"The long-axis view for the internal jugular was more efficient than the short-axis view with fewer redirections" Vogel et al (2014).

Reference:

Vogel, J.A., Haukoos, J.S., Erickson, C.L., Liao, M.M., Theoret, J., Sanz, G.E. and Kendall, J. (2014) Is Long-Axis View Superior to Short-Axis View in Ultrasound-Guided Central Venous Catheterization? Critical Care Medicine. December 16th. .

Long or short-axis view in ultrasound-guided central venous catheterisation? http://ctt.ec/97jxc+ @ivteam #ivteam

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Abstract:

OBJECTIVE: To evaluate whether using long-axis or short-axis view during ultrasound-guided internal jugular and subclavian central venous catheterization results in fewer skin breaks, decreased time to cannulation, and fewer posterior wall penetrations.

DESIGN: Prospective, randomized crossover study.

SETTING: Urban emergency department with approximate annual census of 60,000.

SUBJECTS: Emergency medicine resident physicians at the Denver Health Residency in

Emergency Medicine, a postgraduate year 1-4 training program.

INTERVENTIONS: Resident physicians blinded to the study hypothesis used ultrasound guidance to cannulate the internal jugular and subclavian of a human torso mannequin using the long-axis and short-axis views at each site.

MEASUREMENTS AND MAIN RESULTS: An ultrasound fellow recorded skin breaks, redirections, and time to cannulation. An experienced ultrasound fellow or attending used a convex 8-4 MHz transducer during cannulation to monitor the needle path and determine posterior wall penetration. Generalized linear mixed models with a random subject effect were used to compare time to cannulation, number of skin breaks and redirections, and posterior wall penetration of the long axis and short axis at each cannulation site. Twenty-eight resident physicians participated: eight postgraduate year 1, eight postgraduate year 2, five postgraduate year 3, and seven postgraduate year 4. The median (interquartile range) number of total internal jugular central venous catheters placed was 27 (interquartile range, 9-42) and subclavian was six catheters (interquartile range, 2-20). The median number of previous ultrasound-guided internal jugular catheters was 25 (interquartile range, 9-40), and ultrasound-guided subclavian catheters were three (interquartile range, 0-5). The long-axis view was associated with a significant decrease in the number of redirections at the internal jugular and subclavian sites, relative risk 0.4 (95% CI, 0.2-0.9) and relative risk 0.5 (95% CI, 0.3-0.7), respectively. There was no significant difference in the number of skin breaks between the long axis and short axis at the subclavian and internal jugular sites. The long-axis view for subclavian was associated with decreased time to cannulation; there was no significant difference in time between the short-axis and long-axis views at the internal jugular site. The prevalence of posterior wall penetration was internal jugular short axis 25%, internal jugular long axis 21%, subclavian short axis 64%, and subclavian long axis 39%. The odds of posterior wall penetration were significantly less in the subclavian long axis (odds ratio, 0.3; 95% CI, 0.1-0.9).

CONCLUSIONS: The long-axis view for the internal jugular was more efficient than the short-axis view with fewer redirections. The long-axis view for subclavian central venous catheterization was also more efficient with decreased time to cannulation and fewer redirections. The long-axis approach to subclavian central venous catheterization is also associated with fewer posterior wall penetrations. Using the long-axis view for subclavian

central venous catheterization and avoiding posterior wall penetrations may result in fewer central venous catheter-related complications.

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