



## Review

## A medical ethics review of elective orthopaedic surgery management during the pandemic COVID-19 Era

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## ABSTRACT

**Introduction:** Orthopaedic surgeons may wonder what preparation and recuperation would be like during pandemics. We are concerned about the patient's safety during the operation. All surgical centres have received instructions to discontinue all elective surgery operations, although urgent surgical cases are still being carried out. This procedure should not be delayed in orthopaedic issues such as fracture repositioning surgery, as the unionization process is ongoing.

**Methods:** We gather review articles from a variety of sources. The keywords "Ethics," "COVID-19," "Elective Surgery," and "Orthopedic Surgery" were used to filter the documents. We found 863 documents and then set the criteria for including documents that we thought eligible for review articles, such as research journals and newspaper pieces from reliable sources, resulting in the discovery of 40 papers that met our requirements.

**Result:** We will discuss four basic principles of medical ethics: beneficence, nonmaleficence, autonomy, and justice. Orthopaedic surgeons will face many decisions that will challenge these ethical principles, especially in performing elective surgery during a pandemic.

**Conclusion:** Physicians must protect the most vulnerable, but they are under no obligation to administer treatment they believe to be ineffective. In individuals who are positive for COVID-19, orthopaedic surgical procedures have a significant mortality rate. Surgical leaders must remain attentive, and surgical services must be reintroduced gradually and carefully. A good option is to carry out treatment at a different place and time and ensure that the patient has tested negative for COVID-19 before the procedure, thereby creating safety for patients and health workers.

### 1. Introduction

After the March 11, 2020 pandemic declaration, Coronavirus Disease 2019 (COVID-19) patients continued to increase [1–3]. The COVID-19 Pandemic will leave a permanent mark on all aspects of society, including politics, culture, economics, health policy, and medicine [4, 5]. COVID-19 has changed the way we live our days, such as socializing, studying, working, and working as health workers [6]. Hospitals are at the frontline of this crisis and have shifted their resources to handle the coronavirus pandemic on an unprecedented scale [4]. No department

has been left untouched from the effects of COVID-19, surgery department included [7] (see Fig. 1).

If we have major surgery, we may be concerned about the preparation and recuperation process. We are concerned about whether the patient will be safe during the procedure [6]. All surgical centres have received instructions to discontinue all elective surgery operations, but urgent surgical cases are still being carried out [8].

Delays in surgery will have a real effects on patient health outcomes, hospital finances and resources, as well as training and research programs [9]. This procedure should not be delayed in orthopaedic cases

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such as fracture repositioning surgery, as the ongoing bone unionization process [10].

So how do we practice surgery during this Pandemic ethically? There are four basic principles of medical ethics that we can follow, including beneficence, nonmaleficence, autonomy and justice [11]. Ethics in practice will involve interactions between surgeons and patients which must be done with fairness, honesty, compassion and respect [12,13]. We discuss how medical ethics can guide orthopaedic surgeons to do the right thing and get the best outcomes available to patients during and after this COVID-19 Pandemic.

**2. Materials and methods**

We are collecting review articles from several suitable sources. The selection of documents using the keywords “Ethics,” “COVID-19,” “Elective Surgery,” and “Orthopedic Surgery.” We found 863 articles and research documents based on full-text access to free or paid documents and English-based documents and then re-selected articles that matched the themes we raised so that we found 40 articles that met the criteria and analyzed this review article.

The inclusion criteria of the documents that we deem fit for reviewing articles are research journals and newspaper articles from good sources, reported in English, relevant and reliable, and discussing the ethics of elective orthopaedic surgery during the pandemic [14,15]. Studies are excluded if they lack reliable, inaccessible, and expensive references.

**3. Result**

*3.1. What procedure should be performed?*

Working in orthopaedic surgery and traumatology, the impact of the COVID-19 Pandemic on our work patterns is significant. The caseload has now reduced from an average of 50 surgical cases per week to 10–15 cases per week after the declaration of a pandemic emergency in Indonesia in March 2020. Although restrictions on surgical activity in the hospital, which led to delays and cancellations in elective surgery cases, were the primary cause, recovery rooms and treatment unit beds were also decreased as a result of modifying the distance between patients and limiting the number of patients per room [16].

The American College of Surgeons published Elective Case Triage Guidelines for Surgical Care during the COVID-19 Pandemic [7]. The suggested changes are as described above; However, advice on selecting operations when more than one action is lacking. Consequently, in addition to pre-COVID-19 activities, all types of orthopaedic surgery have primarily had to be discontinued, and current activities include only trauma surgery (such as fractures) and surgery for musculoskeletal tumours (such as malignant bone tumours), soft tissue sarcomas, metastases, and pathological or impending fractures [16]. For all its limitations, careful case selection is essential to minimize harm: only the most urgent patients without a viable alternative can be listed.

*3.2. How to minimize the risk of COVID-19 in the orthopaedic department?*

Despite the fact that the virus is transmitted through the air, community air cleaning is not known to be helpful in preventing future viral

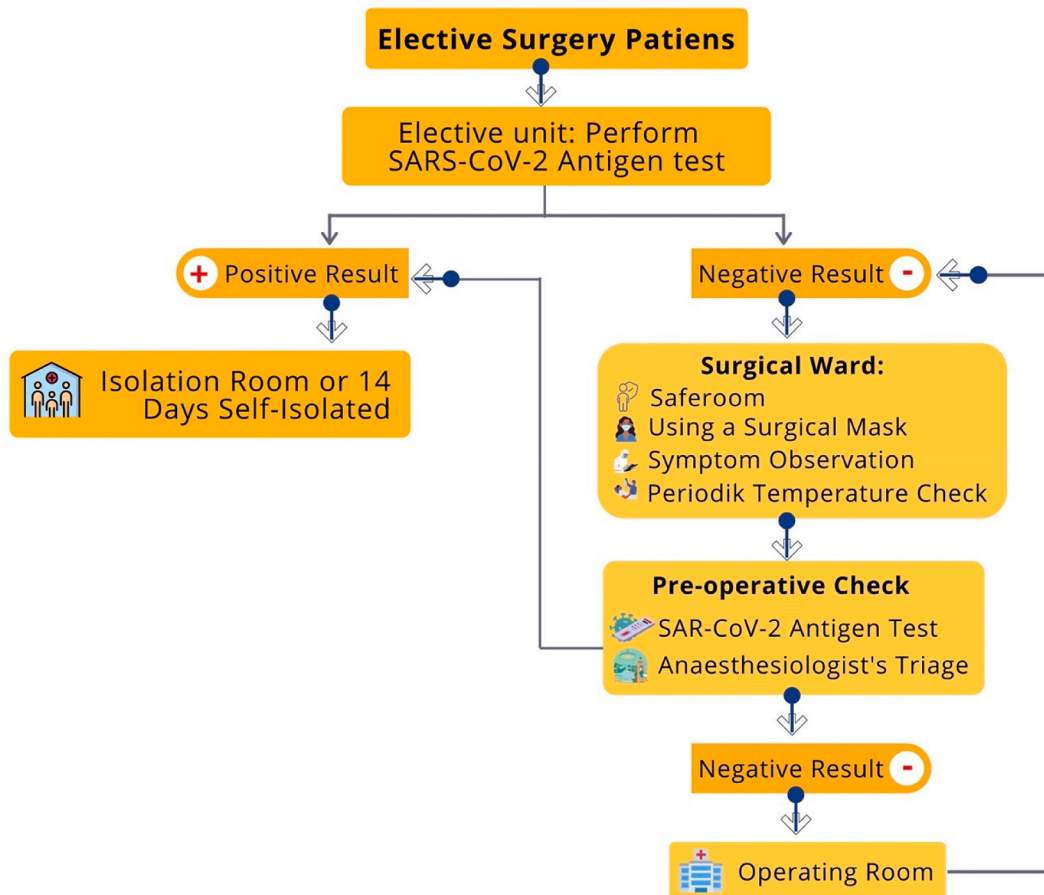


Fig. 1. Perioperative management of elective surgery patient.

transmission and spread. Transmission amplification occurrences should be avoided by limiting human-to-human transmission. Because resources are limited, the use of personal protective equipment should be carefully considered. Patients who are scheduled for elective surgery will be triaged when they arrive at the emergency department. The patient is admitted to the surgical ward if a swab examination of the SARS-CoV-2 antigen on the patient yields a negative result. However, if an infected person has been found, immediate isolation and optimal treatment should be provided [17].

Suspected patients should also be given a medical mask and, if one is available, placed in an isolation room. The patient can self-isolate at home if there are no symptoms. When performing aerosol-generating procedures, single rooms with appropriate ventilation should be used whenever possible. All patients should be taught to use tissues to cover their nose and mouth while coughing or sneezing. Hand hygiene should be emphasized after contact with respiratory secretions. If feasible, avoid contaminating environmental surfaces by using disposable or specialized equipment (e.g., stethoscopes, blood pressure cuffs, and thermometers) for suspected cases (e.g., door handles). In addition, all health care personnel (doctors, nurses, sanitation assistants, and so on) are subjected to comprehensive swab testing with periodic retesting. Furthermore, every day during the consultation, all patients were scanned with a thermometer and required to wear a surgical mask throughout their stay in the hospital [18].

Having a “clean” hospital that performs operations will provide a safe space and can reduce COVID-19 risk [19]. Private hospitals and specialized surgical units have been proposed to do this. In light of the continued spread of the virus despite the national lockdown and the widespread shortage of personal protective equipment [20], keeping any hospital hygiene for an extended period will be needed.

Before entering the operating room, triage was performed by an anesthesiologist, including a medical history review, brief physical examination, and review of blood test results, CT, and tests for SARS-CoV-2 antigen. Since there was a possibility that the patient was infected with SARS-CoV-2 but did not show any symptoms, all patients were placed in an isolation room and transferred to a particular negative pressure operating room with an anteroom (buffer area). Surgical masks or N95 were also given to patients. After the patient entered the operating room, the patient was placed on an electrocardiographic monitor. Normal noninvasive blood pressure and peripheral pulse oximetry were monitored. The anesthesiologist does his job. After the patient is ready, the orthopaedic surgeon operates [21].

After surgery, the patient is transferred to the recovery room and then back to the previous surgical ward. On the day following surgery, the patient had a complete blood count and coagulation testing. If COVID-19 is suspected or confirmed, the SARS-CoV-2 antigen swab test is tested again. Body temperature or other symptoms associated with COVID-19 were recorded daily by nurses during the hospital stay. Supplemental oxygen was supplied via a nasal cannula or mask according to the patient’s clinical state to maintain a SpO<sub>2</sub> of 95% or more [21].

### 3.3. Beneficence, nonmaleficence and best interests

In medical ethics, beneficence is a principle that requires doctors to provide the best possible positive benefits, such as good health and preventing and eliminating harmful conditions in patients [22]. The principle of nonmaleficence explains the obligation not to harm others. This is closely related to the maxim *primum non nocere* (first, do not harm) [23]. The ancient Hippocratic Oath binds a doctor to act “on behalf of my patient, and abstain from what is harmful or naughty.” The primacy of patient well-being is the foundation of medical ethics, and the assurance of these values forms the basis of most professional codes [24]. Physicians have the fundamental responsibility to act in the best interests of their patients, regardless of personal motives, and patients must have faith in their ability to do so. COVID-19’s pandemic potential

necessitates constant surveillance and monitoring to precisely track and anticipate its future host adaptation, evolution, transmissibility, and pathogenicity. These variables will have an impact on mortality rates and prognosis. It is also our job as a surgical community to be aware of the COVID-19 signs and symptoms and to report suspicious cases as soon as possible. Because COVID-19 is transmitted asymptotically, our attention is widened to encompass healthcare personnel, the healthcare system, and society as a whole in biomedical ethical concerns [25].

The patient-doctor relationship has always been exceptional, where patients trust their doctors to act in their best interests. That trust will be tested during the pandemic as surgeons and surgical services cannot function normally if there is unwanted patient damage. However, during the pandemic, most health care systems have stopped all but emergency surgical care. Indeed, in many areas, a moratorium has been placed on unscheduled surgery [26]. Another opportunity to deliver gold standard operations safely is to change the location or timing of the procedure.

Elective orthopaedic surgery can include anything from joint replacement or bone repair to replacing a torn ligament. Usually, orthopaedic surgery is often considered elective surgery. Orthopaedic surgery may be necessary for chronically deteriorating diseases such as arthritis, which may necessitate joint replacement. Your orthopaedic surgeon may choose to try other types of treatment first, such as medication, physiotherapy, or the use of supports such as a brace, before resorting to surgery [27]. The exception to this is if you have an injury that has the potential to cause serious complications or permanent disability if not treated immediately, such as a broken leg sustained in a car or sports accident. In the case of a fracture, the bone undergoes a physiological process known as fracture healing, also known as the bone unionization process [28]. Delay in surgical procedures can cause mal-union, complicating and prolonging the operation duration later [29].

Furthermore, elective major orthopaedic surgeries, such as hip replacement surgery or proximal femur surgery, require an adequate blood supply [30]. On the other hand, the need for blood during the pandemic has significantly increased, especially the demand for convalescent plasma [31].

Most deaths worldwide occur in elderly patients with comorbidities, and we know that surgery on COVID-19 positive patients, especially significant surgeries such as fracture repositioning and joint replacement, carries a high mortality rate. However, we should not assume that all surgeries will be useless in older, frail, or COVID-19 positive [32]. Doctors have to protect the most vulnerable, but doctors are under no obligation to offer treatment that they deem to be futile [33]. However, we cannot withhold the full attention of certain groups and risk the avoidable extermination of the elderly and infirm during the pandemic, but we must apply an individualized and context-specific approach to risk assessment [34].

The dual effect doctrine, where action can cause harm, predicts how this benevolent public health initiative could have a deleterious effect. A compromise must be established between therapies that are now considered too hazardous and the necessity to continue saving patients’ lives or preventing indirect harm such as soft tissue sarcomas, open fractures, and other urgent health requirements unrelated to COVID-19. Surgical leaders must remain vigilant and, when local circumstances allow, advocate for the gradual and careful reintroduction of surgical services prioritized by clinical need and work across specialists to resolve the backlog [35].

### 3.4. Autonomy and justice

In medical decision-making, patient autonomy must be respected, meaning the patient can act purposefully, with understanding, and without controlling influences that would undermine free and voluntary action. This principle forms the basis for the practice of “informed consent” in doctor/patient transactions regarding health services [24].

Everyone has the right to control what happens to their bodies,

including the refusal of treatment, and that decision must be respected by everyone, even if it is not in the patient's best interest. In law, the principle of autonomy is often considered to give negative rights, the right not to interfere [11].

The combined effect of the moratorium on elective surgery and the annexation of private surgical facilities means that patient options have been limited. Even more concerning, in centres where healthcare systems have been overwhelmed by the spike in the pandemic, limited resources such as critical care beds and ventilators are not yet available to all who might benefit, and patient options have been phased out [36].

To have valid consent, the patient must have the capacity to understand the relevant information, voluntarily consent to and communicate the decision. There are many challenges to informed consent, especially in vulnerable patients, including patient-centered barriers (age, education, language, illness, disability, and time) and process-centered barriers (forms, information, communication, and time). Communication barriers increase with personal protective equipment (masks and visors), social distancing, and isolation from family or friends during this pandemic. Surgeons have made efforts to overcome this barrier with the innovative use of proven digital and audio-visual interventions [37]. In an emergency, the orthopaedic surgeon immediately acts in the patient's best interest.

Justice is acting or treating fairly or fairly. We must try to be as fair as possible when offering care to patients and allocating scarce medical resources [11]. One of the recent obstacles has been the COVID-19 oxygen emergency, where demand is soaring, but production is relatively static. Oxygen is an essential drug for the effective treatment of hospitalized COVID-19 patients. COVID-19 has put significant pressure on the health system, with hospitals running out of oxygen. Therefore, the principle of justice must be upheld to determine the priority of patients getting oxygen, lest surgery will only increase oxygen demand if surgery cannot be performed. Performed can cause permanent deformity [38].

During a pandemic, societal concerns take precedence over personal interests. Social isolation, self-isolation, and travel limitations have diminished the workforce across all economic sectors, resulting in the loss of numerous jobs. The demand for commodities and manufactured goods has declined as schools have closed. In contrast, the need for medical supplies has risen dramatically [39]. When treating individual patients, we must consider available resources as well as the needs of all patients for social justice. The biggest death toll occurred at the epicentre, which coincided with the collapse of the local healthcare system. Even well-resourced healthcare systems cannot meet the demand for life support and ventilators, and limited resources must be focused on those who are most likely to benefit [24]. These critical decisions should not be made in isolation but in collaboration with others and with an awareness of the uncertainties. Several serious risks indirectly harm patients during the pandemic, such as delays in diagnosis, treatment, procedures, and surgery. To respect the principle of generosity, providers should endeavour to alleviate suffering to the best of their ability. As a result, concerted efforts must be made to provide redress for disadvantaged patients. Surgeons and healthcare providers need to work collaboratively and creatively to restore surgical services safely and sustainably by recognizing the risks of a second pandemic wave and being constrained financially by the economic devastation caused by the pandemic [40].

#### 4. Conclusion

Most healthcare systems shut down all but emergency services during the pandemic. Physicians must protect the most vulnerable, but they are under no obligation to administer treatment they believe to be ineffective. In individuals who are positive for COVID-19, orthopaedic surgical procedures have a significant mortality rate. Surgical leaders must remain attentive, and surgical services must be reintroduced gradually and carefully. A good option is to carry out treatment at a different place and time and ensure that the patient has tested negative

for COVID-19 before the procedure, thereby creating safety for patients and health workers.

#### Disclosure of interest

The author claims he has no competing interests.

#### Ethical approval

There is no ethical approval to conduct this research because this is a narrative review based on the author's experience as an orthopedic surgeon who is also a bioethics lecturer who is also and of course this paper is reviewed from various references.

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In this study, we did not take funds from the author, the author only collaborated with the hospital in the author's area to collect data on ethical problems that occurred in orthopaedic surgery cases, then applied for permission to publish it.

#### Author contribution

MUHAMMAD ARDI MUNIR: Study conception, Data collection; data analysis; writing & editing. PASCAL ADVENTRA TANDIABANG: Data collection; data analysis; writing & editing. AMIRAH BASRY: Data collection; data analysis; writing & editing. TRY SETYAWATI: Data collection; data analysis; writing & editing. NASRUN: Supervision and review data validation. NUR AZID MAHARDINATA: Supervision and review data validation. NURULHUDA RAHMAN: Supervision and review data validation.

#### Registration of research

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

#### Guarantor

MUHAMMAD ARDI MUNIR.  
PASCAL ADVENTRA TANDIABANG.

#### Declaration of competing interest

During the COVID-19 pandemic, orthopaedic surgery is often delayed. Procrastination is caused by a misunderstanding. Many think that fracture surgery is not an emergency case, because it does not affect life, as a result, orthopaedic surgery is always placed last, even though we as orthopaedic surgeons always emphasize delaying orthopaedic surgery, especially fractures, can cause malunion because bone unionization continues, without knowing the bone alignment.

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