SOUVENIR PROGRAMME & ABSTRACT BOOK

ASMIC 2010

ANNUAL SCIENTIFIC MEETING ON INTENSIVE CARE

29th JULY – 1st AUGUST 2010

Shangri-La Hotel
Kuala Lumpur, Malaysia

Organised by

Malaysian Society of Intensive Care

Ministry of Health Malaysia

Asia Pacific Association of Critical Care Medicine

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Message from the Deputy Minister of Health Malaysia

It is with great pleasure that I extend my warmest greetings to the participants of the Annual Scientific Meeting on Intensive Care 2010.

I would like to commend the Malaysian Society of Intensive Care and the Anaesthetic and Intensive Care Services of Ministry of Health Malaysia for organising this inaugural meeting.

Patients in intensive care units are the most ill patients among all hospitalised patients. Providing care for the critically ill is complex and challenging. Healthcare professionals have to ensure that all critically ill patients and their families receive optimal care. To provide high quality care and skills, professionals need to be equipped with specialised knowledge, skills and experience. Healthcare professionals working in intensive care units also need to work as a team to make the environment a healing, humane and caring one for patients and their families.

The presence of foreign and local experts in this meeting will provide participants with the recent advances and approaches in the management of the critically ill. Participants will also have the opportunity to exchange ideas and information and develop their professional networks.

It is my hope that this scientific meeting will provide a valuable contribution to continued professional development among healthcare professionals caring for the critically ill. The Ministry is fully aware of the fact that the quality of service is closely determined by the level of knowledge and the constant upgrading of skills of all its personnel and therefore, is always committed in supporting such activities.

I wish you all a very successful and fruitful meeting.

DATUK ROSNAH BT HJ ABDUL RASHID SHIRLIN

Message from the President, Malaysian Society of Intensive Care

It is hardly surprising that the Malaysian Society of Intensive Care, as a new kid on the block, is excited about hosting this event. Not only is this the inaugural Annual Scientific Meeting, it has also been endorsed by the Ministry of Health Malaysia and is well received by both the delegates and the trade industry. ASMIC has inherited the legacy of the National Conference on Intensive Care (NCIC) and no doubt this has in part contributed to its success. I take this opportunity to thank the Malaysian Society of Anaesthesiologists for its support and financial assistance to our endeavor leading to the formation of the new Society and the organising of ASMIC 2010.

The birth of the Malaysian Society of Intensive Care signifies a new era for intensive care in Malaysia. It brings together health care providers from the various backgrounds to work as a team to advance the field of intensive care. The current executive committee comprising intensivists, anaesthesiologists, physicians and pediatricians is testimony of the diversity of the group with a shared vision. I am confident that with the enthusiasm and commitment of the committee and its members, the MSIC will not only establish itself as the voice for the profession but also the standard bearer and advocacy for best practice in intensive care.

The Annual Scientific Meeting will remain a cornerstone for the continuing medical education programme and we hope this meeting will provide updates on the management of the critically ill patients and help you keep abreast with current issues. The Organising Committee has worked tirelessly to come up with a rich scientific programme and brought in renowned speakers from abroad and as well as locally to address those issues and make this conference a 'must attend' meeting. I want to register my sincere appreciation and thanks to my colleagues in the Organising Committee for their fantastic efforts.

A big thank you to the Deputy Minister of Health Malaysia, YB Datuk Rosnah Bt Hj Abdul Rashid Shirlin, for officiating the Annual Scientific Meeting. Her presence has made this inaugural meeting a very special one. Last but not least, I thank the delegates for attending the conference and all who have helped in one way or another.

DR TAN CHENG CHENG

Message from the Organising Chairperson, ASMIC 2010

On behalf of the Organising Committee, I would like to extend my warmest welcome to you to the inaugural Annual Scientific Meeting on Intensive Care (ASMIC) 2010, organised by the Malaysian Society of Intensive Care.

We have put forward a comprehensive scientific programme with an exciting combination of plenary and symposia lectures, ask the expert sessions and free paper presentations. In addition to the main conference, there will be a pre-conference workshop for those who are keen to gain experience in performing echocardiography in intensive care patients.

We each have the knowledge and experience to share, as well as the desire to learn more with aims to further improve the quality of care and quality of life for the critically ill. Our distinguished speakers, both foreign and local will be sharing their experience and knowledge on new developments and recent advances in intensive care. We will also benefit from the many booth exhibitions displaying wide array of intensive care-related medical equipment and devices.

We hope you have an inspiring and enjoyable meeting. With your participation, this meeting could be the most memorable ever.

DR TAI LI LING

ASMIC 2010
Organising Committee

ADVISOR	Ng Siew Hian
CHAIRPERSON	Tai Li Ling
COMMITTEE MEMBERS	V Kathiresan
	Noor Airini Ibrahim
	Sekar Shanmugam
	Shanti Rudra Deva
	Suresh Venugobal
	Tang Swee Fong

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Syed Rozaidi Wafa
Suresh Kumar
Suresh Venugobal
Tai Li Ling
Tan Cheng Cheng
Tang Swee Fong
Teh Keng Hwang
Jenny Tong May Geok
Yap Soon Jin

Programme Summary

TIME \ DATE	30TH JULY 2010 FRIDAY	31ST JULY 2010 SATURDAY	1ST AUGUST 2010 SUNDAY
0800 – 0830	REGISTRATION	LET'S ASK THE EXPERT 1	LET'S ASK THE EXPERT 2
0830 – 0900			
0900 – 0930	PLENARY 1	PLENARY 2	PLENARY 4
0930 – 1000	OPENING CEREMONY		
1000 – 1030		PLENARY 3	PLENARY 5
1030 – 1100	TEA / TRADE EXHIBITION	TEA / TRADE EXHIBITION	PRESENTATION OF FREE PAPER / POSTER AWARD / TEA / TRADE EXHIBITION
1100 – 1130	SYMPOSIUM 1 RESPIRATORY I	SYMPOSIUM 7 SEPSIS	SYMPOSIUM 13 GI / MISC
1130 – 1200	SYMPOSIUM 2 PAEDIATRICS I	SYMPOSIUM 8 PAEDIATRICS II	SYMPOSIUM 14 RENAL
1200 – 1230	SYMPOSIUM 3 NEUROLOGY	SYMPOSIUM 9 EPIDEMIC / PANDEMIC	
1230 – 1300			
1300 – 1330	LUNCH	LUNCH SATELLITE SYMPOSIUM (Hospira (M) Sdn Bhd)	LUNCH
1330 – 1400	FRIDAY PRAYERS		
1400 – 1430	SYMPOSIUM 4 CARDIOVASCULAR	SYMPOSIUM 10 RESPIRATORY II	
1430 – 1500			
1500 – 1530	SYMPOSIUM 5 INTENSIVE CARE FOR NURSES I	SYMPOSIUM 11 INTENSIVE CARE FOR NURSES II	
1530 – 1600	SYMPOSIUM 6 MISCELLANEOUS	SYMPOSIUM 12 PHARMACOTHERAPY	
1600 – 1630			
1630 – 1700	TEA / TRADE EXHIBITION		
1700 – 1800	TEA SATELLITE SYMPOSIUM (Merck Sharp & Dohme) / FREE PAPERS / POSTER JUDGING		

29TH JULY 2010 THURSDAY

PRE-CONGRESS WORKSHOP

0800 – 0830 REGISTRATION
0830 – 0945 ECHOCARDIOGRAPHY IN ICU

Daily Programme
29TH JULY 2010 | THURSDAY

PRE-CONGRESS WORKSHOP
VENUE: KEDAH / SELANGOR / PERAK ROOMS

ECHOCARDIOGRAPHY IN ICU

COORDINATOR: SURESH VENUGOBAL

0800 – 0830 REGISTRATION

0830 – 0845 Introduction on the goals of Level 1 ECHO by the general intensivist
RAM RAJAGOPALAN

0845 – 0915 Physics and knobology
KISHORE PICHAMUTHU

0915 – 0945 Anatomical orientation of traditional cardiac views
RAM RAJAGOPALAN

0945 – 1015 TEA

1015 – 1230 **HANDS-ON STATION** (45 minutes each)

1. 2D E
   LIEW HOUNG BANG
2. Basic assessment of preload including IVC and respiratory changes
   KISHORE PICHAMUTHU
3. Stroke volume and left ventricular function assessment
   RAM RAJAGOPALAN
4. FAST scan and lung scan
   SHAHRIDAN FATHIL

(The first 30 minutes in each station is for image acquisition, feeling comfortable with the probe and machine handling. Only done once during the first rotation)

1230 – 1330 LUNCH

1330 – 1415 **HANDS-ON STATION** *(continuation)*

1415 – 1500 Assessment of hypotensive/shock patient and 2D ECHO during CPR
RAM RAJAGOPALAN

1500 – 1530 Assessment of pericardial effusion
KISHORE PICHAMUTHU

1530 – 1615 Assessment of R and L ventricular function
LIEW HOUNG BANG

Daily Programme
30TH JULY 2010 | FRIDAY

0800 – 0845 REGISTRATION

0845 – 0930 **PLENARY 1** ▸ SABAH ROOM
CHAIRPERSON:
SHANTHI RATNAM
First do no harm [pg 15]
MERVYN SINGER

0930 – 1015 **OPENING CEREMONY** ▸ SABAH ROOM
by YB Datuk Rosnah Bt Hj Abdul Rashid Shirlin, Deputy Minister of Health

1015 – 1100 TEA / TRADE EXHIBITION

	▸ SABAH ROOM	▸ SARAWAK ROOM	▸ JOHOR ROOM
1100 – 1300	**SYMPOSIUM 1** **RESPIRATORY I** CHAIRPERSON: **TAN CHENG CHENG**	**SYMPOSIUM 2** **PAEDIATRICS I** CHAIRPERSON: **SOO THIAN LIAN**	**SYMPOSIUM 3** **NEUROLOGY** CHAIRPERSON: **LOUISA CHAN**
1100 – 1130	Fluid management in ARDS: How much is good LIM CHEW HAR [pg 15]	Physiologic changes and management of septic shock [pg 18] MARINO FESTA	Use of cerebral oximetry in the critically ill patients [pg 19] MOHD RAMDZAN JAMIL
1130 – 1200	Rescue therapies in ALI ANDREW DAVIES [pg 16]	Ventilator-associated pneumonia and blood stream infection update TEH KENG HWANG	Intensive care for the geriatric patient KHOO TIEN MENG
1200 – 1230	Prediction and prevention of weaning failure [pg 17] SURESH VENUGOBAL	Acute kidney injury [pg 18] CHAN YOKE HWEE	Sleep in the ICU: How well do our patients sleep? YAHYA SHEHABI [pg 20]
1230 – 1300	Clinical consensus definition of ARDS: Is it still useful? [pg 17] TAI LI LING		Pain and the immune system MARY CARDOSA

1300 – 1430 LUNCH / FRIDAY PRAYERS

Daily Programme
30TH JULY 2010 | FRIDAY

	▸ SABAH ROOM	▸ SARAWAK ROOM	▸ JOHOR ROOM
1430 – 1630	**SYMPOSIUM 4** **CARDIOVASCULAR** CHAIRPERSON: **SEKAR SHANMUGAM**	**SYMPOSIUM 5** **INTENSIVE CARE FOR NURSES I** CHAIRPERSON: **MAHAZIR KASSIM**	**SYMPOSIUM 6** **MISCELLANEOUS** CHAIRPERSON: **JENNY TONG**
1430 – 1500	Functional hemodynamic monitoring [pg 21] KISHORE PICHAMUTHU	Sustaining compliance to care bundles in ICU [pg 23] YAP SOON JIN	Role of interventional radiology in ICU patients OUZREIAH NAWAWI
1500 – 1530	Management of acute infective endocarditis LAM KAI HUAT	The nurse's role in the prevention of infection in the Intensive Care Unit (ICU) NOOR AIRINI IBRAHIM [pg 24]	Early mobility of the ICU patient [pg 26] TAI LI LING
1530 – 1600	Management of acute trial fibrillation in the critically ill RAM RAJAGOPALAN [pg 22]	Communicating with critically ill patients and their families LOUISA CHAN	Interhospital transfer of critical care patients: Problems and solutions SURESH VENUGOBAL [pg 26]
1600 – 1630	Management of acute heart failure [pg 23] MERVYN SINGER	The last hours: Practical aspects [pg 25] AHMAD SHALTUT OTHMAN	Troponin assay in the critically ill SHANTHI RATNAM
1630 – 1700	TEA		
	▸ SABAH ROOM		▸ JOHOR ROOM
1700 – 1800	**TEA SATELLITE SYMPOSIUM (MERCK SHARP & DOHME)** CHAIRPERSON: **SURESH VENUGOBAL** "Benefits of empiric treatment of antifungal in high risk ICU patients" ASOK KURUP		**FREE PAPERS** [pg 51–57] CHAIRPERSON: **SEKAR SHANMUGAM**

Daily Programme
31ST JULY 2010 | SATURDAY

0800 – 0900	**LET'S ASK THE EXPERT 1** CONVENOR: **MAHAZIR KASSIM** How do I approach a patient with low cardiac output state? MERVYN SINGER	▸ JOHOR ROOM
0900 – 0945	**PLENARY 2** CHAIRPERSON: **TANG SWEE FONG** Recent clinical trials in intensive care medicine: Are we any closer to evidence-based practice? [pg 27] ANDREW DAVIES	▸ SABAH ROOM
0945 – 1030	**PLENARY 3** CHAIRPERSON: **TANG SWEE FONG** Use of simulation for education of healthcare teams [pg 28] MARINO FESTA	▸ SABAH ROOM
1030 – 1100	**TEA / TRADE EXHIBITION**	

	▸ SABAH ROOM	▸ SARAWAK ROOM	▸ JOHOR ROOM
1100 – 1300	**SYMPOSIUM 7** **SEPSIS** CHAIRPERSONS: **WAN NASRUDIN WAN ISMAIL** **LAILA KAMALIAH KAMALUL BAHRIN**	**SYMPOSIUM 8** **PAEDIATRICS II** CHAIRPERSON: **MAZNISAH MAHMOOD**	**SYMPOSIUM 9** **EPIDEMIC/PANDEMIC** CHAIRPERSONS: **RAHA ABDUL RAHMAN** **NIK AZMAN NIK ADIB**
1100 – 1130	Adjunctive therapies in sepsis and septic shock JENNY TONG [pg 28]	Nutritional support of critically ill children [pg 31] TANG SWEE FONG	ICU patient with Pandemic 2009 Influenza A (H1N1) infection [pg 34] TAN CHENG CHENG
1130 – 1200	Pathophysiology of multi-organ failure [pg 29] MERVYN SINGER	Which resuscitation fluid should we use in PICU MARINO FESTA [pg 32]	Healthcare workers and an epidemic SURESH KUMAR
1200 – 1230	Severe sepsis and the HIV-infected patient SHANTHI RATNAM	Home ventilation [pg 33] CHAN YOKE HWEE	Developing a coordinated city-wide ICU response plan in an epidemic [pg 35] LOO SHI
1230 – 1300	Ventilator associated pneumonia: New evidence [pg 30] SHANTI RUDRA DEVA		Ethical decision making in an epidemic [pg 36] CHARLES GOMERSALL
1300 – 1430	**LUNCH SATELLITE SYMPOSIUM (HOSPIRA MALAYSIA)** CHAIRPERSON: **LOUISA CHAN** "Current trends in ICU sedation: Finding the ideal SPICE in 2010" [pg 37] YAHYA SHEHABI		▸ SABAH ROOM

Daily Programme
31ST JULY 2010 | SATURDAY

	▸ SABAH ROOM	▸ SARAWAK ROOM	▸ JOHOR ROOM
1430 – 1630	**SYMPOSIUM 10** **RESPIRATORY II** CHAIRPERSONS: **AHMAD SHALTUT OTHMAN** **ROHANA MOHAMAD**	**SYMPOSIUM 11** **INTENSIVE CARE FOR NURSES II** CHAIRPERSON: **SURESH VENUGOBAL**	**SYMPOSIUM 12** **PHARMACOTHERAPY** CHAIRPERSON: **KHOO TIEN MENG**
1430 – 1500	Mechanical ventilation in a patient with bronchopleural fistula [pg 38] ARIFFIN MARZUKI MOKHTAR	Glycaemic control in the critically ill patient MOHD RIDHWAN MOHD NOOR	Magnesium therapy in the critically ill patients [pg 42] NIK ABDULLAH NIK MOHAMAD
1500 – 1530	Does non-invasive ventilation improve outcomes? [pg 39 – 40] RAHA ABDUL RAHMAN	Persistent fever in the critically ill patient [pg 41] MAHAZIR KASSIM	Beta-blockade in intensive care patients [pg 43] SHANTI RUDRA DEVA
1530 – 1600	Inhaled drugs in mechanically ventilated patients LAILA KAMALIAH KAMALUL BAHRIN	Newer ventilatory modes ISMAIL TAN MOHD ALI TAN	Role of statins in critically ill patients [pg 44] NOOR AIRINI IBRAHIM
1600 – 1630	Spontaneous breathing in mechanical ventilation is always better [pg 41] SYED ROZAIDI WAFA		Management of organophophorus poisoning [pg 45] KISHORE PICHAMUTHU
1630 – 1700	TEA		

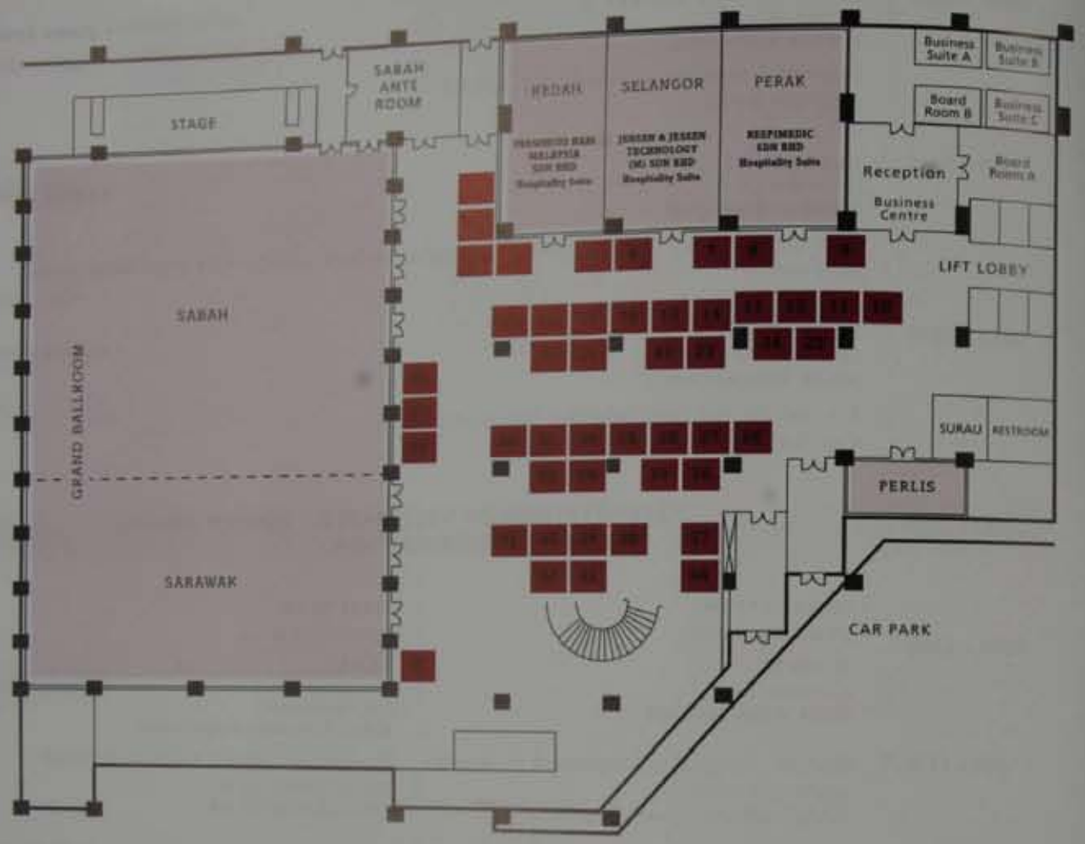
Daily Programme
1ST AUGUST 2010 | SUNDAY

0800 – 0900	**LET'S ASK THE EXPERT 2** CONVENOR: **SURESH VENUGOBAL** How do I ventilate a patient with ARDS? ANDREW DAVIES	▸ JOHOR ROOM
0900 – 0945	**PLENARY 4** CHAIRPERSON: **SEKAR SHANMUGAM** Trial derived evidence becoming sustainable bedside reality - Our experience [pg 46] LOO SHI	▸ SABAH ROOM
0945 – 1030	**PLENARY 5** CHAIRPERSON: **SEKAR SHANMUGAM** It's not the bells and whistles that matter [pg 46] CHARLES GOMERSALL	▸ SABAH ROOM
1030 – 1100	**PRESENTATION OF FREE PAPER / POSTER AWARD** **TEA / TRADE EXHIBITION**	

	▸ SARAWAK ROOM	▸ JOHOR ROOM
1100 – 1300	**SYMPOSIUM 13** **GI/MISC** CHAIRPERSON: **NOOR AIRINI IBRAHIM**	**SYMPOSIUM 14** **RENAL** CHAIRPERSONS: **LIM CHEW HAR** **MOHD RIDHWAN MOHD NOOR**
1100 – 1130	Update: Surgical management in severe acute pancreatitis HARJIT SINGH	Preventing contrast medium induced nephropathy [pg 48] ANSELM SURESH RAO
1130 – 1200	Tight glycaemic control: How sweet it is RAM RAJAGOPALAN [pg 47]	The use of diuretics in the critically ill patient AHMAD SHALTUT OTHMAN [pg 49]
1200 – 1230	Improving quality of nutrition in the critically ill patient [pg 47] ANDREW DAVIES	Renal protection in the critically ill: Are we wasting our time? [pg 50] YAHYA SHEHABI
1230 – 1300	Choosing and dosing antibiotics in the critically ill [pg 48] CHARLES GOMERSALL	Continuous versus intermittent renal replacement therapy in the ICU patient LOO SHI [pg 50]
1300 – 1400	LUNCH	▸ SABAH ROOM

Floor Plan & Trade Exhibition

BASEMENT 2, SHANGRI-LA HOTEL, KUALA LUMPUR



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Floor Plan & Trade Exhibition

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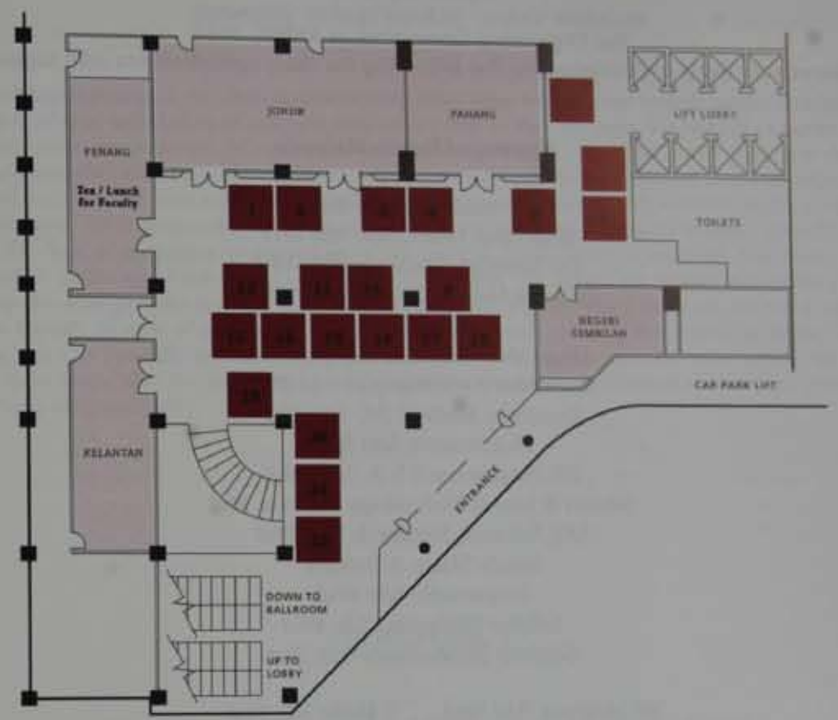

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Thank You

The Organising Committee of ASMIC 2010
records its deep appreciation to the following for their contributions and support:

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First Do No Harm

Mervyn Singer
University College London, United Kingdom

The major advances in critical care over the last twenty years have been almost entirely related to improvements in the process of care rather than to any new innovation. Key to this has been the belated recognition that our ability to intervene aggressively to make the numbers 'look good' is more often than not detrimental. Randomised controlled trials have shown this clearly applies to mechanical ventilation, blood transfusion targets, sedation and nutrition. But why stop there? What about catecholamines, oxygen, synthetic fluids, antibiotics and gastric protectants? What about infection control?! Just because we don't witness an obvious side-effect does not mean that the drug or technique or procedure is not causing covert harm to immune, metabolic, endocrine, energy or other pathways. Paracelsus (1493-1541) noted that *"All things are poison and nothing is without poison; only the dose permits something not to be poisonous."* Five hundred years on, the same message still holds true – though, in view of our enhanced technological capacity, perhaps this should be applied even more forcibly. We need to carefully re-evaluate everything we're doing to our patients, what targets we should be aiming for, how to monitor for harm, and how to optimize treatment to enhance survival and minimize both short- and long-term morbidity.

Fluid Management In ARDS: How Much Is Good

Lim Chew Har
Department of Anaesthesia and Intensive Care, Hospital Pulau Pinang, Penang, Malaysia

Intravenous fluid management in patients with acute respiratory distress syndrome can be particularly challenging. These patients have noncardiogenic pulmonary edema as a hallmark of their disease process, and thus, intravenous fluid management involves balancing between maintaining intravascular volume and perfusion to vital organs and avoiding excessive fluid administration which can worsen the lung edema, further impairing gas exchange.

Fluid management in patients with ALI/ARDS has been the subject of intense debate for decades. Several small trials over the last 20 years have demonstrated improved outcome for ARDS in patients treated with diuretics or dialysis to promote a negative fluid balance in the first few days. However, there are some concerns about the consequences of a conservative fluid strategy. For example, this can lead to a reduction in cardiac output and may affect oxygen delivery.

An ARDS Clinical Trials Network study of conservative fluid versus liberal fluid strategies in the management of patients with ARDS/ALI (FACTT trial) published in 2006 did not demonstrate a statistically significant difference in 60 day mortality when patients were stratified into either group 72 hours after presenting in ARDS. However, patients treated with the conservative fluid strategy had an improved oxygenation index and lung injury score and shorter duration of mechanical ventilation and intensive care, without increasing the incidence of nonpulmonary organ failures. These results support the use of a conservative fluid management strategy in ARDS patients.

Separating out initial resuscitation, as used for early goal directed therapy, and maintenance fluid therapy is important. A simple approach would be to try to keep fluid balance even once clinical euvolemia has been established. This may involve aggressive fluid administration in the initial phases of the systemic inflammatory response syndrome and then reverting to the more conservative approach thereafter.

Rescue Therapies In ALI

Andrew R Davies
Intensive Care Unit, Alfred Hospital and Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Australia

Management of Acute Lung Injury (ALI) is predominantly supportive with optimal use of the mechanical ventilator being the most crucial aspect. Recent studies have demonstrated that a focus on protective ventilation can reduce ventilator-induced lung injury and improve clinical outcomes. Several interventions, however, have been seen as appropriate for use as "rescue therapies" in patients who do not respond to conventional management.

Prone positioning is based on the heterogeneous process that occurs in the lung and the benefits often seen on CT scanning when it is performed in ALI patients. Studies have demonstrated the benefit of improved oxygenation at the time of proning, however this has not been associated with improved survival. Whilst earlier and more prolonged application of the prone position may be promising, the benefits must truly outweigh the risks before widespread use can be recommended.

The use of inhaled nitric oxide has a substantive theoretical basis, however benefits beyond a short-term improvement in oxygenation have not been able to be demonstrated. Prostacyclin has been even less rigorously studied. Late-stage application of corticosteroids was once seen as a useful strategy once the fibro-proliferative stage of ALI was present, however a recent study has suggested this is unlikely to be beneficial and may even be associated with harm. Instillation of surfactant has also seemed theoretically justifiable, but beneficial effects on clinical outcomes have not been clearly demonstrated. A study of a surfactant containing surfactant protein B was most promising, so follow-up studies are eagerly awaited.

High Frequency Oscillatory Ventilation is a complex but safe method of providing what may be considered the most gentle mechanical ventilation in severe ALI, particularly when severe hypoxaemia has developed, but its use outside highly experienced centres remains limited and larger trials are awaited. Application of recruitment manoeuvres, where sustained intermittent high positive airway pressures are used to open atelectatic areas of the lung, is another ventilatory strategy seen as a rescue for severe hypoxaemia, and whilst it may be the most promising, large clinical trials supporting its efficacy remain lacking.

The recent publication of the CESAR trial from the United Kingdon brings hope that extracorporeal membrane oxygenation (ECMO) may be an important rescue therapy for ALI. This study showed the benefits that ECMO-based care offers when compared to conventional ALI management, however the widespread application of ECMO has serious limitations and further studies are clearly needed.

Prediction And Prevention Of Weaning Failure

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As doctors who are involved in Intensive Care Medicine, weaning failure remains a very frustrating aspect of our speciality more so when patients seemed to have triumphed over extremely challenging situations. This remains an Achilles heel in both patients 'outcome and satisfaction. Obviously this leads to extra costs as well as reduced turnover in precious Intensive Care beds. I shall try to elucidate the evidence for both prediction of weaning failure as well as to review current practices and highlight potentially useful strategies in trying to prevent weaning failure.

Clinical Consensus Definition Of ARDS: Is It Still Useful?

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Acute respiratory distress syndrome (ARDS) is a clinical syndrome characterised by inflammatory pulmonary oedema, diffuse endothelial and epithelial injury, reduced lung compliance and severe hypoxaemia.

In 1967, Ashbaugh and colleagues first described this clinical entity and called it "acute respiratory distress in adults". Since then, there were various non-standardised definitions until the development of the Lung Injury Score by Murray and colleagues in 1988, which did not gain popularity due to its complexity.

In 1994, the proceedings of the American-European Consensus Conference (AECC) on ARDS, which included a standardised definition for ARDS was published. The AECC definition of ARDS is as follows: (1) an illness of an acute onset, (2) severe hypoxaemia with an arterial oxygen tension/inspired oxygen fraction ≤ 200 mm Hg (3) presence of bilateral infiltrates on frontal chest radiographs, and (4) no evidence of left atrial hypertension. In clinical practice, the relatively simple and broad-based AECC definition has allowed better recognition and early management of ARDS with consequent improved outcomes. However, the AECC definition has been criticised as it does not reflect the current understanding of pathophysiology in ARDS. The reliability and validity of the components of AECC definition has also been questioned. By grouping very heterogeneous patients into a single syndrome, it may have contributed to the many randomised control trials that failed to find a treatment effect that truly exists.

Attempts had been made to improve the definition of ARDS with an emphasis to accurately identify the target population in clinical trials and yet not to underdiagnose theses patients in clinical practice. One such attempt was made using the Delphi consensus technique in 2005. However, the 1994 AECC definition has remained till today as the most common definition used in clinical and epidemiological studies in ARDS.

SYMPOSIUM 2

Physiologic Changes And Management Of Septic Shock

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AIM
In-vivo study of the microcirculation in 32 ventilated infants and children (median age 66 months (IQR 32-115) in PICU with meningococcal septic shock (MSS) is used to describe the relationship of measured microvascular parameters with disease severity, macrovascular function, colloid osmotic pressure (COP) and assays of plasma antioxidant protection against reactive iron species (RIS).

METHODS
Measured microvascular parameters include limb resting venous pressure (Pv (mmHg)), arterial inflow (Qa (ml/min/100ml tissue)), isovolumetric venous pressure (Pvi (mmHg)), and fluid filtration capacity (Kf ($*10^{-3}$ml/min/100ml tissue/mmHg)) on day 1 of MSS, and on subsequent days in PICU. Paired outpatient studies were performed in 9 children aged >8-years.

MAIN RESULTS
Median volume fluid resuscitation prior to 1st study = 95 ml/kg (75–110)). All patients survived to hospital discharge. Paired outpatient studies (n=9) compared recovery with acute MSS. Day 1 Qa, and Kf were significantly increased compared to paired outpatient studies. Day 1 Pvi correlated significantly with MSS severity and organ dysfunction scores. Day 1 COP was significantly correlated with total protein and less well correlated with plasma albumin. The COP-CVP difference was positively correlated with Pvi. Day 1 assays of plasma protection against RIS were negatively correlated with MSS severity and Day 1 Pvi measurements were negatively correlated with plasma iron-binding antioxidant protection.

CONCLUSIONS
This research relates microvascular function in infants and children with MSS to organ function and disease severity. These novel data provide direct evidence for the importance of COP and hydrostatic forces on microvascular flow in infants and children with septic shock and implicate damage by RIS as a cause of microvascular dysfunction in MSS. These data may be used to provide a rationale for existing therapies as well as for the future development of novel treatments in infants and children with this disease.

SYMPOSIUM 2

Acute Kidney Injury

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Acute Kidney Injury (AKI) is common among critically ill patients and is associated with significant morbidity. It has been increasing recognized that chronic kidney disease may evolve later in life in patients with previous AKI. There are many different and diverse causes of AKI in children. They can be broadly classified into pre-renal injury, intrinsic renal disease and obstructive uropathy. In the critically ill, more than one of these often contribute to the kidney injury.

While the definition of AKI (previously known as acute renal failure) has been varied in the past, the Acute Kidney Injury Network has formulated a multi-level classification system for AKI using the RIFLE (Risk, Injury, Failure, Loss, End-stage kidney disease) criteria. This classification system has been validated for its prognostic value in adults and has been proposed as the standard classification for future research on AKI. This classification system has also been modified for paediatric patients (pRIFLE) and shown to reflect the course of AKI in children admitted to the intensive care unit.

Various biomarkers for AKI have been investigated. Those widely studied include plasma neutrophil gelatinase-associated lipocalin (NGAL) and cystatin C levels as well as urinary NGAL, interleukin-18 (IL-18) and kidney injury molecule-1 (KIM-1). The development of a sensitive and predictive renal biomarker will allow earlier detection of AKI and implementation of therapeutic strategies.

While many strategies have been studied to prevent or limit AKI, including the use of diuretics and low-dose dopamine, the results have been disappointing. Though fenoldopam, a specific dopamine-1 agonist, has shown some benefits in limiting AKI and reducing the need for renal replacement therapy in at-risk patients, these studies were not adequately powered to justify its routine use.

SYMPOSIUM 3

Use Of Cerebral Oximetry In The Critically Ill Patients

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Cerebral oximetry utilizes near infra red wavelength to penetrate the scalp, skull and brain to a depth of a few centimeters. Hence the synonym NIRS. Because of the differential absorption by oxygenated Hb, deoxygenated Hb and cytochrome aa3, using reflectance spectroscopy based on the modified Beer-Lambert Law, it estimates the oxygen content of a small region of the brain.

NIRS is non-invasive and provides prompt, real time changes in the regional cerebral oxygenation. It has been used to monitor patients with traumatic brain injury, intracranial haemorrhage and in patients undergoing carotid enarterectomy. In a study in patients on the intensive care unit following head injury, NIRS detected 97% of desaturations cf 53% via SjvO2 making it more specific and sensitive. During carotid endarterectomy, NIRS has also been used to detect cerebral hypoxia with more than 50% of patients developing cerebral desaturation on internal carotid artery cross-clamping. In a pilot study on patients with severe head injury, cerebral tissue saturation of ≥ 75% was associated with cerebral perfusion pressure (CPP) of ≥ 70mmHg whilst saturation of < 55% was assoc with CPP of < 70 mmHg most of the time. There has been desaturation is some patients despite CPP being ≥ 70mmHg. Its potential use is in the detection of delayed traumatic intracranial haematomas in pts with subdural haematoma or massive amount of blood in the subarachnoid space, hence providing a better timed follow-up CT scans and operations.

Although there are some very encouraging reports using NIRS-monitoring in severe brain trauma as presented above, it must be taken into consideration that scalp hematomas, bilateral hematomas or deep intracranial hematomas can lead to false negative readings. Some authors rise the question whether NIRS is able to detect ischemic events in head traumatized patients. Dramatic intracranial volume shifts as during transtentorial herniation and in the complete loss of cerebral function in brain death and global circulation arrest are not reflected adequately by NIRS in each patient.There is still lack of evidence that it can reliably distinguish between intra and extracranial changes in blood flow and oxygenation.

Development of NIRS technology continues to improve the accuracy of the equipment, and validation by prospective trials could qualify it as a reliable continuous non-invasive monitor of brain oxygenation in coming years.

Sleep In The ICU: How Well Do Our Patients Sleep?

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A human being spend a third of his/her life sleeping. There are many hypothesis of why we need to sleep, however, the dominant hypothesis are those related to restoration of brain metabolism and consolidation of memory.

Natural sleep is characterized by REM sleep in cycles of 90 to 100 minutes alternating with Non-REM sleep subdivided into 4 progressive stages. Noradrenaline, Histamine and 5-HT are the main neurotransmitters involve in sleep regulation.

Induced sleep with sedatives or hypnotic agents suppresses REM sleep intensity and duration and doesn't guarantee a "good night sleep".

Sleep deprivation can result in reduced performance and abnormal behavior. In the critically ill patient, the consequences of sleep deprivation are many, most importantly agitation, emergence delirium, hallucinations and long-term post traumatic stress. Sleep deprivation also impact negatively on immune function, restorative function and therefore might delay recovery from critical illness.

It is imperative that natural sleep is encouraged for ICU patients. Ensuring adequate analgesia is pivotal in promoting sleep. Psychological support with regular visits from family and friends and awareness of daily events. Arranging interventional clinical activities during day time and providing lengthy periods of relative low activity at night time is essential. Adequate day light exposure is critical to maintain a circadian rhythm of sleep. While many environmental factors play a major role in sleep promotion, it is the ICU design which provides privacy, noise reduction, appropriate lighting, adequate space and responsive patients' flow that may have the biggest impact.

There are many endogenous factors that interfere with sleep in the critically ill which is induced by concomitant disease process. While these factors are mostly un-modifiable, there impact can be mitigated by adopting an integrated strategy that identify those at highest risk, reducing impact of environmental factors and using REM sleep friendly analgesics and sedatives.

Functional Hemodynamic Monitoring

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Functional hemodynamic monitoring is that aspect of monitoring which accurately describes the circulatory state at the moment and predicts the effect of therapy, enabling decision making at the bedside. It is this type of monitoring that drives goal-directed therapy and is associated with improved patient outcomes.

The most important question to be answered in the management of the hemodynamically unstable patient is whether cardiac output will increase with fluid resuscitation. Traditionally used CVP and PA occlusion pressure have been proven to be poor indicators of volume status and preload responsiveness. Many newer dynamic measures of preload responsiveness have been recently validated. In sedated mechanically ventilated patients in sinus rhythm, stroke volume variation with respiration >10% (measured by pulse contour analysis, echocardiography or esophageal doppler), Pulse pressure variation >13% and IVC diameter variation>12% (measured by echocardiography) are accurate and reliable indicators of preload responsiveness. Measured changes in hemodynamic parameters during a passive leg raise test (an internal, reversible fluid challenge) can however be used to predict fluid responsiveness even in spontaneously breathing patients and those with arrythmias. These include a stroke volume increase >10%, pulse pressure change of >9% and an increase in maximal femoral arterial velocity >8% with passive leg raise.

Fluid overload during volume resuscitation can be prevented by monitoring invasively measured PaoP, echocardiographically estimated LA pressure, extravascular lung water measured by transpulmonary thermodilution and PaO_2/FiO_2 or SpO_2/FiO_2 ratios.

Profile analysis of cardiac output, lactate levels, central venous saturation and urine output can help answer the question of adequacy of perfusion. These are markers of global perfusion and though specific indicators of tissue wellness exist (gastric tonometry, sublingual CO2, siblingual capillary flow), no evidence exists to support their routine use.

However, these monitoring tools can improve outcomes only when they are used to drive early, appropriate goal-directed therapy. Goal directed therapy algorithms focusing on ensuring adequate tissue perfusion have been shown to reduce costs and improve outcomes in medical and post-operative critically ill patients.

Management Of Acute Trial Fibrillation In The Critically Ill

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Atrial fibrillation (AF) is a common arrhythmia in the critically ill patient. While its prevalence in the general intensive care unit (ICU) is about 5-6%, it may be as common as 30% after CABG and close to 60% after valvular heart surgery. In the general intensive care patient, advanced age and increased severity of illness increase the predilection for this arrhythmia. The data from one large observational cohort indicates that though mortality is higher in patients with the arrhythmia, the development of AF is, by itself, not an independent risk factor for ICU death.

Though spontaneous reversal to sinus rhythm is seen in about one-half of these patients, 45% will relapse within 48 hours. While prophylaxis may be considered in the post-cardiac surgical ICU, its value in the general intensive care patient is not established. Except in the unstable patient, who will need urgent electrical cardioversion, medical therapy is used in acute AF and aims at pharmacological conversion of the rhythm rather than rate control. The relative innocuousness of amiodarone has made it a drug that is used almost as a reflex in the ICU, despite a paucity of data on its efficacy in this setting. Extrapolating from cardiology and emergency medicine literature, amiodarone is superior to procainamide and at least equivalent to flecanide and sotalaol in its ability to restore sinus rhythm. Ibutilide, a class III antiarrhythmic like amiodarone, has equivalent efficacy, but with a higher risk of precipitating polymorphic ventricular tachycardia related to Q-T prolongation. Although some claim greater rates of cardioversion when the two drugs are combined, the high risk of ventricular arrhythmias would preclude widespread use in this manner. Though widely unrecognized, parenteral magnesium sulphate, which has excellent rate-control and cardioversion efficacy, was superior to amiodarone in a small RCT in critically ill patients. Considering the relative safety of magnesium and an absence of drug interactions with amiodarone, its use as a single agent or in combination with amiodarone is a worthwhile option.

Management Of Acute Heart Failure

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In evolutionary terms, heart failure is a modern disease. The commonest cause, coronary artery disease, is largely a complication of lifestyle compounded by a physiologically-inappropriate degree of longevity created by better nutrition, sanitation and medical advance. The body is thus confused by the ensuing low cardiac output into believing there is a problem with volaemia related to decreased fluid intake or losses such as trauma-related haemorrhage. Accordingly, it induces profound vasoconstriction – affecting both arteries and veins – to maintain perfusion pressures. This however places an even greater load on the failing heart and, as a consequence, cardiac output falls still further. It is thus logical to concentrate efforts on treating this maladaptative response by optimal vasodilatation, with additional fluid loading as necessary. Using this paradigm, the irrationality of the general use of diuretics, which further deplete a usually contracted intravascular compartment, becomes obvious. Likewise, the use of inotropes – agents that place greater stress on a damaged, malfunctioning heart – requires re-evaluation. It makes more sense to rest the insulted heart until it recovers – apart from revascularization interventions that improve myocardial blood flow, there is a reasonably well-defined role for mechanical supports – respiratory and renal as well as cardiac. All of the above requires adequate diagnostics and monitoring to ensure no structural problems (e.g. valvular dysfunction) have been missed and to optimal titrate drugs, fluids and support devices.

Sustaining Compliance To Care Bundles In ICU

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Compliance to a medical therapy can be defined as the extent to which a patient acts in accordance with the prescribed interval and dose of a treatment regime. Care bundle is a collection of evidenced-based interventions when performed together result in better outcome than each individually. It provides a standardized, auditable care plan for treatment of a specific medical condition or procedure.

Ventilator Care Bundle was launched in 18 GICUs in December 2006 with a target compliance of 80% and monitored under National Audit in Adult Intensive Care (NAICU). The mean compliance to bundle care for 2007 was 82.4%, while the mean compliance to individual component of bundle was 98% for head elevation, 93.4% for sedation hold, 96.7% for stress ulcer prophylaxis and 91.9% for DVT prophylaxis. The VAP rate was 17.0 per 1000 ventilator days in Jan-Mar 2007 and was reduced to 14.2 per 1000 ventilator days in Oct-Dec 2007.

Sustaining care bundle compliance involves continuing education for nurses, increasing allocation of resource and manpower to the programme, regular communication between administrator and nurses, improving auditing process and regular review of audit. This will ensure a real change to the practice and improvement in patient outcome with time.

The Nurse's Role In The Prevention Of Infection In The Intensive Care Unit (ICU)

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Through their daily close contact with patients in the ICU, critical care nurses have an important role to play in preventing nosocomial infection . With adequate knowledge and proper training, they stand as firstliners in decreasing risk factors, recognizing early symptoms and assisting ICU physicians in making accurate and timely diagnosis. (Myrianthefs et al 2004)

Nosocomial pneumonia (NP) is consistently the most common nosocomial infection in the ICU with prevalence rates ranging from 10% to 70%. (Rello et al 2001, Ibrahim et al 2000, Nichols and Morris 1997). The incidence of NP is 6 to 20 times higher in mechanically ventilated patients, developing at a rate of 1-3% per day of mechanical ventilation. (Ibrahim et al 2001). There are basically four main categories of predisposing factors to NP. – host factors, aspiration, inhalation and cross contamination. There is nothing much we can do to alter host factors , other than to maximise nutritional status and and improve the still reversible component of their organ function. This intervention alone has been shown by Marik and Zaloga in 2001 to reduce the risk of NP.

Aspiration, however is an important predisposing factor and has been shown by Perth in 1998 to be the primary route of pathogen transmission to the lungs. Oropharyngeal colonization may occur in 1 out of 4 patients on admission to ICU but this figure approaches 100% by day 10 – 15 of their ICU stay. (Park 2005, Orgeas 1997). Therefore, it is mandatory to clear oropharyngeal secretions before handling an endotracheal tube . Other factors include alteration in gastric acid secretion and administration of enteral nutrition. It is therefore prudent for the critical nurse to keep up to date with evidence based practices, like the Ventilator Care Bundle , and strictly implements it.

Inhalation of contaminated aerosols from ventilator tubings, humidifier and nebulisers may also predispose to NP. Park 2005 and Safdar et al 2005 showed that in a ventilator circuit, the highest colonization occurs at the part nearest to patient usually from retrograde sputum colonization. Heated humidifiers maybe associated with higher rate of pneumonia compared to heat moisture exchange (HME) devices. Therefore, when ventilator tubings need to be moved ,for example during feeding or positioning, caution must be taken to avoid spillage of contaminated condensate fluid into the tracheobronchial tree.

Cross contamination accounted for 38% of nosocomial infection among the critically ill, as shown by Waist et al in 2002. Handwashing, consistently seen to be the most effective way to prevent cross contamination, are adhered to with high compliance among critical care nurses. Nurses also traditionally respond positively to education and new guidelines.(Pittet et al 2002)

Problems of understaffing and fatigue among critical care nurses have been implicated during outbreaks. (Fridkin 2003)

The Last Hours: Practical Aspects

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The primary goals of intensive care medicine are to help patients survive acute threats to their lives while preserving and restoring the quality of those lives. Even so, the ICU has become a common place to die. Admission to the ICU is therefore often a therapeutic trial. Only when the trials fail do patients and families consider a change in goals, from restorative care to palliative care. This change, which has been called the transition from cure to comfort, is one of the most difficult and important aspects of medical and nursing practice in the ICU.

The actual practice of withdrawal is a combination of theoretical considerations, empirical data and clinical experience. There are no single ways to withdraw. Despite many variations in real life practice, one has to address physical, psychological, social and spiritual issues in this end of life care practice.

ICU clinicians should be competent in all aspects of this care, including the practical and ethical aspects of withdrawing different modalities of life-sustaining treatment and the use of sedatives, analgesics, and non-pharmacologic approaches to easing the suffering of the dying process. All ICU care providers especially clinicians and nurses should be prepared to assist families in the dying process.

End-of-life care is emerging as a comprehensive area of expertise in the ICU

and demands the same high level of knowledge and competence as all other

areas of ICU practice.

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Early Mobility Of The ICU Patient

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Bed rest and sedation is assumed to be beneficial in the critically ill patients for preventing complications, conserving metabolic resources and providing comfort. However, bed rest is known to cause the deconditioning effects of critical illness, which is defined as the multiple changes in organ system physiology that are induced by inactivity and reversed by activity. These include changes in muscle fibers, inflammatory markers and metabolic parameters. Immobility is also a known risk factor for complications such as respiratory insufficiency, deep vein thrombosis and pressure ulcers.

Early mobility helps in providing patient comfort, promoting psychological well-being, improving respiratory function and preventing the complications of bed rest. The ultimate goals of early mobility are to promote maximal level of independence and cardiovascular fitness before hospital discharge. Current literature supports that early mobility in patients in intensive care settings including those on mechanical ventilation is feasible, safe, reduced ICU and hospital length of stays and did not increase costs.

Mobilisation techniques include active/active assisted limb exercises, active moving or turning in bed, getting out of bed to chair via mechanical lifting machines or slide boards, sitting on the edge of the bed, standing, standing transfers from bed to chair, and even walking.

The major challenges to mobilising critically ill patients are fears of accidental dislodgement of tubes and devices and concerns over the strain that mobility could have on the patient's oxygenation and haemodynamic status. Other issues include personnel and equipment resources, pain and discomfort, the time and priority of mobilisation.

There is a need for a cultural shift in the intensive care settings from prolonged bed rest to early mobility in the critically ill patients to decrease the morbidity of the ICU stay.

Interhospital Transfer Of Critical Care Patients: Problems And Solutions

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Interhospital transfer of critical care patients are increasing as the years go on namely due to globalisation and centralisation of services. This has presented the medical fraternity with more challenges as patients transferred are not only sicker but expectations have grown as well. In most countries especially developing ones transfers are done in an adhoc manner as there is no body regulating the transfers. It is generally a discussion between the referring and accepting hospital to sort out the logistics. Training of staff for remains suboptimal. In this lecture I would try to highlight some of the problems we are facing and possible solutions as well.

Recent Clinical Trials In Intensive Care Medicine: Are We Any Closer To Evidence-Based Practice

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Knowing the absolute truth about which intervention should be most effective in each patient remains an elusive goal in intensive care medicine. Research assists in slow accumulation of the evidence that clinicians utilise to approximate the true benefits and risks associated with each intervention in each particular setting but can never provide clinical practice solutions for all situations. Nevertheless, intensive care research has grown overwhelmingly over the last few decades and has no doubt driven and supported an evidence-based movement in intensive care medicine which has no doubt saved many lives.

In the 1980s, clinical trials were infrequent, mostly single-centre, and often focused on surrogate outcomes that were not clinically meaningful. Multi-centre trials became more common in the 1990s, however it has only been in the 2000s that multi-centre clinical trials have become more plentiful, more adequately sized and more clinically focussed. These trials have also been supported by a growth in the publication of systematic reviews, meta-analyses, and clinical practice guidelines.

An unfortunate reality is that most intensive care multi-centre trials have reported no beneficial effect on the primary outcome, usually mortality, and this may have been contributed to by methodological flaws and small sample sizes. On the other hand, many of the "positive" trials in the field have been single-centre unblinded trials, often with more significant limitations. The positive trials have often been heavily promoted with widespread uptake of their findings into practice, most probably due to the relative hunger for trials that report positive outcome effects.

Over the last 15 years, an increasing number of intensive care clinical trials groups have developed, most notably in North America, in Europe, and in Australia and New Zealand. Several of these groups have now performed some of the largest and highest quality clinical trials, many of which have been responsible for significant changes in clinical practice and hopefully improved patient outcomes.

So whilst recent clinical trials have brought us closer to more evidence-based practice, the challenges for the future include improving trial design, adequate resourcing and the development of greater international collaboration to improve the conduct of and the applicability of clinical trials. But perhaps the most significant challenge for the entire intensive care community remains the need to synthesise and then to translate the results of the best performed clinical trials into clinical practice so that patients can benefit right across the world.

Use Of Simulation For Education Of Healthcare Teams

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Simulation based training is increasingly popular and accessible. Immersive scenario based training offers the opportunity for learners to focus both on technical and non-technical skills relevant to their clinical practice.

This presentation sets out the rationale for the use of simulation to train healthcare teams and explores its advantages and limitations.

The potential role for part skills trainers, low-fidelity and high-fidelity simulators to augment existing education and training is discussed in the light of the learner's existing level of competence or expertise.

Methods and rationale for the delivery of immersive, high-fidelity scenario based education are described and discussed together with the existing evidence for the use of all forms of simulation for education of healthcare teams.

Adjunctive Therapies In Sepsis And Septic Shock

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Infection is a common problem for patients in intensive care units (ICUs) and is associated with considerable morbidity, mortality and costs.[1] Sepsis related mortality rates reach 60% and account for approximately 40% of total ICU expenditures.[1,2] The Extended Prevalence of Infection in Intensive Care (EPIC II) study which was conducted in 2007 from 75 countries showed that 51% of ICU patients were considered infected. The ICU and hospital mortality rate of infected patients was more than twice that of non-infected patients.[1] Mortality rates associated with severe sepsis and septic shock were 25-30% and 40-70% respectively.[3] Sepsis remained the 2nd most common diagnosis leading to ICU admission in Malaysian Ministry of Health ICUs over the past 7 years with an in-hospital mortality of 62% in 2009.[4]

Adjunctive therapy refers to any treatment that is used in conjunction with the primary treatment to increase the chance of cure. In sepsis and septic shock established therapies include the appropriate use of, vasopressors, inotropes, recombinant human activated protein C, deep vein thromboprophylaxis, stress ulcer prophylaxis, adequate glycaemic control, sedation protocols and lung-protective mechanical ventilation.[5]

Septic shock is traditionally viewed as an excessive inflammatory reaction to invasive microbial pathogens. Increasingly, sepsis-induced immunosuppression has been recognised as evidenced by the frequent occurrence of infection with relatively avirulent and often multidrug resistant organisms. Over the past 30 years, research into immunomodulatory agents (eg statins, interferon-gamma, granulocyte colony-stimulating factor, granulocyte-macrophage colony-stimulating factor, interleukin-7, interleukin-15) have generally produced disappointing results.[6] The initial enthusiasm about the role of steroids has been downplayed by the negative findings of the CORTICUS study.[7,8] Results of future trials (eg IVORE study) may address the issue of whether high volume haemofiltration has beneficial effects on mortality. Clinical trials into other agents are on-going and may represent a major advance in the treatment of septic shock in the future.

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Pathophysiology Of Multi-Organ Failure

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Multi-organ failure (MOF) is a fascinating condition with many paradoxes that are, as yet, still largely unexplained. Why different individuals are affected to differing degrees implies a genetic component compounded by other factors including co-morbidity, age, gender and concurrent tissue hypoxia that accentuates inflammation. Why different organs are affected in different individuals also remains unclear. Iatrogenic factors are obviously important – witness the marked decline in severe ARDS since the advent of more judicious use of fluid administration and more rigorous attention to fluid balance, and the decrease in severe 'septic' shock with less use of heavy sedation. There is cross-talk between the organs as well as neural regulation of the inflammatory response by the brain via autonomic and endocrine pathways, the importance of which is being increasingly appreciated. Many downstream pathways are activated by the exaggerated and prolonged degree of inflammation – immune, hormonal, metabolic, energetic, coagulation, cardiovascular, etc. We now recognize that MOF evolves through different phases which represent an initial fight against the stressor, then retrenchment and finally, in survivors, repair and recovery. Metabolic needs are high early on and during the recovery phase but, fascinatingly, fall during the established phase of organ failure. Whether this represents a controlled cellular shutdown (as a means of conserving energy and enhancing the likelihood of survival if the body as a whole is strong enough to survive) and/or a response to a decrease in energy supply through mitochondrial dysfunction, remains to be clarified. This increasing knowledge highlights new avenues for either prevention/amelioration of MOF, or acceleration of recovery.

SYMPOSIUM 7

Ventilator Associated Pneumonia: New Evidence

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Ventilator associated pneumonia is a dreaded nosocomial infection when managing patients in the intensive care, increasing mortality, morbidity and health care cost. About 9 to 27% of intubated patients acquire VAP with a crude mortality anywhere between 20% and 60%.

This high albeit crude mortality underscores the need for preventive strategies to be implemented with zero tolerance to non compliance. There are some well established strategies in the prevention of VAP such as the hand hygiene, aspiration precautions and weaning protocols. Ensuring these preventive measures are in place at all times can sometimes be challenging.

Despite the many well founded measures in the prevention of VAP, newer measures are still being explored. Confusion and controversies abound some of these newer strategies. Use of probiotics in the prevention of VAP has been advocated in a recent meta-analysis. Although evidence seems to suggest a role in probiotics, it should not yet be applied globally to all mechanically ventilated patients but perhaps in a selected group of patients.

Another new strategy in the prevention of VPA is the use of kinetic bed therapy. Kinetic bed therapy or continuous lateral rotation therapy has been used to prevent immobilization-induced pulmonary abnormalities. Using a specially designed bed, rotation of patients in a longitudinal axis from one lateral position to another, has recently been shown to decrease the prevalence of VAP in a prospective randomized clinical study. Unlike the previous studies, this one showed a reduction on the duration of mechanical ventilation and length of stay. Kinetic therapy may thus be an effective strategy in the bundle of measures in the prevention of VAP.

Comparing performances across intensive care units by analysing preventable nosocomial infections such as VAP for benchmarking is a current trend. However current data are conflicting as to the optimal diagnostic approach in patients who have suspected VAP. Difficulty in rendering an accurate diagnosis of VAP makes it unreliable basis for quality control or inter-hospital benchmarking.

VAP is an important infection in the mechanically ventilated patients. Diagnosis of this entity is worrisome with no gold standard yet. Initiating early and appropriate empirical antibiotics in the treatment of VAP is crucial. Prevention should be the key factor in our current clinical care practice.

SYMPOSIUM 8

Nutritional Support Of Critically Ill Children

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Malnutrition is a prevalent problem in children admitted to the Paediatric Intensive Care Unit (PICU) and, during the course of illness, the nutritional status may further deteriorate. The aetiology of malnutrition developing during critical illness is multifactorial. Common contributing factors include increased metabolic demands secondary to the metabolic stress response, failure to estimate energy expenditure accurately and inadequate substrate delivery at the bedside.

Assessment of the nutritional status on admission to PICU is important to identify children who will be at high risk for further deterioration. However, nutritional assessment of critically ill children is challenging from both scientific and practical aspects. Anthropometric assessment, body composition and biochemical assessments can be used but each has its own limitations in the intensive care environment.

After an assessment and estimation of the energy needs, the actual delivery of requisite nutrients may be challenging and requires a multidisciplinary effort. Individualised nutritional prescriptions should be tailored for critically ill children. There are however barriers to nutritional intake which may worsen malnutrition in the PICU. These include delay in initiation of nutrition, suboptimal use of parenteral nutrition and overall failure to prescribe adequate calories and protein. Bedside nutrient delivery may be interrupted by routine interventions and procedures that occur in the PICU. Frequent interruptions in enteral nutrient delivery may affect clinical outcomes. Guidelines for enteral and parenteral nutrition for the critically ill child were recently revised by the Guidelines Committee and Board of Directors of the American Society of Parenteral and Enteral Nutrition.

Hospital-acquired malnutrition may be avoidable in some cases. Steps which can be taken to improve the nutritional state of children admitted to PICU include the availability of a multidisciplinary nutrition support teams and the use of nutrition therapy guidelines.

Which Resuscitation Fluid Should We Use In PICU?

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Parenteral resuscitation fluid administration is a common intervention in critically ill infants or children in the intensive care unit (ICU). Whilst studies in adult intensive care have attempted to identify benefit associated with crystalloid or colloid resuscitation fluids, there is no firm evidence upon which to base current practice in critically infants and children.

Global paediatric fluid resuscitation practices are likely to have been influenced by the publication of the Cochrane Review on Albumin (1998), the Saline versus Albumin Fluid Evaluation (SAFE) study in adults (2004) and a subsequent repeat meta-analysis which included the SAFE study by the Cochrane Albumin Reviewers (2004). Opinions vary on the optimal choice of resuscitation fluid and current practice in paediatric ICU is likely to vary.

A pilot point prevalence study (PPS) was conducted in 8 paediatric ICUs in Australia and New Zealand (ANZ). The PPS utilised an electronic case report form (CRF) and web-based reporting of data.

Results: Data were reported in 97 patients (55% infants, 44% post-op, 20% post cardiopulmonary bypass, 8% sepsis, 6% ALI / ARDS, 3% trauma). 78 /97 patients had completed CRFs. 11/78 (14%) received at least 1 fluid bolus on the study day. Hypotension, tachycardia and oliguria were the most commonly stated indications for a fluid bolus. After exclusion of blood products, 4.5% human albumin solution was the most commonly prescribed fluid.

Discussion: The ANZ pilot PPS demonstrates the feasibility of a web-based study to collect cross-sectional observational data from all patients under 16-years in participating intensive care units. The authors propose SAFE EPIC, an international PPS in order to:

document current practice in paediatric (<16-years old) fluid resuscitation

determine whether there are identifiable regional, institutional, unit or patient characteristics associated with choice of resuscitation fluid.

establish a network for future collaborative research in paediatric ICU.

Home Ventilation

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The advance in medical knowledge and technology has brought about the advent of home-based medical care for chronically ill children, including ventilator-dependent children. The shift towards home-based care for these children requiring chronic ventilation stems from various factors: improved survival of critically ill children, availability of home medical equipment including ventilators, move towards reducing hospital healthcare costs as well as awareness of the psychological and developmental benefits of homecare.

The main indication for home ventilation is chronic alveolar hypoventilation. This occurs in children with airway or parenchymal disease; or in children with chest wall deformities, neuromuscular diseases or central nervous system disorders.

For a paediatric home ventilation programme to be effective and safe, it should comprise of a multidisciplinary team of paediatric pulmonologist or intensive care specialist, homecare nurse specialist, social worker and respiratory therapist. Careful patient selection is done based on various criteria including cardiopulmonary stability, availability of caregivers who are adequately trained, psychological readiness of the caregivers, and a home environment that is assessed to be safe. A 24-hour emergency equipment support service must be available. Medical or nursing help must be readily accessible.

Homecare may not be the best choice for every technologically dependent child. The psychological and financial impact of prolonged hospital stay must be weighed against the stresses and the readiness of the society of caring for these children in the community.

ICU Patient With Pandemic 2009 Influenza A (H1N1) Infection

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The pandemic 2009 influenza A (H1N1) virus is different from seasonal influenza in two important aspects: First, the infection mainly develops in humans of less than 65 years old. Secondly, the virus can penetrate deep into the lung tissue and cause rapidly progressive pneumonia.[1,2] Approximately 10-30% of hospitalized patients with 2009 H1N1 infection in the United States, Mexico, Australia/New Zealand and Canada were admitted to Intensive Care Units (ICU). The mortality of these patients were reported to be around 14-46%.[3,4,5,6]

CARE OF THE SEVERELY ILL H1N1 PATIENT IN ICU

1. ANTIVIRAL THERAPY

Oseltamivir therapy should be initiated as soon as possible, even past 48h of symptoms and if not already administered. An increased dose of the drug ie 150mg twice daily in adults for an increased duration ie a total of 10 days are advisable.[7]

2. ANTIBACTERIAL THERAPY

Secondary bacterial pneumonia has been diagnosed in 20-24% of critically ill H1N1 patients.[5,6] Hence empiric antimicrobial therapy against community-acquired pneumonia should also be started.[1]

3. RESPIRATORY SUPPORTIVE CARE

The principal clinical syndrome leading to hospitalization and intensive care is diffuse viral pneumonitis associated with severe hypoxemia, ARDS (Acute respiratory distress syndrome), and sometimes shock and renal failure. This syndrome has accounted for approximately 49 to 72% of ICU admission.[5,6] Chest X-ray changes commonly include diffuse mixed interstitial and alveolar infiltrates.[3] The unrelenting hypoxemic respiratory failure has been the cause of mortality of most patients who died of 2009 H1N1 influenza.[6]

Ventilation strategies should be based on evidence based guidelines for sepsis-associated ALI/ARDS[9] which are optimal lung-protective strategies, focusing on limiting end-inspiratory plateau pressure to < 30 cmH_2O and tidal volume to < 6 mL/kg of predicted body weight, with provision of optimal positive end expiratory pressures for alveolar recruitment.

Other strategies in refractory hypoxemia include:[8]

a. Diuresis to dry weight with frusemide or continuous ultrafiltration to achieve net -ve fluid balance.
b. Prone positioning to improve distribution of perfusion to ventilated lung regions and decreasing intrapulmonary shunt.
c. High frequency oscillation (HFO) characterized by the rapid delivery of small tidal volumes of gas and the application of high mean airway pressures.
d. Nitric oxide (NO), a naturally occurring product identical to endothelial-derived relaxing factor.
e. Extracorporeal Membrane Oxygenation (ECMO) which is indicated when the risk of dying of ARDS is considered >80% despite optimal ventilator and medical management.

4. CORTICOSTEROIDS

No clear data are available regarding the potential efficacy of steroids in the treatment of severe ARDS attributable to 2009 H1N1 influenza at this present time.

5. SEDATION REQUIREMENTS

The requirements for sedation may be unexpectedly high in some patients in order to suppress high ventilatory drive. Requirement for neuromuscular blockade is common.[10]

6. OTHER CONSIDERATIONS

These will include infection control and planning for outbreak.[10]

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Developing A Coordinated City-Wide ICU Response Plan In An Epidemic

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The experience with the SARS epidemic in 2003 laid the foundation for a city-wide ICU response plan against future pandemics in Singapore. In 2009, the H1N1 pandemic allowed testing of this plan against another strain with different virulence.

During a pandemic of contagious disease, the potential challenge to the system managing the critically ill can largely be grouped into the following areas:

1. A larger than normal demand for ICU facilities, stressing the staffing level, resource level
2. Protection of staff and patients against the disease
3. Ethics vs practical operations in situations of demand exceeding resources
4. Managing the psycho-emotional issues of the staff

The response plan would need to cater to the following variations in the pandemic scenarios:

1. Tendency of disease to lead to critical illness and death
2. Community control measures and it's effectiveness
3. Predominant location of spread: hospital vs community

The following areas would need to be planned according variations in the cultural and operational norm of the local community:

1. The local government's overall pandemic management plan
2. Policy on division of patient type management for different hospitals – designated hospitals for pandemic patients vs each treats its own
3. Community's culture in open discussion on sensitive ethical issues

Ethical Decision Making In An Epidemic

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idemic raises a number of ethical issues. These include admission triage, the limits of professional duty and quarantine of healthcare workers.

In a situation where triage is necessary the ethical principle of justice takes precedence over beneficence. Methods of triage should be transparent and publicized but the use of triage systems based on fixed cut off points is not recommended as they do not take into account the great variability between healthcare systems, ICU bed availability, severity of the epidemic disease and number of patients with the epidemic disease. Epidemics also raise the question of whether certain groups of patients should receive higher priority for admission on the basis of their contribution to the stability of society or to the maintenance of a viable healthcare system. Furthermore it is important to take into account the needs of patients with other diseases.

When considering the limits of professional duty it should be understood that the risk to healthcare workers needs to be balanced against the benefit to patients and that there are limits to what healthcare workers should be expected to do. Furthermore the institutions and society also have a duty of care towards healthcare workers who should be provided with reasonable workplace protection, psychological support and insurance.

When considering quarantine of healthcare workers loss of liberty must be justifiable by a demonstrable need for restrictive measures to protect society and it is important to minimize the suffering resulting from quarantine.

Current Trends In ICU Sedation: Finding The Ideal SPICE In 2010

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There has been a plethora of research on ICU sedation over the last 10 years. While many critical care clinicians still observe the published sedation guidelines (2002), current evidence suggest that an appraisal of sedation practice is necessary.

Published sedation surveys in Europe and North America confirmed a significant change in practice compared to few years ago. Sedation scales and targeted light sedation are being more utilized. Additionally, short acting agents are used more in preference to traditional agents. Multiple agents are being used within the same episode of care.

Our ability to monitor the quality of sedation practice has been enhanced by the validation and adoption of sedation scales alongside delirium monitoring. While many sedation scales have been used in ICU, the Richmond Agitation Sedation Scale (RASS) is a perfect companion to the Confusion Assessment Method in Intensive Care (CAM-ICU) and are a recommended sister instruments for monitoring quality and content of consciousness.

Landmark studies published between 1998 and 2002 focusing on significant adverse outcomes associated with continuous and deep sedation (Kollef and Kress) has led to a gradual change in sedation practice with careful selection of sedation targets and sedation agents. This has been complemented with a randomized trial (Riker JAMA 2009) showing that reduction in delirium and ventilation time can be further achieved by careful selection of sedation agents. More recently, a small study showed benefits of no sedation albeit caveats need to be noticed.

While we are yet to test a process of sedation paradigm in large multicentre trials, there is strong evidence to adopt an integrated sedation strategy that focus on effective early analgesia, targeted light sedation unless clinically indicated and justified and cognitive management including monitoring, diagnosis and early management of cognitive dysfunction.

Mechanical Ventilation In A Patient With Bronchopleural Fistula

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The definition, causes, general management and outcome of patients with bronchopleural fistula will be covered as an introduction prior to discussion of the mechanical ventilation management during this presentation.

General medical management is a challenge as the patient is debilitated by the underlying medical condition. Initial assessment and a well planned overall management that is individualized and specific to the patient is important. General medical management will include antibiotic therapy, nutrition, chest tube and drainage system management.

Mechanical Ventilation of a patient with bronchopleural fistula is not curative but supportive in nature to stabilize the patient during conservative management or surgical procedure. The main aim is to prevent hypoxemia and ensure normocarbia, manage the airway leak and soiling plus to promote healing. Options to manage the leak include isolation of the affected bronchus with either a double lumen tube or a bronchial blocker. IPPV, HFOV and escalation to the use of ECMO for respiratory support in selected patients are an option. Weaning strategy will include individual re-assessment of patient after signs of improvement are clinically seen. Always consider to transfer the patient to a center that has more treatment options for the patient.

In conclusion, a well planned comprehensive and individualized mechanical ventilator management is as important as the general medical and surgical management of the bronchopleural fistula.

Does Non-Invasive Ventilation Improve Outcomes?

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Non-invasive ventilation (NIV) is defined as ventilatory support without an endotracheal airway. It can be delivered as positive pressure or as negative pressure ventilation (iron lung). The use of NIV in acute respiratory failure predates the invasive ventilation and has proven to be a valuable therapy. The understanding of physiologic rationale for NIV is important to assist the clinician to choose the appropriate patient that may benefit NIV without causing morbidity or mortality.

Most common modes used are continous positive airway pressure (CPAP), pressure support ventilation (PSV) and biphasic or bilevel positive airway pressure (BIPAP). CPAP augments cardiac output and oxygen delivery, improved functional residual capacity and respiratory mechanic, reduce work of breathing and reduce left ventricular after-load. PSV allows the patient to control inspiratory and expiratory times while providing a set pressure, together with the patient effort and their respiratory mechanics, these will determines the inspiratory flow and tidal volume. In BIPAP mode there are separate settings for inspiratory (IPAP) and expiratory (EPAP) airway pressure. It is conceptually similar but not identical to CPAP plus PSV and may reduce work of breathing and alleviate respiratory distress better. NIV may reverse many physiologic and mechanical derangements and may also stabilised chest wall in the presence of severe chest wall injury.

NIV in is a well evaluated intervention for exacerbations of chronic obstructive pulmonary disease (COPD). However, the use of NIV in more advanced stages of acute respiratory failure is more likely to fail and these patients need closer monitoring and intubation should not be delayed if indicated.

Recently, in 2005 the European Society of Cardiology recommend the use of non invasive intermittent positive pressure ventilation (NIPPV) for acute cardiogenic pulmonary edema (recommendation: class IIA, level of evidence: A). Although it decreases the need for intubation but it does not reduced mortality or improved long term function.

A retrospective study by Peter, et al looking at acute severe asthma patient in Australian ICU (1996-2003) found that the proportion of patients that need intubation is the same but the total number of proportion that need ICU admission is significantly reduced. While a retrospective study by Kimihiko et al in life-threatening asthmatic attack (1999-2003) showed the rate for intubation was significantly reduced without worsening the prognosis. In another retrospective study by Fernandez et al reported no differences in the median length of ICU or stay and mortality. In a prospective study on NIV in status asthmaticus by Meduri et al showed that NIV with low inspiratory pressure is effective in correcting gas exchange abnormalities. Only 2 out of 17 patients studied need intubation with no complications. A recent randomised control trial by Soroksky et al, NIV does improved lung function and reduced the incidence of hospital admission in status asthmaticus.

The benefit of NIV in Acute Lung Injury (ALI) is still unclear. A retrospective analysis by Yuko Y, et al reviewed ALI patients who had received NIV over 7 years period (2002-2006) in intensive care unit found that APACHE II score of more than 17 and a respiratory rate of 25 breaths/min after 1 hour of NIV as a factor predicting the need of intubation. The authors suggested that NIV should not be the routine first line treatment for ALI and careful selection of suitable patient is very important. However, there are many studies reporting failure of NIV in ALI and community acquired pneumonia without COPD.

Most studies excluded patients with do not intubate (DNI) order, few retrospective studies that had included DNI patients reported similar rate of non survival about 65-70%. These include cancer patients, severe COPD and immune-suppressed patients.

Anaesthesia, surgery and post-operative pain lead to respiratory modification which may cause respiratory failure (RF). NIV is proven to improve respiratory mechanics, augment alveolar ventilation and recruitment and reduce left ventricular afterload. Both CPAP and BIPAP had shown to be beneficial in post operative NIV. Recently, NIV has been proposed as both prophylactic measures to prevent respiratory failure in high risk patients (elderly, obese, COPD, heart disease) and as treatment modality for respiratory failure post-operatively.

A few studies had used NIV as a short period of ventilation post cardiac surgery, reported improvement in atelectasis with radiology evidences. A few observational and a randomised control trial post thoracic surgery showed used of NIV post-operatively reduced rate of re-intubation. A few studies showed that NIV has improved oxygenation and respiratory mechanics post cholecystectomy by laparotomy, bariatric surgery and thoraco-abdominal surgery for aneurysm of the thoraco-abdominal aorta. A case-control study in patients with acute respiratory failure post oesophagectomy by Michelet et al showed NIV was associated with lower intubation rate (24% vs 64%,$p<0.008$) shorter length of ICU stay and less anastomotic leak. The total inspiratory pressure should not exceed 25cm H_2O.

Does Non-Invasive Ventilation Improve Outcomes?

Despite all these findings, the successful of NIV intervention always depends on appropriate patient selection. The patient has to be cooperative and able to protect their airway. Copious secretions, repeated vomiting, haemoptysis, haemetamesis, acute myocardial infarct, cardiac arrest, upper airway obstruction, facial trauma and haemodynamic instability are few absolute contraindications.

Since last 15 years, NIV has become one of the major therapies for acute respiratory failure. There are still a few important unanswered questions such as, when, for whom and does it improves outcome at all time. Most of the studies done with NIV are observational, survey and retrospective reviews. Indications for NIV are still increasing. More prospective randomised study should be designed to look into these new indications.

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Spontaneous Breathing In Mechanical Ventilation Is Always Better

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Mechanical ventilation have been associated with a number of serious side effects and risks and can influence the clinical outcome of patients, which increases the length of stay as well increases treatment costs. The various modes of mechanical ventilation have, over the past ten years, been the subject of a wide variety of scientific studies. Many newer developments of these modalities are designed for partial ventilator support which allows and encourages spontaneous breathing while mechanically ventilated. Spontaneous breathing modes during mechanical ventilation may integrate intrinsic feedback mechanisms that should help prevent ventilator- induced lung injury and improve synchrony between the ventilator and the patient's demand. The improvements in pulmonary gas exchange, systemic blood flow, and oxygen supply to the tissue that have been observed when spontaneous breathing has been maintained during mechanical ventilation. Such improvements are reflected in the clinical improvement in the patient's condition. In keeping with evidence based medicine, standard practice in mechanical ventilation should be to maintain spontaneous breathing from the very beginning of ventilatory support and not only during the weaning phase and to continuously adapt the ventilatory support to the patient's individual needs.

Persistent Fever In The Critically Ill Patient

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Fever is defined as core body temperature of > 38.3° C or 101° F and acts as an adaptive response in defending against infection and other bodily insult. It occurs commonly in ICU patients and if persistent for more than 48 hours often triggers orders for many tests that are time-consuming, costly and disruptive. The aetiology of persistent fever in the critically ill patients is diverse involving both infectious and non infectious cause. Common infectious causes include pneumonia, urinary tract, catheter related infection and intraabdominal sepsis. Non infectious causes include venous thromboembolism, acalculous cholecystitis, pharmaceutical agents and iatrogenic causes. The inappropriate use of antibiotics will result in selection of resistant bacterial strain but delay in treating infection could increase mortality. Fever acts as an important host defence mechanism and usually treated in critically ill patients with antipyretics without any good data to support such practice. A structural approach is needed to correctly manage this common problem.

Magnesium Therapy In The Critically Ill Patients

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Magnesium is the fifth most common cation in the body and is essential for life. It is involved in over 300 enzymatic reactions, has important endocrine functions and is required for protein synthesis. It has been estimated that 65% of the critically ill patients develop hypomagnesaemia during the course of their ICU stays. Chernow and colleagues found that hypomagnesaemia was associated with higher mortality rates in critically ill patients. There are several common clinical conditions that can be associated with magnesium depletion, this include chronic alcoholic ingestion, intake of non-potassium-sparing diuretics, diabetic patients in ketoacidosis, patients receiving aminoglycoside antibiotics and stress from critical illness, surgery or trauma.

In critically ill patient with asthma, the role of magnesium therapy remains controversial. Several studies have shown that magnesium sulphate produces an increase in peak expiratory flow rate and forced expiratory volume at 1 second (FEV1) that last up to 30 minutes. Other studies have shown no beneficial effect. Gustavo and colleagues (2000) performed a meta-analysis of randomized trials to look at the efficacy of magnesium sulphate in acute adult asthma and they found that the administration of magnesium sulphate to patients with moderate-severe asthmatic exacerbations does not alter treatment outcomes. However, they suggested that further definitive controlled studies with bigger sample size are needed to clarify efficacy in certain subsets of patients for whom magnesium therapy could be beneficial.

In the treatment of preeclampsia and eclampsia, the American College of Obstetricians and Gynecologists gave strong recommendation for its use. Several studies showed that magnesium sulphate in comparison with diazepam appears to be more effective, reduced risk of further fit and is also shown to be associated with a reduced maternal mortality rate.

Intravenous magnesium therapy is indicated in the treatment of cardiac dysrhythmias. In experimental studies, magnesium seems to preserve electrical stability and function of myocardial cells and tissue. Magnesium is the treatment of choice for torsade de pointes, digitalis-induced ventricular arrhythmias and ventricular arrhythmias occurring in the presence of heart failure or during the perioperative state, in which the antiarrhythmic benefit of magnesium has been established. The ACLS guidelines recommend magnesium for torsades de pointes, and conversion has been reported with both repeated 2 gm boluses and with infusions of 50 mg/min. Research also showed that patients with atrial fibrillation who were given magnesium in addition to digoxin were more likely to have conversion to sinus rhythm, with conversion achieved more rapidly than patients who were not given magnesium.

Studies involving the use of magnesium in the treatment of myocardial infarction present conflicting results. Initially, magnesium therapy looked promising with one study involving 3900 patients showed statistically significant decreases in mortality, heart failure, and dysrhythmias when patients with myocardial infarctions were given intravenous magnesium. However, the Fourth International Study of Infarct Survival (ISIS-4) evaluated more than 58,000 patients found no statistically significant change in survival rates between patients given magnesium and those not given magnesium. In fact, ISIS-4 showed increases in heart failure and cardiogenic shock in magnesium-treated patients.

Hypomagnesaemia is a risk to head injuries, and this has been associated with poor neurological outcome and increased mortality. Restoring the levels of magnesium may reduce oedema, improve neurological and cognitive outcomes, and help with problems associated with ischaemia. However, in a review article by Arango and collegues (2008) whereby they quantify the effect of magnesium administration on mortality and morbidity in patients with acute traumatic brain injury, they conclude that there is no evidence to support the use of magnesium therapy in critically ill patients with acute traumatic brain injury.

SUMMARY

Magnesium is an important ion and there are many critically ill patients that may be at risk of hypomagnesaemia. Intravenous magnesium sulfate has been proven to be effective in the treatment of some critical condition which include certain cardiac dysrhythmias. There is adequate evident to support its use in critically ill patient with certain life threatening condition. Magnesium therapy can be given safely with simple monitoring and it would be interesting to evaluate the results of its therapy when given in cases in which its use is controversial.

Beta-Blockade In Intensive Care Patients

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Beta blockers have long been used for a variety of conditions such as coronary artery disease, hypertension and congestive heart failure. Recent data suggest that beta-blocker effects on metabolism, glucose homeostasis, cytokine expression and myocardial function may be beneficial in the setting of sepsis. Although treating a potentially hypotensive condition appears counterintuitive, the metabolic and immunomodulatory effects of beta-blockers may have some potential benefit in sepsis.

Perioperative risk reduction with beta-blockade use has remained a controversial issue despite large number of trials. There appears to be some benefit in the noncardiac elective surgery. However to be beneficial, the doses of beta blockers need to be titrated to achieve a heart rate of between 60 beats/min and 70 beats/min, implying that they may need to be started as early as 7 to 30 days prior to surgery.

Another area where beta blockers are used is in post burns patients. The hypermetabolic response in burns is mediated by an increase production of catecholamines and induces a catabolic state that can last a year after injury. Beta-blockade exerts anticatabolic effects and attenuates this hypermetabolic response.

It is presently no entirely clear when and in whom to use beta-blockade, to use selective or non selective and at what dose.

Role Of Statins In Critically Ill Patients

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It is well known that by lowering serum lipid levels, statins reduce the risk of myocardial infarction, stroke and death from cardiovascular events in patients with established vascular disease and in those with risk factors, such as diabetes or hyperlipidaemia. Statins also have diverse immunomodulatory and anti inflammatory properties, independent of their lipid- lowering ability. There are abundant in vitro, cellular and human data regarding these pleotropic effects of statins, which have led to many studies looking into possible protective mechanisms in severe sepsis and septic shock. Statin therapy also has the potential to reduce inflammatory response after cardiopulmonary bypass, in the early phase post-cardiopulmonary resuscitation and have been recommended as primary prevention against cardiovascular events in patients who are non hyperlipidaemic but have an elevated level of high-sensitivity C-reactive protein. Previous observations also indicate that statins may also directly affect the infectivity and proliferation of some microorganisms.

The whole conundrum of sepsis syndrome reflects the delicate balance between the extensive triggering of defence mechanism by the body and both the direct and indirect effects of the invading microorganism and their products. In this complex proinflammatory and inflammatory sequence of events , merely blocking a single component maybe insufficient to arrest the inflammatory process. By virtue of its diverse anti inflammatory properties, statins are able to modify several arms of the inflammatory cascade. In one of the many studies, Almog and colleagues reported a prospective observational cohort investigating rates of severe sepsis and ICU admission in 361 patients. Prior statin treatment (n=82) was shown to significantly reduce the incidence of severe sepsis (2.4% vs. 9%; RR 0.07, 95% CI 0.01- 0.5) and need for ICU admission (3.1% vs. 12.2%, $p < 0.25$). Mortality rates were significantly higher in patients who developed severe sepsis ($p < 0.01$) but no statistically significant difference was seen between the stain- treated and non-treated groups.

A variety of other observational studies in human have examine the role of statin in prevention of sepsis, most shows clinical benefit for statins, yet others show no benefit, and one shows possible harm. Several randomized trials of statins in infection are underway or recently completed. However , these studies are underpowered to address mortality or other clinically menaningful endpoints, with their primary endpoints focusing on inflammatory cytokines and markers of endothelial function. In addition to their potential before or during severe infection, one study highlights the role of statins after infection.

Positive, convincing results from well designed trials would support a widely available, inexpensive treatment option in sepsis. They would also discourage discontinuation of statins on hospitalization and possibly support planned administration of statins during periods of highest risk of infection.

Management Of Organophosphorus Poisoning

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Organophosphate poisoning (OP) accounts for a large proportion of patients admitted to intensive care units (ICU) in the developing world. Management of the organophosphate poisoned patient in the ICU consists of specific targeted therapy along with general supportive care.

Skin and gut decontamination is undertaken with the objective of reducing toxin load by reducing absorption. Skin decontamination can be done with soap and water or cholinesterase sponges, ut no human evidence exists to support it. Gastric lavage should be performed only in those presenting within 1 hour of ingestion. A recent RCT has found that activated charcoal confers no benefit in insecticide poisoning.

Oximes have been classically described as the antidote to organophosphate poisoning. However a number RCTs and systematic reviews and meta-analysis have demonstrated no benefit with oximes. The one RCT which showed a benefit used very high doses initiated very early in patients with moderately severe poisoning.The other approach to neutralize the circulating toxin is the use of bioscavengers such as purified butrylcholinesterase, fresh frozen plasma and albumin. However, a recent RCT has shown no benefit with fresh frozen plasma and albumin.

Atropine is commonly used to mediate the cholinergic effects of OP poisoning. Traditionally used atropinization regimens have been shown to take too long for full atropinization and an accelerated regimen is suggested. Atropinization is titrated to achieve heart rate targets, normotension and a clear chest. Glycopyrrolate has no advantage over atropine except in the event of atropine psychosis at therapeutic doses. Other therapies such as magnesium, clonidine, diazepam, adenosine recptor agonists and n-acetyl cysteine are not backed by sufficient human data.

In addition good supportive care in a critical care unit has been shown to reduce mortality. Attention must be paid to prevent deep venous thrombosis, exposure keratitis and nosocomial infections, particularly in those with intermediate syndrome and delayed OP encephalopathy.

The big picture must also be kept in mind, remembering that public health measures such as banning Class 1 OP compounds, and dispensing dilute solutions can help in reducing the mortality from OP poisoning.

PLENARY 4

Trial Derived Evidence Becoming Sustainable Bedside Reality – Our Experience

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An important milestone in the Healthcare community over the past few decades was the global acceptance of "Evidence Based Medicine (EBM)". At the concept level, practitioners of EBM would only agree to adopt principles of patient care that are backed by valid trial derived evidence.

The second important milestone was the movement that is commonly described by the terms "Healthcare Improvement" and "Quality Assurance". This movement aims at helping healthcare delivery units translate evidence based management principles into practical and sustainable realities for every appropriate patient.

We share our experience in our attempt to translate trial derived evidence into sustainable bedside reality in our ICU.

This began with the interpretation of available literature based evidence, and its relevance to the practical needs in our local context and patient population. For practical areas where the published evidence did not address, decisions based on rational analysis of theoretical principles must be made. Adoption of the various described methods of "Healthcare Improvement" to develop new processes in these evidence based management were helpful, however, modifications to suit local situations were always needed. Periodic evaluation of compliance and the performance of the unit over a sustained period of time were important in the continued improvement and fine-tuning of the new process. New evidence that were reported for the same subject must be considered and changes made where necessary. The method of delivery and practice of the new process must be made simple and accessible for the staff, and this includes the use of technology.

PLENARY 5

It's Not The Bells And Whistles That Matter

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Intensive care involves considerable technology and new technologies are constantly being introduced. Furthermore new strategies for supportive management are frequently suggested. It is common for these technologies and strategies to be adopted before they have been properly evaluated. While advancement of medical practice is important, early adoption of new technology and strategies may distract from good basic medical practice that should underlie intensive care.

SYMPOSIUM 13

Tight Glycaemic Control: How Sweet It Is

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Hyperglycemia is frequently seen in intensive care patients, including those with no prior history of diabetes mellitus. Elevated glucose levels in hospitalized patients are associated with poor short and long term outcomes in stroke, burns, cardiothoracic surgery, traumatic brain injury and myocardial infarction. However, it had been unclear, whether the elevated blood glucose levels were just markers of serious illness or if regulation of elevated blood sugars would improve outcomes in the critically ill. Van Den Berghe's 2001 study in cardiothoracic surgical patients was the first to imply that hyperglycemia was indeed causative of the higher mortality and morbidity, as intensive control of blood glucose to levels between 80 and 110 mg/dl resulted in clinical benefits including improved survival.

Our belief in the benefits of glycaemic control was reinforced by the existence of a strong dose-response relationship between the reduction in mortality and morbidity and the aggressiveness of glucose control in this initial study, and 'tight' glycaemic control became the catchword of intensivists earlier in the decade. However, as concerns emerged about the extrapolatability of data from a single study, subsequent investigations were done in heterogeneous groups of critically ill patients and similar benefits could not be demonstrated with 'tight' control in other large randomized, controlled studies. In fact, the most recent of these studies, the NICE-SUAGR trial, suggested a threshold for glucose control at 150 mg/dl, as tighter control increased mortality. Taken together, these trials, while supportive of the need for glycaemic control, are unable to defend a strategy of maintaining glucose levels in the euglycaemic range.

The divergence of these results has been attributed to the negation of the benefits of 'tight' control by high rates of hypoglycemia in the later studies, especially when low targets are set for glycaemic control. Intra-individual variability of glucose levels is also suspected to be causal. At present, our targets for glycaemic control remain in flux as we attempt to minimize these technical problems and to achieve a more nuanced understanding of the issue.

SYMPOSIUM 13

Improving Quality Of Nutrition In The Critically Ill Patient

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Commonly in ICU, nutrition is seen as a supportive therapy that should be the focus of dietitians and nursing staff, whilst the intensivist gives prominence to resuscitation and other organ failure support. The rationale for nutrition has been based on the incidence of and the problems associated with malnutrition in the ICU.

The more modern rationale, which is based on a growing number of research studies, is that nutrition should be considered a therapy rather than support, and that the choice of method of delivery, timing and nutrient content are crucial to delivering our patients the best outcomes. Several sets of evidence-based guidelines suggest that ICU patients should have enteral nutrition commenced early, and that there should be a low threshold for the use of promotility drugs, post-pyloric tubes and supplemental parenteral nutrition. Nutrients such as omega-3 fatty acids, glutamine and antioxidants may also be beneficial in some specific subgroups of patients.

Despite this, several large and well-conducted surveys of clinical practice internationally have demonstrated that ICU patients do not receive adequate amounts of nutrition overall, partly due to delays in commencement, frequent interruptions, and low utilization of promotility drugs and postpyloric tubes.

Improving the quality of nutrition is complex but requires the presence and knowledge of evidence-based guidelines and improved dissemination and education about them. Ongoing international surveys with timely and well-packaged feedback to individual ICUs can also be an extremely useful method to improve performance on key performance indicators of high quality nutritional care.

It would seem vital that ICU clinicians work in a multi-disciplinary fashion to emphasise the importance of nutrition as a therapy in their ICUs, to provide daily checklists to facilitate nutrition as a discussion item, and to embrace the use of evidence-based guidelines to optimise the benefits and minimise the risks of nutrition therapy, thereby leading to optimal patient outcomes.

SYMPOSIUM 13

Choosing And Dosing Antibiotics In The Critically Ill

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Although the antibiotic sensitivity pattern of pathogens is a vital part of antibiotic selection it is far from the only consideration. Other important factors include adverse drug effects, tissue penetration, pharmacokinetic-pharmacodynamic relationships, the ability to achieve pharmacokinetic targets in the relevant tissue and induction of resistance.

The importance of tissue penetration is illustrated by the improved outcome of patients with methicillin resistant *Staphylococcus* aureus pneumonia treated with linezolid, the lack of efficacy of daptomycin for this condition and the efficacy of tigacycline in animal models of *Pseudomonas* aeruginosa pneumonia despite *in vitro* resistance.

The relationship between pharmacokinetic end-points and pharmacodynamics varies for different classes of antibiotics. For beta lactams killing is most closely related to the time that the blood drug concentration exceeds the minimum inhibitory concentration (MIC). For fluoroquinolones the relationship is less clear but it appears to be related to either the maximum concentration:MIC ratio or the ratio of the area under the time-concentration curve to the MIC. The optimal AUC:MIC ratio for *Streptococcus pneumoniae* is 33.7. However even at MICs at which the organism would be considered "sensitive" the optimal AUC:MIC ratio may not be achieved.

Choice of antibiotics may also impact resistance to other agents. For example the increasing incidence of extended spectrum beta lactamase producing organisms seems to be due, in part, to the use of third generation cephalosporins.

SYMPOSIUM 14

Preventing Contrast Medium Induced Nephropathy

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DEFINITION

The most commonly used definition in clinical trials is a rise in serum creatinine of 0.5 mg/dl (44µmol/L) or a 25% increase from the baseline value, assessed at 48 hours after injection of contrast media.

PATHOPHYSIOLOGY

In the setting of preexisting renal impairment, contrast media leads to a release of renal vasoconstrictors (endothelin, vasopresin, adenosine) leading to a reduction in renal blood flow causing renal medullary hypoxia and ischaemic injury.

INCIDENCE

Depends on the definition used, previously around 15%, currently incidence down to 7% of patients receiving iodinated contrast.

RISK FACTORS

Preexisting renal impairment, nephrotoxic drugs, volume depletion, diabetes mellitus, haemodynamic instability, choice and volume of contrast used, site of injection –arteries>vein, old age, hypertension

PREVENTION

Witholding nephrotoxic drugs, volume expansion, periprocedural (pre and post) continuous veno-venous haemofiltration. Pharmacological strategies-(fenoldopam, N-acetylcysteineand ascorbic acid)-current literature does not support use. Theophylline-200mg infusion half hour before contrast, one recent randomised trial showed benefit.

FUTURE STRATEGIES

Large planned studies of new antioxidants, intrarenal infusions of renal vasodilators using flow directed catheters, forced hydration with marked elevations of urine output to reduce the transit time of iodinated contrast in the renal tubules and new less toxic, forms of radio-opaque contrast agents.

SYMPOSIUM 14

The Use Of Diuretics In The Critically Ill Patient

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Diuretics represent one of the most commonly used agents in the intensive care unit and fluid balance occupies a significant amount of attention by the intensivist and the anaesthetist. The use of diuretics in the acute care setting is an area of significant clinical and laboratory research. The presentation will review the risks and benefits of diuretics in three different groups of patients. These included subjects with acute renal failure, congestive heart failure and traumatic brain injury.

Several clinical studies have examined the use of loop diuretics in patients with Acute Renal Failure (ARF). Two major studies suggested that the use of diuretics was harmful to patients.[1, 2] There is no evidence to suggest that the use of loop diuretics reduces mortality, reduces length of ITU/hospital stay, or increases the recovery of renal function.[2] But yet due to the limitations of these studies, we are still waiting to have data from a good powerful clinical trial which can answer whether loop diuretics harm critically ill patients with ARF. Till than the practice of routine administration of these agents should be discouraged and we should think twice before prescribing loop diuretics in the ICU patients with ARF.

Diuretics have become the 'standard of care' for patients with congestive heart failure. Despite widespread clinical acceptance of the use of diuretics, there is uncertainty of the precise therapeutic efficacy because there are no large scale trials on their effects on disease progression and survival. At this point, the overall evidence for a mortality benefit is scarce. Data from ADHERE Registry suggest to minimize exposure to high doses of diuretics in patients with decompensated heart failure to reduce mortality and morbidity.[3]

Mannitol has been widely used in the control of raised intracranial pressure (ICP) following brain injury. However, there is considerable clinical uncertainty not only over the optimal treatment regimen but also over the effectiveness of mannitol as compared to other ICP lowering agents and over the usefulness of mannitol given at different stages following head injury. Mannitol may have detrimental effect on mortality when compared with hypertonic saline.[4] There is also insufficient reliable evidence to make recommendations on the use of Mannitol in the management of patients with traumatic brain injury.[4]

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SYMPOSIUM 14

Renal Protection In The Critically Ill: Are We Wasting Our Time?

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Acute kidney injury (AKI) and the development of acute renal failure (ARF) in critically ill patients is associated with a substantial increase in mortality, ICU complications, Lengthy ICU and hospital stay. Therefore, it is imperative to reduce its occurrence in the ICU.

In contrast to chronic kidney disease, the pathophysiology of AKI and ARF in the critically ill is complex and heterogeneous with no single pathway to explain it. This has made research on pharmacological interventions to prevent or mitigate the development of AKI/ARF complex and difficult o interpret. The so called "low dose dopamine" which was very popular in the early 1990s has shown no benefits in a randomized trial. Similarly other studies investigating N-Acetylcystiene, fenoldopam, Atrial Naturetic peptide and other agents failed to produce any positive results.

One of the significant problems facing ICU clinicians is the absence of accurate real time bedside biomarkers that can predict patients at risk but also detect AKI early and allow for corrective measures to be taken. Some promising biomarkers are emerging. Cystatine C is a good marker for disease severity while Neutrophil Geltinase Associated Lipocalin-2 (NGAL) is a good early predictor of AKI . Similarly, Gamm-GT and IL-8 are also early markers of AKI. It is therefore plausible that more than one marker is needed to assess the impact of any intervention on AKI. The use of the traditional creatinine and GFR is simply imperfect.

While the search is on for the magic bullet to prevent the development of AKI in ICU patients, clinicians should first recognize patients at risk, instigate treatment options that include treating any associated etiology such as sepsis or toxic load, ensure adequate hydration, optimize hemodynamic profile and reduce nephrotoxic exposure including drugs and contrast agents. Some other options for specific causes of AKI can also be utilized.

SYMPOSIUM 14

Continuous Versus Intermittent Renal Replacement Therapy In The ICU Patient

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Renal replacement therapies (RRT) in their various modalities are complex treatment processes that can help to control the blood content of patients. For critically ill patients, especially those in severe renal impairment, derangements in blood content can lead to death rapidly, and RRT can sometimes be life saving, or at least death delaying, thus buying time for the patho-physiological processes to resolve.

The technology of RRTs, whether the continuous or intermittent modalities, have seen significant improvements over the past few decades, leading to improved functionality in blood content control and enhanced safety to patients. It is important to understand the comparative features, ie. capability vs potential complications, of the various modalities of RRT, in order to make a rational choice.

In the practical clinical environment of the ICU, the choice of an appropriate mode of RRT for the patient, whether continuous or intermittent, will require considerations to match 3 groups of factors: (1) the specific needs of the patient based on the overall patho-physiological process, (2) the RRT modality's capability vs potential complications, and (3) resource availability vs demand of the ICU.

We will take a practical and patient-focused approach in examining the available evidence on the comparison of continuous vs intermittent RRT for ICU patients.

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ORAL PRESENTATION 1

Adopting The Protocol Of Early Broad Spectrum Antibiotic Administration For Severe Sepsis/Septic Shock In The Emergency Department, Universiti Kebangsaan Malaysia Medical Centre (ED UKMMC)

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BACKGROUND

Administration of broad-spectrum antibiotic therapy within 1 hour of diagnosis of septic shock and/or severe sepsis is part of the resuscitation bundle of the Surviving Sepsis Campaign. Little is known of compliance to the protocol in Malaysian Emergency Departments.

OBJECTIVE

The purpose of this study was to determine the compliance of broad spectrum antibiotics administration within the recommended 1 hour period of the diagnosis of severe sepsis/septic shock in ED UKMMC before and after the introduction resuscitation bundle protocol.

METHOD

A resuscitation bundle protocol in ED UKMMC was commenced on 1st March 2009. A prospective cohort study for three months was conducted from 1st March 2009 to 31st May 2009. A historical retrospective cohort review of the medical records from 1st December 2008 to 28th February 2009 was also conducted for comparison.

RESULTS

A total of 14 patients were enrolled into post- implementation group and 17 patients were eligible in historical pre-implementation group. There were significant differences between the pre-implementation vs. post-implementation) in the mean time of antibiotics administration from the time of diagnosis of severe sepsis/septic shock (3.9 ± 1.8 hours vs. 1.2 ± 0.7 hours, $p < 0.001$) and compliance of antibiotic administration within 1 hour of the diagnosis of severe sepsis/septic shock (nil vs. 42.9%, $p = 0.003$).

CONCLUSIONS

Compliance of early broad spectrum antibiotics administration in the ED can be achieved through the introduction of a resuscitation bundle in ED protocol.

ORAL PRESENTATION 2

A 2-Year Retrospective Study Of Infantile Bilateral Striatal Necrosis In Sabah

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INTRODUCTION

Infantile bilateral striatal necrosis is a rare neurological disease characterized by degeneration of the caudate nucleus, putamen, globus pallidus and thalamus. It presents with encephalopathy, mimicking meningitis and encephalitis. Pathophysiology of basal ganglia damage is unclear and treatment modalities unknown.

OBJECTIVES

1. To determine demographic data, clinical findings and possible aetiology of patients with striatal necrosis.
2. To compare different treatments used against ICU outcome.
3. To evaluate utilisation of cranial ultrasound in diagnosing striatal necrosis in unstable infants nursed in the ICU.

METHODS

We retrospectively reviewed the case notes of all patients admitted to our hospital with this disorder in 2008 and 2009. Inclusion criteria were (1) previously well infants who presented with encephalopathy or central nervous system symptomatology and (2) striatal necrosis demonstrated on either CT or MRI scans.

RESULTS

A total of 15 patients had striatal necrosis. The age of the patients ranged from 2 to 15 months. Common symptoms included a preceeding febrile illness (93%), lethargy (80%), drowsiness (80%). 3 patients died while13 required mechanical ventilation. No aetiology was found.

9 patients received methylprednisolone for treatment while 5 patients received immunoglobulins. Mortality was 50% in the non methylprednisolone group compared to 0% in the methylprednisolone group ($p = 0.04$). Shorter ventilator days and length of hospital stay in the methylprednisolone group was not significant. In 9 out of 15 patients, we achieved the diagnosis of striatal necrosis by cranial ultrasound prior to confirmation by CT.

CONCLUSION

1. The aetiology of infantile striatal necrosis is unknown.
2. IV Methylprednisolone appears to confer a mortality benefit without reducing ventilator days and length of stay.
3. Cranial Ultrasound shows promise in diagnosing this condition in unstable ventilated patients in the ICU.

Does H1N1 Infection Increase Mortality Compared To Other Influenza Like Illness (ILI) In Critically Ill Patients? – Comparison During A H1N1 Outbreak

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OBJECTIVE
To determine if there is any difference in mortality between critically ill patients with ILI who were H1N1 positive (+ve) and H1N1 negative (-ve) during H1N1 pandemic 2009

METHODS
All consecutive patients with ILI admitted to the Intensive Care Unit (ICU) during the H1N1 pandemic 2009 were studied. The study period is defined as the time the first patient in ICU found to be +ve till one week after the last patient found to be +ve. The following data were collected retrospectively: demographic data, co-morbid diseases, severity of illness, treatment, length of stay (LOS) and outcome. Data was analysed with SPSS 12.0

RESULTS
Out of the 79 patients with ILI admitted to ICU during the study period, only 60 patient records were available: 28 +ve and 32 -ve. Female made up 60% of both groups. The mean age was 40 ± 13.2 years in +ve and 46.1 ± 17.6 years in -ve patients. Sixteen (57.1 %) of +ve and 19 (59.4 %) of-ve patients had co-morbidities. Median P/F (PaO_2/FiO_2) ratio was 160±89 vs 179±101, median time taken to start antiviral and antibiotics 6.33 ± 4 days vs 4.83 ± 4 days and median LOS ICU 5.5 ± 6.7 days vs 2.9 ± 5.2 days, all differences were not significant. The crude in hospital mortality was 21.4% (+ve) vs 40.6% (-ve). The Standardised Mortality Ratio (SMR) ICU was 0.42 vs 0.78 while SMR hospital was the same at 0.84 for both groups.

CONCLUSIONS
The crude in hospital mortality and SMR ICU were lower in H1N1+ve patients. However, there is no difference in the hospital SMR between the two groups. There were more female patients in both groups compared to the normal admission ratio of 60 males: 40 females and this need to be studied further. H1N1 infection did not result in a higher risk of death.

Incidence And Outcome Of Central Venous Catheter Infections In Neonatal Intensive Care Unit (NICU) In Sabah

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OBJECTIVES
To determine the incidence and outcome of central venous catheter (CVC) inserted in the Neonatal Intensive Care Unit (NICU) of Sabah Women and Children Hospital (SWACH).

METHODS
Prospective cohort study conducted in SWACH. All babies admitted to the NICU from January 2009 to April 2010 with CVC insertion were enrolled into the study. These babies were monitored for the development of nosocomial infections from the day of CVC insertion until the removal of the catheter.

RESULTS
A total of 575 babies were enrolled and 685 CVC catheters (UVC: 78.8%, PICC: 18.7%, non-tunneled CVC: 1.8%, tunneled CVC: 0.7%) were inserted in this study. There were 61 episodes of bacteraemia and the rate of nosocomial blood stream (BSI) infection was 10%. The incidence of CVC related BSI infection was 10.8 per 1000 catheter days. (UVC: 9.7 per 1000 catheter days, PICC: 11.6 per 1000 catheter days, non-tunneled CVC: 23.8 per 1000 catheter days, tunneled CVC: 5.6 per 1000 catheter days). The 3 most common organisms isolated were Coagulase Negative Staphyloccoccus (47.5%), Klebsiella sp. (18%) and Staphylococcus aureus (8.2%).

CONCLUSION
The risk of CVC infection varies with the type of CVC used which was highest with non tunneled CVC and lowest in tunneled CVC. The commonest organism isolated in CVC related BSI was Coagulase Negative Staphyloccoccus.

ORAL PRESENTATION 5

Doctors' Perspectives Regarding End Of Life Decisions In A Tertiary Hospital In Malaysia

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OBJECTIVE
To study the opinions and feelings of doctors working in a tertiary hospital regarding end of life decisions

METHODS
A questionnaire on 2 aspects of end of life decisions ie "do-not-resuscitate" (DNR) and "withholding and withdrawal of medical treatment and life support systems" (WH & WD) was personally given to all doctors working in Hospital Sultanah Aminah in August 2009. The doctors were asked to answer on the spot and the questionnaire dropped into a box to maintain anonymity. House officers were excluded.

RESULTS
A total of 363 doctors were eligible for survey. However only 182 (50.1%) doctors could be visited to answer the questionnaire. Regarding DNR, 89% of respondents practiced DNR because they felt that resuscitation would be futile (85.7%) and DNR could ease patient's suffering (51.1%). Seventy-five percent responded that consent was mandatory and 78.5% said DNR order should be documented. Eighty-three percent felt that patient and family should be involved in decision making. Majority of doctors (97.3%) understood DNR as not performing cardiopulmonary resuscitation (CPR). With regards to WH & WD, 70.9% responded that they practiced it. Reasons given were continuation of treatment would be futile (80.7%), ease patient's suffering (53.3%) and create bed for another patient (15.9%). Seventy-six percent thought consent was mandatory and 79.7% would document it. Seventy-eight percent opined that the decision should be a joint decision between patient, family and doctor. The opinion on what to include in withdrawal were as follows: No CPR (92.3% respondents), Stop inotropes (64%), Stop ventilation (57.1%), Stop all drugs (36.8%), Stop dialysis (33.5%), Stop total parenteral nutrition (24.2%) and Stop feeding (10.4%).

CONCLUSION
More doctors practiced DNR (89%) compared to WH & WD (70.9%). Not to perform CPR were acceptable to most doctors. Few doctors would stop feeding at end of life.

ORAL PRESENTATION 6

Echocardiography In Patient Management In ICU

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INTRODUCTION
Echocardiography (ECHO) is a powerful noninvasive imaging modality for the assessment of critically ill patients. This technique provides unparalleled morphological and hemodynamic information that leads to frequent therapeutic changes in the acute management of patients hospitalized in the intensive care unit(ICU). Objective The present study is aimed at determining the usefulness of ECHO in assessing morphological and hemodynamic instability in ICU in the local hospital setting.

METHODOLOGY
A retrospective study was conducted on all ECHO examinations performed in medical ICU patients between January 1 and June 30, 2010. Diagnosis, indication, acoustic window, position and value were recorded. Significant pathology, contractility,preload, filling pressures, dimensions as well as systolic and diastolic functions were assessed. Any change in management that occurred as a result of the study was noted. In addition,bedside ECHO was performed in the following patients: i)Septic shock where ECHO was used to guide fluid therapy ii)Sepsis induced myocardial dysfunction which was diagnosed on ECHO and therapy was guided iii)Persistent shock which was evaluated for right heart failure,dynamic left ventricular obstruction and cardiac tamponade if they did not respond to fluids and ionotropes.

RESULTS
A total of 167 patients were analysed. 60% were males and 40% were females. Of this, half were mechanically ventilated and the rest were on BIPAP, trachy mask, oxygen mask or breathing room air. Management was changed directly as a result of information provided in 25% of these patients. Changes included fluid administration, ionotropes, drug therapy and treatment limitation.

CONCLUSION
ECHO has been shown to positively impact on the management of the critically ill patient. Appropriate training and utilization of this technology will essentially help better manage patients in the ICU setting.

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Transport Of Critically Ill Children In Sabah

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OBJECTIVE
Previous studies have shown that transfer of critically ill children by untrained or inexperienced transport team are associated with high incidence of adverse events. This audit is designed to study such events in Sabah.

METHOD
A prospective audit was conducted over a period of 6 months, from February to July 2009. All patients transferred in from district hospital to the PICU and NICU Level 3 of Sabah Women and Children's Hospital (SWACH) were included. Data were collected using a standardized data collection sheet, capturing patient demographics, referring hospital, diagnosis, and technical, clinical, and critical adverse events during transport.

RESULT
A total of 33 patients were transferred to our intensive care units during the study period, out of which 27 (85%) were transported by district medical officers. The remaining 5(15%) patients were retrieved by SWACH's paediatric retrieval team. 70% or 23 out of these 33 patients had at least 1 adverse event, including 2 retrieved patients. Technical adverse events occurred in 27% of patients, the most common mishap being dislodged ETT. At least 1 clinical adverse event occurred in 27% of patients, with hypothermia identified as the main culprit. 27% of patients had a critical adverse event, of which urgent reintubation during transport was the main contributing factor. Of the retrieved patients, 1 patient had a dislodged ETT and another needed urgent intubation due to impending collapse.

CONCLUSION
A high number of avoidable adverse events occurred in patients transported from district hospitals to tertiary healthcare center in Sabah. This partly reflects on the lack of experience in medical officers managing transport of ill patients from districts, confounded by the unavailability of proper monitoring equipments.

The Use Of IV Fluconazole In Non-Neutroprnic ICU Patients

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INTRODUCTION
Delayed antifungal initiation is associated with worse outcomes and increased risk of mortality.

OBJECTIVES
To observe the use of IV fluconazole in non- neutropaenic patients in intensive care unit (ICU) of Sungai Buloh Hospital (HSB), to evaluate the relationship between the risk factors and the occurrence of fungal infection and to observe the impact of empirical and definitive therapy of IV fluconazole towards mortality risk.

METHODOLOGY
This is a retrospective study to observe the use of IV fluconazole prescribed for patients admitted to the ICU of HSB. 80 non- neutropenic adult patients in ICU whose been prescribed with IV fluconazole were identified for inclusion.14 patients were excluded due to the inability retrieve culture result. Duration of this study was from January until December 2009.

RESULT
In our study, a total of 66 patients received IV fluconazole, 10 patients were initiated IV fluconazole after positive culture obtained. This group had mortality of 70%. 56 patients received IV fluconazole on an empiric basis. Out of the 56 patients, 8 continued to receive treatment based on positive cultures with risk of mortality 50%. In 40 patients, treatments were continued on empirical basis and the risk of mortality is 40%. 8 patients stopped their treatments because of negative culture. Mean duration of ICU stay at the time initiate IV fluconazole is 20. Out of 40 patients that continue treatment as empirical therapy, 25 of it (62.5%) had candida score > 2.5 with risk of mortality 44%.

CONCLUSION
Mortality is higher in patients who received IV fluconazole after positive culture attained (definitive). Thus empiric therapy showed a trend towards reduction in mortality but statistically not significant as number of cases were small. Patients with mean length of ICU stay of 20 days and candida score > 2.5 also had high risk of mortality.

An Incidental Finding Of Congenital Tracheal Stenosis In Pediatric ICU

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Congenital tracheal stenosis (CTS) is a rare condition, which can present as asymptomatic normal infants to life threatening airway obstruction. We report a case of an ex-preme (33 wk) baby boy with left upper eyelid capillary haemangioma, planned for elective MRI to exclude eyeball and intra cranial involvement and was incidentally diagnosed with CTS.

He had history of nasal CPAP requirement after birth but was never intubated and ventilated. There was no episode of stridor or respiratory distress. The corrected age was 47wk and weighted 4.2 kg on the day of MRI. For Endotracheal intubation, laryngoscopy was done with size 1 straight-blade. No apparent airway edema noted and vocal cords were visualized as C&L Grade II. However, it was difficult to pass size 3.0 uncuffed ETT tube on first attempt and was changed immediately with size 2.5 tube that passed without resistance with a minimum leak.

While the anaesthesia team was about to leave the MRI room, ETT was accidentally dislodged due to tripping of extension tubing. Patient was ventilated immediately with the bag-valve-mask while preparing for re-intubation. Patient was successfully re-intubated with size 2.5 after 3rd attempt. No stridor was heard and oxygen saturation was maintained between 96 to 99% throughout the procedure. MRI was carried out uneventfully and there was no orbital or intra cranial invasion.

The baby was transferred to Pediatric ICU for ventilation and weaning. He was successfully extubated 2 days later and tolerated head box and nasal cannula oxygen subsequently. Bronchoscopy was later performed by nenatologist under local anesthetic and mild sedation. Tracheal stenosis in tracheal ring 3 and 4 level with complete tracheal ring formation was noted. CT neck and thorax done 2 wk later under sedation revealed short segment, mid-tracheal stenosis at C5-6 level with inner diameter < 3 mm (Fig). No other tracheal malformations or fistula formation noted. He was diagnosed as Hoffer Class I short segment CTS and was planned for conservative management by pediatric team.

(CPAP = continuous positive airway pressure, C & L = Cormack & Lehane, ETT= endo tracheal tube, ICU = Intensive care unit, C = cervical vertebra)

POSTER PRESENTATION 4

Neural Trigger Ventilation (NAVA) In Children: Case Reports

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INTRODUCTION

Mechanical ventilation has improved tremendously since the polio epidemics in the 20th century but still has its own problems like patient-ventilator asynchrony and ventilator induced lung injury. Hence, there is a need for a more "physiological" mode of mechanical ventilation.

CASE PRESENTATION

We present two cases where we used neurally adjusted ventilatory assist (NAVA) mode of mechanical ventilation (Maquet Servo-i® software). The first case was MS, a 2 months old Malay boy, who had complex cyanotic congenital heart disease and underwent surgical intervention. Post-operatively, there was difficulty in weaning down the ventilator settings (on synchronized intermittent mandatory ventilation – SIMV). We used NAVA with settings of NAVA level: 2.0, PEEP: 6, FiO2: 0.4. Prior to NAVA, his respiratory rate was 65 - 75 breaths/minute with subcostal recession and there was patient-ventilator asynchrony. Within 10 minutes of starting NAVA, his respiratory rate reduced to 45-55 breaths/minute, subcostal recession became minimal and ventilator synchrony improved. The second case was RO, a 4 months old Orang Asli girl, who was ventilated for severe bronchopneumonia. There was ventilator asynchrony and difficulty in weaning the ventilation. Her respiratory rate was 60-75 breaths/minute on SIMV which subsequently reduced to 30-45 breaths/minute when on NAVA (NAVA level: 0.8, PEEP: 5, FiO2: 0.5) with improved ventilator synchrony. In both these cases, NAVA improved patient-ventilator synchrony and facilitated ventilator weaning.

CONCLUSION

NAVA is a promising "physiological" mode of mechanical ventilation in children. Further research is needed to evaluate the role of NAVA in different clinical situations encountered in the paediatric intensive care settings.

POSTER PRESENTATION 5

Patient Characteristics And Mortality Risk Scores At The Paediatric Intensive Care Unit, Sabah Women And Children's Hospital

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INTRODUCTION

This study reports the patient characteristics of a tertiary paediatric intensive care unit in Malaysian Borneo, and compare risk predictors of mortality. The Paediatric Index of Mortality 2 (PIM2) is an established risk predictor of mortality in the PICU, using clinical parameters.

METHOD

All ventilated patients admitted to the PICU at Sabah Women & Children's Hospital, Kota Kinabalu, Malaysia, from October 2009 to March 2010 (6 months), were included. Data on demographics, clinical features, diagnosis were recorded, and PIM2 risk scores calculated.

RESULTS / CONCLUSION

Seventy-two patients were included. Mean age at admission was 3 years ± 6months old and 27 (38%) were girls. Twenty-six (36%) were non-Malaysian. Bacterial septicaemia (30%) and pneumonia (24%) were the commonest admission diagnosis amongst Malaysians and Sepsis (56%) amongst non-Malaysians. Average length of stay was 5 ± 3 days. Twenty-eight (39%) children died (12, 43% non-Malaysian). Commonest cause of death was pneumonia amongst Malaysians and Sepsis amongst non-Malaysians. PIM2 risk prediction showed excellent discrimination and correlation with mortality amongst our patients.

A Microbial Surveillance On Mechanical Ventilator Reusable Circuits

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Currently, both reusable and disposable mechanical ventilator circuits are used in our Intensive Care Unit. The duration of usage, frequency of changing the circuits and the presence of condensates are factors associated with the incidence of ventilator associated pneumonia. The reusable circuits are easily wet with patient's respiratory condensates. Up to date, there is no study looking at microbial existence in the circuits. This study was to detect microbial existence in the mechanical ventilator reusable circuits at 24, 72, 120 and 168 hours. One hundred reusable mechanical ventilator circuits were studied from November 2009 to April 2010. Samples of condensate from the circuits were collected and the quality recorded as clean or dirty. The condensates were cultured using Mac Conkey and blood agar and reported as positive or negative and no organism identification done. There were significant differences between the mean of positive culture of the 24 hours to the 72, 120 and 168 hours circuits ($p<0.05$). However, there were no significant differences in the positive culture report between the 72, 120 and 168 hours circuits. The dirty condensate in the 72 and 120 hours circuits, have the sensitivity of 80%, 66.6% and specificity 98.9%, 98.4% to be positive culture. Positive Predictive Value was 80% for 72 hours and 66.6% for 120 hours. Negative Predictive Value was 98.9% and 98.4% for 72 and 120 hours. There was no significant association between the duration of the circuit usage and the presence of microbial in the circuits after 24 hours duration but dirty condensate was significant for positives microbial culture.

Case Report – Hepatic Disease And Pregnancy

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An isolated liver disease rarely occurs during pregnancy. It is estimated that it complicates up to 3% of all pregnancies and the spectrum of diseases ranges from mild to severe which could be detrimental to both mother and fetus.

We report a case of a 19 year old primigravida who presented at 37 weeks of pregnancy with lethargy, myalgia, sore throat, fever, headache, nausea, vomiting and diarrhoea. Her symptoms worsened, with associated dysphagia, loss of appetite, pruritus and yellowish discolouration of the eyes. Her antenatal period was uneventful except for history of having HINI vaccination 2 days prior to her symptoms. On examination, she was jaundice and in early labour. Her blood pressure was normal. Cardiatocograph however showed non-assuring type II deceleration which subsequently progressed to fetal bradycardia within an hour. She underwent emergency caesarean section with general anaesthesia which was complicated with postpartum haemorrhage secondary to uterine atony, coagulopathy and thrombocytopaenia. She underwent 2 relaparotomies, B-Lynch ligation and subsequently bilateral internal artery ligation with blood/blood products cover. A dose of Novo 7 was also given.

Her initial stay in intensive care was complicated with acute renal failure and recurrent episodes of hypoglycaemia. Her renal function improved after 2 days of renal replacement therapy. Liver transaminases normalized after 5 days except persistent hyperbilirubinaemia and slight coagulopathy. She was extubated well on day 7 and discharged to ward 3 days later. All the infective, connective tissue and metabolic screenings were negative. Ultrasound abdomen was also normal. She was discharged home after 2 weeks stay in the ward.

Provisional diagnosis was acute fatty liver of pregnancy. However, differential diagnosis of the HINI vaccination complication could be considered.

POSTER PRESENTATION 8

Complicated Dissecting Aortic Aneurysm In A Young Mother

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Aortic dissection, also called dissecting aneurysm is relatively uncommon. Anyone can develop the condition but it most frequently occurs in man between 6- and 70 years of age. Approximately 50% of the dissections seen in woman under 40 years of age occur during pregnancy. We present a case report of Madam LSC who unfortunately died due to complication of these fatal disease. LSC, 29 YEAR OLD , PARA 1 D2 post-SVD referred to vascular team for management of acute limb ischaemia. With otherwise normal antenatal history she developed Pregnancy Induce Hypertension and treated with T Nifedipine. She was referred to surgical team for upper GIT bleed and Ischaemic right lower limbs. She was then transferred to Hospital Serdang for embolectomy which had to be postponed in view of DIVC, acute kidney injury and severe metabolic acidosis. She was electively intubated, started on CVVHD. Embolectomy was later cancelled since there is slight improvement in skin colour and because the poor risk benefit. TOE examination showed dissecting aneurysm from root of aorta to decending aorta, however there is no clot in left atrium. CTA thorax and abdomen confirmed that there is multiple segmental dissection of the aorta extending from the region of the arch into left common carotid, descending thoracic aorta, abdominal aorta until the bifurcation. Dissection also noted in right external iliac artery extending from its origin until the origin of the right femoral artery. After reviewing the diagnosis, prognosis, outcome and the high risk surgery by all team including intensivist, vascular and cardiothoracic surgeon and O & G team, she was not offered surgical intervention and was then treated conservatively.. Unfortunately patient continues to deteriorate. She subsequently developed bowel ischemia by evidence of fecal material from abdominal tapping. Since surgery is not possible, discussion with family member regarding medical futility was made. From here the management was change to comfort care, and patient succumbed to her illness after 12 days in ICU.

POSTER PRESENTATION 9

A Review Of Traumatic Brain Injury Admitted To Intensive Care Unit (ICU) Hospital Sungai Buloh

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BACKGROUND
Traumatic brain injury (TBI) is amongst the leading cause of death in Malaysia.

Objectives

Aim of this retrospective study was to look at the outcome of patients with TBI following admission into a closed ICU (in collaboration with neurosurgical) in relation to the pre intubation GCS, the rate of ventriculitis, the length of ICU stay and the GCS outcome following our institute protocolized intervention..

METHODOLOGY
104 patients with TBI were recruited, between January to December 2009. Relevant demographic data, injuries sustained, non surgical and surgical intervention carried out during ICU stay, Glasgow Coma scale (GCS) scoring for pre and post ICU and hospital discharge were reviewed. We classified the GCS scoring as Severe TBI, GCS 3-8; Moderate TBI, GCS 9-12; Mild TBI, GCS 13-15.

RESULTS
The highest ethnic group was predominantly Malay with 58%; gender Male 87.5%. Highest injuries sustained was extradural haemorrhage 24%, subdural haemorrhage 19.2% and intracranial bleed 19.2%. Highest mean group of hospital stay was the moderate GCS group (12.46, SD 8.2) due to ventriculitis. The outcome of patients post non and surgical interventions carried out in ICU showed that the severe GCS group had improved by 61% and the moderate GCS group improved by 25%. The mild GCS group showed an increment of 86% post ICU discharge. Nevertheless no improvement was seen in those with barbiturate coma and a total of 22 patients had died.

CONCLUSION
Our data concluded that patients who had intervention done showed improvement from their initial GCS at ICU admission prior to hospital discharge.

Enteral Versus Parenteral Glutamine Supplementation In Outcome Of Critically Ill Patients In Intensive Care Unit (ICU): A Pilot Study

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Critically ill patients experienced a broad spectrum of cellular disturbances, namely hyperinflammation, cellular immune dysfunction and mitochondrial dysfunction. It was believed that feeding regimen may modulate these processes and improve the outcome of ICU patients. Although various regimens were practised, the data on safety was scarce. This pilot study was designed to compare the outcome of ICU patients in Hospital Melaka administered with enteral versus parenteral glutamine supplementation.

METHOD

In a prospective randomized controlled trial, a total of 33 patients were recruited over the period of three months (March - May). They were assigned to either an enteral glutamine group (n = 15) or a parenteral glutamine group (n = 18). The enteral group received oral glutamine of 30g/day while the parenteral group received intravenous glutamine of 10g/day. Both groups received the treatment for five days. Concurrent enteral feeding was instituted in all the studied patients on day 2 of ICU admission. They were then followed up for specific outcome parameters.

RESULTS

Glutamine was well-tolerated without any significant adverse effects noted in all of our patients. There were no significant differences found in both groups, in terms of demography, mean length of ICU stay (enteral vs parenteral 12.3 vs 8.6 days, p = 0.177), mean duration of mechanical ventilation (10.9 vs 8.2 days, p = 0.358), mean length of hospital stay (19.0 vs 17.6 days, p = 0.529) and ICU mortality (18.8 vs 11.1%, p = 0.853).

CONCLUSIONS

Enteral glutamine is comparable to parenteral glutamine in the patients outcome parameters like mean length of ICU stay, mean duration of mechanical ventilation, mean length of hospital stay and ICU mortality. As our current trial is mainly limited by its small sample size, further studies with larger sample size are warranted to validate further the findings noted in this study as well as to study the various aspects of glutamine supplementation such as pharmacoeconomics and effects on nosocomial infections.