

A Service Evaluation of Nurse-Led Ultrasound Assessment of Arterio-Venous Fistulae and Grafts for Haemodialysis

Fielding C, Berino L, Fluck R, Owen P, John S, Chesterton L
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Problem: Unsuccessful or problematic cannulation of arterio-venous fistulae (AVF) and grafts (AVG) can be traumatic for haemodialysis patients, causing bruising, pain and in the worst case, vascular access failure. To minimise cannulation complications and improve vein assessment, 13 senior haemodialysis nurses were trained to use ultrasound (US) imaging to assess AVF and AVG. US imaging is used as routine to support other cannulation procedures and local practice does indicate this could be beneficial for patients. However, there is no evidence base to support this practice in AVF/G cannulation.

Purpose: A service evaluation project was designed to explore how the senior nurses used US imaging to assess AVF and AVG. The aim was to evaluate the benefits and limitations of this practice.

Design: Data on the current practice of US imaging by the senior nurses was collected with a specially designed questionnaire. It was completed every time each senior nurse carried out US imaging over a 3 month period. A second questionnaire surveyed the 13 senior nurses' opinions on this practice. A third questionnaire provided patient opinion and experience when undergoing US imaging of their AVF/AVG by a senior nurse. A sample of 9 patients undertook the survey – all had been scanned on more than one occasion.

Findings: Over the 3 month survey period, 91 episodes US imaging were recorded. 55 different patients were scanned, with 18 patients undergoing the procedure 2-5 times. Multiple AVF types were scanned - 47% Brachio-Cephalic (26/55), 42% Radio-Cephalic (23/55), 9% Brachio-Basilic (5/55) and 2% thigh AVF (1/55). 0 AVGs were scanned. AVF vintage at time of imaging ranged from 2 weeks to 122 months (mean=20mths, median=8mths, mode=1mth). US imaging was used to assess maturity and/or depth of the vein in 43/91 instances; to assist with first cannulation in 12/91 instances and following problematic cannulation in 59/91 instances. The US imaging was judged to support successful cannulation in 65/91 instances and there were no instances where it was judged to not help or hinder assessment of the AVF. On 7/91 episodes US imaging did not occur at the time the patient was due dialysis. 8 nurses (8/13) responded to the second questionnaire, of which 7 routinely used US imaging to assess AVFs and AVGs. All 8 nurses felt US images assisted with assessment of AVFs and AVGs. However, concerns were raised by the nurses about their skill in interpreting US images. 8 patients (8/9) responded to the patient questionnaire. All 8 patients felt that US images assisted the nurses when cannulating their AVF and 4/8 felt it made the cannulation less painful.

Conclusion: US imaging can be used to assist senior haemodialysis nurses in the assessment of AVF. This is most often used to assess newly formed AVF and assist with first cannulation or following problematic cannulation. Both nurses and patients felt this was beneficial practice that helped with cannulation of AVF.

Relevance: Use of US imaging to assess AVF by nurses can assist with assessment and cannulation of AVF, potentially reducing the pain and trauma of cannulation. This practice appears to assist when cannulating new or problematic AVF. However, training and support is required to assist nurses in learning this practice. Investment in developing this skill in haemodialysis nurses is worthwhile as it reduces the trauma of cannulation and may reduce harm related to access cannulation.