

Anaesthesia for austere environments



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It is early morning in the field hospital where I have just started working as an Anaesthetist. My team and I are in the resuscitation tent making preparations for the day by performing routine drug and equipment checks. Suddenly, we hear a commotion outside and a man with his pregnant wife explodes into our tent.

The woman collapses onto a stretcher whilst the man is desperately shouting and gesticulating, making hostile gestures towards my male colleague. He speaks no English, but a translator hurriedly informs me that he is armed. It becomes apparent that he is making demands for us to ensure that his unborn child survives. He insists that no men are involved in his wife's care and wields a gun as I make a rapid initial assessment. The woman is shocked, suffering catastrophic antepartum haemorrhage requiring urgent resuscitation. Her husband remains agitated, is smoking opium, and refuses to consent for his son to be born by caesarean section.

Fortunately, I did not encounter this scenario for the first time in a conflict zone in Afghanistan or during the aftermath of a natural disaster. Rather, this was part of a series of realistic training scenarios conducted in a simulated field hospital set up on the outskirts of Bristol on a sunny weekend in July. It was specifically designed to target issues that may be encountered whilst delivering anaesthesia in 'austere environments' with limited resources. Some might argue that cantankerous surgeons occasionally have the ability to turn our NHS operating theatres into places that may be described as austere. However, until now unless we have experienced working in conflict or disaster zones, this has not classically been an area in which it is easy to gain experience or undergo specific training.

The need for a co-ordinated response

Following a haphazard and uncoordinated response amongst many international medical organisations and teams to the large-scale disaster in Haiti in 2010, a need for improved co-ordination, accountability and registration of foreign medical teams (FMTs) was recognised, along with a need to

promote implementation of – and adherence to – minimum standards and core principles amongst FMTs. The first guidance on classification and minimum standards for FMTs in sudden-onset disasters was published in November 2013 by the FMT Working Group under the World Health Organisation Global Health Cluster. This document serves as a tool to help improve co-ordination of the FMT response, support the registration of FMTs through a standardised classification system, encourage training and preparation of FMTs before deployment, and promote better standards of medical care.¹

The UKIETR Anaesthesia Training for Austere Environments (AAE) Course

The UK International Emergency Trauma Register (UKIETR) is hosted by UK-Med and funded by the Department for International Development (DfID). It assembles surgeons, anaesthetists, emergency physicians/nurses and other supporting medical, nursing and paramedical personnel to respond to large-scale emergencies overseas. UKIETR ensures that all its members are highly skilled and appropriately trained to meet international standards. When fully trained and experienced, members are available at 12-24 hours notice to be deployed overseas for 2-3 weeks in response to major international catastrophes. All members undertake compulsory pre-deployment training including specialty-specific training courses. This was the first of these specialty-specific courses in anaesthesia – 'Anaesthesia for Austere Environments' (AAE).

The Faculty comprised a hugely experienced team, which had worked in many countries worldwide for a variety of organisations including Médecins Sans Frontières (MSF), and The International Committee of the Red Cross (ICRC). The course was split between



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a simulation centre in Bristol and a scout camp where delegates camped and underwent under-canvas, scenario-based training in a simulated field hospital using the kit and equipment that would be supplied during a UKIETR deployment.

Tales from Tacloban

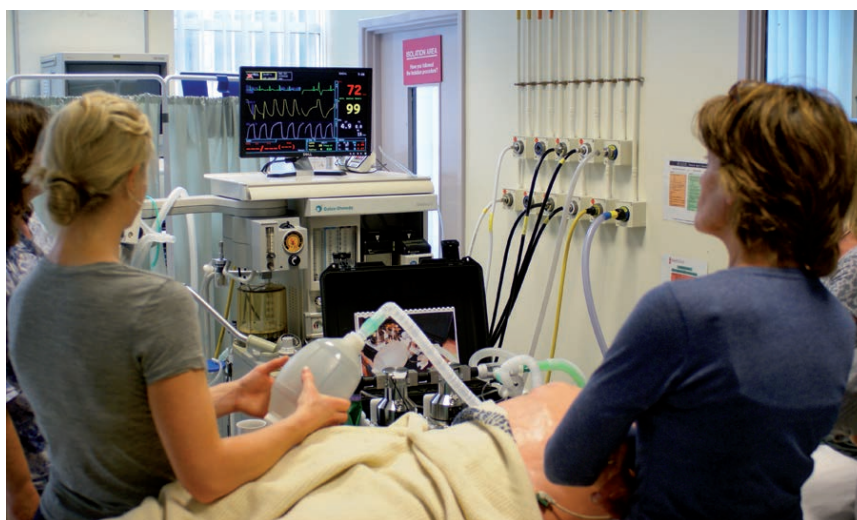
Our first day comprised a series of lectures and workshops. Consultant Anaesthetist Dr Andy Taylor kicked off by providing a fascinating account of his UKIETR deployment last year, highlighting the challenges of providing field anaesthesia in a disaster situation after Typhoon Haiyan. Andy and seven other UKIETR members joined forces with an Australian Medical Assistance Team working in Tacloban where they set up a field hospital and operated on over 100 casualties during a two-week period.

Practical skills

Throughout Day One, our learning was targeted on specific anaesthetic techniques and an introduction to new equipment. Whilst this was all familiar to those who have worked in austere environments, many of us had not seen or even heard of it before. Dr Jeanne Frossard gave a wonderful interactive lecture on the wide-ranging uses of ketamine and 'ketofol'. We soon learned that a great deal can be achieved surgically without administering general anaesthesia as we know it. However, in the event that this is unavoidable, we assembled simple draw-over anaesthesia circuits and learned of the benefits and foibles of oxygen concentrators. The following day the use of these machines was incorporated into a simulation exercise in the Bristol Simulation Suite, which allowed us to set-up, administer and monitor halothane draw-over anaesthesia (Figure 1).

Other skills-based stations included the management of difficult airways with limited resources, discussions surrounding managing paediatric and obstetric emergencies, and the use of a number of commercially available

Figure 1 Set-up and delivery of draw-over halothane anaesthesia using the Diamedica DPA 03 Portable anaesthetic machine in Bristol Simulation Suite



and improvised devices for vascular access. We had an opportunity to use bedside EldonCards to determine our blood groups, and considered how blood transfusion may be managed in a disaster situation. A pig carcass was used for chest drain insertion and two models kindly volunteered for the purposes of FAST scanning and a practical session involving administering regional anaesthesia in a field setting. Whilst the potential benefits in this setting are obvious, this session was particularly useful and has certainly made me consider the value of mastering a handful of nerve blocks that we may not necessarily routinely use in an NHS setting. In a situation where complications would have severe repercussions, certain regional blocks become more or less attractive. In an era where ultrasound is so freely available and actively encouraged, the importance of feeling comfortable performing blocks with and without ultrasound guidance was highlighted.

At the end of a packed first day we were fortunate to be joined by Mr David Nott, who provided a surgical perspective on his extensive work globally with MSF and the ICRC.

Field hospital

At mid-day on Day Two we moved to a scout camp on the outskirts of Bristol where team members from the charity Save the Children had been

very busy setting up a field hospital. A tour of the field hospital allowed us to see how the tents were carefully laid out. We then split into teams to erect a complete operating theatre, recovery and resuscitation room. My team focused on assembling the operating theatre, and the sense of working in the field setting was wholly brought to life by this exercise (Figure 2). Whilst it rained outside, the tents soon got very warm as everyone worked together to achieve a common goal. After a few minor assembly glitches, we had a functional theatre complete with an operating table, electricity, an oxygen concentrator, draw-over anaesthetic machine, suction, drip stands, operating lights, diathermy and consumables.

Scenario training

Soon enough our first patients were arriving into Resus and being transferred to theatre. What followed was a series of extremely realistic scenarios that were run in teams assembled from the skill mix available (Figure 3). This included ED doctors, ODPs, anaesthetists, paramedics, logisticians and an acting surgeon. Together we delivered safe anaesthesia to trauma, obstetric and paediatric emergency casualties (Laerdal SimMan 3G patient simulators) using the equipment and skills that we had been taught. We learnt how to manoeuvre patients onto the canvas operating

table and work as part of a very newly-constructed team. At times we were forced to make uncomfortable decisions and subjected to pressure from stressed surgical colleagues, testing our non-technical skills.

One of the most striking issues, aside from the obvious medical challenges, was the difficulty encountered with the cultural differences of our simulated patients, and the complexities of constantly working via a translator. Other problems included patients and their families refusing to be treated by members of the opposite sex, difficulties surrounding obtaining consent for surgical procedures, and the security threat posed by armed or aggressive casualties. Many of the ethical dilemmas were addressed in two designated discussion workshops on ethics, which I found very useful and which raised a number of pertinent and complex issues.

The faculty hosted a BBQ in the evening, and everyone had a chance to relax and get to know one another. One of the great things about a course such as this is the fantastic mix of enthusiastic, pro-active and like-minded people that it attracts. The final action-packed day incorporated further simulations, tropical medicine, trauma and neonatal resuscitation. As we dismantled the field hospital, I felt that I had learned a huge amount over the course of three days. Some of it was just as relevant to my NHS practice as to more resource-restricted situations. I had also met some like-minded associates with a common drive to work in some very uncomfortable environments overseas. Importantly, I felt a great deal more prepared for the next time I am required to treat a haemorrhaging mother in a hostile field hospital situation.

Acknowledgements

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Photograph credits: Robert Neighbour.

Figure 2 The anaesthetic team working together to assemble the operating theatre on arrival at the field hospital on Day Two of the AAE course

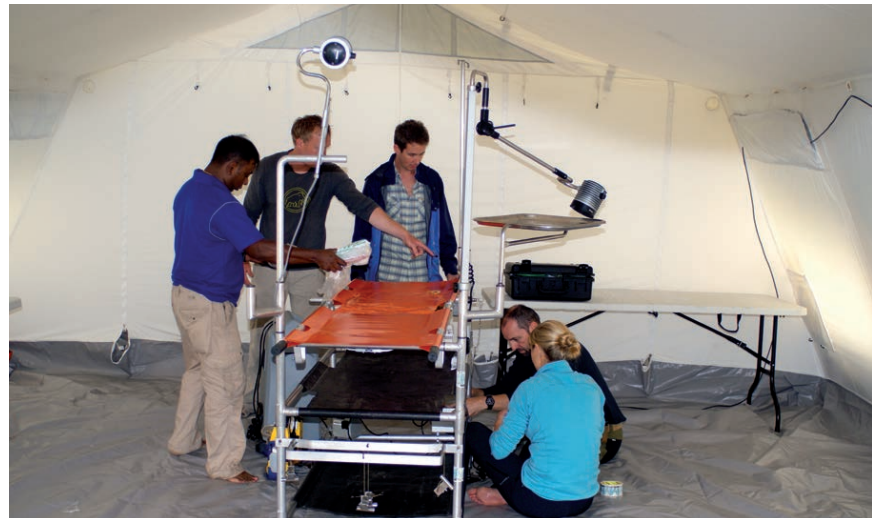
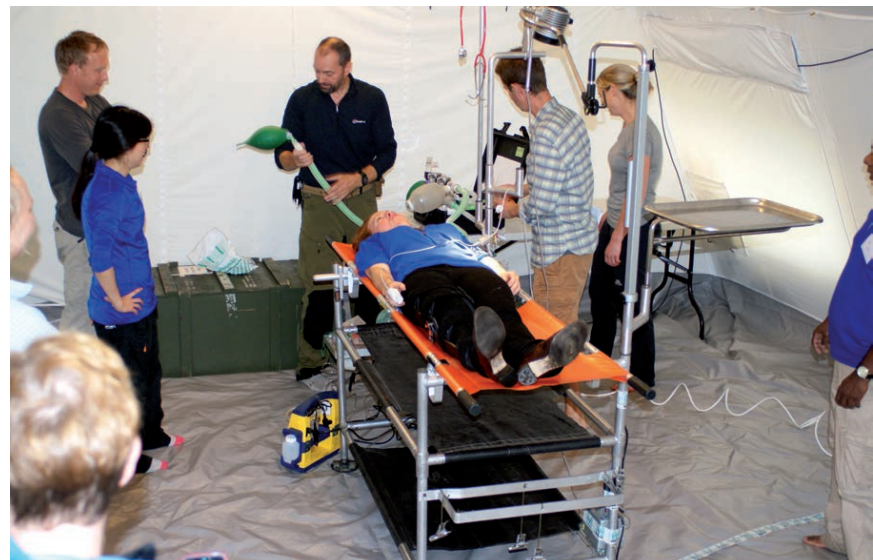


Figure 3 High fidelity scenario training conducted in the field hospital during the latter part of the course



Reference

- 1 Classification and minimum standards for foreign medical teams in sudden onset disasters, *WHO Health Cluster*, 2013.