

Surgery during the prevailing COVID-19 pandemic

Considering the new Corona SARS-CoV-2 virus, the state of knowledge has not yet been explored. The main proliferation is through contact with drip and aerosols from the respiratory tract. It is not yet known if other body fluids can contain viable SARS-CoV-2. According to Zheng et.al (2020), we should expect to find the virus in surgical smoke.

Surgical smoke is a health hazard both for patients and for healthcare professionals and should be filtered and evacuated or otherwise prevented from entering the environment. The surgical smoke produced by the use of heat-producing medical device should be considered toxic as it contains ultrafine particles, living and dead cell fragments, gaseous chemical compounds, mutagenic and carcinogenic materials, blood particles, bacteria and viruses (AORN, 2020; National Association for Surgical Medicine; Sandelin, 2016).

Previous research has shown HPV and HIV virus in surgical smoke. According to '*The Swedish Operating Room Nurses Association considers and recommends about surgical smoke*', it is the operating room nurse's responsibility to see to that the equipment to be used/which is used during the surgical procedure is ok. This includes to decide correct protective equipment, general as well as the personal. When using medical device that generate ultra-fine particles, appropriate and effective smoke evacuation systems are recommended, as well as proper disposal of the equipment after the procedure. The operating room nurse should contribute to ensure that there are appropriate and easily accessible smoke evacuation systems as well as personal protective equipment at the health care unit (Swedish Operating Room Nurses Association, SEORNA, 2015).

In the event of high risk of aerosol formation, when medical devices which generates large amounts of aerosols is used when treating patients both with known and suspected aerosol-forming infection, personal protective equipment must be supplemented with a respiratory protection according to FFP3 class (AORN, 2020; Sandelin, 2016). SEORNA recommends that you follow the guidelines of the Public Health Authority when working with confirmed or suspected Covid-19 infection.

To minimize the risk of surgical smoke reaching the operating room during open and laparoscopic surgery, the following steps are recommended

- Correct number of air exchanges for conventional ventilation with at least 15 / hour
- Personal protective equipment according to routine
- Smoke evacuation system with ULPA (Ultra Low Particulate Air) filter
- Pneumoperitoneum with as low pressure as possible without compromising surgery
- Laparoscopic port holes corresponding to the size of trocars to minimize gas leakage to the surroundings
- Inspect that trocar gaskets are intact
- Minimize the use of medical devices that generate aerosols and ultra-fine particles and strive for as low a setting as possible
- Trendelenburg mode in the shortest possible time
- Caution with tissue extraction through port holes and mini laparotomies. It is recommended to first reduce the abdominal pressure to the minimum and then evacuate residual CO₂ gas via a ULPA filter before the removal of specimens

- At the end of the surgical procedure, it is recommended to lower the abdominal pressure to the lowest possible level and then evacuate the remaining CO₂ gas via a ULPA filter, before switching off the insufflator. Thereafter, trocars can be removed without the risk of leakage of CO₂ gas
- After completed procedure, filters should be considered as infectious and handled accordingly (AORN, 2020; Sages, 2020; Sandelin, 2016; Zheng, 2020)

Zheng, M.H., Boni, L., Fingerhut, A. (2020). Minimally invasive surgery and the novel coronavirus outbreak: lessons learned in China and Italy. *Annals of Surgery. Wolters Kluwer Health, Inc.*

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