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Networking session

#36910 HOW DO WE DEFINE SUCCESS IN REGIONAL ANESTHESIA (RA)?

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10.1136/rapm-2023-ESRA.681

A successful RA block is the accomplishment of providing a satisfactory central neuraxial, peripheral nerve or plane block using local anesthetic solutions to enable the surgeon/obstetrician to perform certain operations on patients in a safe (devoid of complications), efficient (how easily or quickly placement is performed) and effective (pain free) way with a positive outcome.

These blocks are typically performed by well-trained anesthesiologists who have expertise in the field. They need to know all necessary safeguards to avoid potential negative consequences of a loco-regional block, i.e., toxicity and high/total spinal anesthesia, as a complication of an epidural puncture.

The use of ultrasound guidance for inserting peripheral nerve blocks has become the standard practice, as it allows for more accurate needle placement. Blind-insertion techniques should become more the exception. Proper training, adherence to hygienic standards, and the availability of necessary equipment and drugs are crucial for performing RA blocks safely in a monitored environment supported by nursing staff.

Complications associated with RA blocks can arise, including toxicity or high/total spinal anesthesia as a result of epidural puncture. Anesthesiologists need to be prepared and take necessary precautions and have resuscitation equipment and drugs need readily available. In case of local anesthetic overdose or toxicity, the immediate availability of 20% intralipid can be crucial for treatment. RA has its specific complications often related to its reliance based on subjective feelings (loss-of-resistance to air as in epidurals), e.g., postdural puncture headache, where others may have neurological complications (peripheral blocks puncturing nerves). Even supervisors can not see what is happening at the other end of the needle and never can be sure whether the true loss-of-resistance is being felt. Training RA techniques in simulation circumstances is essential.

Like other areas of healthcare, anesthesiologists should also strive for environmentally sustainable practices. The healthcare industry as a whole contributes between 4 and 5% of the global greenhouse gas emissions. While RA techniques themselves are environmentally friendly, the administration of extra oxygen during the procedure can contribute to carbon dioxide production. Anesthesiologists should be mindful of minimizing unnecessary oxygen use and adopting eco-friendly practices wherever possible.

Overall, the goal is to achieve successful RA blocks that provide pain relief, allow for efficient surgical procedures, and prioritize patient safety while also considering environmental sustainability and minimizing potential complications.

#36938 TRACKING MOTION DEVICES IN ANESTHESIA PROCEDURES

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10.1136/rapm-2023-ESRA.682

Tracking motion devices in anesthesia procedures

1. Introduction Hand motion analysis through specific devices has been successfully used for years in the surgical field. (1) More recently, they have been used in anesthesia as assessment tools for procedural skills.

2. Motion-Tracking Technology Motion-tracking devices may be divided into two forms: optical and nonoptical.

- Optical systems typically use high-speed cameras to detect either infrared light reflection or emission, from which three-dimensional positional data can be extracted and postprocessed.

- Nonoptical systems typically rely on one of three methods of data acquisition to determine orientation and movement: electromagnetic, mechanical, and inertial mechanisms.

- Two main different devices using electromagnetic fields have been described in the anesthesia literature[1]:

1.- The Imperial College Surgical Assessment Device (ICSAD) is a device that tracks operator's hand-motion. It uses an electromagnetic tracking system (Isotrak II; Polhemus Inc., Colchester, VT, USA) consisting of an electromagnetic field generator and sensors placed on the back of the operator's hands. Three dexterity scores can be measured: total distance travelled by each hand, number of movements, and total time.

2.- The HMA hardware consisted of a DriveBay electromagnetic field generator and control box (Ascension, VT, USA), one reference sensor, and two hand sensors (Model 800, 7.9 mm, 6-DOF). Three-dimensional position data from the electromagnetic sensors are registered using an open - source software. Metrics used to evaluate motion efficiency are the same: total time of procedure, total path length (distance travelled) and number of translational motions. Both systems collect the x, y, z Cartesian coordinate information from each sensor at a determined resolution and frequency. Most reports of ICSAD use an accuracy of 1mm at 20 Hz. On the other hand, DriveBay device reports an accuracy of 1.4 mm at 50 Hz.

Finally, the use of this motion device in the evaluation of motor skills allows obtaining quantitative data complementing previous validated visual scales. Having as many instruments as possible for evaluating motor skills could improve the learning process. In the future, if we want to set up metrics or cutoff scores to be achieved with motor skills training, a previous standardization of both parameters to be used and calibration thresholds should be established for each setting.

3. Value of Motion Metrics:

The ICSAD has demonstrated construct validity in many surgical procedures, including open, laparoscopic, and microsurgery. Additionally, in the anesthesia field, its construct and concurrent validity has been established in labor epidural placement, spinal anesthesia, ultrasound-guided supraclavicular block, and jugular CVC placement.[3-7]