

Conclusion We found variation in how the schemes are implemented. Future research is required to explore the experiences of those undertaking EM ACFs in more detail to identify the features of successful ACF training schemes, and whether any aspects may benefit from standardisation.

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DRONE DELIVERED DEFIBRILLATORS (THE 3D PROJECT): A SIMULATION STUDY

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Aims/Objectives/Background Cardiopulmonary resuscitation (CPR) and defibrillation can double survival from out-of-hospital cardiac arrest. Members of the public can perform both before the arrival of the ambulance service, but they currently use a public-access Automated External Defibrillator (AED) in around only 5% of out-of-hospital cardiac arrests.

There are several barriers in getting an AED to a patient's side promptly. One means of overcoming these barriers may be to deliver AEDs using Unmanned Aerial Vehicles ('drones'). In this study we aimed to create a technologically feasible solution for drone-delivered defibrillation, and to investigate how easily a bystander performing CPR could use a drone-delivered AED.

Methods/Design We developed a drone capable of flying an AED and lowering it to the ground via winch between July and September 2020 and tested the mechanism in October 2020. On 9th July 2021, we will conduct simulated cardiac arrests in an outdoor controlled test environment. Twenty participants will find a simulated patient, call an experienced 999 call-handler from Welsh Ambulance Service NHS Trust, and start CPR. Once cardiac arrest is confirmed during the 999 call a drone will take off, reach hovering altitude and lower the AED to the ground on-scene. The call-handler will alert the participant, who will then leave the patient to retrieve and attach the AED.

Hands-off CPR time is the primary outcome. Secondary outcomes are: time taken to reach the drone, recover the AED and apply it; usability of drone-delivered AEDs (using a questionnaire adapted from the System Usability Scale); and an exploration of participant behaviours by review of audio (999 calls) and video of the simulation.

Results/Conclusions We will determine what additional burden there is for a lone bystander after introducing a drone-delivered AED to a simulated cardiac arrest scenario. This will inform future work developing protocols for drone delivery of AEDs in clinical trials.

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ASSESSMENT OF HEADACHE IN THE EMERGENCY DEPARTMENT TO RULE OUT SUBARACHNOID HAEMORRHAGE: A SYSTEMATIC REVIEW OF DIAGNOSTIC ACCURACY

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Aims/Objectives/Background Acute headache accounts for around 2% of Emergency Department attendances. Headache guidelines recommend non-contrast head computed tomography (CT) followed by lumbar puncture to exclude subarachnoid haemorrhage (SAH). Advances in imaging technology have led emergency physicians to question the necessity of routine lumbar puncture after negative CT. This systematic review assessed diagnostic strategies for neurologically intact headache patients.

Methods/Design In February 2020, 18 electronic databases (including MEDLINE and Embase) were searched for studies of any clinical decision rule or diagnostic test for assessing neurologically intact severe headache patients, reaching maximum intensity within an hour. Studies were quality assessed using the QUADAS-2 tool. Diagnostic accuracy data were extracted into 2x2 tables to calculate sensitivity, specificity, false-positive and false-negative rates. Where appropriate, hierarchical bivariate meta-analysis was used to synthesise results.

Results/Conclusions Thirty-seven studies were included. Eight studies assessing the accuracy of the Ottawa SAH clinical decision rule were pooled; sensitivity was 99.5%, specificity was 23.7%. Four studies (with neuroradiology expertise) assessing CT within six hours of headache onset were pooled; sensitivity was 98.7%, specificity was 100%. CT sensitivity beyond six hours was considerably lower ($\leq 90\%$; 2 studies). Three studies assessing lumbar puncture (spectrophotometric analysis) following negative CT were pooled; sensitivity was 100%, specificity was 95.2%. LP-related adverse events were reported in 5.3–9.5% patients (2 studies).

The evidence suggests that the Ottawa Rule has limited value for ruling out SAH; the high false positive rate means that its use would potentially result in 76% SAH-negative patients undergoing further investigation with no additional benefit. Modern CT within six hours of headache onset (with images assessed by a neuroradiologist) is highly accurate and likely to be sufficient to rule out SAH. However, sensitivity reduces considerably over time. The CT-LP pathway remains a highly sensitive pathway for detecting SAH, although LP resulted in some false-positives and adverse events.

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OTTAWA ANKLE RULES CANNOT BE SAFELY USED TO RULE OUT ANKLE FRACTURES IN PATIENTS WHO PRESENT ≥ 10 DAYS POST-INJURY

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Aims/Objectives/Background The Ottawa ankle rules (OAR) have been validated as a highly sensitive tool to rule out ankle fractures and reduce need for radiography. However, datasets validating OAR to date have excluded patients presenting ≥ 10 days post-injury and there is a need to ascertain if OAR can be safely used to rule out ankle fractures in this population.

Methods/Design Patients presenting with ankle injuries to an emergency department (ED) in England between June 2015