Evidence check

13 July 2020

Rapid evidence checks are based on a simplified review method and may not be entirely exhaustive, but aim to provide a balanced assessment of what is already known about a specific problem or issue. This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.

Resuming elective surgery

Rapid review question

What evidence is available regarding the resumption of elective surgery following cancellation and deferment of routine services during COVID-19?

In brief

- COVID-19 has disrupted the provision of elective surgery across jurisdictions but there is limited evidence-based advice regarding the resumption of services.
- Three papers estimate the time needed to clear the backlog of deferred and cancelled surgeries:
    - A study based on an international online survey and Bayesian modelling of 12 week elective surgery cancellation rates reports that if countries increase their normal surgical volume by 20% post-pandemic, it will take a median of 45 weeks to clear the backlog.(1)
    - For orthopaedic surgery, a modelling study in the US estimates up to 16 months to clear the backlog post-COVID-19.(2)
    - For cardiac surgery, a modelling study in two US health systems found that cardiac surgery volumes decreased by 54%. To clear the backlog in one month post-resumption on 1 July will require 263% of baseline volume. If only pre-pandemic capacity is available, the model shows the backlog never clears.(3)
- The literature includes options to manage pent up demand, including:(2, 4)
    - Use of different models of care including telehealth and outpatient surgery for primary total hip and knee arthroplasty in appropriate patients.
    - Increased operating room volumes with extended hours into the evening and weekends, while mitigating potential effects of staff fatigue.
    - Dedicated care coordination resources in the perioperative care pathways.
    - Prioritisation of elective surgical patients on the basis of severity and urgency and scheduling other patients far out into the future.
    - Redefining surgical indications to render a subset of patients ineligible for surgical care.
- It is noted that some strategies to reduce pent up demand may propagate bias and potentially worsen pre-existing disparities.(2)
- Guidance has been issued by a range of professional colleges and organisations:
    - The Royal College of Surgeons of England published guidance for resuming elective services – highlighting the importance of local recovery management teams, availability

of data on deferred cases; multidisciplinary and multiprofessional prioritisation processes, reconfiguration of services and patient communication.(5)

- A joint strategy document from the UK's Royal College of Anaesthetists, Association of Anaesthetists, Intensive Care Society and Faculty of Intensive Care Medicine outlines considerations relevant to the return to planned surgery in four broad categories: space, staff, stuff (equipment) and systems. Within each category, preparedness for a return to activity is RAG-rated - Red (not ready for a return), Amber (close to being ready for a return) and Green (ready for a return).(6)
- ESSKA (The European Society for Sports Traumatology, Knee Surgery and Arthroscopy) outlines a four stage strategy for resumption of orthopaedic surgery based on COVID-19 infection status/exposure, age, American Society of Anaesthesiologists (ASA) physical status classification system and risk factors, socio-professional situation and surgical indication.(7)

Limitations

There is very limited empirical evidence available to guide the resumption of elective surgery post COVID-19. There are a number of social media-based articles providing advice – these have been excluded from the evidence check.

Background

On 22 April 2020, the Australian Government announced the reintroduction of elective surgery using a staged process which balances the ongoing need for the capacity to treat COVID-19 patients, while allowing hospitals to treat elective surgery patients.

The selection of patients to undergo elective surgery is noted as a clinical one, guided by the following principles, recommended by the Australian Health Protection Principal Committee (AHPPC) and endorsed by National Cabinet:

- Procedures representing low risk, high value care as determined by specialist societies
- Selection of patients who are at low risk of post-operative deterioration
- Children whose procedures have exceeded clinical wait times
- Assisted reproduction (IVF)
- Endoscopic procedures
- Screening programs
- Critical dental procedures.

This first stage of reinstating elective surgeries will require health administrators to monitor supplies of personal protective equipment (PPE), ICU and bed capacity, while preparing for the next phase. On the advice of AHPPC, in addition to category 1 elective surgeries, hospitals will initially recommence one in four closed operating lists, with a focus on category 2 and some important category 3 surgeries.(8)

A previous CIU evidence check focused on preoperative testing of COVID-19 patients.

Methods (Appendix 1)

PubMed and Google websites were searched on 8 June. A supplementary search was made of the CIU daily digest feed. Descriptive studies of surgery triage processes during the pandemic were excluded.

Results

Findings from the peer reviewed (Table 1) and grey literature (Table 2)

Table 1: Resuming elective surgery: peer reviewed literature

Source	Summary
Elective Surgery Cancellations Due to the COVID-19 Pandemic: Global Predictive Modelling to Inform Surgical Recovery Plans CovidSurg Collaborative, et al. 2020 (1)	• A global expert-response study created projections for the proportion of elective surgery that would be cancelled or postponed during 12 weeks of peak disruption. • The overall 12 week cancellation rate would be 72.3%. • Globally, 81.7% (25,638,921/31,378,062 of benign surgery, 37.7% of cancer surgery and 25.4% of elective caesarean sections would be cancelled or postponed. • If countries increase their normal surgical volume by 20% post-pandemic, it would take a median 45 weeks to clear the backlog of operations resulting from COVID-19 disruption.
SARS-CoV-2 Impact on Elective Orthopaedic Surgery: Implications for Post-Pandemic Recovery Jain, et al. 2020 (2)	• Modelling study explores the impact of elective-surgery deferment on the US healthcare system and subsequent recovery after COVID-19 containment. • Monte Carlo stochastic simulation-based analysis was performed to forecast the post-pandemic volume of elective, inpatient total joint arthroplasty and spinal fusion. • Assuming that elective orthopaedic surgery resumes in June 2020, it will take 7, 12 and 16 months, in optimistic, ambivalent and pessimistic scenarios, respectively, until the healthcare system can perform 90% of the expected pre-pandemic surgical volume. Specific strategies to deal with backlog include: • scaling up or increasing surgical throughput • greater utilisation of telemedicine • increased orthopaedic block times • dedicated anaesthesia and nursing teams for orthopaedic care • a shift in care to ambulatory surgery centres • amplification of dedicated care coordination resources in perioperative orthopaedic care pathways • prioritising elective surgical patients on the basis of severity and urgency and scheduling other patients far out into the future • redefining surgical indications to render a subset of patients ineligible for surgical care.

	The study notes that some strategies may propagate bias and potentially worsen pre-existing disparities.
The Surge After the Surge: Cardiac Surgery post-COVID-19 Salenger, et al. 2020 (3)	• Data was collected from four cardiac surgery programs across two health systems in the US • Cardiac surgery volumes fell to 54% of baseline after restrictions were implemented. • Assuming a service restoration date of either 1 June or 1 July, 216% or 263% of monthly baseline volume, respectively, will be required to clear the backlog in one month. • The actual duration required to clear the backlog is highly dependent on hospital capacity in the post-COVID-19 time period, and ranges from one to eight months depending on when services are restored and the degree of increased capacity. • If only pre-pandemic capacity is available, the backlog will never clear.
After the COVID-19 Pandemic: Returning to Normalcy or Returning to a New Normal? Zeegen, et al. 2020 (4)	• The COVID-19 pandemic may impel an increased utilisation of outpatient surgery for primary total hip and knee arthroplasty in appropriate patients. • One option to meet pent up demand is increased operating room volumes with extended hours into the evening and weekends. • Fatigue has been shown to negatively impact outcomes and surgical case order is an independent risk factor for adverse events in arthroplasty procedures. • Fatigue risk mitigation and enhanced safety strategies include comprehensive preoperative planning, promotion of fatigue awareness and intraoperative 'microbreaks'. • These have been operationalised with the establishment of clear operative team roles, responsibilities, and assigned tasks in a preoperative team brief; reduction of need for extra intraoperative decisions; optimisation of surgeon sleep, nutrition, and hydration to maximize surgeon endurance; and establishment of a detailed backup contingency plan • Preoperative safety checklists are a procedural safeguard to help ensure patient safety.
Medically Necessary, Time-Sensitive Procedures: Scoring System to Ethically and Efficiently Manage Resource Scarcity and Provider Risk During the COVID-19 Pandemic Prachand, et al. 2020 (5)	• Outlines an online tool developed to triage surgical cases in COVID-19 and its potential application to gauge capacity to perform surgeries while still maintaining capacity for a surge. • The medically necessary, time-sensitive (MeNTS) score takes into account 21 factors, such as outcome, use of resources and risk of viral transmission to providers and patients. • Score thresholds can be adjusted based on day-to-day personnel and resource availability and on the status of COVID-19.

Restarting with COVID-19: seven key action items Forese and Corwin, 2020 (6)	This paper describes the Restart Coordination Committee at NewYork-Presbyterian hospital and outlines its key restart action items: 1. Outline which areas to open, balancing capacity with ICU census, staffing, cases and personal protective equipment (PPE). 2. Determine pre-procedure testing process and locations. 3. Create centralised 100% pre-visit completion process: scheduling, registration, insurance, questionnaires and check-in pre-visit screening. 4. Develop process for lobby screening, moving patients directly to exam or procedure rooms, waiting rooms and elevators with enhanced environmental services. 5. De-deploy the COVID-19 staffing and develop new staffing plans. 6. Ensure adequate PPE and testing. 7. Develop marketing and communications plans (internal and external).

Resuming elective surgery in the time of COVID-19: a safe and comprehensive strategy
 	
Al-Omar, et al. 2020 (7)
	• Proposes a strategy to resume elective surgery post-COVID-19, comprising four categories:
	  ○ The isolation of COVID-19 treatment facilities
	  ○ The prioritisation of surgical cases
	  ○ Screening surgical patients for COVID-19
	  ○ Maintaining a safe and clean hospital environment.

COVID-19 - ESSKA Guidelines and Recommendations for Resuming Elective Surgery
 	
Mouton, et al. 2020 (8)
	• The article provides recommendations and guidelines for resuming elective orthopaedic surgery.
	• Patients considered first for surgery should be selected according to COVID-19 infection status/exposure, age, American Society of Anaesthesiologists (ASA) physical status classification system/risk factors, socio-professional situation and surgical indication.
	• Preoperative testing for COVID-19 infection is recommended.
	• A strategy for resuming elective surgery in four phases is proposed.
	  1. Mini-invasive surgeries for patients under 60 years old, with no comorbidity and a hospital stay of maximum three days.
	  2. Surgeries for all patients without comorbidities and a hospital stay of maximum three days.
	  3. Mini-invasive surgeries for patients under 60 years old, with comorbidities or with a hospital stay of more than three days.
	  4. Surgeries for all patient with comorbidities.

Pandemic Recovery Using a COVID-Minimal Cancer Surgery Pathway Boffa, et al. 2020 (9)	• It outlines a 'COVID-minimal surgery pathway' - a predetermined patient flow, that dictates the locations, personnel and materials that come in contact with the Yale New Haven cancer surgery population, designed to minimise risk for virus transmission. • Authors acknowledge that there are no data to support that implementation of the proposed pathway will reduce the risk of nosocomial COVID-19 infections.

Table 2: Resuming elective surgery Grey literature

Source	Summary
Recovery of surgical services during and after COVID-19 Royal College of Surgeons of England (10) 26 May 2020	Provides guidance and toolkits for recovery of surgical services. Key topics include: 1. Key considerations before resuming elective services 2. Developing cohesive leadership and process of frequent communication 3. Assessing surgical workload and patient population 4. Ensuring adequate hospital capacity and facilities 5. Enhancing workforce capacity 6. Reconfiguring services 7. Supporting the surgical workforce 8. Patient communication 9. Supporting training. The toolkits cover: • A checklist for restarting elective services • Safety considerations and risk assessment • Information for patients.
Restarting planned surgery in the context of the COVID-19 pandemic Royal College of Anaesthetists, Association of Anaesthetists,	Experts from the UK acknowledge a mounting expectation from clinicians, the NHS and the public to return to what is seen as a 'normal' service, as soon as possible, and potential pressure to aim for supranormal levels of activity in order to 'catch up' with cases postponed during the peak of the COVID-19 infection. This document seeks to ensure that planned activity matches a realistic assessment of the ability of staff and resources to deliver this activity. It is essential that when the resumption of planned

Intensive Care Society and Faculty of Intensive Care Medicine (11) 1 May 2020	surgery takes place, care is delivered safely, efficiently and in a sustainable manner, taking into account the staffing, environment and equipment needed to operate and the continuing impact of care of COVID-19 patients on postoperative critical care capacity. The relaxation of lockdown brings the possibility of a surge in viral infection. Any increase in surgical activity may need to be reversed and planning should take this into account. This document is structured around four broad categories: space, staff, stuff (equipment) and systems (the four Ss). Within each category, preparedness for a return to activity is RAG-rated - Red (not ready for a return), Amber (close to being ready for a return) and Green (ready for a return). Readiness for a return to planned surgery will differ between regions, between different hospitals within a region and between different surgical services within a hospital. When coordinating activity within regions and hospitals, those delivering surgical services will need to be mindful of the fundamental principle that all patients across the UK should have equity of access to treatment.
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 (12) 17 April 2020	A list of principles and considerations to guide physicians, nurses and local facilities in their resumption of care for operating rooms and all procedural areas, including: • Timing for reopening of elective surgery • COVID-19 testing within a facility • Personal protective equipment • Case prioritisation and scheduling • Post-COVID-19 issues for the five phases of surgical care • Collection and management of data • COVID-19 related safety and risk mitigation surrounding second wave • Additional COVID-19 related issues.
Local Resumption of Elective Surgery Guidance American College of Surgeons (13) 17 April 2020	This guidance document outlines a set of principles and issues to help local facilities plan for resuming of elective surgical care: • COVID-19 awareness 1. Know your community's COVID-19 numbers, including prevalence, incidence and isolation mandates.

	2. Know your COVID-19 diagnostic testing availability and policies for patients and healthcare workers. • Preparedness 3. Promulgate personal protection equipment (PPE) policies for your healthcare workers. 4. Know your facility capacity, such as beds, intensive care units (ICUs), ventilators, and expansion plans (e.g., weekends). 5. Ensure operating room supply chain/support areas. 6. Address workforce staffing issues. 7. Assign a governance committee. • Patient issues 8. Patient communication. 9. Prioritisation protocol/plan. • Delivery of safe and high-quality care 10. Ensuring safe, high-quality, high-value care of the surgical patient across the 'Five Phases of Care' continuum (pre-operative, immediate pre-operative, intraoperative, postoperative and post-discharge periods).
COVID-19: Reintroduction of Elective Surgery The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (14) 24 April 2020	This guidance states: • Ensure that there are compelling reasons for surgical management at this time. Medical management of disease e.g. for heavy menstrual bleeding, pelvic pain, endometriosis is usually first-line but where medical management is not indicated, or is unsuccessful, surgery may be indicated. Perhaps the best discriminator is the degree of dysfunction experienced by the individual patient, which is best determined through consultation between the doctor and the patient. • When booking category 2 or important category 3 patients for surgery, the following factors need to be considered: ○ Decision making principles. This should include factors such as transparency, consistency, equity, fairness, duty of care, duty to steward resources and accountability. ○ Patient selection. This should be administered at a regional level, involving discussions between surgeons, anaesthetists, intensivists and hospital administrators. Prioritisation of patients for elective surgery needs consideration of

	the following factors: patients with low or no risk of COVID-19, procedures that require low resources (PPE, postoperative HDU/ICU, short length of stay), additional patient risks e.g. older age and coexistent morbidities, the chance of harm if a treatment course cannot be continued (worsening COVID-19 status), geographical and inter-regional travel considerations. ○ Ongoing monitoring of various safety and quality variables. This needs to occur at both a regional and national level, taking into account PPE usage and supply, ICU bed capacity, hospital bed capacity and community transmission rates. ○ Preparedness to scale back and stop non-urgent elective surgery.

Appendix 1: Search strings

PubMed: (("elective surgery") AND (restart* OR resum* OR recovery)) AND (COVID-19 OR sars-cov-2 OR coronavirus)

Google: COVID-19 and elective surgery/restart/resume

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