included in those studies. The most common antibiotics used were cefazolin and ceftazidime. The rate of infection ranged from 0.5% to 3.1 % for meningitis as the most common infection. **Conclusions:** The need to use antibiotic(s) perioperatively is not clear in patients with pituitary lesions undergoing EETS. Randomized control trials are needed to evaluate the efficacy of prophylactic antibiotic use in patients with pituitary lesions undergoing EETS.

NEUROCRITICAL CARE

P.058

Introduction of continuous video EEG monitoring into two different NICU models by training neonatal nurses

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Background: Continuous video-EEG (cvEEG) monitoring is the standard of care for diagnosis and management of neonatal seizures. However, it is labour-intensive. We aimed to establish consistency in monitoring of newborns utilising NICU nurses. **Methods:** Neonatal nurses were trained to apply scalp electrodes, troubleshoot technical issues. Guidelines, checklists and visual training modules were developed. A central network system allowed remote access to the cvEEGs by the epileptologist for timely interpretation and feedback. We compared 100 infants with moderate to severe HIE before and after the training program. **Results:** 192 cvEEGs were performed. Of the 100 infants compared; time to initiate brain monitoring decreased by average of 31.5 hours, in electrographic seizure detection increased(20% compared to 34% a), seizure clinical misdiagnosis decreased (65% compared to 36%), and Anti-Seizure burden decreased. **Conclusions:** Training experienced NICU nurses to set-up, start and monitor cvEEG can decrease the time to initiate cvEEG which may lead to better seizure diagnosis and management.

P.059

A systematically conducted review of the Full Outline of UnResponsiveness (FOUR) score and its use in outcome prediction

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Background: Our goal was to perform a scoping systematic review of the literature on the application of the FOUR score within critically ill patients. **Methods:** 6 databases were searched. Two reviewers independently screened the results. Inclusion and exclusion criteria were applied to each article to obtain final articles for review. **Results:** The initial search yielded 1709 citations. Of those used, 49 were based on adult and 6 on pediatric populations. All but 8 retrospective adult studies were performed prospectively. Patient categories included traumatic brain injury, intraventricular hemorrhage, intracerebral hemorrhage, subarachnoid hemorrhage, ischemic

stroke, general/combined neurology and neurosurgery, post-cardiac arrest, medicine/general critical illness, and patients in the emergency department. A total of 9092 adult patients were studied. 14 studies demonstrated good inter-observer reliability of the FOUR score. 9 studies demonstrated prognostic value of the FOUR score in predicting mortality and functional outcomes. 31 studies demonstrated equivalency or superiority of the FOUR score compared to GCS in prediction of mortality and functional outcomes. Similar results were seen for the pediatric population. **Conclusions:** The FOUR score has been shown to be a useful outcome predictor in many patients with depressed level of consciousness. It displays good inter-rater reliability among physicians and nurses.

P.060

Utility analysis of continuous video EEG (cvEEG) monitoring during the treatment of hypoxic ischemic encephalopathy (HIE) in the NICU

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Background: Therapeutic hypothermia (TH) improves the outcome in HIE but cvEEG is vital to detect any seizures that occur. Unfortunately, the costs associated with cvEEG can make it impractical. We studied outcomes in TH with the objective of optimizing the length of cvEEG required. **Methods:** Term infants with HIE were treated with 72 h of TH followed by 6 h of rewarming. cvEEG reports were quantified (background, sharp transients, seizures) and compared with pre and post-cooling variables to determine whether risk stratification was possible. **Results:** 25/78 infants had seizures during the TH, however, most seizures occurred early, with 7 infants seizing prior to cooling and 15 having their first seizure within 24h. Only 3 infants had their first seizure between 24-48h and none were recorded after. Novel seizures after 24h were brief and did not require treatment. EEG variables such as frequent sharp transients and first seizures within 24h were correlated with MRI abnormalities. **Conclusions:** For the majority of infants undergoing TH, 24h of cvEEG may be sufficient with few infants requiring longer than 48h. A combination of clinical variables (abnormal neurological exam) and EEG traits (frequency of discharges, seizures) can help to decide on the likelihood of seizures and length of EEG recording needed.

P.061

Reliability of EEG reactivity in assessment of comatose patients under standardized protocol

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Background: Electroencephalography (EEG) is a routine clinical tool that is used to evaluate thalamocortical function in comatose patients. The presence or absence of reactivity in background EEG patterns to afferent stimuli is believed to be an important indicator of clinical outcome. At present, there are no guidelines or standardized testing protocols for the assessment of EEG reactivity in critically ill patients. Moreover, the inter-rater reliability of subjectively identifying

presence or absence of reactivity is known to be poor. **Methods:** Here we report the implementation of a clinical protocol formalizing the use of afferent stimuli – name-calling, clapping, nasal tickle, central painful stimuli and tracheal suction – administered during the routine EEG evaluation of behaviourally unresponsive patients in the critical care units at London Health Sciences Centre. EEGs were evaluated by qualified electroencephalographers. **Results:** This retrospective observational study of consecutive patients describes the inter-rater reliability of detecting presence or absence of EEG reactivity since implementation of the clinical protocol. Moreover it evaluates the relationship between EEG reactivity and clinical outcome to determine its reliability as a prognostic tool. **Conclusions:** The implementation of clinical protocols to standardize testing parameters may improve the ability to provide a reliable neurologic prognosis for critically ill patients in a comatose and behaviourally unresponsive state.

NEUROIMAGING

P.062

MR Venography predicts increased intracranial hypertension in children with hydrocephalus

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Background: We investigated whether the presence of dural sinus narrowing is a more reliable marker of intracranial hypertension / shunt failure in children than the imaging finding of hydrocephalus. **Methods:** Cranial MRIs of n=12 children were included when being well and when there was definitive intracranial hypertension as per follow-up and intraoperative results (gold standard). Images werde assessed for hydrocephalus on T2w images and narrowing of dural sinuses on MR vengraphy (diameter of <50%). **Results:** Dural sinuses narrowing was detected with a sensitity of 0.67, a specificity of 1.0, PPV of 1.0 and NPV of 0.75 (Table 1). Hydrocephalus was detected with a sensitivity of 0.5, a specificity of 0.83, PPV of 0.75 and NPV of 0.63. Results differed between the test methods (p = 0.01, Cochrane Q test). **Conclusions:** Dural sinus narrowing more reliably predicted intracranial hypertension, a sign which might significantly improve care in critically ill children.

Patient #	Age at MRI	Shuntfailure as per clinical follow-up (Goldstandard)	Hydro cephalus	Dural Sinus Narrowing
	Years	1 = yes / 2 = no	1 = yes / 2 = no	1 = yes / 2 = no
1	1	1	1	0
	4	0	0	0
2	6	1	1	1
	6	0	0	0
3	12	1	0	1
	12	0	0	0
4	18	1	0	1
	19	0	0	0
5	0	1	1	0
	1	0	1	0
6	0	0	1	0
	0	1	1	0
7	17	1	0	1
	17	0	0	0
8	10	1	1	1
	10	0	0	0
9	0	1	1	1
	1	0	0	0
10	8	1	0	1
	8	0	0	0
11	14	1	0	1
	14	0	0	0
12	18	1	0	0
	18	0	0	0

		Shuntfailure(Goldstandard)		
		Affected	Non-affected	total
Hydrocephalus	Positive	6	1	8
	Negative	6	10	16
		12	12	24

		Shuntfailure(Goldstandard)		
		Affected	Non-affected	total
Dural Sinus Narrowing	Positive	8	0	8
	Negative	4	12	16
		12	12	

P.063

Stereotactic targeting of hippocampal substructures using ultra-high field magnetic resonance imaging: Feasibility study in patients with epilepsy

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Background: The hippocampus can be divided longitudinally into the head, body, and tail; and unfolded medial-to-laterally into the subiculum, cornu ammonis (CA) sectors, and the dentate gyrus. Ultra-high field ($\geq$ 7 Tesla; 7T) magnetic resonance imaging (MRI) enables submillimetric visualization of these hippocampal substructures which could be valuable for surgical targeting. Here, we assess the feasibility of using 7T MRI in conjunction with a novel computational unfolding method for image-based stereotactic targeting of hippocampal substructures. **Methods:** 53 patients with drug-resistant epilepsy were identified undergoing first-time implantation of the hippocampus. An image processing pipeline was created for computationally transforming post-operative electrode contact locations into our hippocampal coordinate system. **Results:** Of 178 implanted hippocampal electrodes (88 left; 49.4%), 25 (14.0%) were predominantly in the subiculum, 85 (47.8%) were in CA1, 23 (12.9%) were