

Evaluation of Fluid Bolus Administration Rates Using Ruggedized Field Intravenous Systems.

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OBJECTIVE: The purpose of this study was to evaluate 2 ruggedized field intravenous (IV) systems currently in use by US military medics and to determine their effect on fluid bolus administration rates.

METHODS: A series of 500 mL fluid boluses consisting of either Lactated Ringer's solution or Hextend were delivered to 2 artificial intravenous training arms using a standard 18G catheter (control) and 2 separate ruggedized field IV systems. Fluid boluses were delivered under both gravity force and pressure infusion (constant 300 mm Hg), and total bolus times were recorded.

RESULTS: Using Lactated Ringer's solution, the standard IV system took a mean time of 9:33 minutes (95% CI: 9:13-9:54) to deliver a 500 mL fluid bolus whereas the 2 ruggedized field systems took mean times of 14:50 minutes (95% CI: 14:00-15:40) and 12:20 minutes (95% CI: 11:54-12:45). Using Hextend, the mean bolus time for the control system was 24:39 minutes (95% CI: 22:47-26:32). The 2 ruggedized field systems required an average of 49:32 minutes (95% CI: 48:07-50:58) and 39:46 minutes (95% CI: 37:30-42:01) to deliver an equivalent bolus. Pressure infusion significantly increased flow rate in all systems.

CONCLUSIONS: Ruggedized field IV systems can significantly delay fluid bolus rates. In instances where ruggedized field systems are deemed necessary, pressure infusion devices should be considered to overcome the constrictive effects of the ruggedized system.