

Approaching surgical triage during the COVID-19 Pandemic

*Mary E Brindle MD MPH Ariadne Labs at Brigham Health and Harvard TH Chan School of Public Health, Boston, MA; Cumming School of Medicine University of Calgary, Calgary, AB**

Gerard Doherty MD Harvard Medical School, Harvard University, Boston, MA; Brigham Health and Dana Farber Cancer Institute, Brigham and Women's Hospital, Boston, MA

Keith Lillemoe MD Harvard Medical School, Harvard University, Boston, MA; Massachusetts General Hospital, Boston, MA

Atul Gawande MD MPH Ariadne Labs at Brigham Health and Harvard TH Chan School of Public Health, Boston, MA; Brigham and Women's Hospital, Boston, MA

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**Corresponding Author*

The COVID-19 pandemic has drastically changed surgical priorities in the United States and world-wide. Patients with time-sensitive surgical conditions or tumours have been prioritized while patients with surgical conditions that require less urgent management such as asymptomatic hernias or obesity have been postponed indefinitely. As the spread of COVID-19 places greater demands on health systems, further triage will be required. The American College of Surgeons has provided guidance to aid in prioritizing cases¹ but challenges will remain both in this current time of crisis and over the several months after the peak of the pandemic. Getting this right will be a challenge, and there are several considerations that will

need to be taken into account as systems develop long-term strategies for surgical prioritization.

I. Before the Peak of the Pandemic

Surgical systems that have not deferred non-urgent operations may be too late to mount the necessary response to COVID-19. Even those that have postponed these cases should be prepared for the impact of the pandemic to escalate sharply with little time to adapt. With

the initial spread of COVID-19 into North America, the American College of Surgeons (ACS) was quick to recommend the suspension of all elective surgery before the need hit. The adoption of these recommendations was not immediate nor was it complete. The harm caused by failure to modify the surgery schedule has been clearly demonstrated in countries like China where ongoing elective operations and non-essential clinic visits contributed to early rates of in-hospital COVID-19 transmission;² and from Italy where resources consumed through elective surgery including personal protective equipment left health care workers vulnerable when the pandemic crested.³ Empty operating rooms and inpatient beds prior to the peak of the pandemic are necessary preparation to ensure that hospitals are not crippled by a large volume of critically ill patients presenting within a short timeframe.

Life-saving operations should be prioritized with a clear plan to move to triage based on quality of life years attainable if resources become scarce. Prioritizing cases that are immediately or urgently life-saving offers the greatest benefit for lives saved during crisis and is

the current form of triage undertaken across most of the United States and Canada. Under extreme circumstances, triage shifts to consider prioritizing patients for whom the greatest number of quality life years can be salvaged. This form of triage has been enacted in Italian critical care units, where patients most likely to recover have been prioritized over the sickest.³ Other hospitals in the United States and Canada have developed similar frameworks to consider adopting “Crisis Standards of Care” if resources become scarce.⁴ Alternatives to surgery may also allow for operative room resource conservation but may consume other resources and contribute to patient morbidity. In making recommendations around case urgency and alternatives, the ACS has aimed to balance these risks. For example, treating appendicitis with antibiotics was suggested as an alternative to surgery. However, there was immediate backlash to this suggestion from surgeons who were concerned with the failure rate and the potential need for prolonged admissions.^{5,6} The concerns about these failures may be over-estimated; and surgical biases can be difficult to separate from best evidence dictating best management. Antibiotics for appendicitis is first line therapy in a number of hospitals across the globe. Although non-operative care of appendicitis may have a failure rate between 14 and 30%, the majority of patients will get out of hospital without surgery and will not consume the human and material resources that are most needed in COVID-19 management.^{5,7} Decision-making must balance the concerns of surgeons advocating for what they consider best management with what is most acceptable in the face of a rapidly evolving public health emergency. When feasible, non-operative solutions that may require future operation but spare current resources should be considered. Different specialties, such as oncology, require different approaches to

triage. For example, diagnostic procedures such as biopsies that offer the potential for early potentially curative intervention should be prioritized as life-saving. When considering the management of patients with operable cancers, the meaningful survival benefits achievable with optimal and timely surgery need to be weighed against the potential survival achieved with less optimal approaches including delayed surgery, radiation and chemotherapy. Large, and complex oncologic resections and transplants can consume large amounts of resources including blood and intensive care support. In situations of extreme scarcity, it is possible that centers may not be able to offer these procedures. When life-saving operations cannot be offered because of resource scarcity, every attempt should be made to transfer patients to centers that have sufficient resources to provide necessary surgical care. The perspectives of clinical experts as well as administrative leaders are essential in balancing clinical need and operational capacity.

Recommendations for systems to consider before the peak of the pandemic:

- 1. Stop all non-urgent operations as soon as possible (if not already stopped) in all ambulatory and non-ambulatory centers*
- 2. Define time-sensitive cases within each specialty following standard criteria such as those provided by the ACS.¹ These should be centrally reviewed, aligned between specialties, and strictly enforced.*
- 3. Define life-or-limb cases before triage based on these criteria is required.*

4. *High resource but life-saving operations such as transplant will need to be constantly reviewed and may necessarily become a second priority if resources become scarce.*
5. *Develop a framework with the aid of ethicists to consider triage to maximize the quality of life years saved to be used when demand for health system resources exceeds supply.*
6. *Develop protocols for the non-operative management of common and uncommon emergent, urgent and elective conditions. This should include strategies to palliate and otherwise care for patients not able to receive urgent intervention due to triage criteria.*
7. *Develop pathways to transfer surgical patients to centers with greater capacity if resources become scarce.*
8. *Communicate clearly with patients who are delayed or postponed including the rationale, recommended treatment until surgical intervention, and indications for them to re-contact the surgeon.*
9. *Establish a clear process for surgeons to present special cases for consideration that do not fit strict triage criteria.*
10. *Prepare for moral distress and frustration within surgical systems and provide ample support for providers.*

II. After the Peak of the Pandemic

When human and resources become more available, the volume of cases will pose significant challenges for recovering systems. Delays will persist, many patients will have more complicated and further advanced disease and triage will be essential.

During the early stages of the pandemic, operative cases that need to be done urgently and those that can wait several months with no morbidity are usually easily differentiated.

However, there remains a third group; where delays add significantly to the burden of disease experienced by the patient. As time passes, knowing how to manage these patients will become more challenging. This large and diverse population have conditions that are not immediately life threatening but for whom surgery should not be postponed (e.g., biopsies for presumed malignancy), and patients who may run the risk of acute exacerbation of their disease (e.g., biliary colic), chronic deterioration (e.g., bariatric surgery), or persistent disability and pain (e.g., severe osteoarthritis requiring joint replacement). It is inevitable that many patients from this group will require emergency surgery that could have been avoided while others may suffer unnecessary pain, disability or death if the period of triage is prolonged.

The importance of planning for resumption of expanded medical and surgical services post-COVID is crucial but difficult to contemplate in the current environment. The World Health Organization has recommended that health systems develop an organized approach to recovery after a pandemic but there is no good blueprint for exactly how this should be done.⁸

The experience of Hong Kong post-SARS provides a good illustration of the issues encountered when dealing with a backlog of 16,000 cases after suspension of 30% of medical services when

operating capacity returned to normal.⁹ The recovery process for hospitals took years. The scope of Hong Kong's problem will likely pale in comparison to what the United States will experience. There will be a tremendous burden of surgical care acquired over many months of delay and, no doubt, some of this burden will be made more challenging due to progression of disease and neglect. In addition, the workforce prepared to take on this burden will be diminished, under strain from the stresses of personal and financial losses as well as physical exhaustion from the care delivered during the pandemic.¹⁰ As in Toronto after SARS, significant financial resources will likely be consumed by hospitals and health systems to deal with this backlog of cases.¹¹ Developing an approach to prioritization of non-urgent cases that have waited variable amounts of time will require thoughtful sequencing. Triage is as crucial during this phase as it is at the early stages of the pandemic and should include re-evaluation of patients who have suffered from significant delays. Patients suffering from acquired and persistent morbidity should still be prioritized over those with less severe conditions. Lucrative but non-urgent cases should be delayed. A staggered recovery across and within hospitals, states and territories may allow for sharing of resources and distribution of cases, allowing patients to access systems earlier and unburdening those centers that have seen the greatest impact to care delivery.

Recommendations for systems to consider after the peak of the pandemic:

1. *Once the peak of the pandemic has passed, regularly and realistically assess the hospital systems capacity to expand surgical services.*

2. *Expand surgical services slowly but early.*
3. *Maximize capacity by transferring patients to ambulatory centers or other nearby systems that have capacity for surgery.*
4. *Rapidly re-assess and re-triage patients who have been delayed beyond the recommended timeframe.*
5. *Cancer cases and oncology diagnostic tests that have been delayed beyond optimal windows for treatment or have undergone less optimal alternative therapies should be prioritized.*
6. *Second level re-prioritization should consider sustained but reversible morbidities incurred during waiting, prolonged pain, and increasing projected complexity.*
7. *For patients who are likely to be asymptomatic with a risk of acute deterioration (e.g., infant hernias) operations can continue to be delayed with good counselling.*
8. *Patients that are waiting to undergo surgery without direct benefit to health (e.g., minor cosmetic surgeries) should be delayed. Ambulatory centers should help to address the burden of delayed prior to addressing less urgent operations.*
9. *COVID-19 surgical care pathways and a COVID-19 Operating room will need to be maintained after the peak of the pandemic has passed as patients with COVID-19 will continue to present with conditions requiring surgery. Approaches developed during the pandemic should be integrated into hospital practices for use in future cases with high infectious transmission risks.*
10. *Ongoing provider support during the time of increased demand is crucial.*

During the next several months, deliberate decision-making around surgical priorities will save lives. These decisions will not be made easily and will become even more challenging over time. The course of the pandemic and its impact on surgical systems will be variable between and within countries. The ACS has provided the groundwork for developing a surgical triage strategy for the initial stages of the COVID-19 pandemic. The tremendous burden of surgical disease that will accumulate due to delayed and cancelled operations will demand new, system-wide strategies. As with the planning for the early stages of the pandemic, preparation for this phase of the pandemic is necessary. The relief that will be eagerly anticipated by surgical systems at the end of COVID will not occur until some time after the peak of the pandemic has passed.

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