To determine the proficiency of nurses in placing peripheral lines using ultrasound (US) guidance in patients who had failed IV attempts

To assess which veins were sonographically visible

To assess success rates of cannulation based on the vein chosen

To determine if there was a difference in success rate in 1-person vs. 2-person technique

**OBJECTIVES**

Nurse-performed US-guided upper arm cannulation was successful in most patients with difficult venous access.

The basilic vein was sonographically visible in the majority of patients and had the highest rate of successful cannulation, although this did not reach statistical significance.

The median antecubital and cephalic veins were rarely visible sonographically, and were rarely used even when visible.

The 1-person technique was chosen 4 times more than the 2-person technique and did not have a statistically significant difference in success.

**RESULTS**

**Patient Characteristics**

- Number of patients enrolled: 74
- Average age: 48-years-old

- Percentage requiring central venous access in past: 67%

- Vein visible but not adequate for cannulation: 6/74 patients — Considered as treatment failure — Always the brachial

**Procedure Characteristics**

- Vein used for initial cannulation attempt:
  - Basilic: 56
  - Brachial: 28
  - Median antecubital, cephalic: 4

- Vein used for central venous access
  - Basilic: 36
  - Brachial: 9
  - Median antecubital: 4
  - Cephalic: 26

- 1-person vs. two-person attempts:
  - Total: 54
  - One-person: 41
  - Two-person: 13

- One-person vs. two-person cannulation success:
  - Total: 54
  - One-person: 44
  - Two-person: 10

**Success Rates**

- Cannulation success rate by vein (%):
  - Basilic: N=48
  - Brachial: N=25
  - Median antecubital: N=6
  - Cephalic: N=9

- Cannulation success rate by patient (%):
  - N=74

- Venous blood obtained:
  - Percentage:
    - By total attempt: 49%
    - By patient: 49%

**METHODS**

**DESIGN:** Prospective, observational

**SETTING:** Urban teaching hospital with an emergency medicine residency program

**PATIENTS:** Patients with at least 2 failed peripheral IV attempts AND no other peripheral vein suitable for cannulation

**TRAINING:** Nurses were given a 1.5 hour training course in dynamic US-guided cannulation in the transverse plane.

**PROCEDURE:** The nurses used a compact US machine designed for vascular access to survey the upper arm for the presence of the following veins:

- Basilic, brachial, median antecubital, cephalic

Nurse made independent determination of:

- Which vein to cannulate
- Whether to use 1 or 2 person technique
- Whether to use 1.88 in. or standard 1.25 in. cath

**STATISTICS:** Compared success rates using Chi-squared tests

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