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COVID-19 and Surgery: Are We Trading One Problem for Another?

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Insights

- The COVID-19 pandemic has led to mass cancellation of surgical services around the world.
- Even if the typical surgical volume is increased post-pandemic, it may take a long time to catch up with the backlog of surgeries.
- A wide range of factors influence the capacity of surgical services to keep up with the pandemic, including the spread of SARS-CoV-2 and the duration of societal regulations.
- There is emerging evidence highlighting the importance of weighing the risks of delaying surgery and conducting surgery during the pandemic.
- Guidelines for providing surgical services during the pandemic have contradictory recommendations.
- Moving forward, there is a need for collaboration between governing bodies to develop guidelines, which will have to be further customized to meet the needs of individual countries.
- Collaborative Generated Resources include: OE Best Practices and Resuming Elective Surgery

> "The team [The COVIDSurg Collaborative (1)] estimated that more than 28 million elective surgeries worldwide could be cancelled or postponed in 2020, based on a 12-week period of peak disruption to hospital services due to COVID-19 — including potentially hundreds of thousands of procedures in Canada."
>
> **Lauren Pelley**
> CBC News, 2020 (2)

> "An estimated 45 000 fewer surgeries were performed in adults with non-cancer-related illness in Ontario in late March and early April 2020, which is a more than 90% reduction compared with the same 4-week period in 2019"
>
> **David R. Urbach & Danielle Martin, 2020 (3)**

The COVID-19 Crisis in Surgery

The COVID-19 pandemic has placed significant challenges on healthcare systems of many countries around the world. One of the hardest hit areas of care has been surgery – with near-universal disruption and mass cancellation of surgical services (4). In order to accommodate the surge of COVID-19 patients who require critical care, all non-essential elective surgeries have been cancelled or are pending cancellation due to the current high demands for ventilators, hospital space, as well as hospital staff (4). These cancellations can lead to tremendous short and long-term health implications for patients who require surgery, including potential loss of function, risk of adverse prognosis, worsening quality of life, and even death (1,4). As an example, earlier this summer in the midst of the pandemic, we identified 7 key consequences for the growing unmet burden of orthopaedic care, which are likely to amplify the negative implications of the current backlog of surgeries (Exhibit 1).

Countries that were hit particularly hard by the pandemic, and especially countries such as Canada where wait times for surgery were already long even before the pandemic, recovering from the current public health crisis and catching up on the backlog of surgeries will require plans that are proactive, ethical, and creative (5). While it may be challenging to see beyond the immediate demands on healthcare systems, critical reflection of the current challenges to support constructive preparation for the future will not only allow surgical services to survive post-pandemic, but thrive in a care landscape that will no longer be the same.

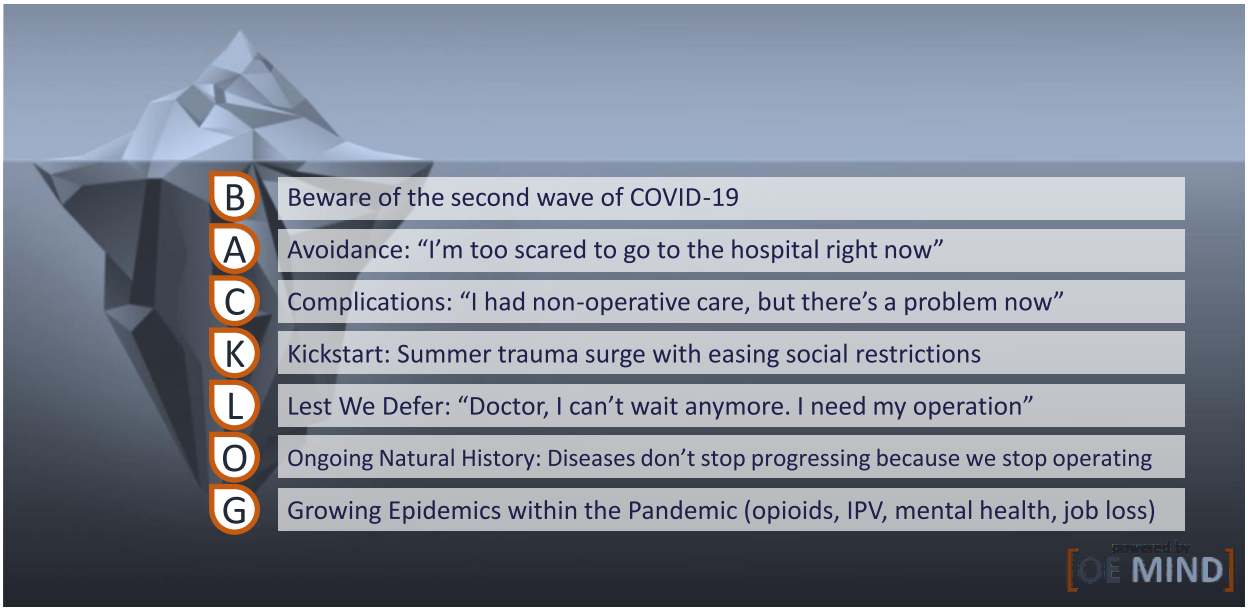

Exhibit 1: Consequences for Growing Unmet Burden of Orthopaedic Care

> "If countries increased their normal surgical volume by 20 percent after the pandemic, it would take a median of 45 weeks to clear the backlog of operations resulting from COVID-19 disruption."
>
> **The COVIDSurg Collaborative, 2020 (1)**

> "Hitting that kind of ambitious target [increasing normal surgical volume by 20 percent after the pandemic] would be challenging…In Canada, we're already working at or beyond capacity in many ways."
>
> **Dr. Janet Martin, Associate Professor at the Schulich School of Medicine & Dentistry, Western University (2)**

Keeping Up with The Pandemic

Soreide et al (2020) described the capability of surgical services to keep up with the pandemic depends on a wide range of factors, including (4):

1. The peak of the pandemic,
2. The spread of SARS-CoV-2,
3. The duration of societal regulations, and
4. The duration and temporal epidemic repeats by which the disease burden approaches the threshold of maximum capacity of the critical care resources.

This highlights the complexity of providing surgical services in the midst of a pandemic, which will require different strategies than those most healthcare systems are used to implementing to cope with seasonal disruption and occasional cancellation of surgeries. It is hypothesized that even when the threshold of maximum capacity of critical care resources is not surpassed, the capacity can come close to, or temporarily cross the threshold, before the pandemic ends (4). In this context, capacity building in surgical services to withstand the challenges of a dynamic environment – where demands on the healthcare system can rapidly change – is crucial for moving forward.

> "Patients having surgery are a vulnerable group at risk of SARS-CoV-2 exposure in hospital and might be particularly susceptible to subsequent pulmonary complications, due to the pro-inflammatory cytokine and immunosuppressive responses to surgery and mechanical ventilation."
>
> **The COVIDSurg Collaborative, 2020**

Surgery During Pandemic: Experience So Far

Despite the mass cancellation of surgical services across many settings, there are reports of surgeries taking place for patients with or without COVID-19. The COVIDSurg Collaborative led an international, multicentre cohort study across 24 countries in 235 hospitals with patients undergoing surgery who had SARS-CoV-2 infection confirmed 7 days before or 30 days after surgery (6). Postoperative pulmonary complications occurred in half of these patients (51.2%) and the 30-day mortality rate was high (23.8%). Additionally, men, individuals aged 70 years or older, those with comorbidities, those having a malignant diagnosis, and those needing emergency or major surgery were more vulnerable to 30-day mortality. The authors noted that the postoperative outcomes observed in SARS-CoV-2 infected patients were much worse than pre-pandemic baseline rates of pulmonary complications and mortality. Taken together, these findings highlight the importance of weighing the competing risks of delaying surgery until patients recover from COVID-19 versus the progression of disease or adverse outcomes in the intervening period (7).

There is now emerging evidence on the impact of COVID-19 on surgeons' knowledge, attitude, practice, and socioeconomic burden. An international, multicentre cross-sectional study of 781 spine surgeons showed that 70% of surgeons were willing to operate on patients with COVID-19 if needed, while only 23.3% received training or knew another spine surgeon who received training to deal with the pandemic (8). Additionally, being an orthopedic spine surgeon, working in the private sector, and older age of practice were predictors of higher effects of COVID-19 on practice (8). While authors of this study have not provided hypotheses regarding these associations for all the risk factors, they did propose that surgeons working in private hospitals were likely more affected because many of them do not work on a salary basis, unlike most surgeons working in university hospitals, thus losing patients would lead to a loss of income. It is clear that spine surgeons from different regions around the world are ready to face the challenges of the pandemic, even if they may not be ready for them or pay a personal cost for their service. While these altruistic traits are commendable, practicing in this manner in the long term, given the uncertain duration of the pandemic, is neither sustainable nor desirable. In this context, health system capacity building to better support surgeons to survive the pandemic and its aftermath should be a top priority for decision makers.

Although the pandemic has been a cause of much distress, there are also a few silver linings of this crisis. Notably, after the pandemic began, the majority of spine surgeons reported improvement in general and personal hygiene, increased awareness of the importance of medical and scientific research, as well as increased use of telemedicine (8). With continued commitment, these positive changes can have a lasting impact on surgical services and raise the standards for better practices in the field.

> "Wait times can, and do, have serious consequences such as increased pain, suffering, and mental anguish. In certain instances, they can also result in poorer medical outcomes -- transforming potentially reversible illnesses or injuries into chronic, irreversible conditions, or even permanent disabilities"

Bacchus Barua
Associate Director, Health Policy Studies, Fraser Institute (9)

Guidance for Surgery During a Pandemic

Times of public health crises not only impose new challenges on healthcare systems, but also reveal many of the inherent limitations of these systems that otherwise remain hidden. There is growing consensus on the need for guidance to navigate through surgical services during a pandemic, and considerable research and guideline formation activities have followed at rapid speed. Earlier in the pandemic on April 15, 2020, the COVIDSurg Collaborative published their findings of a scoping review and key informant interviews that identified key themes to consider in pandemic preparedness plans for surgical services (10). Moreover, since the beginning of the pandemic, our team has taken a leading role in providing recommendations to surgeons through a series of guidance documents, the first version published on April 12, 2020, the second version published on April 22, 2020, and the latest version published on May 30, 2020 (11). For the latest guidance document, we conducted a critical review and proposed a series of evidence-based principles to guide musculoskeletal care decision making in the context of the current resource scarcity experienced around the world. We provided updated peer-reviewed recommendations from an ongoing systematic mapping review of the published literature to guide key areas of orthopedic management during the COVID-19 pandemic. These key areas include general considerations for surgery, outpatient care, phased management of elective procedures, urgent/emergent procedures, perioperative care, and steps to restart non-urgent restorative surgery. We have prepared easy to access summary documents with recommendations in each of these areas, while indicating the strength of evidence these recommendations are based on. Exhibit 2 shows a summary of our recommendations for general considerations for surgery.

Exhibit 2: Surgery Protocols During COVID-19 - General Considerations

(DOWNLOAD FULL PDF)

	The COVID-19 pandemic is a rapidly evolving situation. Surgeons' should stay updated on local indicators of pandemic severity, as well as best practices, policies and protocols.
	Ensure patient and staff safety. Provide psychological support for the healthcare personnel and promote initiatives for their well-being.
	Individuals and institutions should follow general hygiene and social/physical distancing measures to limit disease spread*.
	Be prepared for supply shortages and develop contingency plans and policies to preserve personal protective equipment (PPE).
	Clear and effective leadership is crucial. Experienced surgeons should take leading roles to guide their teams.
	Establish rotating teams that can work in isolation of each other. Plan for redundancy as some personnel might need to be quarantined due illness or exposure*.
	During surge stages, surgeons may be asked to redeploy into unfamiliar (non-orthopaedic) roles. Prepare for this scenario, be willing to collaborate and stay updated on COVID-19 patient management recommendations.
	Tele-health should be used where possible to limit exposure risk. Tele-health can be used for new consultations, follow-ups, and/or provide rehabilitation guidance*.
	Surgical training programs should implement technology to help trainees engage in remote knowledge and skill acquisition*.

One of the criticisms of some of the surgical and perioperative guidelines is that many of the recommendations are contradictory and based on anecdotal data (4). While the rapid speed of guideline development during a public health crisis is necessary, it is still important to ensure recommendations are based on a critical assessment of risks and benefits, if not based on relevant evidence which may be unavailable during a pandemic. In order to avoid duplication of efforts, one pragmatic strategy can include collaboration between prominent governing bodies to develop some general guidelines surgeons from different countries can refer to. However, given the heterogeneity in the healthcare systems and prevalence of COVID-19 cases across countries, the need to adapt guidelines based on local needs is inevitable. At a broader level, in addition to dealing with the short-term challenges in hand, the appropriateness of proposed recommendations to cope with the backlog of surgeries in the long-term should be considered. It may be the case that in addition to proactive planning, increased staff training, and operational changes in hospitals, there is a need for a bigger healthcare system reform. For example, in Canada, there have been calls for a team-based, single-entry approach to deal with the backlog of surgeries in an efficient and ethical manner moving forward (3).

> "The post pandemic evaluation and future planning should involve surgical services as an essential part to maintain appropriate surgical care for the population during an outbreak. Surgical delivery, owing to its cross-cutting nature and synergistic effects on health systems at large, needs to be built into the WHO agenda for national health planning"
>
> **Kjetil Søreide et al 2020 (4)**

Trade-offs: To Delay Now, is a Crisis Emerging

Given the difficulties of providing surgical services in the midst of a pandemic, it is tempting to take a conservative approach and postpone or cancel surgeries, while promoting non-operative treatment to delay or avoid the need for surgery. Although this approach may be appropriate for some cases of elective surgery, there can be a significant detrimental cost of this approach for both patients and healthcare systems. The current approach of largely deferring surgeries is an unsustainable short-term solution, which will not save us from an overwhelming public health crisis in the near future. An effective way forward will begin with joining forces with leaders around the world to determine common recommendations that can be applicable across countries, with a concerted effort in individual countries to customize recommendations based on their needs.

Contributors

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