

Peri operative Management for Robotic Surgery: the New Era

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Team working /non-technical skills/professionalism

Technological advancement has made robots an integral part of several fields, including medicine. Implementation of the use of Robotic technology requires

- To understand the main INDICATIONS for robotic surgery.
- To understand the phases and challenges related to various type of Robotic surgery:
 - Configurations and Trouble Shooting the Robot
 - Optimal patient's monitoring
 - Best position to prevent harm, fall and injury to the patient during any type of robotic surgery.
 - PHYSIOLOGY of Trendelenburg and anti-trendelenburg (reverse trendelenburg) position. The attendee will be able to prevent and treat physiologic changes caused by the sudden variation between these positions as well as those caused by prolonged lay in any of the mentioned positions. Changes in normal PHYSIOLOGY caused by the pneumoperitoneum.
 - Ventilation challenges and haemodynamic challenges in an area of more restrictive fluid management.
 - Antibiotic prophylaxis if and when needed.
- To understand Perioperative care, including patients' selection and optimisation.
- To understand long term risks and complications including the need for DVT/PE prophylaxis (including early mobilisation), post-operative effective analgesia and prevention of post-operative respiratory complications (physiotherapy). Various problems are related to post op pain in different specialty (eg: opioids in obese patients with obstructive sleep apnoea or bladder spasm in urology patients).
- To understand and plan perioperative patients' flow including recognition of factors influencing intensity and site of care (ward, high dependency unit (HDU), intensive care unit (ICU). Ensure the necessary resources are available for safe post-operative care

Main topics

-patients' positioning (before prep): to prevention nerve injuries, falls, pressure damage. The process will include securing the endotracheal tube (avoiding kink), eye protection, joint protection, warming. The selection of adequate level of monitoring can be gathered during the team work with the Anaesthetist's assistant, for example ECG dots needs to be away from the operating field but locked because if these come off they are difficult to reposition.

-patients' positions during surgery allow no access, no view. Participants will be familiar with the physiology of extreme trendelenburg (bariatric surgery) and anti-trendelenburg

(urology) position in order to prevent or treat the most common abnormalities due to the sudden change between these positions (changes in blood pressure and heart rate due increased or decreased of the venous return, hypoxia secondary to atelectasia) as well as those caused by prolonged lay in any of the mentioned positions (rhabdomyolysis in obese patients). We can use video, virtual reality or vignettes to explain such changes!

-Challenges in Ventilation caused by:

- Limited view and access to the patients during all procedures. The endotracheal (ET) tube could kink (robot leads over the patient's face) or dislocate expectably changing position during surgery. Consider when to use armed tube to prevent obstruction. Tricks to prevent ET tube dislocation could be to secure with tape and tie and make sure it is far enough through the cords.
- Pneumoperitoneum and CO₂ management. (Not applicable for ENT surgery)
- 45-degree head down in the context of increased BMI (obese or morbidly obese patients) and pneumoperitoneum.
- Hypoxia
- Haemodynamic problems related to high pressure ventilation, CO₂, position and if required recruitment manoeuvre. Physicians need to manage high inflation pressures (P pressure or even plateau pressure above 40) some tricks are inverse ratio and muscle relaxant.
- Surgery specific problems such as inserting the arms of the robot and starting the pneumoperitoneum in bariatric patients (I can provide video of clinical cases when problems at the start of bariatric surgery are improved once the patient is head up. On the opposite ventilation is very difficult in urology patients when surgeons are suturing prostatic urethra and often increase pressures in the peritoneum up to >20!)

Team working.

-Professionalism/non-technical skills: Well-controlled perioperative patient's management can contribute to make robotic surgery safer, more efficient and, hopefully, more cost effective. Grocott and Mythen described 5 key opportunities for optimising value in the perioperative setting: collaborative decision-making, lifestyle modification before surgery, standardised in-hospital perioperative care with process mapping and improvement, the overall goal of achieving full recovery, and finally the use of clinical data for quality improvement.