

Title: Potential Advantages of the Accelerated Seldinger Technique

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Category: Innovation of Practice

Purpose & Introduction: Since development of the Seldinger technique in 1953, there have been few significant improvements. The technique still presents hazards for patients and clinicians. Precision bench tests were performed to ascertain whether the accelerated Seldinger technique (AST), with a novel device integrating all components into one safety introducer, might offer advantages of safety and speed compared with the modified Seldinger technique (MST).

Method: The WAND™ 4Fr. Microaccess Safety Introducer (Access Scientific, Inc., San Diego CA) was compared with the MPIS-405 Micropuncture® Introducer Set (COOK, Inc., Bloomington IN).

Test #1—Air flow through each device was measured. (Table 1) “Open to air” events were enumerated and compared. (Table 2)

Test #2—Accidental needlestick injury: Thirty AST samples were forcefully driven into an aluminum plate, to assess impact force, sheath integrity and needle-lock security. (Table 3)

Test #3—Speed to Access: 6 MST and 6 AST samples were tested for speed to access using a vein simulator (VATA, Oregon City, OR). (Table 4)

Results:

Test #1—At negative 16.5cmH₂O, the MST needle allowed air to enter at 3.54 cc/second, suggesting an open system with minimal resistance. At negative 16.5cmH₂O, the AST device allowed no measurable flow, suggesting a virtually closed system. “Open to air” events were 50% fewer with AST.

Test #2— No needle-lock failures or sheath disruptions were observed at an average force of 8.5 newtons.

Test #3—Speed to access. Average time to complete MST was 38.8 seconds; average time to complete AST was 11.3 seconds.

Conclusion: AST proved 3 times faster than MST. Further, “open to air” events were 50% fewer with AST—reducing risk of bloodstream contamination and air embolism. The AST passive needlestick safety feature appears fail-safe. A large-scale clinical trial comparing AST to MST is now needed

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