0.857 (p=0.042), and the optimal cutoff point for D-dimer was 19.8 µg/dL because at that level, sensitivity (80%) and specificity (86%) were well balanced.
CONCLUSION. The plasma D-dimer levels may be used to screen for VTE in spinal cord injury patients who require long-term hospitalization and rest. The optimal measurement timing is 13 days after injury, and optimal threshold level is 19.8 µg/dL.

REFERENCE
1. None

001023

Development of an ovine model of haemorrhagic shock: Characterisation of systemic and local oxygen supply/demand imbalance

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INTRODUCTION. The global burden of haemorrhagic shock (HS) is substantial and mostly caused by severe physical trauma. Essential pathophysiologic features of HS are imbalance between oxygen delivery and demand, hyper or hypocoagulatory states and compensatory anti-inflammatory response syndrome, ultimately resulting in multi-organ failure (1). Animal models of HS are essential to study underlying pathobiology and develop new treatments.
OBJECTIVES. To develop an ovine model of severe HS caused by blood loss > 30% of the estimated blood volume (EBV) and study dynamics of oxygen supply/demand imbalance systemically and at end-organ tissue level.
METHODS. Six adult female Leicester cross breed sheep (46±5 Kg) were anaesthetised, intubated and on mechanical ventilation. We cannulated the femoral artery for blood sampling and mean arterial pressure (MAP) monitoring. Swan-Ganz catheter was inserted through the right jugular vein. Animals were haemorrhaged through consecutive collections of 300 mL of blood over 90 min, up to approximately 30% of the EBV. HS was halted in case of MAP < 50 mmHg, heart rate (HR) >200 beats/min, or venous oxygen saturation (SvO2) <50%. At baseline, and every 15-min thereafter, haemodynamic parameters were recorded, and arterial blood gas analysis performed, oxygen delivery (D02) computed. Microdialysis probes were positioned into various organs to measure, at baseline and end of bleeding period, interstitial lactate and lactate/pyruvate ratio.
RESULTS. All sheep survived HS. On average, sheep were haemorrhaged 1055±193 mL of blood (33.6±5.2% of EBV). At baseline, and at the end of HS period, Hb varied from 10.3±2.1 to 7.6±10.8 g/dL (p<0.01), arterial lactate from 2.0±1.5 to 4.3±1.2 mmol/L (p<0.01), HR from 102±14 to 154±30 bpm (p=0.06), MAP from 95.6±8.8 to 51.3±15.2 mmHg (p<0.01), cardiac output from 4.4±1.4 to 2.1±0.8 L/min (p<0.01), SvO2 from 76.3±9.8 to 54.0± 24.3% (p=0.192) and D02 from 552±218 to 241±114 ml/min (p< 0.01). Table below depicts development of organ-specific oxygen debt, measured by microdialysis.
CONCLUSION. We described an ovine model of HS, characterized by significant impairment in cardiac output and oxygen delivery, resulting in multi-organ oxygen supply/demand imbalance. The model will be first used to compare the efficacy of different resuscitation fluids.

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Table 1 (abstract 001023). See text for description

	Brain	Renal cortex	Liver	Skeletal muscle
Lactate (mmol)				
Baseline	3.3±1.3	0.9±0.6	2.4±1.4	3.4±0.9
End of haemorrhage	5.0±1.7	11.8±16.9	5.4±1.3	7.6±2.5
(P-value)	(0.25)	(0.05)	(0.06)	(0.04)
Lactate/Piruvate Ratio (%)				
Baseline	50.6±62.1	24.9±12.1	87.0±49.4	43.2±14.1
End of haemorrhage	60.8±52.2	53.6±30.6	76.7±22.9	145±116
(P-value)	(1.00)	(0.05)	(0.31)	(0.18)

001119

Inhaled Argon improves neurological outcome in experimental traumatic brain injury

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INTRODUCTION. While supportive treatment in the management of Traumatic Brain Injury (TBI) has progressed over the past 20 years, specific drug treatments are lacking [Maas *et al*]. New strategies are needed. Altering how patients are ventilated, could be an easily modifiable variable in TBI management. Data in *in vitro* and *in vivo* models of ischemic heart [Ristagno *et al*] and brain injury [Loetscher *et al*] show that the gaseous agent Argon is endowed with neuroprotective potential. Whether Inhaled Argon (iAr) is protective in experimental TBI is presently unknown.
OBJECTIVES. To test the effects of inhaled Argon administered after experimental TBI in mice on neurological functions and structural outcome by longitudinal behavioural assessments and magnetic resonance imaging (MRI) including T2W and DWI sequences.
METHODS. Severe TBI was performed in anesthetized mice (C57BL/6J, 8 weeks old, male) over the left parietotemporal cortex by controlled cortical impact as previously described [Zanier *et al*]. Immediately after TBI, mice were randomized to 24h treatment by iAr 70%-O2 30% (n=10) or air (n=10) from 10 minutes after TBI. Sensorimotor deficits were evaluated at the end of treatment (24h post TBI) and at 1 week by neuroscore and simple neuroassessment of asymmetric impairment (SNAP) tests. MRI (7 Tesla, Bruker) was performed at 3 days post TBI to evaluate contusion volume by T2W. The effect of iAr on acute brain edema, was analysed in a subset of mice (n=3 per group) by DWI-MRI. Maps of the apparent diffusion coefficient generated by DWI-MRI were used to evaluate iper/ipo intense regions as a proxy of vasogenic and cytotoxic edema, respectively. A simple random allocation was applied to assign a subject to an experimental group. Data acquisition and analysis were done blindly. Data were

normally distributed. A t-test was used to evaluate differences between iAr and air treated TBI mice.
RESULTS. Argon inhalation significantly improved neurological function at 24 hours and 7 days after TBI (Neuroscore 24h post TBI iAr 6.1±0.5 vs. Air 3.7±0.7, p=0.0102). Contusion volume was reduced by 16% in iAr than air breathing TBI mice. Vasogenic brain edema showed a reduction in iAr treated TBI mice close to significance (p= 0.056).
CONCLUSION. iAr induces an acute and persistent improvement of sensorimotor function when administered for 24h starting 10 minutes after TBI. This outcome is reinforced by preliminary MRI data showing a trend in toward a decrease in vasogenic edema in iAr treated mice. Our data support future studies to understand the potential of iAr as an accessible treatment in TBI.

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001243

The impact of different intensivist staffing models on drug-drug interactions in adult trauma intensive care units

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INTRODUCTION. Drug-drug interactions (DDIs) are considered as concerning issues for public health especially in those admitted to intensive care units (ICUs). There are many studies that show involvement of intensivists in the ICUs improves outcome and limits costs. Different types of intensivist-driven care exist. This study evaluated the effect of academic versus non-academic (therapeutic) intensivist as well as hours of coverage and attendance of intensivist on DDIs in six adult trauma ICUs of a level one trauma center
OBJECTIVES. Considering the high incidence of pDDIs in the ICU, and the importance of ADRs caused by DDIs in critically ill patients, we aimed to investigate the effect of presence of an academic versus therapeutic intensivists as well as hour of coverage of intensivist on DDIs in six adult trauma ICUs of a level one trauma center in Shiraz, Iran.
METHODS. Two hundred patients were included in this prospective study in a 6-month period. The DDIs were classified into 5 categories, including type A, B, C, D, and X. Type D and X were considered as potential DDIs (pDDIs). Effect of three different types of intensivist staffing models including type A (once daily therapeutic intensivist visit followed by 24 hour on-call), B (twice daily academic intensivist visit, 8 hours attendance in ICU and 16 hours on–call) and C (all criteria just like ICU type B except presence of therapeutic instead of academic intensivist).
RESULTS. 3735 drug orders and 3869 drugs (193 different types) were assessed and 1826 potential DDIs were identified including 1107 (60.6%) type C, 648 (35.48%) type D and 12 (0.6%) type X. The mean of DDI per patient was significantly higher (P value <0.001) in ICU type A than ICU type C and type B. The frequency of DDIs was highest in type A. There was a statistically significant relationship between the number of prescribed drugs and ICU length of stay (P value <0.001 and P=0.009, respectively).
CONCLUSION. Different types of intensivist models affect DDIs to varying degrees. In this regard, academic versus therapeutic intensivist, twice versus once daily visit and 8 hours attendance with16 hours on-call versus 24 hours on-call is associated with more reduction in DDIs in adult trauma ICUs.

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001291

Airway Management in Spinal Cord Injury: Preventing and Decreasing Tracheostomy Morbidity

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INTRODUCTION. High level cervical spinal cord injuries (SCI) often result in respiratory failure and the need for tracheostomy mechanical ventilation. The National Trauma Data Bank reports tracheostomy rate for high cervical injuries to be over 30% and even 20% of patients with injury below C4 require a tracheostomy. The benefits of tracheostomy are documented however they do have risks and in chronic long term use, there is sub optimal management. Early complications include bleeding(2-5%), stomal infection (2-5%) and dislodgement 1%. Late complications approach 65% including tracheomalacia and stenosis.
OBJECTIVES. This is a report of tracheostomy use in all traumatic SCI patients who underwent diaphragm pacing (DP).
METHODS. This is a retrospective review of prospective IRB and or FDA approved protocols involving SCI and DP. Airway management of traumatic SCI who underwent DP was analyzed pre and post DP implant.
RESULTS. Out of over 500 implanted DP patients 99 were traumatic SCI with complete tracheostomy data on 84 patients. Fifty nine or 63% of patients had a cuffed tracheostomy at the time of DP evaluation. Average age at time of injury was 27. 8 years (1 day to 74 years). The average time spent on mechanical ventilation prior to DP was 9.7 years (6 days to 25.6 years). Within this group are 13 pediatric patients age 0 to 17 in which 54% presented with a cuffed tracheostomy tube. Post DP implant, 7 patients were decannulated, 15 patients had tracheostomy converted to cuffless tube and 2 patients went to a stoma stent. One patient required laryngectomy due to tracheal damage. Two patients went directly from Endotracheal tube mechanical ventilation to DP to extubation avoiding tracheostomy altogether. T Median survival was 22.2 years (95% CI 14.0 - not reached) with only 31 deaths. Subgroup analysis showed that earlier DP implantation leads to greater 24 hour use(72%) of DP and no need for any MV.
CONCLUSION. There continues to be a widely held belief that positive pressure ventilation must be delivered via cuffed and generally inflated cuffed tracheostomy tube. Inflated cuffed tracheostomy tubes has significant morbidity including speech difficulty, aspiration increases from difficulty swallowing, tracheal stenosis and tracheomalacia. The efficacy and benefits of the cuffless tracheotomy was first described in 1990. Publications in SCI and chronic mechanical ventilation describe the use of cuffless tracheotomy but this report confirms cuffed tube usage is dominant. The choice of tracheostomy style needs to be better scrutinized. DP implantation allowed for downsizing and decannulation. It obviated the need for tracheostomy in two patients. Early DP use may significantly alter the morbidity of tracheostomies leading to improved survival.

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