

Recommendation K: Use of Nurse-Led Ultrasound to Assist with Needling

Use of ultrasound (US) by nursing staff is relatively new practice that some units have started to utilise over the last few years. This practice involves nursing staff using US images to assess the vessel to assist with needling and to assess maturity of an AV fistulae. US images can be used by nursing staff to measure the diameter of the vein, assess the position of the vessel and recognise abnormalities that may require further assessment from a skilled US practitioner.

Consideration should be given as nursing staff do not routinely use US images. Nurses should not use US to diagnose abnormalities. This is the remit of skilled US practitioners. However, US images can be a useful tool to assess the vessel and allow nurses to refer previously unrecognised abnormalities to a more skilled US practitioner.

It is also recognised that not all haemodialysis units currently have access to a portable US machine or have training to support nursing staff. A lack of use of US imaging in haemodialysis units does not make needling unsafe and safe assessment can be performed on AV access without US images, with referral to radiological services as required. However, it is recognised it can make needling of difficult AV access more successful and less traumatic for patients. Each unit should consider investment in this technology and training for nursing staff, to implement this practice to support needling of difficult AV access.

Clinical Practice Recommendations

- 1) US images can be used:
 - a. To assess maturity of the AV fistula vein, to identify if it is ready for needling
 - b. To assess the AV fistula vein / graft prior to needling if it is difficult to palpate or has previously been difficult to cannulate
 - c. To view the AV fistula vein / graft during needling, undertaking US imaging concurrently with needling, allowing assessment of the vessel's response to needle insertion.
- 2) US assessment of an AV access should complement clinical assessment and never replace the initial look, listen, feel clinical assessment. The results of US imaging of an AV access should be interpreted in conjunction with clinical assessment. US imaging alone is not a complete assessment of the AV access.
- 3) US images interpreted by a registered nurse to demonstrate abnormal findings should be referred to an experienced US practitioner for interpretation. The nursing interpretation alone should not lead to a definitive diagnosis.

- 4) Nurses who use and interpret US images need training on how to use the US machine correctly, how to interpret the US images and how to detect signs of complications or abnormal anatomy.
- 5) US imaging in this context is only recommended for use by experienced, senior registered nurses. These are nurses defined as those who have achieved the 'Gold' Standard of the 'VASBI / BRS VA National Needling Competency'.

Rationale for Recommendation K

Whilst there is little evidence of the use of nurse-led US imaging to assist with needling of AV access, it has been used in other needling procedures. US imaging during CVC insertions is shown to minimise the complications of catheter insertion in certain circumstances (82-84). For this reason, NICE recommends the use of US guidance for insertion of internal jugular catheters, but not for all CVC insertion (85). Walker (86) also identified that US assessment led more successful peripheral needling.

It can be presumed that some of the benefits in other needling procedures are applicable to AV access. This assumption indicates nurse-led US assessment could lead to more successful needling of AV access and minimise complications from needling. Problems cannulating AV access can lead to anxiety and pain in haemodialysis patients, which can be repetitive trauma for patients (13, 14). In this context, implementing procedures for more successful needling could also be presumed to improve the patient's experience of haemodialysis.

Currently there is no published evidence as to the benefits of nurse-led US assessment of AV access. However, the majority of units involved in the development of the recommendations use US images to assist with difficult needling and all felt it was of benefit. Units do have concerns that US assessment could lead to de-skilling and override clinical assessment, especially in inexperienced hands. It is recognised that the US image does not show everything required to assess an AV access. Use and interpretation should occur alongside clinical assessment.

At national conferences, Derby renal unit (87, 88) have presented their experience of implementing nurse-led US assessment of AV access, completing a service evaluation project. Conclusion of their work demonstrates that this practice is of use when AV access is problematic to needle or for needling of new AV access. In this context, US assessment led to more successful needling and improved the patient's experience of needling, reducing their anxiety and pain (88). However, they were unable to identify an improvement in clinical outcomes when nurse-led US assessment was used to assess AV access (87). Harwood (15) also indicate that US images may lead to a better assessment of AV access prior to needling, leading to more successful needling. These pieces of preliminary work indicate there is a benefit to US assessment of AV access in

specific circumstances i.e. following problematic needling and needling of new AV access.

Fielding et al (89) and NICE (85) highlight that proper training is essential to interpret US images. US image interpretation is not a skill that registered nurses use routinely. Correct interpretation of US images by registered nurses requires the skill of an experienced needlers, with training in understanding and interpreting the US images. As always, registered nurses need to acknowledge their limitations and not hypothesise interpretation of US images beyond their knowledge and skill level. It is also recognised that using US images concurrently with needling is a difficult skill to develop (88). Despite experience in needling, not all registered nurses feel comfortable with this skill (15).

Points for Future Consideration

- 1) Small hand held US machines have recently become available to assist AV access needling. These may assist development of US imaging concurrently with needling. However they generate an image in a different perspective to normal US images, so still need evaluation.
- 2) Further work is still required to identify what are the right circumstances to use nurse-led US assessment of AV access and what are the true benefits of this practice.
- 3) In the future, standards need to be developed for training of registered nurses on how to use US assessment of AV access.