In this review, we describe the rationale for the use of US during CVC placement, the basic principles of this technique, and the current evidence and existing guidelines for its use” Saugel et al (2017).

Abstract:

The use of ultrasound (US) has been proposed to reduce the number of complications and to increase the safety and quality of central venous catheter (CVC) placement. In this review, we describe the rationale for the use of US during CVC placement, the basic principles of this technique, and the current evidence and existing guidelines for its use.

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In addition, we recommend a structured approach for US-guided central venous access for clinical practice. Static and real-time US can be used to visualize the anatomy and patency of the target vein in a short-axis and a long-axis view. US-guided needle advancement can be performed in an “out-of-plane” and an “in-plane” technique. There is clear evidence that US offers gains in safety and quality during CVC placement in the internal jugular vein. For the subclavian and femoral veins, US offers small gains in safety and quality. Based on the available evidence from clinical studies, several guidelines from medical societies strongly
recommend the use of US for CVC placement in the internal jugular vein. Data from survey studies show that there is still a gap between the existing evidence and guidelines and the use of US in clinical practice. For clinical practice, we recommend a six-step systematic approach for US-guided central venous access that includes assessing the target vein (anatomy and vessel localization, vessel patency), using real-time US guidance for puncture of the vein, and confirming the correct needle, wire, and catheter position in the vein. To achieve the best skill level for CVC placement the knowledge from anatomic landmark techniques and the knowledge from US-guided CVC placement need to be combined and integrated.

Reference: