REAL-WORLD DEPLOYMENT OF POINT-OF-CARE SARS-COV-2 TESTING IN THE EMERGENCY DEPARTMENT ADMISSION PATHWAY CAN SUPPORT THE SAFE, ACCURATE AND RAPID DIAGNOSIS OF COVID-19

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Aims/Objectives/Background Patients admitted to hospital via the emergency department (ED) need to be separated by SARS-CoV-2 infection status to prevent transmission. Using clinical criteria alone is not feasible due to the range of symptoms and asymptomatic spread. Turnaround time of laboratory PCR assays (~6–24 hrs) hinders patient movement through the hospital with pressure on side-rooms pending results and exposure risk if unsuspected cases are moved into bays. Lateral flow devices (LFD) can provide a rapid diagnosis and aid patient movement. This implementation study aimed to assess the accuracy and safety of LFDs within an ED during a high-prevalence period.

Methods/Design Two rapid point-of-care tests (POCT) were introduced during December 2020: Cobas®-Liat® system (Roche Diagnostics) is a 20-minute assay comparable to laboratory PCR (in-house validation), and LFDs. Symptomatic patients with a positive LFD were cohorted on a ‘red’ ward. Asymptomatic patients with a negative result were allocated an ‘amber’ ward, pending lab PCR. Where there were discrepancies between results and symptoms; a Liat® was performed. The LFDs were validated by PCR swabs to determine true positive and false negative (FN) rates and to minimise fallout via contact tracing. The PCR cycle threshold (CT) values were recorded to evaluate the LFD sensitivity and specificity. Results were collected between December 2020-March 2021.

Results/Conclusions Comparing LFD with PCR results, the sensitivity and specificity were 70.7% and 99.1%. LFD FNs had higher CT values (≥25), indicating the beginning or end of infection – unlikely infectious. One period of false positives during lower prevalence revealed a faulty batch. During the study period 90% of patients left the ED with a virological diagnosis.

We conclude that POCT can aid the diagnosis of COVID-19 in the ED when combined with existing laboratory-based PCR algorithms. We demonstrate a safe and effective use of POCT in the ED which could be replicated across other centres.

EXTERNAL VALIDATION OF A NOVEL TRIP (CAST) SCORE TO IDENTIFY PATIENTS AT RISK OF VENOUS THROMBOEMBOLISM AFTER TEMPORARY IMMOBILISATION FOR LOWER LIMB INJURY

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Aims/Objectives/Background Temporary immobilisation after lower limb injury incurs a significant risk of venous thromboembolism (VTE). These events are potentially preventable through patient education and risk based pharmacological thromboprophylaxis. Recent evidence has identified a potentially optimal risk assessment model, the TRIP (cast) score. We sought to evaluate the potential impact of implementation within a UK Emergency Department (ED).

Methods/Design A retrospective cohort study, using prospectively collected routine data accessible through electronic health records. All ED patients with temporary lower limb immobilisation and documented VTE risk assessment during 2019 were included. TRIP (cast) scores were calculated retrospectively. Rapid case note review was undertaken to identify VTE, bleeding and mortality events up to 90 days post discharge. The project was formally approved as a service evaluation and had R&D oversight throughout (Ref: S21HIP25).

Results/Conclusions We identified 670 relevant ED patients with lower limb injury. We excluded all subsequent hospital admissions and patients already established on anticoagulation. 520 patients were included in the final dataset, with a mean age of 40.7 (SD 17.1) and a median ED stay of 170 minutes. Discharge diagnoses and immobilisation method are shown in figures 1 and 2.
Aims/Objectives/Background Previous studies have demonstrated an association between hyperoxia and increased mortality in various patient conditions. In the present study, we aim to investigate the incidence of hyperoxia in trauma patients receiving PHEA, and we aim to determine factors that may help guide prehospital oxygen administration.

Methods/Design A retrospective cohort study was performed of all patients who received PHEA by a single helicopter emergency medical service (HEMS) service between 1 October 2014 and 1 May 2019 and who were subsequently transferred to one major trauma centre (MTC). Patient and treatment factors were collected from the electronic patient records of the HEMS service and the hospital. Hyperoxia was defined as a PaO2 >16, based on the first arterial blood gas analysis upon arrival in hospital. In the prehospital setting, ABGA is not readily available, target SpO2 of 87.9% as recommended in BTS Guidelines should guide FiO2 titration to reduce risk of tissue hyperoxia. Predeparture checklists should include an agreed system to adjust FiO2 according to a patient's SpO2 rather than fixed concentration.

Results/Conclusions On presentation to the MTC, the majority of the patients (90/147, 61.2%) had severe hyperoxia, 30 patients (20.4%) had mild hyperoxia, 26 patients (19.7%) had normoxia, and 1 patient (0.7%) had hypoxia. The median [IQR] PaO2 in the first ABGA after HEMS handover was 36.7 [18.5–52.2] kPa, with a range of 7.0–86.0 kPa. SpO2 readings before handover were independently associated with presence of hyperoxia. An SpO2 ≥97% was associated with significantly increased odds of hyperoxia (OR 3.99 [1.58–10.08], and had a sensitivity of 86.7 [79.1–92.4]% , specificity of 37.9 [20.7–57.8]%, positive predictive value of 84.5 [70.2–87.9]%, and a negative predictive value of 42.3 [27.4–58.7]% for presence of hyperoxemia.

HEMS oxygenation strategies are effective; trauma patients who have undergone PHEA often have a profound hyperoxemia upon arrival in hospital. In the prehospital setting where ABGA is not readily available, target SpO2 of 94–98% as recommended in BTS Guidelines should guide FiO2 titration to reduce risk of tissue hyperoxia. Predeparture checklists should include an agreed system to adjust FiO2 according to a patient’s SpO2 rather than fixed concentration.