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OBJECTIVE: To compare the success rates, complication rates, and times required for paramedic students to perform saphenous vein cutdown and adult intraosseous infusion using the bone injection gun (BIG). METHODS: This was a prospective, randomized crossover study of 13 senior-level students in a baccalaureate degree paramedic program. Study subjects were instructed in adult intraosseous and saphenous vein cutdown techniques through lecture and laboratory exercises and then randomized into two groups. Group 1 performed saphenous vein cutdown at the ankle, followed by intraosseous infusion using the BIG. Group 2 performed the same procedures but in reverse order. All procedures were performed on preserved cadavers and videotaped. Using a standardized scoring sheet, the authors evaluated the study subjects at the time of the procedures to determine success rates, errors, and complications. Videotapes were later reviewed to verify the time required to complete the procedures. RESULTS: The normalized mean procedure scores were 96.15 (SD 4.28) and 83.83 (SD 15.52) for the intraosseous infusion and saphenous vein cutdown procedures, respectively (95% CI for difference in means, -12.34 to -1.3; p = 0.020). Success rates for establishing venous access were higher for the intraosseous route (92.3%) than the cutdown technique (69.2%), but did not achieve statistical significance (p = 0.250). The times required to initiate fluid flow were 3.91 minutes (SD 0.82) by the intraosseous route and 7.57 minutes (SD 1.80) by venous cutdown (95% CI for difference in means, 2.43 to 5.55; p = 0.000). One critical error and 11 noncritical errors were encountered during the intraosseous procedure, compared with ten critical errors and 29 noncritical errors during the cutdown procedure (p = 0.195). CONCLUSION: In a group of inexperienced paramedic students working on a preserved human cadaver model, intravenous access was gained more rapidly, with a higher success rate, and with fewer complications using the bone injection gun than by the saphenous vein cutdown procedure. Further study is needed to evaluate these procedures in the field setting and to compare their feasibility with other alternative venous access techniques such as femoral, external jugular, and central venous cannulation.