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### ORAL PRESENTATIONS

#### O1

##### Redefining massive transfusion

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**Background:** The concept of massive transfusion was developed to trigger clotting factor therapy for the treatment of coagulopathy due to dilution, after a certain number of units of packed red blood cells. It has been defined as the replacement of circulating volume or the transfusion of more than 6 or 10 units of packed red blood cells (PRBC) in the 24 hours after injury. Until recently there has been little consideration of the transfusion of clotting products. Given the recent identification of the early coagulopathy of trauma and the new therapeutic regimens for massive transfusion, there is therefore a need to re-examine the concept of massive transfusion.

**Aims:** To determine if there is a clinically relevant definition of massive transfusion based on outcome.

**Methods:** A retrospective multi centre registry analysis of the transfusion practices of five centres in Europe and North America was carried out. 5150 patients were studied. Data was collected on demographics, mechanism of injury, 24 hour PRBC requirement and mortality.

**Results:** There was a linear increase in the number of PRBC transfused and mortality (Figure 1). No clear threshold above which mortality increased was found. Each additional unit of blood transfused added cumulatively less to the mortality risk (Figure 2).

**Conclusion:** The current definitions of massive transfusion are arbitrary and do not select patients on the basis of outcome. The differences in transfusion practices amongst centres around the world and the change in the treatment of the coagulopathy of trauma with PRBC and use of blood products in higher ratios may mean that massive transfusion has become an outdated concept.

Figure 1 (abstract O1)

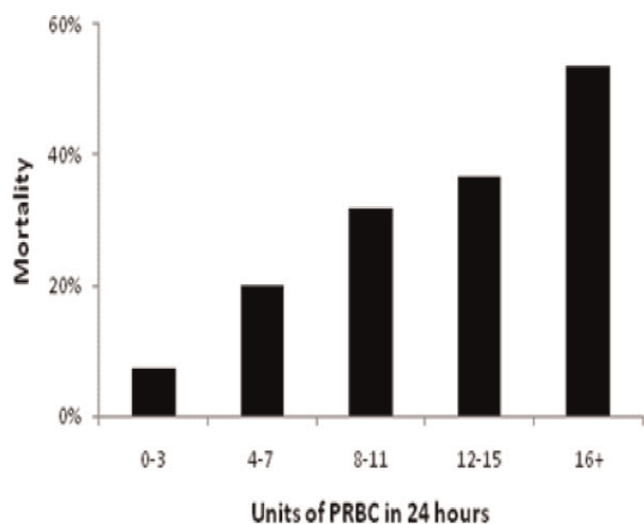
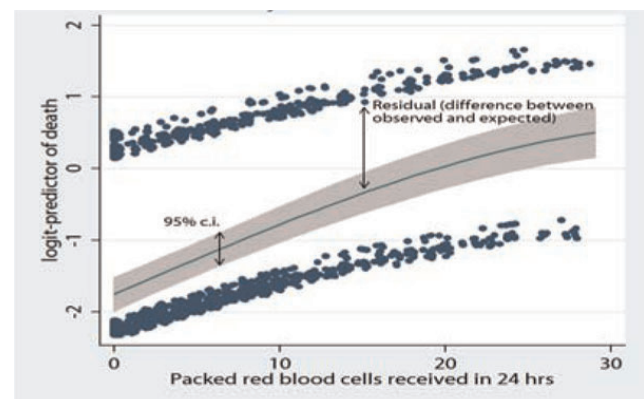


Figure 2 (abstract O1)



**O2**

**Pre-hospital recording of vital data in the severely head injured patient**

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**Introduction:** Traumatic brain injury (TBI) is associated with substantial morbidity and mortality. Recent guidelines on pre-hospital management of TBI emphasize the prevention of hypotension and hypoxemia [1]. Our aim was to assess pre-hospital documentation of vital signs among patients with suspected traumatic brain injury.

**Methods:** Retrospective analysis of prospectively collected data from the trauma registry at St. Olavs University Hospital, Norway in the period from 1<sup>st</sup> Jan 2004 to 31<sup>st</sup> Dec 2006. Patients with a Glasgow Coma Score (GCS) < 9 either pre-hospital or in the emergency department were selected for further analysis. Pre-hospital recordings of vital signs, i.e. GCS, systolic blood pressure (sBT), respiratory rate (RR), heart rate (HR) and oxygen saturation (SaO<sub>2</sub>) were examined.

**Results:** 1237 trauma patients were identified in the trauma registry during the study period. Of these, 105 (8%) patients had a GCS < 9. 32 (30%) were female. The majority (89%) was treated and accompanied by an emergency physician. The proportion of patients whose vital signs were documented is presented in Table 1:

**Table 1 (abstract O2) Median Glasgow Outcome Scale [2] was 3 (range 1–5), and 24 (23%) patients died from the injuries**

Variable	GCS	sBT	RR	HR	SaO <sub>2</sub>
Fraction	92%	71%	52%	78%	Not available*

\*SaO<sub>2</sub> was not a trauma registry item, but will be introduced.

**Conclusion:** Patients admitted to our hospital with potentially severe head injury have high lethality or severe sequelae. We discovered a lack of documentation of vital signs in this group of patients. The importance of recording and documenting vital signs according to recent guidelines for management of traumatic brain injury needs to be emphasized.

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**O3**

**The Trauma Centre: a specialty hospital, not a hospital of specialties**

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**Background:** Trauma is a leading cause of death and disability in England and Wales, with 16,000 injury deaths per year. High estimates of preventable death rates have renewed the impetus for national regionalisation of major trauma to specialist centres. We hypothesized that the institution of a specialist multi-disciplinary trauma service and performance improvement programme had resulted in significant improvements in outcomes in excess of any observed national changes.

**Methods:** This study was a comparative analysis of data from 2000–2005 for the Royal London Hospital (RLH) trauma registry and the Trauma Audit & Research Network for England and Wales. Reductions in preventable mortality were evaluated through prospective analysis of the RLH performance improvement programme.

**Findings:** RLH mortality from critical injury was 48% lower in 2005 than 2000 ( $\chi^2$ ,  $p = 0.001$ ). Overall mortality rates were unchanged for acute hospitals (4.3% vs 4.4%) and other multispecialty hospitals (MSH) (8.7% vs 7.3%). Improvements at RLH outpaced any changes in national outcomes. Secondary transfer mortality in critically injured patients was 53% ( $p = 0.001$ ) lower in our regional network than the national average. Preventable deaths fell from 9.1% to 1.8% ( $p = 0.04$ ) and significant gains were made in critical care and ward bed utilization. 2005 benchmarks for time to CT and laparotomy were significantly faster at RLH than other MSH.

**Interpretation:** Institution of a specialist trauma service and performance improvement programme was associated with significant improvements in injury outcomes that exceeded national variations. A national trauma system requires specialist trauma hospitals, not hospitals with trauma specialties.

**O4**

**Hypothermia in injured patients – does it happen often?**

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**Introduction:** Hypothermia is an independent predictor of increased morbidity and mortality in severely injured patients,

mainly due to negative effects on coagulation [1]. Hypothermia can result from trauma itself, reduced tissue perfusion, pre-hospital interventions or lack of such. Efforts to increase body temperature by insulation and active re-warming can be life-saving if the risk of hypothermia in these patients is acknowledged. The aim of this study was to investigate the prevalence and severity of hypothermia in a trauma population.

**Methods:** Retrospective analysis of data collected prospectively from the trauma registry at St. Olavs University Hospital, Norway, from 1<sup>st</sup> Jan 2004 to 31<sup>st</sup> Dec 2006. Hypothermia was defined as temperature  $\leq 36^{\circ}\text{C}$  [2].

**Results:** 1237 trauma patients were identified during the study period. Among these, 67% (N = 827) had their temperature registered in the emergency department. Overall median temperature was  $36.5^{\circ}\text{C}$  (range 15–39.2), and 218 patients (26%) were hypothermic with a median temperature of  $35.6^{\circ}\text{C}$ . Physician staffed transport (consultant anaesthetist) treated 138 patients (63%). See Table 1.

Table 1 (abstract O4)

	Severe	Moderate	Mild
Severity of hypothermia	$<32^{\circ}\text{C}$	$32\text{--}34^{\circ}\text{C}$	$34\text{--}36^{\circ}\text{C}$
Number of patients (%)	5 (2)	21 (10)	192 (88)

**Conclusion:** The prevalence of hypothermia could not be assessed due to no recording of temperature in a significant number of our patients. This suggests a less than adequate level of vigilance. Among patients with recorded temperature, a substantial number was hypothermic. It is necessary to address this issue along the entire chain of survival.

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**O5**

**Cricoid pressure – friend or foe?**

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Cricoid pressure was described by Sellick [1] over 40 years ago to reduce the probability of the aspiration of gastric contents onto the pulmonary tree. It subsequently became part of the technique termed rapid sequence intubation and is used in most countries of the world as an integral part of the emergency induction of anaesthesia. Its introduction into clinical practice followed a simple technique description and case series. The technique was never evaluated in a trial. Subsequently evidence has emerged to suggest that the use of CP may impair laryngoscopy and bag mask ventilation [2]. Releasing CP has been recommended as a way of improving the laryngeal view at difficult intubations. However there is limited data concerning the effects of releasing CP (with/without laryngeal manipulation) on the resultant quality of the laryngeal view and subsequent intubation's success rates [2]. We prospectively evaluated the use of CP and its release on 402 emergency pre-hospital trauma airways over 16 months. CP was released in 47 cases. Its release was associated with an improved or neutral effect on laryngeal view in all cases. Removing CP facilitated intubation in most cases and was not associated with a worsening view of the cords in any patient. There were two cases of regurgitation associated with failed intubation, prolonged BMV and the removal of CP.

CP has entered into clinical practise with scant evidence that it reduces aspiration and little evaluation of its risks and benefits. We suggest that in cases of poor laryngeal view early removal of CP is likely to facilitate intubation with little evidence of risk to the patient.

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