PWD (*P* = 0.042) and information source (*P* <0.001). Factors affecting willingness of LPA appointment include educational level (*P* = 0.031) and contact time with PWD (*P* = 0.018). Caregiver personal beliefs are significant enablers or barriers towards LPA appointment (*P* <0.001). Presence of the following beliefs was an enabler, absence was a barrier: 1) necessity to make plans in case of future mental incapacity, 2) fear of burdening their family, 3) unconfident of family making the right decision for them, and 4) willingness to consider the possibility of losing mental capacity.

**Conclusion:** LPA awareness is suboptimal. People with lower educational level and socioeconomic status should be targeted through educational media. Ingrained personal beliefs—strong barriers to LPA appointment—should also be addressed.

## P23 Prevalence of Mental Health Disorders amongst Alzheimer's Disease Caregivers

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**Introduction:** It remains unclear as to the overall prevalence of mental health disorders amongst caregivers of Alzheimer's disease (AD) patients. This meta-analysis aims to evaluate the prevalence of various mental health disorders among caregivers of AD patients globally and to determine factors which predisposed to development of the aforementioned, namely gender of caregiver, gender of patient and caregiver-patient relationship.

**Methods:** A total of 18 studies were eligible for systematic review with a total of 5 studies eligible for meta-analysis. A meta-analysis of published work was performed using the random effect model. Data analysis was done with RevMan 5.3. A total of 10,825 caregivers were assessed.

**Results:** The aggregate prevalence of depression amongst caregivers was 34%, anxiety at 43.62% and use of psychotropic drugs at 27.16%. There was insufficient data to accurately calculate any other associated mental health disorders. Meta-analysis revealed the odds ratio of prevalence of depression was significantly 1.53 times higher in female caregivers (95% CI, 1.29 to 1.83; *I*<sup>2</sup> = 7%; *z* = 4.78, *P* <0.001), caregivers to female care recipients were 0.54 times less likely to develop depression than those with male care recipients (95% CI, 0.48 to 0.60; *I*<sup>2</sup> = 40%; *Z* = 10.86; *P* <0.001) and spousal caregivers were 2.51 times more likely to develop depression than non-spousal caregivers (95% CI, 1.68 to 3.76; *I*<sup>2</sup> = 55%; *Z* = 4.49; *P* <0.001).

**Conclusion:** Allied healthcare professionals should constantly monitor caregivers for symptoms of psychiatric disorders, particularly depression, and provide appropriate intervention. In particular, greater attention should be given to female caregivers, caregivers to male care recipients and spousal caregivers.

## P24 Residential Mobility in Public Rental Flat Estates in Singapore and its Association with Health Behaviours at Baseline and Follow-up

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**Introduction:** We sought to determine if length of stay in public rental flat enclaves was associated with health behaviours, health screening participation and hypertension management.

**Methods:** From 2008 to 2012, we recruited residents from 3 public rental flat enclaves; at baseline, assessing for a) health behaviours; b) health screening participation; c) hypertension management. Follow-up visits were made 1 year later to determine if residents were still residing in these enclaves. Finally, in 2013 to 2014, we visited 2 of the enclaves to compare health behaviours in those who stayed  $\geq 1$  year in the community, with residents who newly moved into the community in 2013 to 2014.

**Results:** Half the residents (51.5%, 345/670) recruited at baseline went on to stay  $\geq 1$  year. Site, year (all  $P < 0.05$ ), older age (aOR = 1.66, CI, 1.03 to 2.65,  $P = 0.036$ ), diabetes (aOR = 1.78, CI, 1.14 to 2.78,  $P = 0.011$ ), overweight (aOR = 1.55, CI, 1.03 to 2.32,  $P = 0.034$ ) and exercising infrequently (aOR = 2.32, CI, 1.59 to 3.45,  $P < 0.001$ ) were all associated with staying  $\geq 1$  year. There was no association between health screening/hypertension management and staying  $\geq 1$  year, at baseline. On follow-up in 2013 to 2014, compared to new residents ( $n = 127$ ), residents who had already stayed  $\geq 1$  year tended to be older (aOR = 3.08, CI, 1.78 to 5.32,  $P < 0.001$ ) and diabetic (aOR = 1.85, CI, 1.26 to 2.58,  $P = 0.013$ ) but exercised more regularly (aOR = 1.42, CI, 1.06 to 2.94,  $P = 0.034$ ) and have controlled blood pressure (aOR = 5.26, CI, 1.39 to 20,  $P = 0.014$ ).

**Conclusion:** In this rental flat population of low socioeconomic status, while at baseline poorer health status was associated with going on to stay  $\geq 1$  year in the community, on follow-up, residents who stayed  $\geq 1$  year had better blood pressure control and exercised more compared to new entrants into the community. While poorer health reduces residential mobility, perhaps longer duration of residence in these enclaves encourages healthier behaviours by providing sustained exposure to interventions targeted at these communities.

## P25 Analysis of Pharmacological Blue Letter Suggestions Made by the Department of Palliative Medicine

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**Introduction:** The Division of Palliative Medicine (DPM) at National Cancer Centre (NCC) provides a consultation service to the Singapore General Hospital (SGH). Primary teams at SGH make a referral to DPM if they require a palliative review for their patients. The DPM team then assesses the patient and makes recommendations regarding their management. The primary team decides which suggestions to take up. We aim to find out the proportion of pharmacological suggestions made by DPM that were taken up by the referring team and the types of suggestions not taken up.

**Methods:** A retrospective study of the blue letter referrals to the NCC DPM consultation team from January 2015 to March 2015 was done. The pharmacological suggestions made were compared against the medication and investigation orders entered into Citrix.

**Results:** A total of 400 referrals were reviewed, with 1945 pharmacological suggestions made, of which 144 suggestions were 'keep in view' and excluded from the analysis. Out of the 1801 suggestions analysed, 1619 (89.89%) were taken up. Of the 182 (10.11%) that were not taken up, 133 (7.38%) were omitted and 49 (2.72%) were ordered with modifications. Out of the 182 suggestions not taken up, suggestions pertaining to oral and skin care were the most common (28; 21 omitted, 7 modified), followed by analgesia (26; 14 omitted, 12 modified), laxatives (22; 10 omitted, 12 modified), anxiolytics (15; 14 omitted, 1 modified) and investigations (15; 15 omitted).

**Conclusion:** Most of the pharmacological suggestions made by the DPM were acted upon by the primary teams, showing that the palliative input is well received.

## P26 Mental Health Issues amongst Medical Students in Asia—A Systematic Review

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**Introduction:** Studies have shown that the stress experienced by medical students is far greater than that experienced by other university students. In this study, we aim to understand the consequent mental health issues that are experienced by medical students, particularly in Asia, via a systematic review of the current literature.

**Methods:** Initial searches on MEDLINE, Embase and SpringerLink came up with a total of 1440 articles. Studies

not focusing on medical students alone, not mentioning mental health issues or not containing prevalence values were excluded.

**Results:** We included 27 articles in our analysis. Anxiety disorders had a prevalence of 7.04% (100/1420). Depression was prevalent in 11% (1115/10147) of students. A total of 12.9% (54/420) and 12.9% (41/319) of male and female medical students respectively were screened for depression. Preclinical students were also 1.63 times more likely to be depressed compared to clinical students, with 98% (48/49) preclinical students having screened for depression, compared to 60% (27/45) clinical students. Home staying medical students are 1.33 times more likely to be depressed compared to hostel dwellers, with 12.1% (29/239) of home stayers being depressed compared to 9.2% (37/402) of hostel dwellers. Mental health issues are more prevalent in certain subpopulations of medical students. Our data revealed that preclinical and home staying students can be more susceptible to depression.

**Conclusion:** Mental health issues affect a significant proportion of medical students. More research should be done regarding this issue. With such information, it is hoped that appropriate interventions can be designed to improve the mental health of medical students.

## P27 High-Sensitivity Troponin T Reference Intervals for Men and Women are Different

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**Introduction:** Previously, we verified that the vendor's 99<sup>th</sup> percentile upper reference limit (99PURL) for the high-sensitivity cardiac troponin T (hs-cTnT) assay was 15 ng/L. Recent guidelines recommend deriving the 99PURL from a large pool of reference subjects and to incorporate effects of gender.

**Methods:** We thus studied the serum hs-cTnT in 1086 (543 men) apparently healthy subjects aged 40 to 65 (mean 52.2 ± 7.24) with no history of diabetes, hypertension, heart, lung, or renal disease. There were at least 100 subjects in each 5-year age group. Statistical analyses were performed on MedCalc 15.0 software (Mariakerke, Belgium). The hs-cTnT assay has a limit of detection (LoD) of 5 ng/L.

**Results:** Hs-cTnT concentrations (range, <3 ng/L to 34 ng/L) were detectable (>assay LoD) in 60% of participants,

and higher in men and individuals >55 years. Notably, 81.9% of females had undetectable hs-cTnT (<assay LoD) in contrast to 39.26% for men. The proportion of subjects with detectable hs-cTnT is greater in those over 55 years than younger subjects—30.3% and 11% in women, 71% and 54.8% in men, respectively. All subjects, male, and female 99PURL (90% CI) were 17 (14 to 19), 18.6 (17 to 25) and 12 (11 to 17) ng/L, respectively.

**Conclusion:** This is the first large scale hs-cTnT reference range study in Asia. We confirm that men in Singapore also have higher hs-cTnT than women and hence, different 99PURL. Should we begin to consider gender specific decision limits for hs-cTnT as we have for CK and CK-MB given that the male 99PURL is 55% higher than that for women?

## P28 The Connecting Link: How Family Physicians can Contribute to Integrated Care for Patients with Multiple Comorbidities

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**Introduction:** The current subspecialised and fragmented healthcare for our ageing population has resulted in patients with multiple comorbid states having multiple specialist follow-up appointments. Family physicians can play a larger role in integrating care and ensuring a better continuity of care for patients.

**Methods:** We describe 3 interventions put in place by National University Hospital (NUH), Frontier Family Medicine Clinic and St Luke's Community Hospital (SLH) to bring about better integration of clinical care for patients. Each is accompanied by a case study illustrating its utility.

**Results:** Hospitalisation Triggers. A trigger system informs NUH Family Medicine residents of patients admitted to NUH whom they had previously seen in the primary care setting. Residents are encouraged to visit, follow-up and follow through, thereby promoting a culture of better handovers of care. Shared Electronic Medical Records. Under the shared computer system (CPSS2), Frontier family physicians are able to view entries made by NUH specialists, and vice versa. This not only eliminates uncertainties in management, but also promotes better communication among healthcare providers who practise in different sites. Outpatient Risk Stratification. Stable SLH patients with multiple specialist appointments at NUH are identified and

enrolled into a programme designed to further consolidate care in the community outpatient clinics. This is through actively seeking specialists' concordance for rightsiting to the above clinics when subspecialty care is no longer needed.

**Conclusion:** There remains much room for improvement in the area of patient care integration. Current initiatives offer promising solutions, and physicians should continue to innovate and advance these endeavours.

### **P29 Reduced Incidence of *Staphylococcus Aureus* Bloodstream Infections may have Resulted from Improved Infection Control in Patients with Chronic Kidney Disease: Observations from a Prospective Cohort Study**

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**Introduction:** Chronic kidney disease (CKD) is a prevalent disease in Singapore and an important risk factor for *Staphylococcus aureus* bloodstream infections (SAB). We report an analysis of trends of CO-SAB over a 7-year period in a large teaching hospital in Singapore and compare differences in incidence between patients with or without CKD.

**Methods:** All laboratory-confirmed SAB cases at the National University Hospital, a 1000 bed teaching hospital were prospectively classified into hospital-onset and community-onset based on United States Centers for Disease Control and Prevention (CDC) definitions. CKD was defined using standard criteria. Mean incidence per month were modeled as a time-series using Poisson generalised additive mixed models with an additional seasonality term and autocorrelation at a lag of 1 month.

**Results:** Between October 2007 and March 2014, there were 416 cases of community-onset CO-SAB over 37,2890 admissions. Cases among patients with CKD accounted for 152 episodes (36.5%) while there were 264 episodes in patients without CKD (63.5%). There was a sustained decrease in incidence of CO-SAB overall and the decrease in incidence in patients with CKD could account for almost all of the decrease in overall incidence of CO-SAB. The data are shown graphically.

**Conclusion:** There was a decrease in incidence of CO-SAB from October 2007 to March 2014. Efforts to reduce infections in patients with CKD may have contributed to this temporal trend and further detailed analyses are warranted.

### **P30 Successful Therapeutic Intervention of Cervical Spondylosis with Hyaluronic Acid Facet Joint Injection—A First Report of 3 Patients**

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**Introduction:** Chronic recurrent neck pain affects up to 15% of the adult population with up to 67% of them due to cervical facet joint disease. Various therapies including physiotherapy, NSAIDs, muscle relaxant, and medial branch block of facet joints with steroids have been reported with limited success. We report the first 3 cases of successful therapeutic intervention of cervical spondylosis with hyaluronic acid (HA) facet joint injections.

**Methods:** From our clinical records of patients who had undergone CT-guided HA facet joint injection of the spine, 3 patients who had symptomatic cervical spondylosis were identified. The 3 patients underwent CT-guided injection of the cervical facet joints with 1 mL of Marcaine followed by 1 mL of HA injection.

**Results:** Three patients (2 male, 1 female) were identified. Age range: 58 to 78 years old. Cervical symptoms: 2 had neck ache and crepitus, and 1 had recurrent neck pain. Duration of symptoms were 2 months to 3 years. Cervical spine x-ray showed C5/C6 spondylosis in 2 patients and C5/6 and C6/7 spondylosis in 1 patient. Two patients had 1 mL of Hylan GF-20 (Synvisc) into both C5/C6 facet joints, while 1 had 1 mL of sodium hyaluronate (Arthrum H 2%) injected into bilateral C5/6 and C6/7 facet joints. No complications were encountered; 80 to 100 % resolution of symptoms, up to 2.5 years follow-up.

**Conclusion:** CT-guided cervical facet joint injection with HA is a safe and successful therapeutic intervention for symptomatic cervical spondylosis. Long-term remission is achievable with this innovative new therapeutic approach and more patients can benefit from this form of treatment.

## Y1 Long-Term Prognosis in Patients with Diabetes Mellitus after Coronary Artery Bypass Grafting: A Propensity-Matched Study

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**Introduction:** The study aimed to determine the impact of diabetes mellitus (DM) on long-term survival after coronary artery bypass grafting (CABG) in patients with multivessel coronary artery disease.

**Methods:** A retrospective review was conducted for 5720 consecutive patients who underwent isolated first CABG between 1982 and 1999. Outcomes were reviewed to include in-hospital mortality and long-term survival. Mean follow-up was  $13.0 \pm 5.8$  years. To obtain comparable subgroups, 561 diabetic patients were matched with 561 non-diabetic controls based on estimated propensity scores.

**Results:** Mean age was  $59.3 \pm 9.1$  years with 4373 (76.5%) males. Amongst 5720 patients, 1977 (34.6%) had DM. Hypertension and dyslipidaemia were the most common cardiovascular comorbidities, present in 2920 (51.0%) and 2664 patients (46.6%) respectively. Emergency surgery was performed in 563 patients (9.8%). In-patient mortality occurred in 115 patients (2.0%), 48 (2.4%) in the DM group and 67 (1.8%) in the non-DM group, ( $P = 0.102$ ). In the unmatched cohort, overall 20-year survival rates were  $30.9 \pm 1.6\%$  in diabetics and  $49.2 \pm 1.0\%$  in non-diabetics ( $P < 0.001$ ). Freedom from cardiovascular mortality at 20 years was  $56.0 \pm 2.0\%$  in diabetics and  $68.4 \pm 1.0\%$  in non-diabetics ( $P < 0.001$ ). In the propensity-matched group, overall 20-year survival rates were  $35.4 \pm 2.5\%$  in diabetics and  $48.9 \pm 2.9\%$  in non-diabetics ( $P < 0.001$ ). Freedom from cardiac mortality at 20 years was  $57.8 \pm 3.0\%$  in diabetics and  $70.2 \pm 2.9\%$  in non-diabetics ( $P = 0.001$ ). Multivariable Cox regression analysis identified age [hazard ratio (HR) 1.03/year], female gender (HR 1.43), DM (HR 1.51), previous myocardial infarction (HR 1.54) and LVEF  $< 35\%$  (HR 2.60) as independent factors influencing long-term cardiac mortality.

**Conclusion:** Despite low operative mortality, long-term survival and freedom from cardiac death are significantly lower in patients with DM compared to non-diabetics. Aggressive treatment of DM, cardiovascular comorbidities and smoking cessation are essential to improve long-term survival in diabetic patients.

## Y2 Surgical Fixation of Radial Head Fractures Using Cannulated Headless Compression Screws. Treatment Protocol and Outcomes in a Prospective Case Series

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**Introduction:** Screw fixation has been a popular method of operative treatment of simple Mason II radial head fractures, while plate fixation and arthroplasty are more often used in complex Mason III and IV radial head fractures. The purpose of this study is to determine the effectiveness of using a uniform technique of headless compression screw fixation in simple, isolated Mason II to complex Mason III and IV radial head fractures in terms of functional outcome, treatment efficiency and assessment of complications with the procedure.

**Methods:** A prospective evaluation of a surgical technique was conducted on 31 adult patients with closed, non-pathological Mason II, III and IV radial head fractures sustained due to trauma. All patients included underwent fixation with either 2 or 3 2.0 to 2.5 mm cannulated headless compression screws (SBI Autofix Morrisville PA). During analysis of results, patients were divided into simple Mason II fracture group and complex Mason III-IV fracture group; and operative time, time to discharge and radiological union were used as parameters for assessment of clinical outcome while Mayo Elbow Performance score, range of motion and complications were used to assess functional outcomes.

**Results:** Twelve cases of 2 parts simple Mason Type II fractures, 13 Mason III and 6 Mason IV fractures were identified under the Mason-Johnston classification. The mean age is comparable between the simple Mason II fracture group of 38 years (21-77) and 40 years (24-77) in the complex Mason III and IV fracture group. Both groups had comparable days to union, mean hospital stay and operative time. Mean Mayo elbow score was 97 (80-100), with 10 excellent and 2 good outcomes, in simple fracture group while mean Mayo elbow score in the complex fracture group was 89 (75-100), with 7 excellent and 12 good outcomes,  $P = 0.035$ . Complication rates were also comparable in both groups with 1 case of heterotopic ossification in the simple group and 2 cases of implant loosening that required implant removal and 1 lateral sided elbow pain which resolved with conservative management. All fractures united in our series. Range of motion mean for simple Mason II fracture group is  $133 \pm 17.0$  degrees for flexion-extension arc,  $85 \pm 5$  degrees in pronation and supination as compared to complex group with  $120 \pm 20$  degrees flexion-extension arc,  $69 \pm 10$  degrees in pronation

and 70+/- 8 degrees in supination,  $P = 0.068$ .

**Conclusion:** Overall, clinical and functional outcomes of this technique are satisfactory in both simple and complex fractures with simple Mason II fracture group doing better than complex 3 parts Mason III and IV fractures in terms of Mayo elbow score and range of motion. Screw fixation also gives added advantage of less periosteal stripping and less impingement compared to other fixation methods, and allows for flexible fixation in constrained areas. Headless compression screw fixation can be considered as a method of fracture fixation in simple and complex 3 parts radial head fractures.

### Y3 Is Intraoperative Local Vancomycin Powder the Answer to Surgical Site Infections in Spine Surgery?

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**Introduction:** Surgical site infection (SSI) after spine surgery is a dreaded complication associated with increased morbidity and mortality. Prophylactic intraoperative local vancomycin powder to the wound has been recently adopted as a strategy to reduce SSI but results have been variable. The primary objective is to compare the rate of SSI between the treatment (vancomycin) and the control group (no vancomycin) in patients undergoing instrumented spine surgery.

**Methods:** This is a retrospective cohort comparative study of all patients who underwent instrumented spine surgery at a single institution. All patients received identical standard operative and postoperative care procedures based on protocolised department guidelines. Patient characteristics, diagnosis, surgical details and outcome parameters were compared using chi-square and t-tests. Multivariable logistic regression analysis was used to compare the rates of SSI while adjusting for confounders.

**Results:** In this study, there were 117 (30%) patients in the treatment group and 272 (70%) patients in the control group. The overall rate of SSI was 4.7% with a decrease in infection rate found in the treatment group (0.8% vs 6.3%). This was statistically significant ( $P = 0.049$ ) with an odds ratio of 0.13 (95% CI, 0.02 to 0.99). The treatment group had a significant shorter onset of infection (5.5 vs 16.7 days;  $P < 0.001$ ) and shorter duration of infection (8.5 vs 26.8 days;  $P < 0.001$ ). The most common causative

organism was *Pseudomonas aeruginosa* (28%). Smoking, patient diagnosis, surgical approach and intra-operative blood loss remained as significant risk factors for SSI after multivariable analysis.

**Conclusion:** Prophylactic intraoperative local vancomycin powder reduces the risk and morbidity of SSI in patients undergoing instrumented spine surgery. Common organisms identified allow better selection of empirical antibiotics when treating these infections. Future prospective randomised controlled trials in larger populations involving other spine surgeries with a long-term follow-up duration are recommended.

### Y4 A Primary Asian Perspective of Short-Term Results for Drug Eluting Balloon Angioplasty for Critical Limb Ischaemia

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**Introduction:** Restenosis remains an obstacle to successful treatment of peripheral artery disease, especially in infrapopliteal arteries. Drug-eluting balloon (DEB) angioplasty is a novel endovascular technique aiming to improve patency rates for treatment of critical limb ischaemia (CLI). This study aims to evaluate the early outcomes of DEB angioplasty in treatment of CLI in Asians.

**Methods:** We reviewed our registry data of 22 patients with 24 lesions treated with DEB, in the 1-year period from August 2010 to August 2011. Clinical evaluation and imaging with duplex ultrasound was performed 3 months after the procedure. Restenosis rate, change in Rutherford class, clinical patency rate, and major adverse events (defined as death, target limb amputation, and clinically driven target lesion revascularisation) were evaluated as study endpoints.

**Results:** Eighteen patients had a minimum follow-up of 3 months, of which 88.9% had at least 2 BTK vessels with >50% stenosis. The average segment treated per vessel was 2.57. In the follow-up period, 2 patients died and 1 required above the knee amputation, hence limb salvage rate was 93.8%, and overall survival rate was 88.9%. Of the remaining 15 patients, 86.7% had no or low-grade stenosis, and restenosis rate was 13.3%. Target lesion re-vascularisation (TLR) rate was 0%, and there was a 93.8% improvement in Rutherford class.

**Conclusion:** This study suggests that DEB is an effective treatment modality with good short-term outcomes, for the multilevel multisegmental CLI in the Asian population.

## Y5 Recurrent Diverticular Bleeding – Incidence and Role of Elective Surgery for an Uniquely Asian Problem

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**Introduction:** This study aims to establish the recurrence rates of diverticular bleeding, the morbidity rate of emergency and elective surgery and risk factors for recurrent diverticular bleeding. This was done to determine if earlier elective surgery is beneficial in recurrent diverticular bleeding.

**Methods:** Between 2004 to 2008, patients diagnosed with first episode of diverticular bleeding were identified. Forty-five patients with a second episode of diverticular bleeding formed the study group. National and hospital electronic records were reviewed to gather demographic, clinical and surgical outcome data. Statistical analysis was performed with Statistics Package for Social Sciences (SPSS) 20.0 software.

**Results:** A total of 11.7% (45) of patients with a first episode of diverticular bleeding went on to have a second episode, with 88.2% (40) of these occurring in the first 2 years. After excluding those who were managed surgically, 45.9% (17) went on to have a third bleed. The morbidity rate in patients requiring emergency surgery after the second and third bleeds was 50% and 66.7% respectively.

**Conclusion:** A total of 45.9% of patients with a second diverticular bleed have another recurrence. In addition, the morbidity rate following emergency surgery appears to be between 50% to 66.7%. It may be beneficial to offer patients early elective surgery following a second episode of diverticular bleeding.

## Y6 Does Inability to Demonstrate Aetiologic Microorganism in Pyogenic Liver Abscess Result in Adverse Outcomes Compared to *Klebsiella Pneumonia* Pyogenic Liver Abscess?

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**Introduction:** Pyogenic liver abscess (PLA) is a potentially life-threatening infection. Whether inability to demonstrate aetiologic microorganism in pyogenic liver abscess i.e. culture negative pyogenic liver abscess (CNPLA) results in adverse outcomes compared to *Klebsiella pneumonia* pyogenic liver abscess (KPPLA) was evaluated.

**Methods:** All patients with CNPLA and KPPLA admitted from January 2003 to December 2011 were included in the study. A retrospective review of medical records was performed and demographic, clinical and outcome data were collected.

**Results:** A total of 528 patients were treated as CNPLA or KPPLA over the study period. CNPLA and KPPLA each was diagnosed in 264 patients. CNPLA was more common in the older age group (59.1 vs 62.2,  $P = 0.029$ ) and presents more commonly with abdominal pain (53% vs 43.2%,  $P = 0.024$ ). Fever (85.2% vs 68.6%,  $P = 0.001$ ) and constitutional symptoms (83% vs 68.9%,  $P = 0.001$ ) were more common in KPPLA. KPPLA was associated with thrombocytopenia ( $P = 0.001$ ), elevated creatinine ( $P = 0.002$ ), bilirubin ( $P = 0.001$ ), aspartate aminotransferase (AST) ( $P = 0.025$ ), alanine aminotransferase (ALT) ( $P = 0.006$ ) and C-reactive protein level (CRP) ( $P = 0.036$ ). CNPLA patients tend to have anaemia ( $P = 0.015$ ) and smaller abscess size (5.4 vs 6.2,  $P = 0.008$ ) and less likely to be treated with percutaneous drainage (34.8% vs 63.6%,  $P = 0.001$ ). There was no difference in hospital stay (15.7 vs 16.8,  $P = 0.397$ ). No patients required surgical drainage after initiation of medical therapy. Overall 30 day mortality of CNPLA and KPPLA patients (14% vs 11%,  $P = 0.292$ ) was similar.

**Conclusion:** Despite demographic and clinical differences between culture negative and KPPLA, overall outcomes are indifferent.

## Y7 Longer Examination Time Improves Detection of Gastric Cancer during Diagnostic Upper Gastrointestinal Endoscopy

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**Introduction:** It is not clear how duration of upper endoscopy affects detection of cancer or premalignant lesions that increase risk for gastric cancer. We investigated whether the length of time spent on esophagogastroduodenoscopy (EGD) examination affects detection of important pathologic features of the stomach.

**Methods:** We collected data from 837 symptomatic patients, during a 3-month period in 2010, who underwent a first diagnostic EGD at a tertiary university hospital in Singapore. Endoscopists were classified based on the mean amount of time it took them to perform a normal EGD examination. We used logistic regression to compare between groups the

numbers of intestinal metaplasia, gastric atrophy, dysplasia, and cancer detected, using histologic analysis of biopsy samples collected during endoscopy as the standard.

**Results:** Of 224 normal endoscopies, the mean duration was 6.6 min (range 2-32 min); when we used 7 minutes as the cutoff, 8 endoscopists were considered to have short mean examination time (mean duration, 5.5 ± 2.1 min; called fast endoscopists) and 8 were considered to have long mean examination times (mean duration, 8.6 ± 4.2 min; called slow endoscopists). Eleven cancers and 81 lesions considered to pose risks for cancer were detected in 86 patients; 1.3% were determined to be cancer, 1.0% dysplasia, and 8.7% intestinal metaplasia and/or gastric atrophy. Slow endoscopists were twice as likely to detect high-risk lesions compared to fast endoscopists (odds ratio, 2.50; 95% confidence interval, 1.52 to 4.12), regardless of whether they were endoscopy staff or trainees. The slow endoscopists also detected 3 fold more neoplastic lesions (cancer or dysplasia; odds ratio, 3.42; 95% confidence interval, 1.25 to 10.38).

**Conclusion:** An endoscopist with mean EGD examination time longer than 7 minutes when performing a normal EGD identifies a greater number of high-risk gastric lesions than a faster counterpart. Examination time may be a useful indicator of quality assessment for upper endoscopy.

## Y8 “Start to Finish Transinstitutional Transdisciplinary Care”: A Novel Approach Improves Colorectal Surgical Outcomes in Frail Elderly Patients

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**Introduction:** The frail elderly surgical patient is at increased risk for morbidity after major surgery. A transdisciplinary Geriatric Surgery Service (GSS) has been shown to produce consistent positive outcomes in our institution. A transinstitutional transdisciplinary Start to Finish (STF) programme was initiated incorporating seamless prehabilitation and rehabilitation to further enhance outcomes.

**Methods:** Patients who underwent major colorectal resection in Khoo Teck Puat Hospital and were managed under the GSS from January 2007 to December 2014 were included in this prospective study. The STF programme was initiated from January 2012 and patients >65 years were included. The surgical outcomes of patients managed under the GSS before the initiation of STF were compared to the outcomes after the implementation.

**Results:** There were 57 patients after the initiation of STF programme compared to 60 patients managed before STF. There were 26.4% versus 25% of frail cases in the STF group compared to the non-STF group respectively,  $P = 0.874$ . Mean length of hospital stay was reduced significantly in the STF group, from 11.0 to 8.4 days,  $P = 0.029$ . Clavian 3 and above complications were reduced from 8.3% in non-STF group to 5.3% in the STF group,  $P = 0.511$ . Functional recovery at 6 weeks was improved in the elective STF group who received prehabilitation compared to the elective non-STF group who did not receive prehabilitation, 100% (46/46) versus 95.7% (45/47) respectively,  $P = 0.157$ . There were no significant differences in 30-day mortality between the 2 groups.

**Conclusion:** Through a transinstitutional transdisciplinary approach, we managed to achieve significantly shorter hospital stays. All elective patients who received prehabilitation achieved full functional recovery.

## Y9 Early Outcomes of Combination MRI-targeted and Transperineal Template Biopsy in Restaging Low-risk Prostate Cancer for Active Surveillance

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**Introduction:** In low-risk prostate cancer, we investigate if a strategy of combination of robotic transperineal template biopsy (rTPB) and MRI-targeted biopsy (MRTB) better classifies patients for treatment options.

**Methods:** This IRB-approved, prospective, single-blinded study included men with low-risk prostate cancer according to D’Amico’s Criteria diagnosed on conventional transrectal ultrasound-guided (TRUS) biopsy. Patients first underwent multiparametric-MRI of the prostate ≥6 weeks after initial TRUS biopsy. Each suspicious lesion is marked on a 24-sector prostate template grid and assigned a PIRADS score by the radiologist. Template biopsy is first performed with the surgeon blinded to MRI findings, using a robotic transperineal biopsy guidance platform. The surgeon is then unblinded to the mapping template and targeted biopsy then planned and performed by cognitive fusion. All 5 patients who were upclassified underwent radical prostatectomy and histological correlation with whole mount prostatectomy specimen was performed. Cancer detection rate and upclassification rate of both modalities were analysed and correlation of tumour grade and location with MRI and PIRADS score was performed.



**Results:** The 15 Singaporean men included have a mean age of  $65.5 \pm 5.5$  years. The mean PSA at diagnosis was  $6.6 \pm 2.0$  ng/mL and mean prostate volume was  $32.1 \pm 13.4$  cc. Fourteen patients had lesions detected on MRI, of which 4 (28.6%) had significant disease detected by MRTB alone; 3/15 patients (20%) had significant disease detected by template biopsy alone. In combination, both techniques upclassified 5 patients (33%) all of whom underwent radical prostatectomy. Whole mount histology confirmed tumour location and grade. All 6 patients with PIRADS 5 lesion had cancer detected of which 2 thirds were significant disease.

**Conclusion:** Combination of rTPB and MRTB upgrades one-third of our patients presumed to be low-risk by initial TRUS biopsy. MRTB detects 80% of these patients. In patients with PIRADS 5 score, MRTB detects all Gleason  $\geq 7$  cancers.

### Y10 Validation of a Novel Asian Dietary Questionnaire in Assessing Nutritional Risk Factors for Urinary Stone Formation

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**Introduction:** Nutritional risk factors for lithogenesis can be identified using a detailed 3-day food diary, which is analysed by a registered dietician. An individually tailored dietary advice can be given based on the food diary. However, some individuals may find completing a food diary to be cumbersome. Additionally, many urologists do not have access to a registered dietician. A novel dietary questionnaire, tailored to local food and beverages in Singapore was developed to identify dietary lithogenic risk factors.

**Methods:** A 36-item dietary questionnaire was developed, which quantified intake of stone inhibitors (citrate and fluids), stone promoters (animal protein and oxalate) and calcium. Twenty healthy volunteers were recruited to complete the dietary questionnaire. They were then asked to complete a 3-day food diary. Using the diary, a dietician conducted a telephone interview for 24-hour diet recall. The responses to the dietary questionnaire were compared with the nutrient analysis of 24-hour diet recall. The dietician was blinded to the data in the questionnaire. Pearson's correlation analysis was used to determine the relationship between the 2 variables.

**Results:** The questionnaire required approximately 5 minutes to complete. Amount of fluid intake was well

captured on the questionnaire ( $r = 0.55$ ; moderate positive linear relationship,  $P = 0.01$ ). Strong positive linear relationship was observed for calcium intake ( $r = 0.87$ ,  $P < 0.01$ ). No linear relationship noted for animal protein intake on the questionnaire ( $r = 0.08$ ,  $P = 0.73$ ). From the questionnaire, subjects responded average consumption of citrate-rich food (orange, lime, pineapple) of 1-2 times/month. On average, oxalate-rich food (bai-cai, tofu, tempeh) was consumed on a weekly basis. Both of these corresponded well with the 24-hour diet recall.

**Conclusion:** The lithogenic dietary questionnaire provides a simpler tool in identifying stone-related nutrition factors compared to a 3-day food diary. Validation of this tool will allow future studies on dietary patterns of stone-formers to be conducted.

### Y11 Robot-assisted Versus Open Radical Prostatectomy: A Contemporary Analysis of an All-Payer Discharge Database

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**Introduction:** Despite a decade of widespread dissemination, the benefits and cost efficiency of robot-assisted radical prostatectomy (RARP) continue to elicit controversy. In the absence of randomised trials (with its own inherent biases), large observational retrospective cohort studies deliver the best evidence to compare real-world effectiveness of RARP vs open radical prostatectomy (ORP). The study aimed to compare the perioperative outcomes and costs of RARP vs ORP.

**Methods:** A cohort study of 654,030 men who underwent radical prostatectomy for localised prostate cancer at 449 hospitals in the United States from 2003 to 2013, using the Premier Hospital Database (Premier, Inc., Charlotte, NC), a nationally representative all-payer discharge database. RARP was ascertained through a review of the hospital charge description master for robotic supplies. Main outcomes and measures: 90-day postoperative complications (Clavien), blood product transfusions, operating room time, length of stay and direct hospital costs. Propensity-weighted regression analyses accounting for clustering by hospitals and survey weighting ensured nationally representative estimates.

**Results:** Utilisation of RARP grew rapidly from 2% in 2003 to 85% in 2013 ( $P < 0.001$ ). Adjusted analyses showed that RARP patients ( $n = 352,867$ ) were less likely to experience any complications (odds ratio [OR]: 0.72, 95% CI, 0.60 to 0.87), prolonged length of stay (OR: 0.12, 95% CI, 0.09 to

0.16), or receive blood products (OR: 0.30, 95% CI, 0.14 to 0.64) compared to ORP patients (n = 301,163). Results were similar among patients with poorer comorbidities (Charlson score  $\geq 2$ ). Mean operating room time for RARP was 155 min (95% CI, 67 to 243) longer; higher surgeon and hospital volumes were associated with shorter operating time; 90-day direct hospital costs were higher for RARP (+\$5339, 95% CI, \$3418 to 7261), primarily attributed to operating room and supplies costs. Costs were no longer significantly different between ORP and RARP among the highest volume surgeons ( $\geq 104$  cases/year) (+\$1188, 95% CI, -\$1560 -+\$3935).

**Conclusion:** Our contemporary analysis found that RARP confers a perioperative morbidity advantage at higher costs. In the absence of large randomised trials due to the widespread adoption of RARP. This retrospective study represents the best available evidence for the morbidity and cost profile of RARP vs ORP.

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