COVID-19 - ESSKA Guidelines and Recommendations for Resuming Elective Surgery

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SECTION 1: PRE-OPERATIVE MANAGEMENT

Q: When I will resume my surgical activities, what are the objectives?

- Avoid importing asymptomatic cases to prevent secondary surge
- Maintain a persistent COVID-negative clinical path
- Keep your patients, your colleagues, your staff, your institution safe
- Make locally based decisions, follow legal restrictions and guidelines from your health authorities

CAVE: Peri-operative COVID infection might have higher complication and mortality rates among patients with comorbidities.

Q: In which type of facility should I resume my activity?
See appendixes: Checklist facility

Ideally, the facility should be in a COVID-free, isolated institution or a separate COVID free building of the institution and should be only devoted to elective surgery or urgent, somewhat elective surgery.

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Q: What are the basic requirements for my collaborators and staff?
Ideally, all collaborators should be tested (COVID-kit test, Immune/serology test if possible) before resuming your practice. According to the development of the pandemic, they should be regularly monitored (e.g. on a weekly basis).

Q: How should I identify and select the first patients for surgery?
This selection is based on four parameters: Age, COVID exposure, ASA / risk factors, socio-professional situation.

Six types of patients have been described, according to COVID-19 exposure (Fineberg, NEJM):

1. Who is not known to have been exposed or infected
   Should get a COVID-RT-PCR test 48-72h before surgery (± other means according to your institutional rules and regulations)

2. Who has been exposed but asymptomatic
   Should get a COVID-RT-PCR test, immune/serology test if allowed and available, and eventually lung CT-scan before surgery

3. Who has recovered from infection and maybe adequately immune
   Should get an immune/serology test if allowed and available before surgery

4. Who is presumed to be infected (persons with sign and symptoms consistent with infection who initially test negative)
   Should get a repeated COVID-RT-PCR test, an immune/serology test if allowed and available, and eventually lung CT-scan before considering any surgeries

5. Who is infected (COVID-kit test – eventually lung CT-scan)
   Delay any elective surgery for six weeks and should get an immune/serology test if allowed and available before surgery

6. Who is infected with co-morbidity (COVID-kit test – eventually lung CT-scan)
   Delay any elective surgery until full recovery (for at least two months) and then should get an immune/serology test if allowed and available

Category[1]/Age	< 40	40-60	60-70	70+
1				+
2			+	++
3		+	++	+++
4	+	++	+++	++++
5	+	++	+++	++++
6	++	+++	++++	+++++

Table 1: Stratification of the theoretical risk of infection with respect to patient age and category according to Fineberg.

- For elective surgery, patients 1, 2, 3 should have the priority regardless of the diagnosis.
- According to the diagnosis, patients 4, 5, 6 should have fully recovered and displayed an adequate immune response.
- ASA I and II should have the priority regardless of the diagnosis.
- Risk factors (e.g. age> 60 years, obesity, high blood pressure, cardiovascular disease and diabetes) are disqualifying conditions in this early phase (should always be discussed with the anesthesiologists).
- The socio-professional situation must obviously be considered with probably a priority for active workers.

Q: Which type of pre-operative screening is recommended in this period of pandemic?

- Pre-operative questionnaire (see appendix).
- Detailed discussion with the patient about his/her situation (e.g. by tele-or videoconference).
- COVID-19-RT-PCR test and/or immune/serology test 48 to 72 hours before the operation.
- Consider other diagnostic tests (e.g. lung CT-scan; stool culture).
- C-reactive protein.
- Eventually complete blood count (prevent lymphocytopenia).
- Monitoring of the temperature until the day of the surgery.
- Monitoring again of the COVID symptoms at the arrival (hospital check-list).

SECTION 2: SURGICAL INDICATIONS

Q: Which types of surgeries do the ESSKA guidelines cover?

→ Categories A&B of the AAOS definition (four types of orthopaedic procedures in times of pandemics: A) emergency only, B) urgent types of surgeries, C) urgent/somewhat elective and D) elective). This includes all types of surgeries with predominantly chronic conditions or acute cases where surgery generally can be delayed without causing serious harm to patients.

→ More precisely, the following procedures are considered: tendinous or ligamentous intra- or periarticular injuries of chronic and acute in nature; deformity-correcting osteotomies; joint arthroplasty procedures; elective shoulder, elbow, hand, hip, knee and foot and ankle surgery.

Category	**A**	**B**	**C**	**D**
Degree of emergency	Emergency	Urgent	Urgent/somewhat elective	Elective
Types of procedures (non-exhaustive selection)	Life- or limb-threatening conditions	Joint/arthroplasty infections Most trauma cases	Acute intra- and periarticular ligament & tendon conditions (e.g. ACL tears, meniscus bucket handle tears) Selected trauma cases	Total joint arthroplasty Osteotomies Chronic intra- and periarticular ligament & tendon conditions Chronic peripheral nerve compression syndromes

Table 2: AAOS guidelines for elective surgery (modified).

Q: Are there some types of surgery which are safer than others at the current state of knowledge?

Currently the viral SARS Cov-2 concentration in articular, periarticular and bony tissues and fluids of infected patients is unknown. However, it is reasonable to assume that it is lower in musculoskeletal tissues than in respiratory or digestive tissues. Given these uncertainties, it is recommended to decrease those types of surgeries which generate a high amount of aerosol production like electrocautery, working with oscillating saws as well as pulse lavage procedures. In the absence of well-established scientific criteria, minimally invasive and arthroscopic may have the lowest infection risk.

Q: Which types of surgery should be considered first?

Currently, it appears that patients of categories 1-3 (see Table 1), combining the criteria young age, absence of comorbidities and minimally invasive or arthroscopic surgery have the lowest risk both for patients and surgeons. They should be considered a priority if elective surgeries will be resumed. Surgeries with a higher degree of invasiveness / blood loss may follow later. Surgical procedures followed by a hospital stay of no more than 2 to 3 days should be initially favored.

Q: Which types of anesthesia should be preferred?

Prevention of the coronavirus through aerosolization in a potentially infected patient should be the priority (Rajan & Joshi). Therefore, it appears that local/regional anesthesia should be preferred to invasive airway management whenever possible for elective orthopaedic procedures of the upper and lower extremity. Spinal anesthesia is reported to be safe, even in COVID positive patients (Zhong et al.). If possible, patients should wear surgical masks during the procedure. In case of anesthetic procedures with invasive airway management, surgeons should be aware that aerosolization through exhaled gases may occur. After the procedure, coughing on emergence should be minimized or avoided, as well as postoperative nausea and vomiting.

SECTION 3: RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT FOR THE ORTHOPAEDIC AND TRAUMA SURGEON

Q: What are typical aerosol generating procedures (AGPs)?

Aerosol generating procedures can be defined as respiratory or surgical. Respiratory AGPs, such as intubation, are a high risk of transmitting respiratory virus infections, such as COVID-19. Surgical AGPs, such as the use of high-speed power tools, are a high risk of transmitting virus particles in body fluids and pieces of body tissue; COVID-19 is known to be present in all body fluids.

Q: What procedures of an orthopaedic surgeon lead to aerosol generation?

Surgical technique	Level of surgical aerosol generation
High speed power tools such as saws or burrs	high
Drill	high
Jet lavage systems	high
Electrocautery	high

Q: Why should gowns be used in the OR?
Sterile surgical gowns are part of the standard protection in the OR. In every surgery the OR team consisting of the surgeon, the surgical assistants and the scrub nurse wear sterile surgical gowns in order to reduce intraoperative wound contamination and to minimize the patient's infection risk. It is also a personal protection against blood and body fluids which often spray in an area of 3-8 meters around the operating table.

Q: What type of gowns are available?
The safety levels of gowns for medical use can be classified in levels 1-4.
Level 1 gowns should be used in minimal risk environment such as basic care or for visitors.
Level 2 gowns should be used in low risk procedures such as venous blood draw.
Level 3 gowns are generally used for moderate risk procedures such as arterial blood draw, or in the ER.
Level 4 gowns are preserved for high risk procedures such as surgery or when infectious diseases are suspected.
Helmets or togas might also be an option for protection against body spray, but only protect against airborne transmission of COVID-19 in combination with respirator masks.

Q: What type of face masks are known?
There are three different types of disposable masks available. Single-use face masks, surgical masks, and respiratory masks.

Q: What makes the difference between those face masks?
Single use face masks, which are typically thin and consisting of only one layer are only capable of filtering rather larger particles (3 microns). Surgical masks are generally more effective than single use face masks in filtering virus-sized particles. A medical or surgical mask may be sufficient to prevent droplet transfer, while a respirator mask is required for airborne infection.

Q: Do surgical masks protect against airborne COVID-19 transmission?
No, it is a general consensus among surgeons that conventional surgical masks do not offer protection against high risk AGPs.

Q: Do multiple surgical masks offer a protection against airborne COVID-19 transmission?
No.

Q: Which masks protect against airborne COVID-19 transmission?
Air purifying respirator masks should be used. Respirator masks are generally filtering more smaller sized particles (0.3 micron) than surgical masks.

Q: What are the different standards for masks?
The European Standard (EN 149:2001) classifies respirator masks into three different categories: Filtering facepiece 1 (FFP1), FFP2, and FFP3. FFP2 is comparable to US standard N95 [19].

Q: Which masks are recommended for what?
Respiratory AGP require FFP3 masks or powered air-purifying respirators, whereas surgical AGP only require FFP-2 masks.

Q: What are other significant factors for optimal protection using masks?
The fitting and sizing of the mask is of utmost importance. Only a perfect sized and well fitted mask leads to efficient sealing of the respiratory tract.

Q: Why is eye protection using googles or face shields necessary?
Eye protection is critical for orthopaedic surgeons as many procedures such as the use of power tools frequently lead to contamination of every OR personal in the room and surface contamination in the OR in an area of up to six meters around the operating table.

Q: What should be the personal protective equipment in the OR?
Balanced recommendations for PPE in operating area for COVID-19 positive patients or suspected COVID-19 patients are found below:

	Health care personal (HCP)	Masks		Surgical gowns	Eye protection	Gloves
		Surgical	FFP1-3 N95-100			
Patient transport in and from OR	Persons involved in transport of patients	X	-	Level 1	-	X
Transfer of patient into OR area	All HCP	X	-	Level 1	X	X
Intubation and initiation of anesthesia in OR	All HCP in OR	-	>FFP2/N95F FP3 N99	>Level 3	X when distance <2m	X
Surgery including surgical AGPs	All HCP in OR Occupational department personal (ODP)	- X	>FFP2/N95F FP3 N99	>Level 3 >Level 3	X when distance <2m X	X (double gloving) X
Surgery including respiratory AGPs	All HCP in OR Occupational department personal (ODP)	 X	>FFP2/N95F FP3 N99 or PAPR* if surgeon needs it -	>Level 3 >Level 3	X when distance <2m X	X X
Extubation and ending of anaesthesia in OR	All HCP in OR	-	>FFP2/N95F FP3 N99	>Level 3	X when distance <2m	X
Cleaning of OR	Cleaning personal	-	>FFP2/N95F FP3 N99	>Level 3	X	X

***** Powered air-purifying respirator, X=indicated, -=not indicated

SECTION 4: POST-OPERATIVE FOLLOW-UP

Q: What are the specificities related to the postoperative period?

To assure a proper post-operative management of your elective cases, the country, the region, the city should be partially or completely reopened with notably a reopening of physical therapy and outpatient facilities.

Postoperative appointments should be planned early after the operation to detect potential COVID-related complications.

Postoperative follow-up should be made, if possible, with the use of visioconference and/or telehealthcare to minimize repetitive post-operative visits and therefore limit patient displacement.

A complete planning of the treatment agenda should be made available and precisely discussed with the patient prior to any surgery.

Care should be taken to operate patients when a standardized and sufficient postoperative rehabilitation is assured.

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Joint Statement: Roadmap for Resuming Elective Surgery after COVID-19 Pandemic
American College of Surgeons
American Society of Anesthesiologists
Association of periOperative Registered Nurses
American Hospital Association
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