

## POINT-OF-CARE ULTRASOUND – AN ESSENTIAL TOOL FOR EMERGENCY MEDICINE

Point-of-care ultrasound systems are now a ubiquitous sight in UK hospitals, with applications across virtually every discipline from anaesthesia to palliative care. Despite this, training in ultrasound use occurs on an ad hoc basis in many specialties, and is not a component of the formal curriculum for general medical students. Dr Rip Gangahar, Trauma Lead for the Pennine Acute Hospitals NHS Trust and Chair of the International Federation for Emergency Medicine Ultrasound Group, discusses the past, present and future of ultrasound training for emergency medicine.

I first became interested in ultrasound around 10 years ago by pure chance, after seeing an advertisement for a PgC in focused ultrasound. At the time, very few people were using ultrasound in emergency medicine – I don't remember a single department locally having an instrument while I was training – and so I had no real expectations going into the course. As soon as I started my training, the possibilities became obvious, and I was immediately converted. I started to work closely with the Radiology Department at The Royal Oldham Hospital to practice the skill I had learned, spending two half days each week scanning patients under the supervision of a Consultant Radiologist. The more I did, the more I wanted to learn.

I was using one of the Radiology Department's cart-based systems for these elective scans, but the cost and sheer size of this system made it impractical in an emergency setting. We managed to secure funding for four SonoSite TITAN® instruments, one for each emergency department within the Trust, and began to incorporate ultrasound scans into our daily practice. Those compact, robust and highly portable systems soon gained favour, and it just snowballed from there. We have been lucky enough to update our ultrasound equipment as the SonoSite range has grown, and the improvements in both the image quality and ease-of-use have come on markedly over that time.

Since its initial adoption, point-of-care ultrasound has found a wide range of uses in the emergency setting, and can offer huge

potential time savings by helping to rule in or rule out conditions much earlier. The flexibility and advanced scanning capabilities of SonoSite's latest instrument – the X-Porte – have probably been the biggest leap, making the stethoscope virtually obsolete for competent users; although I still carry mine, I find myself using it less and less and reaching for the transducer at every opportunity. Beyond the obvious applications of FAST scanning and vascular access, ultrasound has a role to play in many other patient pathways, including aortic scanning, echocardiograms for cardiac arrest, gall stones and even initial assessment of fractures in children.

As a result of the rapid expansion in ultrasound use, there has been an increasing need for properly structured user training and certification. Ultrasound is a powerful diagnostic tool, which can be used to inform a wide variety of clinical decisions, but it can also be dangerous if misinterpreted. Within my Trust we have introduced stringent guidelines about when and where to use ultrasound imaging to direct clinical actions; only ultrasound trained and certified clinicians can base their diagnosis on the results of an unsupervised scan. If appropriate supervision is not available, for example if a patient presents with a suspected aneurysm at 3 o'clock in the morning, then trainees can still perform the scans, but they can only rule in what the clinical presentation and pathology are indicating, not rule something out. This ensures patient safety, while still giving junior doctors access to this invaluable tool.



### Dr Rip Gangahar

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Suitable, rigorous training in ultrasound for emergency medicine is vital to ensuring patients are not put at risk unnecessarily and, within the Trust, we provide a high degree of mentoring and supervision for both novice users and more experienced trainees. We try to incorporate ultrasound into our day-to-day emergency medicine practice for users of all levels of experience, but a busy department dealing with very sick patients is not necessarily the most appropriate setting to practice your ultrasound skills. To overcome this, we run a dedicated, four hour ultrasound teaching session each week, supported by the Trust management; they recognise both the patient benefits and the cost savings ultrasound brings.

On a national level, ultrasound is now a compulsory element of a consultant's accreditation by the College of Emergency Medicine (CEM). Although we are a little late in implementing this – it has been part of general surgical training in Germany for almost 20 years – we now have very clear guidelines on the levels of training expected. The basic skills required by the College for Level 1 certification include vascular access, aortic scanning, FAST (focussed assessment with sonography in trauma) and ELS (echocardiography in life support).

Rather than stipulate a minimum number of scans or hours of training before assessment, the CEM operates a 'triggered assessment' system, where the trainees request assessment when they feel comfortable with the techniques. Despite this, there is still a high failure rate, so the College runs a number of 'Ultrasound Finishing Schools' each year to help candidates prepare for the assessment, as well as to provide suitable certification pathway for clinicians from trusts without local provision for training and assessment. These finishing schools provide trainees with the opportunity to revise the skills they learned during their initial course, helping to address any weakness they may have and fill in gaps in their experience prior to an assessment on the final day. There is still no

guarantee they'll pass though as, at the end of the day, they must fully understand when and where it is safe and appropriate to use ultrasound, and be able to accurately interpret what they see.

There is also a real drive towards incorporating ultrasound into the general medical curriculum at a much earlier stage, as it is an increasingly valuable skill across all disciplines – from anaesthesia and critical care to gynaecology and rheumatology – and gives medical students a much better understanding of cross-sectional anatomy. Although there is still resistance to this from some – a large proportion of physicians in the UK do not use ultrasound even for vascular access, and so many do not recognise the obvious benefits – it will happen sooner or later, as the junior doctors now entering the profession are far more technologically minded, and most are keen to use ultrasound. This is a generation that has grown up with mobile phones and tablet computers, making the newer touchscreen instruments – such as the X-Porte – very intuitive for them to use. Within our Trust, we always try to ensure that medical students learn at least guided vascular access during their time within the Emergency Department, as this is usually enough to get them excited about the true potential of ultrasound.

The rate at which the switch from the stethoscope to ultrasound can be achieved will largely depend on the support of ultrasound equipment manufacturers, and SonoSite has always led the field in this regard. All of the courses I have run over the last eight years, every single one of them, could only happen because of the support and equipment SonoSite has been able to provide. In terms of pushing ultrasound education forward, I don't think that any other company has done as much. This means more than anything else, as there is no point having a nice ultrasound machine and nobody coming through the system that knows how to use it.



Dr Rip Gangahar using SonoSite's latest ultrasound system – the X-Porte



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