



Annual Scientific Meeting 2008

Neuroanaesthesia Society of Great Britain and Ireland



Abstracts
Thursday 8 May
Friday 9 May

Abstracts – Thursday 8 May

8.30 -12.30 **Update Session**

Head injury transfer - West Midlands Style

Chair: Dr Nigel Huggins

The Immediate Assessment of Head Injuries

Dr. Peter Oakley

Consultant in Neuroanaesthesia

North Staffordshire Royal Infirmary

Stoke on Trent

For patients with life-threatening intracranial haematomas, initial management at the closest hospital and stabilisation before transfer must be judged against direct transport to a more distant Neurosurgical centre. The proportion of good outcomes following acute extradural haematoma has remained unchanged for 30 years. Current arrangements do not allow transferred patients to have their haematomas evacuated within 4 hours. Immediate assessment and airway intervention by experts at the scene has been recommended by the recent NCEPOD report and is supported by evidence from European practice.

Immediate assessment prior to emergency airway control in an unconscious, severely head-injured patient is a key skill. Not only must the airway be assessed, but sufficient information about the circulatory status and the conscious level must be obtained in a rapid primary survey to inform the clinician of the drug doses required to secure the airway. The conscious level should be assessed using a verbal stimulus, followed by a painful stimulus if not responding to voice. It should be reported using GCS or the Swedish Reaction Scale. Prompt exclusion of hypoglycaemia is of critical importance.

Head injuries cannot be assessed in isolation. Other injuries may be of higher priority and may influence the risk of secondary brain injury. Immediate plain chest and pelvic films and a FAST ultrasound scan help to identify major trunk injuries prior to reaching the CT scanner. Ultrasound may also be used to indicate the likelihood of raised intracranial pressure, using the optic nerve sheath diameter.

References:

1. Leach P, *et al.* Transfer times for patients with extradural and subdural haematomas to neurosurgery in Greater Manchester. *British Journal of Neurosurgery* 2007; 21:11-15
2. Timmermann A, *et al.* Paramedic versus emergency physician emergency medical service: role of the anaesthesiologist and the European versus the Anglo-American concept. *Current Opinion in Anesthesiology* 2008;21;222-227
3. Trauma: who cares? The National Confidential Enquiry into Patient Outcome and Death, November 2007 ([www. www.ncepod.org.uk](http://www.ncepod.org.uk))
4. Triage, assessment, investigation and early management of head injury in infants, children and adults. National Institute for Health and Clinical Excellence, updated September 2007 (www.nice.org.uk/guidance)
5. Moppett IK. Traumatic brain injury: assessment, resuscitation and early management. *British Journal of Anaesthesia* 2007;99:18-31
6. Kimberly HH, *et al.* Correlation of optic nerve sheath diameter with direct measurement of intracranial pressure. *Academic Emergency Medicine* 2008;15:201-204

When to Refer to a Neurosurgical Unit

Mr. Ronan Dardis FRCSI (Neuro Surg)

Consultant Neurosurgeon

University Hospital Coventry and Warwickshire

Only a minority of head injured patients need assessment or treatment at a neurosurgical unit. The proportion transferred to such units varies by region and even within a region.

The recent guidelines on the early management of patients with a head injury will be reviewed. In particular, the indications for referral to a neurosurgical unit as suggested by the National Collaborating Centre for Acute Care, (commissioned by the National Institute for Clinical Excellence), the Royal Colleges of Surgeons, and the Scottish Intercollegiate Guidelines Network will be considered. Commentary from guidelines for the management of Severe Brain Injury (3rd edition 2007, Brain Trauma Foundation, AANS, CNS) will also be presented.

The concept of pre-emptive action will be re-iterated.

The local referral patterns within the Midlands region and the changes which have occurred over the last few years will be discussed with a view to closer integration between the local units.

The Evolving Head Injury – What Can Go Wrong

Mr. Jonathan Wasserberg BSc MB BChir(Cantab) FRCS (SN)

Consultant Neurosurgeon

University Hospital Birmingham NHS Trust

The failure so far to find an effective neuroprotective agent for traumatic brain injury (TBI) means that prevention of secondary brain insults remains essential for optimizing outcomes in TBI. Predicting which patients are at risk of deterioration is difficult. Successive guidelines have lowered the threshold for CT scanning, admission to hospital, discussion with a neurosurgeon and transfer to a neurosurgical unit. Recent studies have found that admission to a neurosurgical unit is associated with a reduced mortality rate and recommend admission of all severe head injuries to a specialist unit. Transfer to a specialist unit itself carries risk to the patient. Guidelines for transfer are not always achieved due to resource limitations and episodes of hypoxia and hypotension, seizures and other cause of brain hypoxia and subsequent swelling still arise during transfer. Knowledge of and adherence to current NICE and Society of Neuroanaesthesia guidelines is important but is not always achieved.

Up to 10% of comatose TBI patients are estimated to develop new lesions on a second CT scan and up to 50% of cerebral contusions have been found to enlarge on subsequent scans. Patients with mild and moderate head injury can also deteriorate. Ultra-early CT scans <1 hour after injury, thin extra or subdural haematomas and small cerebral contusions on an early scan may all develop new or enlarged lesions on later imaging and a high index of suspicion of delayed deterioration should be maintained for such patients. Consistent interpretation of the Glasgow Coma Scale (the three elements and not a summated score) is still the first line of defence in early detection of deterioration in the awake patient. Intracranial pressure monitoring is essential for the detection of rising pressure in the ventilated patient. The future for head injury is increased referral to specialist units of at risk cases with a continuing effort to maintain high standards of transfer and critical care with early intervention where deterioration is suspected.

References:

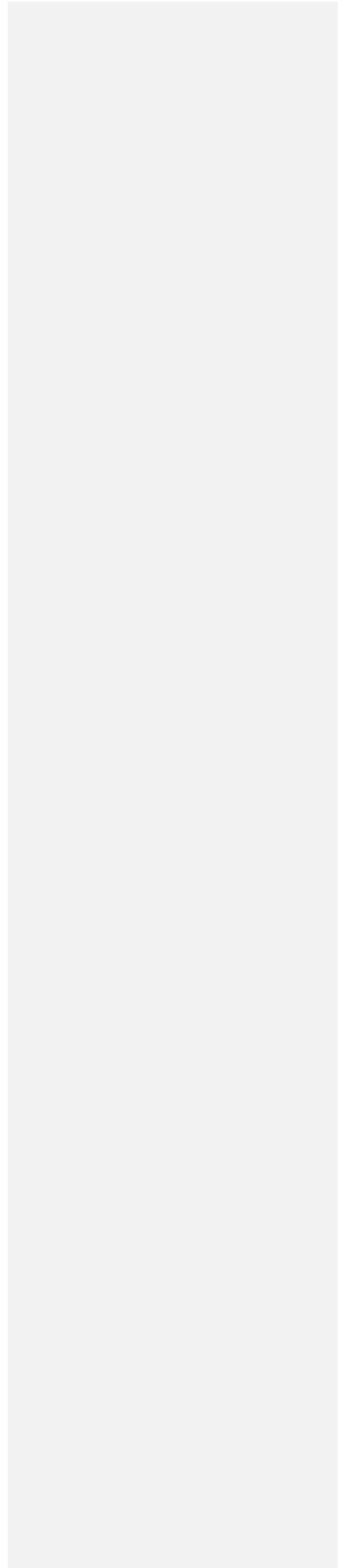
Wasserberg J. Treating Head Injuries. BMJ 2002 Aug 31;325(7362):454-5.

The Neuro-Critical Care of Head Injuries Including Transfer

Dr Michael Knowles MRCP FRCA

*Consultant in Anaesthesia and Critical Care
University Hospital Birmingham NHS Trust*

This talk will review the recent Association of Anaesthetists of Great Britain and Ireland's 'glossy' entitled 'Recommendations for the Safe Transfer of Patients with Brain Injury'. It will then focus on aspects of the intensive care management and, in particular, the approach taken at the Queen Elizabeth Neuroscience Centre in Birmingham.



NASGBI Scientific Meeting

13.30 –14.45 **Session 1**

Neuroanaesthesia – It Makes You Think

Chair: Dr. Mike Smith

Co-morbidity and Neuroanaesthesia

Dr R. John Elton FRCA

Consultant Neuro Anaesthetist

University Hospital UHCW NHS Trust Coventry

Preoperative evaluation of the neurosurgical patient enables the anaesthetist to assess the surgical pathology and its effects not only on the nervous system but also on other organ systems of the body. Although ageing is rarely a contraindication to surgery its associated co morbidities, especially involving the cardiovascular and respiratory systems, increase the potential for intraoperative and postoperative adverse events.

The current trend towards same day admission surgery has created the need for well organised and delivered preoperative assessment protocols that reliably prevent cancellation of operations and the ethically unsound practice of performing excessive and unnecessary investigations. It is a continuing challenge to the health care community.

The use of scoring systems to assess risk has been widely adopted in other surgical specialities and we will consider their applicability to neurosurgery. Neurosurgical operations are commonly decompressive procedures that need to be performed on patients as urgent or emergency operations and there may be limited time to optimise the patient in whom there are comorbid conditions.

Neurosurgical patients frequently display patterns of disease that can alert the anaesthetist to potential problems in both the intraoperative and post operative phases and some common examples will be considered, along with strategies for their management.

It is helpful to the anaesthetist to understand the pathology and radiology of the condition and the surgical approach to the problem. The importance of discussing the patient's status and degree of risk with the surgeon will be discussed.

Current and Future Challenges for the Neuroanaesthetist

Dr S. Jaya

*Consultant Anaesthesia and Intensive Care
University Hospital Coventry*

In today's age of internal markets, commissioning, business cases and private finance initiative, there is much resource wasted on unnecessary bureaucracy. This presents us with less finance to fund clinical care. Payment by results forces us to put elective surgery unduly often ahead of emergent and urgent cases. Bed closures and the 4 hour A&E target impacts on the availability of acute neurosurgical beds as patients with back pain flood our wards, blocking more urgent admissions as well as discharges from intensive care. Delays in imaging acquisition accentuate this further. Many of us training to be doctors did not expect to find ourselves in the position that we are in now. Amidst this chaos we are expected to provide first class care, train the doctors of the future and hit the targets required of us. Added to this is the 18 week wait and the inexorable march towards foundation status. All this whilst we still struggle to treat patients with intracranial haematomas within the "golden hour" – or should I say the bronze 4 hours!

Fortunately it is not all doom and gloom – doctors' jobs may be at a premium but whilst 70% of multiple trauma continues to fall at the feet of the weary neurosurgeon there still appears to be work aplenty for our specialty and the future looks bright. Improvements in coiling for aneurysms will keep us interested whilst neuronavigation techniques do the reverse – though helpful for more deep seated lesions. Monitoring tools are burgeoning although many remain mainly for research use. Imaging though has revolutionised diagnosis and treatment. Any reduction in surgical techniques has been overshadowed by our ability to treat inaccessible lesions by radio surgery. Improvements in techniques for surgical treatment of movement disorders have increased the need for novel anaesthetics including awake techniques – use of propofol and remifentanyl has helped in this area.

Despite the efforts of the DoH and the juggernaut of civil service bureaucracy, medical science survives and lives on although sadly, if recent reports are to be relied on, the throughput of research in the UK has declined in relative terms, and needs some resurrection.

Will the neuroanaesthetists of tomorrow have a certain future? – the answer depends on the legacy we leave them. Let us not fail in our endeavours.

Neuroanaesthesia – “My Practice” versus “Best Practice”

Dr Mike Nathanson

*Consultant Neuroanaesthesia
QMC, Nottingham*

One of the dilemmas facing anaesthetists in any of our areas of expertise is that there is so little outcome data to determine what should guide our practice. Whilst as clinicians we are trained in many techniques that may be used for different situations, determining which of these is 'best' is fraught with difficulty. We know the limitations, advantages, and pit-falls of these techniques. We know, from a physiological and pharmacological point-of-view, which should be best for any given situation. Yet how many papers exist which inform us that one particular technique is 'better' or 'best' in terms of real, useful, patient-centred outcome?

In neuroanaesthesia our knowledge, derived from research investigations, of the relevant physiology and pharmacology is superb. As individuals we can quote changes in autoregulation, cerebral vasodilatation, intracerebral pressure etc, and describe potential neuroprotection strategies from pharmacological agents to temperature control. We can opine that recovery is quicker after volatile anaesthesia than intravenous anaesthesia (or vice versa), but there is precious little outcome data. Even where good outcome-based studies have been performed they have often failed to answer the question - or have given an answer that was unexpected or unhelpful. Hence, determining 'best practice' is fraught with difficulty. Even if we try and examine our own practice there is little we can measure that will indicate if we are doing a good job.

This lecture will attempt to summarise those papers that truly do provide meaningful outcome data to guide neuroanaesthetists. It will also describe why, perhaps, we need to consider what is best for each of us – guiding 'my practice' rather than 'best practice' so that we can offer what in our own hands is the best anaesthetic for our own patients. "It may not be the best for you, but it works for me" is not a bad place to start from.

15.45 -17.00 **Session 2**
Dilemmas in Neurocritical Care
Chair: Dr. Mike Knowles

Fluid Use in Brain Injury

Dr Egidio J daSilva

*Consultant in Neuroanaesthesia and Critical Care
Royal Orthopaedic Hospital Birmingham*

The consequence of fluids given in brain injury depends partly on the quality of the brain at the distal end of the giving set, but more so on the quality of the brain at the proximal end of the same giving set.

The fluid choice in brain injury remains polemical. Use of the wrong fluid or incorrect use of a fluid can have severe consequences. It has been difficult to standardize protocols for resuscitation during brain trauma as there is accompaniment of other organs and systems affected by the trauma, which may be compromised by the type, duration and speed of fluid administration. This fact makes it obvious that there is no single answer for any single patient. Indeed, the type of fluids used may change during the course of a single patient's journey through resuscitation, intensive care and rehabilitation following head trauma.

Unfortunately, multi-centred collaborative research will need more time and money but in the interim we can only be guided by best practice, an accurate knowledge of fluid composition, newer available fluids, quality of fluids from individual manufacturers and current evidence. In the context of traumatic brain injury, the behaviour of cerebrovascular physiology and ensuing pathology needs to be well identified and characterised as part of the assessment and treatment. Newer methods of monitoring such as PET scanning¹ have proved useful but are in only limited use.

During persistent hypotension in a trauma patient with head injury, in whom other causes of hypotension have been excluded, a laparotomy is as important as a craniotomy².

Avoidance of hypotension, hypoxaemia and raised intracranial pressure are key aims whilst managing a head-injured patient. ICP monitoring is highly important in all patients with severe brain trauma.³

The lecture will focus on the numerous recent developments in fluid content and usage.

References:

1. Coles JP, Fryer TD, Smielewski P, et al. Incidence and Mechanisms of Cerebral Ischaemia in Early head injury. J Cerebral Blood Flow Metabolism 2003; 24:202-211
2. Wisner DH, Victor NS, Holcroft JW. Priorities in management of multiple trauma: intracranial vs intra-abdominal injury. J Trauma 1993; 35:271-8
3. Rosner M, Rosner S, Johnson A. Cerebral perfusion pressure: management protocol and clinical results. J Neurosurgery 1995; 83:949-62

Electrolytes in NCCU – Which Ones Cause Problems

Dr Tom Gallacher

Consultant Neuroanaesthesia and Critical Care

University Hospital Birmingham NHS Trust

Following neurological insults derangements in plasma sodium levels are common. These can be associated with, or as a result of, traumatic brain injury, subarachnoid haemorrhage, neurosurgery, infections and brain tumours.

Hypernatraemia normally occurs as a result of diabetes insipidus (DI) where there is a relative deficiency in anti-diuretic hormone (ADH) production by the posterior pituitary resulting in excessive free water loss in the urine.

Hyponatraemia can occur as a result of either the syndrome of inappropriate anti-diuretic hormone release (SIADH) or cerebral salt wasting (CSW). The latter two are almost indistinguishable clinically and biochemically using routine analyses. However, significant morbidity (in the form of permanent brain damage) and mortality from hyponatraemia occurs predominantly in pre-menopausal females with post-menopausal females and males seemingly protected. In the correction of symptomatic hyponatraemia the rate of correction of serum sodium is not associated with the development of brain damage but rather the absolute change in serum sodium in the first 48 hours.

A simple algorithm for the management of hyponatraemia in patients with neurological injury will be presented.

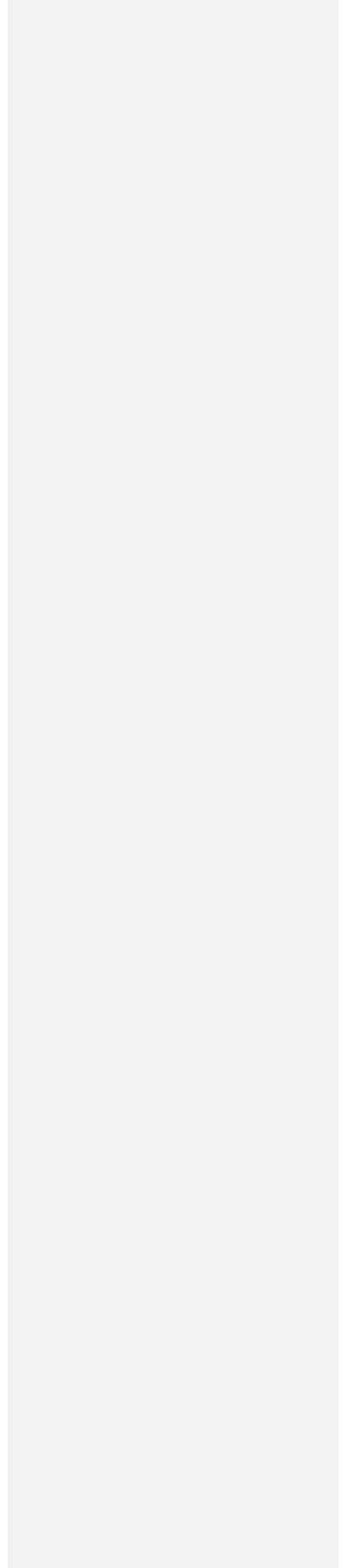
Tackling the difficult chest

Dr Tom Clutton-Brock

Senior Lecturer

University of Birmingham

Abstract not available at time of printing



Abstracts – Friday 9 May

09.15 -10.45 **Session 3**
Pain, Paediatrics and Protocols
Chair: Professor Peter Hutton

Electrickerly and Needlework in Chronic Pain

Dr Dalvina E Hanu-Cernat

Consultant Neuroanaesthesia and Pain Medicine
University Hospital Birmingham NHS Trust

In the last 50 years cutting edge research led to major improvements in healthcare. However, chronic pain remains a major health care and social problem. The prevalence of chronic pain varies between studies (17.1%–46.5%) but even allowing for the lowest estimate the problem is of epic proportions. In the UK the management of adolescent chronic pain costs the taxpayer £3.8 billion a year. Chronic pain is the leading cause for absenteeism from work creating a deficit of € 34 billion to the European economy.

These findings highlight the need for effective pain treatments that still elude us despite our better understanding of the complex nociceptive processes. The obstacles faced include the late development of Pain Medicine as an individual specialty, the difficulty in assessing and diagnosing pain, and the behavioural and structural changes that pain induces. Ample evidence attests to the reorganization of the brain in chronic pain, a process which could impact upon the outcome of procedural interventions.

The use of nerve blocks for isolating the pain source is still an issue of debate. Double blind placebo controlled studies are currently considered by some the only validated method. Long term reduction in nociceptive input can be obtained by radiofrequency denervation but more studies are needed. There is little or no laboratory evidence for the mechanisms of this intervention.

When remodelling of the central nervous system has occurred more advanced techniques are required. The gate theory of pain paved the way for spinal cord stimulation (SCS) which was introduced in 1967. This presentation will highlight the evidence that emerged over the next 40 years on the use of SCS. Other advanced neuromodulation and neurosurgical procedures will also be briefly discussed.

Paediatric Neuroanaesthesia Matters

Dr Carol Millar

Consultant Anaesthesia

Birmingham Children's Hospital

Introduction: Rocket science is an informal term describing an endeavour requiring great intelligence or technical ability. Quantum mechanics are laws relating to the behaviour of the very small, which are very different to those governing the very big. This typifies the difference between adults and children. Paediatric neuroanaesthesia is not rocket science; it requires an adjustment of thinking. There are four areas which are of special interest to those who deal with children.

When is a child not a child? Age is the discriminator used by the Health Service to determine who is a child. Physiology and psychology may be better determinants of when a child achieves adulthood.

Fluid management. Controversy exists over the correct fluids to use for children during acute hospitalisations. There has been a rise in morbidity and mortality from hyponatraemia in children receiving intravenous fluids. Recent guidelines from the NPSA and the APA are reviewed.

Sitting position and venous air embolism. Children form 20% of the population, yet suffer proportionately fewer neurosurgical conditions. Up to 70% of brain tumours in childhood are located in the posterior fossa necessitating the use of the sitting position. Haemodynamic instability during positioning is less common, but the incidence of venous air embolism is similar: (9% - 37%). Paradoxical air embolism is a potential problem.

Awareness during anaesthesia. This is a recognized phenomenon in children. The incidence is 0.8% to 1.2%. Assessment of awareness is problematic. The use of BIS or AEPs may be confounded by lack of data and changes in brain function due to maturation.

Conclusion. Paediatric neuroanaesthesia owes most of its routines, techniques and instrumentation to adult neurosurgical practice. Much can be translocated into the paediatric setting, but it requires a little fine tuning and attention to detail.

Neuroanaesthesia – Awake or Asleep?

Dr Mike Smith

Consultant Neuroanaesthesia

University Hospital Birmingham NHS Trust

It is a fascinating fact of neuroanaesthesia practice that almost all elective neurosurgical procedures can be, and therefore have been, carried out on awake and co-operative patients. This lecture will provide a brief overview of the diverse procedures that can be performed on the conscious patient, and will explore why this might be a desirable option and whether or not recent and future advances in medical and anaesthetic technology are likely to facilitate its use or, indeed make it less relevant.

There are substantial arguments both for and against awake neurosurgery, and although it's popularity has waxed and waned, with various advances in medical treatment, neurosurgical techniques and the introduction of new anaesthetic agents, its practice is often influenced more by cultural context and local historical precedence, than by logical reasoning.

Many different techniques have been described in order to allow major neurosurgery in the awake patient. However, the widely used term "awake" can be misleading, as there exists a spectrum of methods ranging from monitored local anaesthesia alone, to controlled conscious sedation, to awake-asleep-awake protocols, where the patient is only conscious for cortical mapping.

Awake neurosurgery is usually discussed in the context of "awake craniotomy" and while this is probably the most challenging scenario with respect to operating on the conscious patient, similar techniques and principles can be applied to other neurosurgical procedures. Our experience of "awake craniotomy" is fairly limited; however, we do have extensive experience of both awake and asleep techniques used in the siting of Deep Brain Stimulators (DBS). The main part of the lecture will focus on the anaesthetic requirements for DBS surgery, and will reflect on the evolution of our techniques in Birmingham, and the rationale for their use.

In all awake neurosurgery, it is of critical importance to maintain adequate patient comfort, analgesia, immobility and co-operation in what is likely to be a long procedure. This has to be achieved with the least possible compromise to important physiological factors, such as the regulation of PaCO₂, and the maintenance of optimal haemodynamic control.

There are currently many advantages to performing neurosurgery in the awake patient, however these have to be evaluated in the context of the specific surgical benefits envisaged against the limitations of the techniques available, especially with respect to individual patient factors.

The choice for the neuro-anaesthetist is actually therefore a complex and potentially difficult one, in which appropriate patient selection, accurate planning and detailed attention to each patient's surgery is vital.

11.30 -12.15 **Session 4**
Free Papers
Chair: Dr. EJ daSilva
Dr. Tom Gallacher

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12.15 -13.00 **Session 5**
Key Note Presentation
Chair: Dr. Nigel Huggins

Surgical Oncology – From Sleeper Awake to Molecular Neurosurgery

Professor Garth Cruickshank
University Hospital Birmingham NHS Trust

The surgery of intracranial tumours has a long history but a thin evidence basis. With the huge strides in our understanding of tumour biology, imaging and patient safety what is the role of aggressive cranial surgery? Where do new surgical techniques offer promise? What are the current and future requirements of surgeons and anaesthetists to deliver patients safely, and should we be working to new standards of outcome?

Maximising the cytoreductive effect of surgery using new technology has shown progressive benefits from adjuvant therapies, thus enabling patients with high grade glial tumours to expect a 15-20% chance of living four years. The introduction of Stereotactic Radiosurgery has reduced the need for high morbidity acoustic neuroma surgery. The use of awake craniotomy, image directed surgery, peroperative probes and intraoperative magnetic resonance imaging has augmented surgical possibilities, but created greater challenges to anaesthetists. Novel treatments to deliver biological agents such as stem cells, immunotoxins and viruses will require novel delivery mechanisms such as convection enhancement, nanospheres, and robotic microinjection. Such approaches border on molecular neurosurgery but their translational evolution will require close cooperation between neurosurgeon and anaesthetist.

14.00 -15.25 **Session 6**
The Frontline – What HM Forces Can Do
Chair: Lt Col James Ralph

The Spectrum of Military Neurosurgical Trauma

Major S E Harrisson RAMC

Research Associate

Academic Department of Military Surgery and Trauma

Royal Centre for Defence Medicine.

Introduction

Historically the majority of head injuries seen in military personnel are due to accidental injury, as is found in a similar civilian population.

During times of conflicts two other modes of injury are seen (blast and ballistic injury), which are only rarely experienced in civilian medical practice.

Initial management is provided consistent with clear Battlefield Advanced Trauma Life Support (BATLS) protocols before specific military surgical techniques are employed.

Blast injury

An explosion can cause injury through several different mechanisms.

The most common cause of blast injury is due to energised fragments, which are known as secondary blast injuries. The fragments can either be primary designed fragments or other pieces of debris that become energised in the explosion.

Explosions can also cause injury by the blast shock wave (primary blast injury), by the blast wind or other mechanisms such as burns or toxin effects. Little is known how primary blast injury affects neural tissue, though there is ongoing research in to this area.

Ballistic injury

Modern ballistic injuries are caused by bullets or rounds, that are themselves a type of secondary blast mechanism.

The degree of injury caused is dependent on the energy imparted and on to which tissues are involved. It is necessary to consider the trajectory of the round, which may have been altered by the tissues involved.

With ballistic neurotrauma the primary injury can often be fatal, but where there is going to be survival it is necessary to prevent secondary injury.

Injuries due to rounds or fragments can be prevented by enhanced protection, though development of protection must be carefully tempered against simply converting energy in to another medium that can cause other injury.

Recent operational data

Data on all major trauma cases in both Iraq and Afghanistan has been collected since 2003 by the Academic Department of Emergency Medicine at the Royal Centre for Defence Medicine. An overview of this data will be presented.

What We Can, Should and Have to Do

Surgeon Commander Adrian Mellor FRCA Royal Navy

Consultant Anaesthetist

MDHU(N)

The principles of care for wounded British servicemen on overseas operations are that, wherever practicable, care will be provided to the same standard as NHS. This means that guidance, such as that issued by NICE regarding head injury, provides a stimulus for forward provision of care with, for example, CT scanning being provided as early as possible in the evolution of a field hospital.

Battle casualties with isolated head injury have a poor outcome but are uncommon. US casualties during the invasion of Iraq had an intracranial injury rate of only 1.6% with an overall rate of injuries to the head of 3.9%¹. British casualties are rapidly repatriated by a highly skilled, specialist team after wounding (in practice from Afghanistan often little more than 24 hours) limiting what measures need to be carried out as an emergency in often sub-optimal conditions. This creates debate about the positioning of a neurosurgical team and what care needs to be provided.

A field hospital's primary role is to provide short term hospital care (including ICU) for British soldiers injured as a result of conflict. However the role of the hospital almost invariably expands as NATO doctrine dictates the treatment of all casualties with life or limb threatening injuries. This can put greater strain on resources in an area, such as Afghanistan, where there are few other intensive care beds and no other neurosurgical facilities. Assets (and especially ICU beds) must be managed to ensure that facilities are always available to support the military effort whilst providing emergency care to all comers. Patients with significant neurological injury have huge potential resource implications.

One further ethical debate is the long term care and rehabilitation of those with neurological injury. For British servicemen this will be in sophisticated well developed units in the UK. However, often such facilities are not available for local military or civilians. Furthermore the local culture may not be well adapted to caring for patients discharged with residual disability.

1. Zouris J, Walker G, Dye J, Galarneau M. Wounding Patterns for US Marines and Sailors during Operation Iraqi Freedom, Major Combat Phase. *Military Medicine* 171, 3:246 2006

The logistics of repatriation

Wing Commander Robin Berry

*Consultant in Anaesthetics and Intensive Care
MDHU Derriford, Plymouth*

Almost two decades of experience in the RAF and involvement in aeromedical retrievals and operational tours of duty in Oman, Iraq and Afghanistan fuelled my interest and expertise in transport of the critically ill and field intensive care.

This presentation will describe the composition of the RAF Critical Care Aeromedical Support Teams (CCAST), their training and equipment used. The logistics of repatriating servicemen with traumatic brain injury will be considered in the context of the current neurosurgical capability in the various theatres of operations. I will also discuss the field intensive care of traumatic brain injury and the problems associated with transporting such patients over long distances by air. The therapeutic options available to the transfer team and the timing of repatriation will be described. The military experiences will be compared and contrasted against the patterns of working in a busy NHS neurosurgical critical care unit.

Free Papers

Anaesthesia for Day Surgery Craniotomy

Dhuleep Wijayatilake¹, Venkat Raghavan², Raman Diddee³, Pirjo Manninen², M Bernstein⁴

¹Locum consultant in neuroanaesthesia, Queens Hospital, Essex, UK, ²Assistant Professor of neuroanaesthesia and ⁴Professor of neurosurgery, Toronto Western Hospital, Ontario, Canada, ³Specialist registrar in anaesthesia, Newcastle, UK.

Antihypertensive Policies Following Acute Intracerebral and Subarachnoid Haemorrhage in Neurocritical Care Units in the United Kingdom and Ireland

Amy C F Chan-Dominy, Jonas Nordmeyer, Michael J Shaw
Neurointensive Care Unit, St George's Hospital, London

An Audit of Imaging and Neck Management of Head Injured Patients at Their Base Hospital before Transfer to a Tertiary Neurosurgical ITU

Puxty A, Pow C

Department of Neuroanaesthesia, Southern General Hospital, Glasgow

Admission Blood Glucose is Associated with Poor Outcome Following Traumatic Brain Injury in Adults

Dr HCL Hann¹, Dr D Sperry² and Dr P Yeoman²

Specialist Registrar¹ and consultants², Department of Intensive Care, Queens Medical Centre, Nottingham

Predictive factors for Postoperative Hypertension in Craniotomies for Tumor

R Diddee¹, D S Wijayatilake², AJ Prabhu³

¹Locum Consultant, James Cook University Hospital, UK, ²Locum Consultant Queen's Hospital, Romford, Essex, UK, ³Consultant, Toronto Western Hospital, Canada

Is Treatment of Poor-Grade Aneurysmal Subarachnoid Haemorrhage Patients Justified?

Pickett GE¹, Laitt RD², Protheroe R³

Departments of ¹Neurosurgery, ²Neuroradiology, and ³Anaesthesia and Intensive Care, Salford Royal Hospital, Salford

Poster presentations

Neurosurgical Transfers into a Tertiary Neurosurgical Centre: Auditing the impact of “Recommendations for the Safe Transfer of Patients with Brain Injury¹”

Dean P¹ and Jones MJ²

¹*Specialist registrar in Anaesthesia and Intensive Care Medicine,*

²*Consultant Anaesthetist, Royal Preston Hospital, Lancashire Teaching Hospitals NHS Foundation Trust, Preston, PR2 9HT*

Audit of Temperature Control Management on United Kingdom Neurointensive Care Units

Justine K Elliott, Neil Burgess, Christopher Bruncker and Michael J Shaw

Neurointensive Care Unit, St. George’s Healthcare NHS Trust, London

Alcohol Licensing Legislation (2005): Does it impact on Neurosciences Intensive Care Unit admissions?

V Sharma, S Yarrow, H Madder

Nuffield Department of Anaesthesia, Oxford, UK.

Nerve blocks for burr hole surgery and removal of cranial access devices

TJ Morgan-Jones¹, SL Chavan¹, J Sturgess², EJ da Silva³,

¹*Special registrar in anaesthesia, Queen Elizabeth Hospital, Birmingham,* ²*Senior Clinical Fellow neurocritical care, Addenbrooke’s Hospital, Cambridge,* ³*Consultant Anaesthetist, Royal Orthopaedic Hospital, Birmingham*

Deep Vein Thrombosis Prophylaxis in Neurosurgical Patients: A National Survey of Practice

A Sherrington¹, A. Garner²

¹*Specialist Registrar and* ²*locum consultant, Department of Anaesthesia, St George’s Hospital, London.*

Case Report: Frontal Cerebral Abscesses in Identical Twins

Catherine Sinclair¹, Simon Clark², Elizabeth Wright³, Conor Mallucci⁴

¹ *Specialist Registrar in Anaesthesia, North West Deanery,* ² *Specialist Registrar Neurosurgery, The Walton Centre, Liverpool,* ³ *Consultant Neuroanaesthetist and* ⁴ *Consultant Neurosurgeon, The Walton Centre and Royal Liverpool Children's Hospital, Liverpool*

Case report: New Onset Drug Resistant Status Epilepticus (NODRSE)

A Nandakumar¹, J Andrzejowski², D Turnbull²

¹ *Senior clinical fellow and* ² *consultant in neuroanaesthesia, Royal Hallamshire Hospital, Sheffield Teaching Hospitals, Sheffield.*

Practice of Perioperative Thromboembolic Prophylaxis in Elective Intracranial Surgery: a Survey of Current Practice in the United Kingdom.

S Gudipati, M Varma

Department of Anaesthesia, Newcastle General Hospital

Guillain-Barré Syndrome and Myasthenia Gravis. Admissions and Management in Neurosurgical Intensive Care 2003-2006

Meikle A¹, Walker E¹, Cunningham V²

¹ *Specialist registrar and* ² *consultant anaesthetist, Institute of Neurological Sciences, Southern General Hospital, Glasgow, Scotland.*

Anaesthetic Complications in Children following MR Imaging as a Day Case, in a Regional Neuroscience Centre

¹V P Lam, ²B Minhoff, ³B Sutton

¹ *Medical student,* ² *Specialist registrar and* ³ *Consultant in anaesthesia, St George's Hospital, London*

Transfusion Triggers in Neurocritical Care (NCCU) Patients

Hari Krovvidi¹, Mike Knowles², Atanu Bhattacharjee³

¹Specialist registrar and ²Consultant Anaesthesia, ³Clinical Fellow in Critical Care,

Department of Anaesthesia and Critical Care, Queen Elizabeth Hospital, Birmingham

Survey of Transfer Training Amongst Anaesthetic Trainees in Leicester and Nottingham

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