



The 6th NIVAS Conference  
Adapt, Develop, Evolve: Striving for Excellence  
in Infusion Therapy and Vascular Access

Wednesday 21 and Thursday 22 June 2017  
Birmingham Conference and Events Centre (BCEC)

## The 6th NIVAS Conference: Striving for Excellence in Infusion Therapy and Vascular Access

The NIVAS Chair, Jackie Nicholson, opened the first Birmingham NIVAS Conference with a warm welcome and a sincere thank you to the conference's main sponsor, Boehringer Ingelheim. At this year's conference, emphasis was placed upon adapting, developing and evolving to overcome challenges in delivering safe vascular therapy throughout professional environments. This was reflected in the unveiling of the updated NIVAS website (<http://nivas.org.uk/>) and the encouragement of healthcare professionals (HCPs) to tweet information (using the hashtag #NIVAS2017) on the stimulating presentations, major study updates, case studies, latest guidance updates and interactive workshops that were organised.

### Vascular access — a military perspective

Captain Michael Collins provided a humorous presentation on vascular access from a military perspective. Setting the scene, he asked HCPs to imagine they were in the sweltering and unsterile desert of an active military combat zone, where the nearest help was 24 hours away. HCPs were requested to think about the limitations, such as inadequate resources, for providing the patient with effective treatment. From his perspective, teamwork, communication, preparation and empowerment are key drivers to success in delivering safe vascular access in such an environment. Knowing colleagues' strengths and weakness, as well as one's own, simplifies communication during emergency patient procedures. He elaborated further by mentioning that training opportunities should be readily available to team members so they are prepared and empowered to use new or updated guidelines and devices. By regularly rotating roles within a group, team members will remain appropriately skilled and alert in all emergency situations. Finally, a key practice is remembering to engage and reassure patients during all steps of the work flow so that they remain calm. Although vascular access in a military context requires a different thought-process to vascular access in a civilian setting, HCPs could translate the crucial considerations, including logistics, skill set into their current location, which can directly impact on their own practice.

### Industry sponsored satellite – Bard

#### Setting up a peripherally inserted central catheter (PICC) service with electrocardiogram (ECG) technology to improve patient outcomes

*Getting Sherlock 3CG® into hospitals – our experience*

Steve Heath and Nick Harrison presented a report on the incorporation of Sherlock 3CG®, a tip confirmation system, into their PICC insertion routine. Before using Sherlock 3CG®, Steve and Nick report that PICC malposition was common at their Trust, increasing patient anxiety, endangering patient safety and wasting hospital resources. A small poem, written by the presenters, echoed the sentiment of many in the room:

“Lords of the PICC, listen to my plea: guide this wretched tip, into the SVC (superior vena cava).”

To fund Sherlock 3CG® technology, Steve and Nick compiled detailed, compelling arguments into a business case and presented it, with support from stakeholders, to the 'Health Tree Foundation', a department that manages and distributes National Health Service (NHS) Foundation Trust Charitable Funds for Northern Lincolnshire and Goole. Although it is still in the early stages of use at the Trust, HCPs view Sherlock 3CG® as an invaluable tool that they have learnt to trust. However, this technology still requires the operator to quickly analyse the situation and find solutions as to why a PICC is not travelling in the right direction.

*Vascular access: how we set up a service using Sherlock 3CG®*

Jodie Johnson and Ami Ryder-Leese provided a brilliant presentation on the set up of Sherlock® 3CG technology at The Princess Alexandra Hospital NHS Trust in Essex. The Trust was previously using a Site-Rite® 5 ultrasound system for guided PICC insertion when a local charity contacted the Oncology department offering to donate £20,000. After discussions were held, the Trust was persuaded to use the donation to purchase the Sherlock 3CG® technology. Implementation of the system removed the need for X-ray confirmation to confirm tip location, which was replaced by ECG; being able to measure the vein size relative to the PICC helped to ensure that the risk of thrombosis was lowered. Jodie and Ami are currently developing a Sherlock 3CG® information leaflet, as well as providing regular monthly PICC placement teaching sessions incorporating the new technology.

## **Infection and blocked catheters – challenges for the intravenous (IV) team**

In vascular access devices (VADs), infection is a common complication and therefore recognising the signs are crucial. In this context, Donald Dobie presented the microbiologist's perspective of vascular access. He recommended that if an infection is present, HCPs should practice 'source control' (removal of the line), followed by specific antibiotic therapy to stop the infection from spreading. Incorporating volunteers from the audience, Donald demonstrated how biofilm covers bacteria creating a sessile and sticky state making them more resistant to anti-bacterial action. Biofilm can be implicated in the formation of a fibrin tail at the end of a central line that can be disrupted when blood is drawn, releasing bacteria into the bloodstream. Removing devices that are highly associated with bacteraemias, such as central venous catheters (CVCs), standardising approaches to line care and infusion preparation, good hand hygiene, and involving a dedicated IV team working 7 days a week are methods to help reduce these infections.

## **Update on Aseptic Non Touch Technique (ANTT)**

In his presentation, Stephen Rowley promoted the use of ANTT, a classification of aseptic technique with a unique theory and practice framework, by reflecting back on a negative experience he had as a vascular access patient. ANTT is intended to provide a common practice framework and language to enable safe decision making about aseptic technique and reduce patient harm. ANTT can be used in a range of scenarios, from brain surgery to putting on a plaster. International observations of vascular access environments provided common themes of surprisingly poor IV maintenance skills, a lack of regard for basic infection prevention and poor equipment procurement. In addition, multiple guidelines and definitions of aseptic technique means ambiguity can creep in, undermining patient safety. ANTT is intended to be a framework and foundation upon which aseptic technique can be improved; however, in order for ANTT to be fully adopted, practitioners will have to continue educating HCPs at local levels.

## **Vascular access on the road**

The attitudes of paramedics to vascular access have changed over the last few years. Rhiannon Roderick shared with attendees her experiences on the road. Paramedics are now required to have a university education that contains modules on paramedic skills, as well as undergo supervised placements in an operating theatre, the accident and emergency service and in an ambulance. When considering vascular access, Rhiannon noted that she has several considerations in mind, including what can be achieved, the mechanism of injury, extraction time and travel distance to a site of definitive care. Any delay in vascular access must be justified. Rhiannon then revealed several inspiring and difficult vascular access cases including: a patient who was cannulated at a foam party, a car accident that resulted in a long patient extraction time, and several experiences in an area of social deprivation. She emphasised that preparation and a constant forward-thinking approach are key to the patient's care, given that the back of an ambulance is a small environment and access to life-saving tools can be blocked.

## **Industry sponsored satellite – Boehringer Ingelheim**

### **Implementing and utilising Actilyse® Cathflo® to maintain CVC IV catheter patency: product review, points for practice and a case study review**

#### *Maintaining IV catheter patency*

Maya Guerrero spoke about patients with challenging CVC care. Thrombus, due to blood blocking the catheter lumen, can occur as a result of poor IV care, inadequate catheter flushing, or even the patient coughing. Pulsatile flushing of a catheter regularly with saline is the most effective way to avoid partial or total occlusion; however, if it does occur, there are several steps that can be taken to attempt to unblock it. The first method is to remove the needle-free connector and instigate a pulsatile flush 10 ml of saline into the catheter. An alternate method is to use the 'three-way tap' technique in combination with Actilyse® Cathflo®, a well-tolerated, easy to use medication that has been demonstrated as a success in unblocking catheters. In Cardiovascular thrombolytic to Open Occluded Lines (COOL)-2, an open-label study of 995 patients with dysfunctional CVCs, one dose of Actilyse® Cathflo® restored function in 52% (516 of 991) of catheters after 30 minutes and 77% (747/976) of catheters after 2 hours. Overall, 91% of patients had functional resolution of CVCs obstructed for less than 24 hours. There were no cases of death, major bleeding episodes or embolic events attributable to treatment found. Time since occlusion has an impact on whether a line can be unblocked, therefore good protocols for line maintenance should be in place so that any blockages can be caught early.

#### *Catheter occlusion protocols*

Andrew Barton shared his evidence-based, IV catheter occlusion protocol that had been developed to help unit nurses troubleshoot IV catheter related complications. He found that the protocol improved practices within his Trust, and he advised HCPs to also establish and share protocols by identifying areas of poor vascular access practice in their own Trusts.

### **Adapt, develop, evolve – my experience – an interview with Andrew Jackson, Nurse Consultant and Director, IVTEAM Ltd.**

Andrew Jackson by Gemma Oliver

Although Andrew Jackson was the first Nurse Consultant in IV Therapy in the UK, this was not a role that he particularly sought out. By focussing on vascular access and infusion therapy in his organisation he highlighted a need for this type of role. He was then approached to take on the job of a Nurse Consultant. Over the last 20 years, he has set out to educate clinicians and provide high standards of care for patients in order to improve vascular access in hospitals. Since his early days as a Nurse Specialist in IV therapy, he has sought to make a difference in patients' lives and have a positive impact in his field. While he was a Nurse Specialist, he travelled around to various hospitals and identified a re-occurring problem within the vascular access field: phlebitis. After reaching a senior position, he worked on developing a simple and effective method clinicians could use to combat this issue. While in the shower, he had an 'eureka moment' for the Visual Infusion Phlebitis (VIP) score, a popular tool for monitoring infusion sites which due to its simplicity, has been adopted internationally. Andrew has been credited with coming up with the phrase 'shoe leather surveillance', a preventative measure to reduce infection rates that involves 'eyeballing' patients who have long-term VADs; however, he says that the term was coined by a microbiologist who sat next to him at an infection control conference. In 1999, Andrew started his website, IVTeam.com, which provides knowledge and research in vascular access; however, the website initially failed to gain support due to technology limitations. Andrew persisted, and today, IVteam.com has over 5,500 members. In his Trust, Andrew has set up a dedicated vascular access team and keeps them motivated by rotating their roles on a regular basis. He sees the next two big steps forward in IV therapy as less vascular access and more job diversification.

### **Royal College of Nursing (RCN) guidelines and practice 2016**

Jackie Nicholson reviewed the updated RCN guidelines. Tribute was paid to the authors of the previous guidelines and the contribution from a broader set of authors in the new guidelines was highlighted. These included specialists in surgery, anaesthetics and infection prevention as well as vascular access HCPs and the RCN. A particular feature of the new guidelines are appendices that set out information on developing services with sample business cases. NIVAS members were provided with a complimentary copy of the new guidelines.

## Case study presentations

Three case studies were discussed this year by Tim Jackson, Steve Hill and Matt Jones. These cases included an overview of key solutions to treating challenging vascular access patients, such as collaboration, thinking outside the box and not making assumptions. Cases presented included: alternative thinking for patients with difficult vascular access; placement of a central line when anatomy is not 'textbook'; and alternative access routes for patients where the normal vascular options were unavailable. This interactive session was informative and entertaining for HCPs at all levels of their training.

## Industry sponsored satellite – Syner-Med (PP) Ltd

### Standardising the approach to persistent withdrawal occlusion

Lisa Dougherty and Steve Hill reviewed the background and solutions to occluded lines.

#### *Syner-Kinase® (urokinase) in practice*

Steve Hill provided his treatment algorithm for occluded lines. Previously at The Christie NHS Foundation Trust in Manchester, there was no protocol for managing persistent withdrawal occlusion (PWO) and CVC blockage. Steve's management plan initially focuses on trying to prevent line blockage; however, if prevention fails, there need to be troubleshooting algorithms that can be followed. His go-to algorithm involves infusing 10,000 unites of Syner-Kinase® reconstituted in 0.9% saline with a good, firm, pulsating flush.

#### *Applying evidence and experience to vascular access*

Following up on Steve's presentation, Andrew Jackson provided his view on occluded lines. He agreed with Steve, and considers total line occlusion as a preventable episode and PWO as a treatable episode influenced by tip location and catheter type. His take-home message was that with proper clinical education and vigilance in the care of all VADs, the number of PWO and total occlusions should reduce.

#### *Standardising management of PWO*

Lisa Dougherty presented a prospective audit to discover the most successful method of incorporating Syner-Kinase® in the management of CVC occlusions. She presented a draft protocol and invited HCPs to be part of the audit.

## NIVAS members presenting back from abstract submissions

### *The story of MY line: living with a VAD*

As vascular access is required by the majority of patients who enter the healthcare system, Linda Kelly presented preliminary data from her study documenting perceptions of patients living with a VAD. Her current insight is that device selection, care and maintenance should be approached in a more sensitive and sophisticated way.

### *Bard PowerGlide® for access in apheresis to avoid temporary central catheterisation in patients with difficult venous access*

Deborah Powell presented her study regarding Bard PowerGlide® Midline Catheters as an alternative to tunnelled central venous catheters (TCVCs) in apheresis patients. TCVCs are associated with significant complications and place high demands on hospital resources. Her study has so far concluded that the insertion of Bard PowerGlide® Midline Catheters managed to prevent the placement of 29 TCVCs.

### *A laboratory comparison of microbial entry into six different needle-free connectors*

Anna Casey provided a useful analysis of the microbial barrier capabilities of needle-free connectors with anti-reflux technology. Her preliminary results demonstrated that it is important to consider the device as well as the decontamination procedure when choosing a needle-free connector.

### *Developing collaborative working to improve patient care and experience with VADs*

Jan Hitchcock spoke about her Trust's experiences with audits and switching from paper to electronic records, including the effect this has had on vascular access patients. She noted that proper communication, training and collaboration within the team and with auditors was needed to avoid documentation errors for vascular devices.

## **Eclipse – errors and discrepancies in intravenous infusion practices: a situated study**

Dominic Furniss provided an interactive presentation on the findings of a point-prevalence study of infusion device use across 16 hospitals in England. The study demonstrated that there were fewer vascular access errors in critical care than in general medicine, and fewer errors with patient-controlled analgesia (PCA) pumps than syringe drivers. Higher errors rates were found with fluids in comparison to medications and blood products. From Dominic's perspective, variations in discrepancy rates often resulted from differences in hospital policies. By utilising an online polling programme, Poll Everywhere, he was able to engage with the NIVAS audience and collect information on their IV infusion practices.

## **The uncompliant patient in vascular access**

Andrew Barton described barriers to patient compliance with vascular access. Non-compliance can occur at any stage during the vascular access or IV process due to several factors, such as inability to understand the reasons for a device, pain, IV drug misuse, or needle phobia. Patients have the right to decline vascular access, however HCPs need to determine their reasons for refusing vascular access and either reassure the patient or look for an alternative solution. Andrew provided four strategies for successful vascular access in such patients and urged HCPs not to put themselves at risk of harm if the patients are aggressive and against the procedure.

## **Workshop sessions**

### *Use of elastomeric devices*

Gemma Oliver focused her workshop on the uses of elastomeric pumps in outpatient clinical settings. The different types of pumps available, uses for them, drug stability and governance processes to make their use safe were discussed. The advantages and disadvantages that the pumps bring were debated and the factors that can affect flow rate were highlighted. The workshop ended with a practical session on handling and filling the elastomeric pumps.

### *Ultrasound-guided cannulation*

This workshop was led by Matt Jones and supported by Andrew Barton and Gemma Oliver. The workshop was run twice on Thursday afternoon, with both sessions very well attended. The session began with a brief presentation covering the basic principles of ultrasound-guided cannulation, and included plenty of time for practice with ultrasound systems and cannulating training blocks. Sharing of knowledge was encouraged, which led to a very interactive experience for all participants. Most attendees valued the session and picked up at least one useful tip for their own practice. It was agreed that ultrasound-guided cannulation of a vein is easy to learn and can be invaluable as a basic skill for all vascular access experts.

### *Paediatrics – devices and insertion & paediatrics – care and maintenance*

Paediatric venous access workshops were, for the first time, introduced at the NIVAS conference to bring this specialism to a wider audience. Beverley Graham and Brian Carey, two members of a dedicated paediatric venous access team, detailed how they manage and solve the unique challenges of this patient group. Workshop participants had a wide range of experience with vascular access in children, ranging from none to extensive; all were engaged in the discussion. The paediatric team covered the insertion of the devices, including the types of VADs, approaches to insertion and supplementary equipment. HCPs should be aware of the differences in paediatric vascular anatomy and the ethical, legal and practical considerations of inserting a VAD. HCPs were encouraged to use strategies such as distraction or negotiation to ensure insertion of VADs in paediatric patients, or request the assistance of play specialists. Furthermore, the insertion and management of peripheral lines, midlines and PICC lines were discussed. It was concluded that there is great potential in this field to improve patient care and be cost effective.

### *Closure and securement techniques*

Securement and dressings play a crucial role in the performance of the VADs. Poor securement can lead to infection, thrombosis, phlebitis, migration and total device dislodgement, which may result in replacement of the device. Infection can occur if VADs are not secured correctly; micro-movements of the catheter in and out of the skin can draw microbes into the skin. Steve Hill and Tim Jackson ran a workshop on the securement of VADs. The workshop covered the advantages and disadvantages of transparent semi-permeable dressings and the evolution of dressing

development with an overview of relevant research. Sutured versus suture-less devices, subcutaneous engineered securement stabilisation devices, chlorhexidine dressings, and chlorhexidine-impregnated sponges were also reviewed and discussed. The effects and causes of Medical Adhesive Related Skin Injury (MARS), including the intrinsic and extrinsic factors that may contribute to the phenomenon, were reviewed. In this session, HCPs provided valuable perspectives of their own experience with both the established and evolving dressing and securement technologies.

#### *Needle-free devices*

Nicola York and Marie Woodley's workshop on needle-free devices gave a brief overview of the complexity of choosing an appropriate device and the need for HCPs to be involved in their Trust's procurement processes. There are a vast array of needle-free devices, such as bungs and extension sets; these were discussed, and explanations of their housing, sizing, mechanisms and functions, all of which require clinical review before introduction, were provided. A demonstration was performed to show the difference between negative and neutral pressure bungs with regard to back flow into a line. The session closed with a discussion centred on community care.

#### *Scotland & Northern Ireland sub group*

Jackie Nicholson met with a small group who represented clinicians and industry working in Scotland or Northern Ireland. Preliminary plans have been made to hold a study day in Scotland in due course.

### **Excellence in vascular access – what does it look like and how do we achieve it?**

Matt Jones gave his views on the future of vascular access. Excellence, according to Matt, would be the creation of dedicated vascular access teams. To illustrate this, he presented the results of an American study in which a dedicated vascular access team dealt with difficult access cases in the emergency department. The creation of this team resulted in increased patient safety and satisfaction, as well as reduced resource and economic burden to the emergency department. From his perspective, dedicated vascular access teams will be able to provide thorough training on asepsis and sterility, line maintenance, and dressing securement, and therefore will build the foundation excellence in vascular access.

### **Award for best poster and best oral presentation**

Linda Kelly was this year's recipient of the Best Oral Presentation Award with the enthusiastically-delivered presentation "*The story of MY line*".

Anna Casey received the Best Poster Award for "*An in vitro comparison of microbial ingress into six different needle-free connectors*".

### **Closing remarks**

Jackie Nicholson concluded the conference by recognising the informative and engaging discussions that took place amongst a wide range of profession. She thanked the attendees for striving to make a difference and improve outcomes for patients. She then thanked Boehringer Ingelheim and other sponsors for their support, as well as Succinct Medical Communications, the AV team, and finally Murdoch the photographer. Altogether, the NIVAS conference was highly informative and generated thoughtful discussions that will aid HCPs in their use of vascular access.