# Driving improvement in vascular access

In this article, Vygon UK clinical educators **David Wynne** and **Ian Tydeman**, together with paediatric surgery registrar and vascular access trainer **Sean O'Donnell**, share practical tips, common pitfalls, and a roadmap for embedding ultrasound-guided vascular access (UGVA) as standard practice – empowering Trusts to deliver safer, kinder care more efficiently.

Ultrasound-guided vascular access (UGVA) is reshaping cannulation and line placement across the NHS. From reducing pain for patients with difficult intravenous access (DIVA) to improving first-pass success and saving valuable clinician time, the case for UGVA is compelling. Yet adoption remains inconsistent, often limited by training opportunities and access to suitable devices.

For patients with difficult intravenous access (DIVA), the experience of repeated needle attempts can be distressing, painful, and, ultimately, harmful to their vascular health. Whether paediatric, geriatric, or patients with chronic illness, these cases frequently present with fragile or poorly visible veins, previous cannulation trauma, or scarring. Traditional 'blind' insertion relies on palpation and visual cues, which often leads to multiple failed attempts in some NHS settings.

According to Vygon's David Wynne, blind insertion depends on a myriad of intrinsic and extrinsic factors, and DIVA patients are not always heard when they voice past difficulties. Clinically, repeated attempts can delay therapy initiation, consume staff time and increase consumable use.

Worryingly, the impact on these individuals extends far beyond physical discomfort and inefficient practice. Multiple failed attempts can lead to extended hospital stays, erosion of trust between patient and healthcare teams, and in paediatric cases, the development of needle phobia in children who were not initially fearful of procedures. For older patients facing repeated cannulation attempts, the psychological toll adds another layer of difficulty to what may be a distressing hospital experience.

"A DIVA patient isn't usually needle phobic," says David, "but becomes phobic due to repeated needle attempts."

For clinicians too, the emotional impact of repeated failures should not be underestimated.

David explains: "Confidence is hard won and easily lost. Some clinicians take failure personally. No healthcare professional likes to hurt their patient, and any failed attempt usually involves some discomfort. This can feel counter-intuitive to a caring clinician."

## Why ultrasound guidance? Shining a light on the vessel

Ultrasound brings real-time visualisation to the bedside, replacing guesswork with imaging and transforming cannulation into a precise, controlled procedure. It enables:

- **Accurate vessel selection:** Identifying size, depth, course, and surrounding structures.
- **Real-time needle tracking:** Continuous guidance to enter and stay within the lumen.
- **Broader options:** Access to vessels not palpable or visible, expanding device suitability (from short cannulas to midlines and PICCs where appropriate).

For clinicians first using ultrasound guidance, the initial challenge is often rooted in coordination and trust. Ian Tydeman describes the experience: "I struggled to translate what I saw on the screen to what my hands were doing with the needle and ultrasound probe. It is instinctive to look at the needle and the site when inserting a needle into a patient's vessel. But when using ultrasound, the visual feedback is on a screen."

David also notes that clinicians can battle with logistics in the early stages of adoption. "For those new to UGVA, mastering the hand-eye coordination is often the steepest learning curve, and trusting what you can see on screen comes with experience," he explains. "It's necessary to practise aligning probe orientation, needle angle, and image interpretation; and to use a consistent approach (short or longaxis methods), keeping the needle visualised from skin entry to tip placement.

"With good training and practice, initial hurdles can be overcome, leading to significantly improved outcomes."

David describes the benefits simply: "Why poke around in the dark, when you can shine ▶

a torch? This is especially true of ultrasound-guided vascular access."

## Best practice UGVA: techniques that protect vessels and elevate success

With experience supporting hundreds of clinicians across NHS Trusts nationwide on UGVA, Vygon's clinical education team endorses thorough preparation and technique as critical to success. In fact, best practice UGVA starts before the probe touches the skin. Key steps include:

- **Patient preparation** should address positioning, comfort, explanation, and anxiety reduction.
- **Equipment readiness** is paramount. Ensure the ultrasound device is fully charged and configured, select the correct probe, set depth and gain, and have sterile gel, probe covers, and fixation materials ready.
- **Identify vessels and structures**, and advance the needle with continuous ultrasound guidance.
- **Maintain ANTT** (Aseptic Non-Touch Technique) throughout. Protecting vessel health is inseparable from protecting patients from infection.
- **Appropriate device selection.** Consider midlines or PICC where dwell time, therapy type, and vessel characteristics warrant. The right device reduces repeated punctures, bruising, and early failure, protecting limited venous capital.

Crucial, in the experience of DIVA trainer, Sean O'Donnell, is the consideration of human factors and effective, patient-centred communication when it comes to UGVA. "Patients are reassured by confident, competent clinicians. Seeing their veins on a machine allows discussion of the challenge and a solution."

Ian agrees: "UGVA succeeds in calm, well-prepared environments, and DIVA patients benefit when teams move beyond 'just another cannula'.

"Good practice involves explaining the plan, showing patients and carers the ultrasound image where appropriate, and narrating the steps you will take. Confidence, empathy, and clear communication help reduce anxiety and build trust."

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>
> David Wynne, clinical educator

For DIVA patients particularly, UGVA can be transformational, offering:

- **Fewer punctures and less pain** through real-time guidance.
- **Timely intervention**: Faster time to a guaranteed cannulation, meaning earlier therapy and fewer delays.
- **Better experience**: Reduces needle-related anxiety and the psychological burden of repeated failures.

"Patient outcomes will be improved by zero delays in treatment and timely intervention, which ultimately means less time in hospital, and that's a system-wide win," says David.

"DIVA patients aren't always listened to when they explain their particular challenges to a clinician. Many patient pathways involve some form of IV therapy. Without reliable access, the DIVA patient receives suboptimal therapy, usually over a longer time period."

## Benefits to the NHS: success, speed and sustainability

It has been demonstrated that embedding UGVA delivers measurable system benefits:

- Higher first-pass success reduces consumables and frees staff time.
- Shorter procedure duration streamlines workflows and reduces bottlenecks.
- Fewer complications and re-attempts lower cost and bed-day utilisation.

"Increasing first attempt cannulation and phlebotomy saves time and resources, as less consumables are used, and less clinical time is required," says David. "This reduces length of stay and gets patients home quicker, so the efficiency gains to the NHS are significant."

Sean also notes that robust cannulation skills limit escalation to theatres and avoid sedation risks and resource-intensive workflow, which is particularly salient in paediatrics. Yet, despite its benefits, UGVA is not universal. Three recurring barriers emerge:

1. **Training access**
   Resident doctors, advanced practitioners, and outreach teams frequently report limited hands-on UGVA training. David notes: "Without routine exposure and mentorship, confidence lags. It should be a skill every trained clinician has, to support vessel health and preservation. That's why we need to expand adoption as a priority."

2. **Equipment availability and funding**
   Cost and procurement delays limit ultrasound availability at the point of care. For NHS Trusts considering how to improve vascular access outcomes, the investment represents not just a clinical imperative but also a financial opportunity. As Ian puts it: "Cost is always a barrier in the NHS, and you can't practise without access to an ultrasound machine. Without practice, confidence stalls."

3. **Local variation and pathway inconsistency**
   Some Trusts have mature vascular access

teams and clear escalation pathways, others rely on *ad hoc* individual expertise. Standardising UGVA as the default for DIVA, paediatrics and geriatrics would help align practice with outcomes.

Ian believes that when it comes to training, gaps exist particularly among advanced nurse practitioners, medical staff, and outreach teams. While resident doctors and advanced practitioners are often the clinicians receiving DIVA referrals, "these may be 'clinically' senior, but they are not always 'practically' senior."

## Selecting a UGVA device

When assessing UGVA technology, clinical teams need to prioritise:

- **Image clarity and optimisation**: Depth, gain, optimal probe availability and speckle reduction functions that reveal small, shallow paediatric vessels, as well as deeper adult veins.
- **Portability and connectivity**: Devices that move with clinicians – from ward to ED to community - and will integrate with current workflows.
- **Ease of use and durability**: Ergonomics, interface simplicity, and reliable power management matter in busy clinical settings.

"Clarity, functions such as depth and gain, and portability are important," comments Ian. "We train teams using Vygon's hand-held Vysion ANDY, which has received positive feedback for its compact form factor, clarity, and usability. It can also support access to UGVA beyond specialist areas.

"Of course, there are other options on the market. The product doesn't need to be complex to use, with all manner of bells and whistles; it just needs to be fit for purpose."

As clinical educators, David and Ian are tasked with building capability within teams, via practical on-site training, alongside remote and on-demand workshops.

David explains: "Training, hands-on practice and support, plus regional networking, helps clinicians build the skills required. There has to be access to workshops, simulation models, supervised clinical sessions, and cross-disciplinary faculty (nursing, anaesthetics, emergency, and paediatrics) to accelerate skills and improve team communication."

## Building skills and confidence in UGVA

Addressing the gulf in training requires a multifaceted approach. Sean O'Donnell runs specialist Difficult Vascular Access in Children (DVAC) courses and has trained over 200 clinicians across 11 courses since launching his own programme three years ago, when he was fed up of children getting the raw end of the deal from lack of clinician ability to gain appropriate IV access. David and Ian from Vygon's vascular access education team have joined the sessions, which prioritise real-world skills: ultrasound needle control, device selection, soft-skills communication, and team-based problem solving. Accredited by the Royal College of Paediatrics and Child Health for CPD, ▶

a training objective is to mirror the complexities of ward cannulation and central access decision-making and trouble-shooting. Sean's experience highlights the appetite for proper training and the impact it can have.

"Taking bloods and gaining vascular access in children and babies are daily occurrences that require skill, practice and counselling for the patient and parents," he says.

"The ultimate aim is to alleviate stress with sound decision-making, longer lasting lines, and an improved patient and clinician experience. Effective training means less trauma and safer care, and there is a worrying lack of formal training."

Key to this, says Sean, is bringing together clinicians from different backgrounds and experience levels, creating a collaborative learning environment where paediatricians, anaesthetists, surgeons, and advanced care professionals can share knowledge and techniques.

Each discipline brings different expertise - whether it's ultrasound proficiency, cannulation skills or experience in managing distressed families. This diversity means the knowledge doesn't stop in the classroom. It spreads across departments and back into frontline practice.

"Every successful first attempt is a win for the child, the family and the clinical team. That's what drives me, and why training matters."

## Universal UGVA as the gold standard

The consensus is clear: UGVA should be available to all patient groups – DIVA, paediatrics, geriatrics, and those with complex venous histories, such as intravenous drug users. Making this a reality requires:

- **Clear local policy to default to UGVA for DIVA and high-risk cohorts:** define escalation steps and device selection criteria.
- **Protected training time:** Build ultrasound skills into induction, rotation curricula, and competency frameworks; support mentorship and supervised lists.
- **Accessible equipment:** Ensure portable devices are available on wards, ED, ICU and community services; rationalise procurement to match demand.
- **Vessel preservation mindset:** Reduce unnecessary punctures and early failure; choose devices based on dwell time, therapy and vessel status.

Ian observes: "Some UK regions are further along than others. I've experienced pockets of excellence where vascular access teams are established, and best practice is visible. The next step is consistent, system-wide adoption, so every patient experiences the benefits routinely, rather than by exception. We have a long way to go to make this a reality."

## A commitment to education and innovation

Vygon continues to support Trusts with clinical education, offering access to technology that fits frontline realities. Through Campus Vygon, clinicians can access resources, webinars and courses focused on best practice, vessel preservation, and ultrasoundguided techniques – helping to bridge training gaps and accelerate confident adoption.

David concludes: "Ultrasound guidance is more than a technique; it represents a best-practice standard for vascular access – one that delivers less pain, faster treatment, higher success rates, and greater efficiency for the NHS. With practical training, accessible devices, and clear pathways, Trusts can make UGVA the norm. Doing so will protect vessels, improve patient experience, and free clinicians to focus on the most vital part of their work, which is delivering high-quality care." **CSJ**

**SCAN ME**

For more information on courses on Difficult Vascular Access in Children, please scan the QR code.

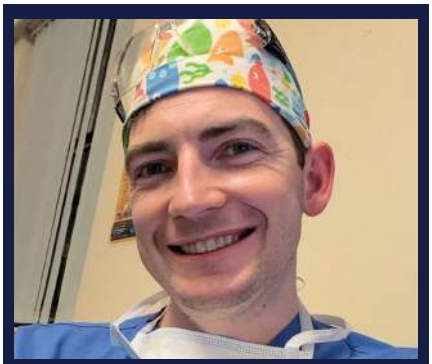
## Ian Tydeman

Ian is a Clinical Nurse Specialist at Vygon UK within the vascular management team and has over two decades of frontline experience within the NHS including a background in critical care, vascular access, and OPAT services.

Ian is passionate about developing education and best practice to NHS teams and helping to join the dots between Trusts and share best practice nationwide.

## David Wynne

David is a Clinical Nurse Specialist at Vygon UK, who also works within the vascular management team. During his two decades of hands-on experience in nursing and vascular accesses within the NHS, he also established and led a specialist vascular access service at Wirral University Teaching Hospitals. His passion lies in education and delivering services that address healthcare challenges and improve patient care.



## Sean O'Donnell

Sean is a paediatric surgery registrar, currently practicing at Leeds General Infirmary, with a passion for improving vascular access experience in children using newer techniques, lines, and equipment.

Sean is also a founding member of the Difficult Vascular Access in Children course that helps to train clinicians on practical IV skills for paediatric care.