Ultrasound Probe Holder for Guidance of Central Line Insertion Procedure

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Technology description

Innovative researchers at UCSF have developed a novel compact device that facilitates ultrasound-guided central line insertion procedures by holding the ultrasound probe in place and allowing the physician to insert a central line needle using both hands without a nurse's assistance. This approach provides a convenient small-size tool that is a significant improvement over the few ultrasound probe holders currently available on the market because it is cheap, easy to set up and use and doesn't provide an obstruction in a crowded emergency room environment. A prototype ultrasound holder has been created and continual work on other designs is on going.

It is estimated that 750 thousand to 1 million of central line insertions are performed in the United States every year to deliver large doses of drugs, blood or nutrients to hospitalized patients. This common surgical procedure involves insertion of a catheter in either the jugular or femoral veins and requires substantial dexterity and the use of both hands from the physician. Studies have reported central line insertion failure and complication rates as high as 30% and 18.8% in the emergency medicine and critical care literature, respectively. Serious complications due to improper central line insertion can include arterial puncture, pneumothorax, bleeding and air embolism. The National Institute for Clinical Excellence recommends the use of ultrasound guidance during central line insertions, because it allows physicians to visualize blood vessels in real-time as they insert the catheter, and has been demonstrated to significantly decrease procedural failure and complication rates. However, ultrasound probes need to be held with a single hand, so a physician holding the probe while simultaneously preforming the procedure is seriously inconvenienced.

Additional Information

Inventor Information

John Stein, M.D., is a leading researcher in emergency department ultrasound. He has been the recipient of an award through the Agency for Healthcare Research and Quality to validate the training guidelines for emergency physician pelvic ultrasonography. He has completed his Masters degree in clinical research, and is an active participant in the UCSF Clinical and Translational Sciences Institute's Young Scholars Program.

Application area

Facilitation of ultrasound-guided central line procedures for delivery of drug products and blood, IV feeding, hemodialysis and intensive care monitoring
Facilitation of ultrasound guidance for other surgical needle procedures

Advantages

Allows the physician to insert the needle with both hands while benefiting from constant ultrasound imaging at insertion site
Offers significant maneuverability and flexibility as compared to bulky, large state-of-the-art devices
Disposable and biodegradable
Low manufacturing cost
Can be included in the central line insertion kit

Institution

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