Background Acute headache is a common reason for presentation to emergency departments. Some have significant structural pathology requiring further intervention. Emergency clinicians often rely on presenting headache features (such as thunderclap onset) to guide the need for neuroimaging and further investigation. It is unclear whether these features discriminate accurately or how the investigations of patients presenting with thunderclap headache differs internationally.
Objectives To determine the proportion of patients presenting with thunderclap onset of headache from a general headache cohort and compare demographics, investigation strategy and final diagnosis, across an international sample of patients.
Methods An international, multicentre, observational prospective cohort study. This planned sub-study focussed on patients presenting with thunderclap onset headache, with characteristics compared to the general headache cohort. The prospective observational design was chosen to capture real-world data on current international practice.
Results The study recruited 4536 patients across 67 hospitals and 10 countries during 2019. Of this, 644 patients presented with thunderclap headache onset (14.2%). Median age was 44. The majority of patients self-referred to hospital. CT brain imaging was performed in 62.7% cases and lumbar puncture in 10.6%, with wide international variation. New Zealand reported the highest rate of neuroimaging, 78.4% of patients presenting with thunderclap headache, compared to 25.0% in Romania. All cases of subarachnoid haemorrhage (SAH) were diagnosed on CT imaging results.

When compared with the parent cohort of all headache patients presenting to the ED, those with thunderclap headache had a significantly higher rate of serious cranial pathology (13.7% vs 8.5%, $p<0.001$) and final diagnosis of SAH (3.6% vs 0.8% $p<0.001$).
Conclusions Thunderclap headache presenting to the ED appears to correlate with a higher risk for serious intracranial pathology and/or SAH. Investigation strategies varied within this international cohort. Neuroimaging rates did not align with international guidelines, suggesting potential for further work on standardisation.

803 CHARACTERISTICS OF PATIENTS WITH COVID-19 UNDERGOING CT PULMONARY ANGIOGRAPHY IN THE EMERGENCY DEPARTMENT: A RETROSPECTIVE OBSERVATIONAL STUDY

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Aims/Objectives/Background The shared features of pulmonary embolism (PE) and COVID-19 create a diagnostic challenge for Emergency Departments. Raised D-dimer and CRP are predictive of PE, critical illness and mortality from COVID-19, however guidelines state there is insufficient evidence to recommend that biomarkers be used to guide practice to diagnose PE. This retrospective observational study analyses characteristics and biomarkers of patients with COVID-19 undergoing CT pulmonary angiography (CTPA) in the Emergency Department. The aim is to establish whether there is a role for D-dimer, CRP and Wells' score to risk stratify patients with COVID-19 to guide CTPA imaging and enable early diagnosis of PE.
Methods/Design CTPA scans requested by two London Emergency Departments in April 2020, December 2020-February 2021 were identified. *Inclusion:* COVID-19 positive by PCR or radiographic appearances. Patient records screened to identify: gender, age, days since symptom onset, D-dimer and CRP. *Exclusion:* >30 days symptoms, chronic PE, already receiving anticoagulation or insufficient data. Wells' scores calculated for patients diagnosed with PE.
Results/Conclusions 468 patients were included, with 47 diagnosed with PE on CTPA (prevalence=10%). D-dimer (ng/ml) is significantly higher in patients with PE compared to no PE (median 6154; IQR 2455-12092 v med 1221; IQR 787-2350, $p<0.05$). Odds ratio for PE with D-dimer $\geq$1000 compared to D-dimer <1000 = 26.8 (95% confidence interval: 3.66–196.29). Diagnostic testing: sensitivity 97.87%, specificity 36.82%, PPV 14.74%, NPV 99.36%. Mean Wells' score in patients with PE=4 (3–7.5), with 53% (n=25) having a Wells' score of 4 or less ('PE unlikely').

D-dimer has a strong NPV for PE at values less than 1000ng/ml in the COVID-19 population, and therefore may have a role in ruling out PE and reducing CTPA scans in the Emergency Department. The Wells' criteria, if used according to NICE guidance, would not indicate CTPA and potentially lead to delayed diagnosis in this patient group.

808 CHANGING NATURE OF MAJOR TRAUMA FROM 2000 TO 2019 IN ENGLAND AND WALES: OBSERVATIONAL REGISTRY STUDY

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Aims/Objectives/Background Low energy transfer mechanisms – predominately falls from a standing height – have been identified as the most prevalent cause of major trauma in higher-income countries. This study examines the epidemiological trends in major trauma in England and Wales between 2000 – 2019, incorporating changes in mechanism of injury, imaging practices, case ascertainment and national demographic shifts. In addition, changes in the whole cohort of major trauma patients and differences between patients who suffered high energy and low energy mechanism of injury are described.
Methods/Design A retrospective observational cohort study was conducted using Trauma Audit and Research Network (TARN) data. Patients with an injury severity score (ISS) >15 admitted to hospital in England and Wales between 1 January 2000 to 31 December 2019 were included. The primary outcome was the temporal trend in the proportion of major trauma sustained through low energy transfer, and its association with imaging practices, case ascertainment and demographic changes.
Results/Conclusions 241,484 participants were included in the analysis, of which 96,833 were classified as low energy. Low energy trauma accounted for 12.5% in 2000 (n = 373), rising

to 52.6% (n=16,087) in 2019. Over the same period the proportion of patients receiving CT imaging increased from 20.7% (n=676) to 88.9% (n=27,174). TARN hospital membership doubled from 96 to 179 hospitals, and the annual mean numbers of cases per hospital per annum increased six-fold from 31 to 174. Case ascertainment improved from 42% in 2008 to 95% in 2019. Significant differences were observed in the demographics, injury patterns, presenting physiology, care pathways, and outcomes between the high and low energy cohorts.

Changes in imaging and reporting practices have revealed a previously hidden burden of injury resulting from low energy transfer mechanisms. It is essential that future research recognises this distinct cohort and investigates how trauma systems can be changed to optimise outcomes.

834 COMPARATIVE ANALYSIS OF MAJOR INCIDENT TRIAGE TOOLS IN CHILDREN – A UK POPULATION-BASED ANALYSIS

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Aims/Objectives/Background Triage is a key principle in the effective management of major incidents. There is currently a paucity of evidence to guide the triage of children. The aim of this study was to perform a comparative analysis of nine adult and paediatric triage tools, including the novel 'Sheffield Paediatric Triage Tool' (SPTT), assessing their ability in identifying patients needing life-saving interventions (LSI).

Methods/Design A ten-year retrospective database review of TARN data for paediatric patients (<16years) was performed. Primary outcome was identification of patients receiving one or more LSIs from a previously defined list. Secondary outcomes included mortality and prediction of ISS>15. Primary analysis was conducted on patients with complete pre-hospital physiological data with planned secondary analyses using first recorded physiological data. Performance characteristics were evaluated using sensitivity, specificity, under and over-triage.

Results 15133 patients met TARN inclusion criteria. 4962 (32.8%) had complete pre-hospital physiological data and 8255 (54.5%) had complete first recorded data. Male patients predominated (69.5%), sustaining blunt trauma (95.4%) with a median ISS of 9. 875 patients (17.6%) received at least one LSI.

The SPTT demonstrated the greatest sensitivity of all triage tools at identifying need for LSI (92.2%) but was associated with the highest rate of over-triage (75.0%). Both the PTT (sensitivity 34.1%) and JumpSTART (sensitivity 45.0%) performed less well at identifying LSI. By contrast, the adult MPTT-24 triage tool had the second highest sensitivity (80.8%) with tolerable rates of over-triage (70.2%).

Conclusion The SPTT and MPTT-24 outperform existing paediatric triage tools at identifying those patients requiring LSIs. This may necessitate a change in recommended practice. Further work is needed to determine the optimum method of paediatric major incident triage, but consideration should be given to simplifying major incident triage by the use of one generic tool (the MPTT-24) for adults and children.

Elizabeth Molyneux Prize Papers

822 MORTALITY IN ADOLESCENT TRAUMA: A COMPARISON OF CHILDREN'S, MIXED AND ADULT MAJOR TRAUMA CENTRES

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10.1136/emermed-2022-RCEM.6

Aims/Objectives/Background We aimed to compare adolescent mortality rates between different types of major trauma centre (MTC or level 1; adult, children's and mixed).

Methods/Design Data were obtained from TARN (Trauma Audit Research Network) from English sites over a 6-year period (2012–2018), with adolescence defined as 10–24.99 years. Results are presented using descriptive statistics. Patient characteristics were compared using the Kruskal-Wallis test with Dunn's post-hoc analysis for pairwise comparison and χ^2 test for categorical variables.

Results/Conclusions 21 033 cases met inclusion criteria. Trauma-related 30-day crude mortality rates by MTC type were 2.5% (children's), 4.4% (mixed) and 4.9% (adult). Logistic regression accounting for injury severity, mechanism of injury, physiological parameters and 'hospital ID', resulted in adjusted odds of mortality of 2.41 (95% CI 1.31 to 4.43; p=0.005) and 1.85 (95% CI 1.03 to 3.35; p=0.041) in adult and mixed MTCs, respectively when compared with children's MTCs. In three subgroup analyses the same trend was noted. In adolescents aged 14–17.99 years old, those managed in a children's MTC had the lowest mortality rate at 2.5%, compared with 4.9% in adult MTCs and 4.4% in mixed MTCs (no statistical difference between children's and mixed). In cases of major trauma (Injury Severity Score >15) the adjusted odds of mortality were also greater in the mixed and adult MTC groups when compared with the children's MTC. Median length of stay (LoS) and intensive care unit LoS were comparable for all MTC types. Patients managed in children's MTCs were less likely to have a CT scan (46.2% vs 62.8% mixed vs 64% adult).

Children's MTC have lower crude and adjusted 30-day mortality rates for adolescent trauma. Further research is required in this field to identify the factors that may have influenced these findings.

784 THE LANDSCAPE OF PAEDIATRIC PROCEDURAL SEDATION IN UK & IRISH EMERGENCY DEPARTMENTS; A PERUKI STUDY

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10.1136/emermed-2022-RCEM.7

Aims/Objectives/Background Approximately 250,000 children undergo paediatric procedural sedation (PPS) in UK and Irish