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The Faculty of Pre-Hospital Care HEMS Elective 2021

Essex & Herts Air Ambulance Trust, Earls Colne, Colchester
The Faculty of Pre-Hospital Care, Royal College of Surgeons of Edinburgh, Edinburgh

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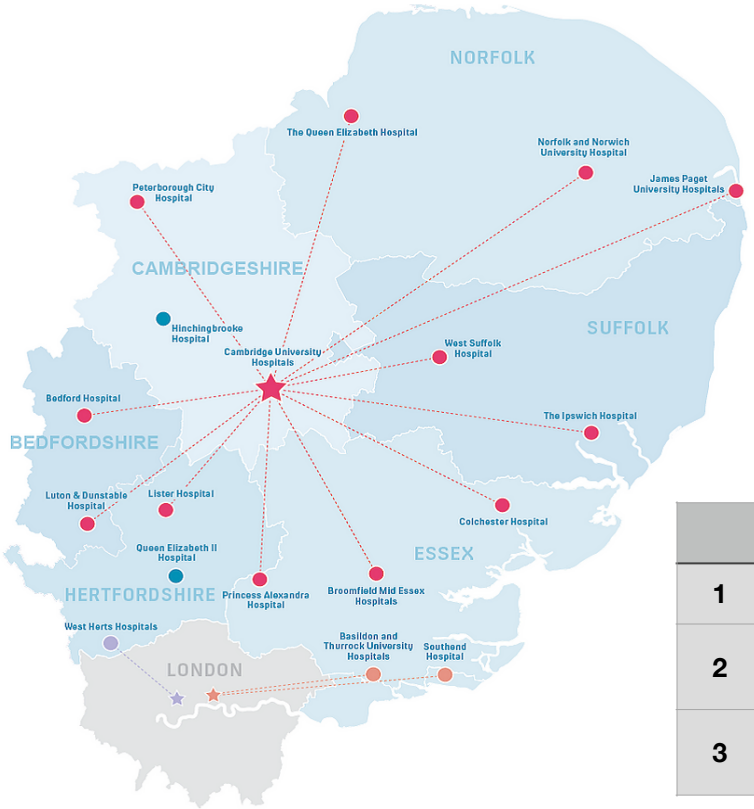
The Faculty of Pre-Hospital Care is an organisation within the Royal College of Surgeons of Edinburgh which works to advance the practice of pre-hospital emergency medicine in the UK. Each year, the Faculty runs a national elective programme for medical students which places them with a Helicopter Emergency Medical Service (HEMS). Due to stipulations from the Civil Aviation Authority, this is one of only a handful of opportunities for medical students to spend time on air ambulances in the UK. Applications open in September and students are selected through interviews with the Faculty's Student & Junior Trainee Group. Successful applicants are then placed with either The Air Ambulance Service in the midlands, or Essex & Herts Air Ambulance.

Essex & Herts Air Ambulance is a well-established HEMS service that provides pre-hospital critical care to the populations of Essex, Hertfordshire, Suffolk, Cambridgeshire, and Greater London. They operate on a doctor-paramedic model, providing level 3 critical care cover (see below) for the region's NHS ambulance service. They are dispatched by a critical care paramedic in the ambulance control room to the highest priority calls in one of three ways: immediate send, where the call is so serious it warrants an automatic dispatch (e.g. gunshot to the chest); interrogated, where the critical care paramedic assesses the call; and crew-request, where the on scene ambulance crew need additional skills and/or decision making of the doctor-led team. During daylight hours, two helicopters, an AW169 and an MD902, transport the teams anywhere within the two counties in 15 minutes. At night, there is one team which uses a Volvo XC90 T5. East Anglia is a large geographical area and the most seriously injured patients need to be flown to a major trauma centre (typically Addenbrooke's in Cambridge or the Royal London in Whitechapel, see below), hence EHAAT is one of 3 air ambulance services operating a total of 5 helicopters. This makes East Anglia one of the best-served regions for HEMS in the UK.



	Senior Clinician	Examples in Scope
1	Paramedic	ALS, IV morphine
2	Critical Care Paramedic	IV ketamine, midazolam thoracostomy
3	Senior Critical Care Doctor	General anaesthetic thoracotomy

I was lucky enough to join EHAAT for six weeks, by which point I'd really become integrated in the team. The clinical managers are the leads for the placement and are very welcoming; the level of support was excellent. During the time, they were able to organise plenty of shifts on both the night car and the daytime aircraft, from both of the two bases in Essex. Typically, there are at least two jobs per shift. Two shifts stood out as particularly busy and interesting.

A very hot day…

The day started with a “silver trauma” - an elderly woman who had fallen from standing onto her bed post and was thought to have broken her ribs. It was tempting to think this wasn’t really ‘serious’ enough for us, however, as a crew-request tasking, these are usually the jobs where we are required most. Indeed, at this job, two experienced paramedics had correctly diagnosed a flail chest and used the trauma tool to identify her as major trauma positive based on her oxygen levels and breathing rate. As a result, we took her by road to a London major trauma centre. Following handover, we were picked up in Kensington Gardens by our pilots. Time for ice cream, and then views of the royal parks and river Thames as we set off back to base.

The next tasking was to a car accident. A car had been stopped by the side of the road had been rammed by another at 75 mph. The driver of the stopped car had been inside and was not wearing a seatbelt, giving him sadly unsurvivable internal injuries. We found him in traumatic cardiac arrest and after following the HOT principles - a roadside blood transfusion, a tracheal breathing tube, and bilateral thoracostomies - we ceased resuscitation.

No time for rest; we were sent straight out to a woman who was in refractory status epilepticus despite benzodiazepines administered by the ambulance service. As the hospital was just around the corner, we decided to give additional drugs and then move quickly to definitive care. The final job was a man who was entrapped following a T-boning car accident, who was complaining of numbness and tingling in his back and legs. We were able to assist with safe extrication from the car and conveyed him to hospital.

… and an even hotter day

This shift started slowly, but quickly picked up. The first job was a road traffic accident with an entrapped hand. We circled overhead in the aircraft: a small truck had overturned and was surrounded by several fire engines and ambulances. This is a key advantage of the helicopters - we are able to get a good overall impression of the scene and the mechanism of the accident, before we even arrive and get a handover. As we approached, a fireman ran up to us (never a good sign - they are good at keeping calm) and said “he’s in cardiac arrest”. This was a shock as we had prepared for a patient who was well except for a hand injury. As before, we set about addressing the reversible causes. Because he had only just arrested, the team decided to proceed with a thoracotomy, a procedure in which the chest is opened using only normal ambulance scissors, to expose the heart, lungs and aorta and enable the control of bleeding and lifesaving repairs. However, he had lost a catastrophic amount of blood, and sadly died.

In some ways, we then encountered the opposite situation: a massive truck accident in which the original 999 call stated that the driver had died and was beyond help. We arrived to find a man who was fully awake but completely trapped within the lorry cab. Following two hours of work from the fire service, he was freed, and miraculously, had few injuries.

We finished with the single most common type of patient - an older person in medical cardiac arrest. Some HEMS services only attend trauma (e.g. London’s Air Ambulance), however, as the East of England has a fairly elderly population which is geographically spread out, and the ambulance service have no critical care paramedics on cars, this is a common job which we can offer important assistance with. I think I ended up seeing around 10 of these types of job. This

was incredibly valuable, as it is very rare that medical students get involved with or even see cardiac arrests in hospitals. Yet, as a first year doctor on call, you may be the most senior person, at least initially. These calls always get your heart racing, but at least the first time I have to lead a cardiac arrest won't be the first time I've ever even seen CPR!

Other placement activities

Six weeks was plenty of time to get in some good shifts. However, the majority of the time was not spent flying around (whether on blue lights or 500ft above the ground). Students are very involved in the training and development of the doctors and paramedics. We were regularly actors in moulage (practice scenarios), as the patient or the ambulance crew. Equally, it was expected we attend morbidity & mortality (M&M) meetings. Each week, the duty consultant reviews the most serious and interesting cases, and they are debriefed with the entire medical staff. I think these were the single most useful activity of the whole placement. It was the ideal learning experience: all the most complex cases, discussed in detail by 30+ experts in pre-hospital emergency medicine. Through these, I learnt about the management and difficulties with drowning, acute behavioural disturbance in children, hypothermia, stabbings, massive maxillofacial injuries, spinal injuries, industrial burns accidents, etc.

I also completed an audit of all the severe traumatic brain injury patients treated by EHAAT with an emergency anaesthetic since the start of the pandemic. Again, as for the M&M meetings, this multiplied my clinical exposure to very interesting and unwell patients (albeit second hand). I was expecting road traffic accidents to be a leading cause of these injuries, but was surprised when by the commonest cause was actually people falling down stairs and off ladders! Equally, I learnt the Cushing's response we are taught at medical school as a classic sign of raised intracranial pressure is actually *really* rare. I had a pre-existing interest in clinical neurosciences, and therefore am continuing to work on this project, which will hopefully lead to a conference presentation and/or publication.

I feel incredibly lucky to have been able to get such good 'on-shift' observership experience with the HEMS teams. Flying over the London Eye at 150 mph and assisting open-heart surgery on the roadside are certainly once-in-a-lifetime experiences, and definitely made it the the most fun elective out of everyone I spoke to! However, it was all the experiences that came with being warmly welcomed into such a high performing, well-governed team that probably made the elective for me. I have developed friendships and links that will last beyond the placement, and through the weekly M&M meetings, I was able to learn from all the most interesting and complex cases, increasing the experience from only those I'd seen on shift myself. EHAAT is driven by its governance and education focus, from registrars to students, and has many years' experience fine-tuning their elective. I can't recommend it enough to students interested in pre-hospital care (or, anyone who wants to go in a helicopter, really!).

Disadvantages

Like anything at medical school, the elective was what you made of it and you get out what you put in. For the first ten days, I had only one night observation shift and we saw a concussion - my housemates were confused why I was leaving before 8am and getting back after 7pm 5-6 days per week, when I wasn't even getting to go in a helicopter. The aircraft shifts are even earlier & longer: 6am start at the base in Earls Colne and a 6.30pm finish. Equally, my audit involved a lot

of database trawling. However, this effort was rewarded with lots of flying shifts later on in the placement (with the associated fantastic clinical experience), and a potential publication on a topic which will be relevant to my long term career plans in neuroscience/critical care. It is also a competitive selection process, typically with ~50 applicants for 2-3 places, and I wasn't sure I'd get it, even with experience working for an NHS ambulance service. If you are interested in applying for this elective, or another one in a similar area, please feel free to contact me!