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THE ROLE OF POINT-OF-CARE ULTRASOUND IN MODERN GENERAL ANESTHESIA

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Background:
Point-of-care ultrasound (POCUS) has evolved from a primarily procedural tool into an important component of modern perioperative medicine. It provides anesthesiologists with rapid, real-time anatomical and physiological information that complements physical examination and conventional monitoring. Its portability and non-invasive nature make POCUS particularly valuable when immediate clinical decision-making is required.

Objective:
To review the current role and major applications of POCUS in general anesthesia and its contribution to perioperative assessment, clinical decision-making, and patient safety.

Discussion:
POCUS can be applied throughout the preoperative, intraoperative, and postoperative periods. Focused cardiac ultrasound enables rapid assessment of ventricular function, volume status, pericardial effusion, and potential causes of hemodynamic instability. Lung ultrasound can assist in identifying pneumothorax, pleural effusion, pulmonary interstitial syndrome, atelectasis, and causes of perioperative hypoxemia.

Gastric ultrasound may help assess gastric content and aspiration risk, particularly when fasting status is uncertain. Airway ultrasound can support airway assessment and confirmation of endotracheal tube position. Ultrasound guidance is also widely used for vascular access and regional anesthesia.

In hemodynamically unstable patients, integration of cardiac, pulmonary, and vascular ultrasound findings may facilitate rapid differentiation of major causes of shock and guide individualized fluid and vasoactive therapy. However, POCUS remains operator-dependent and requires structured training, appropriate image interpretation, and integration with the overall clinical picture.

Conclusion:

POCUS is becoming an important extension of the anesthesiologist's clinical examination. Its integration into general anesthesia practice may support faster diagnosis, individualized perioperative management, and improved patient safety. Continued development of portable ultrasound technology and standardized training is likely to further expand its role in modern anesthesiology.

Keywords: Point-of-Care Ultrasound; POCUS; General Anesthesia; Perioperative Medicine; Patient Safety.