Kidney function tests were investigated in both 1-day and 7-days DMTU-treated (500 mg/kg ip initially, then 125 mg/kg ip every 12h) rats. The effect of DMTU on maximum urine concentrating function was investigated in low (6%) and normal (20%) protein-fed rats.

Results DMTU non-competitively inhibited UT-A and UT-B with IC_{50} of ~ 3 mM. Following 500 mg/kg ip injection, plasma DMTU concentration was initially 10 mM (plasma elimination $t_{1/2} \sim 10$ h) and urine DMTU concentration was >20 mM for 12 h. DMTU-treated rats showed reversible, sustained reduction in urine osmolality ($>60\%$) and 3-fold increased daily urine output. DMTU increased renal electrolyte-free water excretion without altering solute excretion. DMTU impaired maximum urinary concentrating function only in normal protein-fed rats. Methylurea, a non-UT inhibitor urea analogue, had no effect on either urine volume or osmolality. DMTU-treated rats had greater diuresis and much reduced urinary salt loss compared to that of furosemide-treated rats.

Conclusions These results establish a rat model of sustained UT inhibition and demonstrate remarkable diuretic efficacy of UT inhibition. Prominent effect of UT inhibitors on net renal water excretion implies a novel therapeutic strategy for treatment of oedema in hypervolemic diseases.

Neuromuscular Disorders

O-072 INCREASED INTRACRANIAL PRESSURE IN CHILDREN WITH ACUTE DISSEMINATED ENCEPHALOMYELITIS

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Introduction Lumbar puncture (LP) is routinely performed as part of the workup evaluation of suspected acute disseminated encephalomyelitis (ADEM). Mild pleocytosis and/or increased CSF protein concentration are common findings in ADEM. However, the CSF opening pressure, reflecting the intracranial pressure (ICP), has not been acknowledged to date in the literature.

Methods Chart reviews of paediatric patients hospitalised in the Tel-Aviv Sourasky medical centre, between 2005–2013, that were diagnosed with ADEM, were identified retrospectively.

Abstract O-072 Figure 1 CSF opening pressure of 20 patients with ADEM. Each dot represents a patient, the blue zone indicates the normal limits of CSF opening pressure, the upper normal limit of 18cmH2O marked as a red line. The scatter plot shows that most patients had elevated opening pressures with 4 patients having values beyond 40cmH2O.

Results Among 35 children diagnosed with ADEM, 20 who had documented CSF opening pressure comprised the study group. The mean age was 5.3 ± 4.1 years, ten males (50%); Mean CSF opening pressure was 27.8 ± 12.4 cmH₂O, range 10–55 cmH₂O. Considering the upper normal limit of CSF opening pressure in this age group (18 cmH₂O), 15/20 (75%) patients had elevated pressure and one sample t-test comparison showed significant elevated CSF opening pressure among patients with ADEM ($p_v = 0.0023$, 95% CI 3.9–15.6). Minimal pleocytosis was present in seven samples (median=2 cells/mm²). Eighteen out of twenty (90%) patients had clinical complaints/signs that can be explained by increased ICP (drowsiness/encephalopathy $n = 18$, vomiting $n = 8$, headache $n = 8$).

Discussion This study highlights that increased ICP is a prominent patho-physiologic change occurring in the CNS of ADEM patients. In our cohort, this was the most common CSF abnormal finding, independent of pleocytosis level. This observation is in line with the common non-focal neurological symptoms and signs and the beneficial effect of steroid treatment in ADEM. Furthermore, it suggests a potential efficacy of other reducing ICP treatments in ADEM.

O-073 TOTAL AND REGIONAL CORPUS CALLOSUM VOLUMES ARE RELATED TO INTELLIGENCE AND MOTOR FUNCTION IN DYSKINETIC CEREBRAL PALSY

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Background The relationship between corpus callosum (CC) morphology and mainly motor outcomes has been studied in spastic cerebral palsy (CP) but not yet in dyskinetic CP, which

Abstract O-073 Figure 1 CC subdivisions generated by Freesurfer (in colour)

has been recently related to a diffuse brain injury pattern. This study aims to analyse the relationship of total and regional CC volumes with intelligence and motor impairment severity in dyskinetic CP.

Methods 15 subjects (age range, 12–34) with dyskinetic CP and signs of perinatal asphyxia underwent a MRI. CC total, anterior, central and posterior volumes were calculated (Figure 1). The intelligence and motor scales most commonly used in CP were administered.

Results The CC total volume and most of its parts were related to intelligence and motor measures (Table 1).

Abstract O-073 Table 1 Partial correlation controlling for age

	Intelligence		Motor		
	Verbal ¹	Non-verbal ²	GMFCS	BFMF	MACS
TOTAL CC	0.773***	0.775***	0.641**	0.542*	0.634**
ANTERIOR	0.612**	0.681**	no significant		
CENTRAL	0.659**	0.637**	0.619**	0.587*	0.641**
POSTERIOR	0.812***	0.779***	0.684**	0.517*	0.656**

* <.05; ** <.01; *** <.001; GMFCS: Gross Motor Function Classification System; BFMF: Bimanual Fine Motor Function; MACS: Manual Ability Classification System; ¹Peabody Picture Vocabulary Test-3rd; ²Raven's Progressive Matrices.

Conclusions Total CC volume may be indicative of intelligence and motor status in dyskinetic CP. Regionally, the posterior part is the most related to intelligence, in agreement with recent theories of intelligence. The anterior part of the CC is not found to be related to motor function. This result agrees with the fact that premotor and sensorimotor fibres are located more posteriorly than previously thought.

New Concepts In Neonatal Sepsis

O-074

THE RELATIONSHIP BETWEEN MULTISITE NIRS-MEASUREMENTS AND ROUTINE HAEMODYNAMIC MEASUREMENTS IN PRETERM INFANTS WITH CLINICAL SEPSIS

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Background Multisite Near-infrared spectroscopy (NIRS) monitoring may help to detect circulatory failure in preterm infants. The aim of this study was to assess the correlation between multisite NIRS-measurements and routine haemodynamic measurements in preterm infants with clinical sepsis.

Methods Prospective exploratory cohort study in which preterm infants (GA²Leiden University Medical Centre, Leiden University, Leiden, Netherlands).

Background Heating and humidification of inspired gas is routine during neonatal non-invasive respiratory support, but little is known about the effects of different techniques on temperature and humidity in the upper airway.

Method Eight non-invasive respiratory support modes were applied to a neonatal manikin, in an incubator set to 34°C with relative humidity (RH) 60% (approximate normal upper airway

conditions). Continuous positive airway pressure (CPAP), high-flow nasal cannulae (HFNC), and low-flow nasal cannulae (LFNC) devices were tested. Except for unhumidified LFNC, set humidifier temperature was 37°C. Typically used pressures and gas flows were assessed. Temperature and RH in the manikin's oropharynx were measured every 5 min for 30 min, using a thermohygrometer. Each variation was repeated 3 times.

Results Steady state was reached by 10 min. Median values from 10–30 min are shown below.

Abstract O-074 Table 1

Device	Prongs/cannulae	Oropharyngeal			
		Set pressure (cm H ₂ O)	Set flow (L/min)	temperature (°C)	Oropharyngeal RH (%)
Hudson		8	8	38.3	82.5
Bubble CPAP	Midline	8	8	36.9	96.7
Babylog	Hudson	8	8	36.5	94.3
8000 CPAP	Midline	8	8	36.8	97.2
SiPAP	Infant Flow	-	8	35.1	88.0
Optiflow Jr.	Optiflow Jr.	-	8	36.3	88.8
Vapotherm	Vapotherm	-	8	34.3	81.2
LFNC	Salter	-	8	33.5	0.8

Conclusions Achieved oropharyngeal temperature and RH varied between devices. RH of 0.8% occurred during LFNC using unconditioned 'dry' gas. Most devices achieved temperatures >34°C and >80% RH. Bubble CPAP delivered by Hudson prongs resulted in an oropharyngeal temperature above body temperature, which could result in water condensation as gas cools in the airway.

Non-Invasive Ventilation – What is the Evidence?

O-077

MEASUREMENT OF RESPIRATORY MECHANICS AND THORACOABDOMINAL ASYNCHRONY INDICES IN NEONATES BY RESPIRATORY INDUCTANCE PLETHYSMOGRAPHY DURING NON-INVASIVE VENTILATION

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Background Measurement of respiratory mechanics during non-invasive ventilation (NIV) precludes use of the traditional airway flow sensor. Increasing use of NIV in premature infants necessitated novel instrumentation for measuring airflow without interfering with the nasal/oral interface. Respiratory inductance plethysmography (RIP), in addition to providing chest wall motion analysis, may be used for volume and airflow measurements when properly calibrated.

Objective To develop an efficient RIP calibration technique to allow bedside measurement of respiratory mechanics and to validate it's accuracy against traditional pneumotachometer (PNT) measurements while simultaneously computing thoracoabdominal asynchrony indices in premature infants.

Design/methods RIP ribcage and abdominal signals were recorded simultaneously with facemask PNT signals. RIP was calibrated by qualitative diagnostic calibration and multiple