Reintroduction of elective paediatric otolaryngology procedures in South Africa during the COVID-19 pandemic

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Cancelling elective clinical consultations and surgical procedures was instrumental in assisting hospitals prepare for the COVID-19 crisis. Essential bed space was made available, and it allowed mobilisation of health workers and enforced social distancing. A shift in patient-centred ethics to public health ethics was required to provide a utilitarian approach to the crisis. However, at some point, clinicians need to start becoming patient centred again, and this needs to happen within the utilitarian framework. Children only account for 1 - 5% of confirmed COVID-19 cases, and they present with a much milder disease spectrum than adults. Consequently, paediatric units may be at the forefront of implementing reintroduction of patient-centred elective clinical and surgical procedures. The following recommendations provide a framework to do this in a way that minimises risk to patients and clinicians. They are the first paediatric guidelines in the literature to propose a strategy to reintroduce elective surgical procedures.

The World Health Organization classified the novel coronavirus disease 2019 (COVID-19) outbreak as an international emergency by declaring it a global pandemic on 11 March 2020.1,2 Although understanding of the transmission risk is incomplete, person-to-person spread is primarily through droplet transmission and may occur through contact with symptomatic, presymptomatic or asymptomatic individuals.3,4 Health workers represent 4 - 20% of the infected population, and a large proportion of health workers develop severe symptoms.5-8 Procedures that have the potential to aerosolise droplets are particularly high risk, and many guidelines have recommended only performing life-saving and emergency interventions, with immediate cancellation of elective surgery.9-12

Risk stratification of emergency and urgent cases has meant that life-saving airway surgery and surgery for sepsis and trauma have been maintained during the outbreak and have been stratified according to time sensitivity, performed within 12 - 48 hours.9,10,11 Urgent elective surgery such as oncological surgery has also been accounted for.9,10,12 However, to prevent progression of complications due to delay in definitive treatment, clinicians need to start thinking about the necessity of reintroducing essential elective surgical cases. These are cases that have been delayed for 1 - 3 months and in paediatric otolaryngology include adenotonsillectomies for moderate obstructive sleep apnoea, mastoidectomies for locally advancing cholesteatoma, and microlaryngoscopies for airway diseases such as laryngeal papillomatosis.9,11,12 Other cases would be ventilation tubes for hearing loss in children with speech delay or ‘at-risk’ children, and children with bilateral chronic suppurative otitis media with at least bilateral moderate hearing loss.

The paradigm behind cancelling elective surgery was four-fold. Firstly, hospitals were required to free up beds for the influx of COVID-19 cases.12 Secondly, from a public health perspective, social distancing (in this case preventing patients from leaving their homes and contracting the virus from high-risk facilities like hospitals) was essential to ‘flatten the curve’ and support health system infrastructure.12 Thirdly, protection of health workers was required to allow them to function within the rapidly draining services, and this included preventing them from unnecessary (particularly high-risk) exposure.12 Lastly, there is evidence to show that patients who undergo elective surgery while in the incubation period for COVID-19 have poorer outcomes (surgical and COVID). In a retrospective study from Wuhan, where the outbreak began, 44% of adult patients who underwent elective surgery during their incubation period required intensive care admission, and the mortality rate was 20%.13

A shift in patient-centred ethics to public health ethics has been necessary to provide a utilitarian approach to this crisis.14 However, as clinicians we need to start becoming patient centred again at some point, and this needs to happen within the utilitarian framework.15 Children only account for 1 - 5% of confirmed COVID-19 cases, and they present with a much milder disease spectrum than adults.15 Paediatric units, and especially dedicated paediatric hospitals, may therefore find themselves at the forefront of implementing reintroduction of patient-centred elective surgery. This should be done in a way that does not place patients or clinicians at risk.

Objectives

To provide a systematic review on how countries that have already reached their peak in transmission rates have reintroduced elective clinical services, particularly looking at paediatric otolaryngology practice. However, there are no articles to date on an evidence-based strategy to reintroduce elective clinical procedures and elective surgery in otolaryngology, head and neck, or paediatric otolaryngology patients.
Research and methods
A systematic review was performed in accordance with PRISMA
guidelines. This review involved a systematic search of the
electronic databases MEDLINE/PubMed, Google Scholar, Ovid
MEDLINE and Embase. No language restrictions were applied to the
search strategy; Search terms (medical subject headings or keywords)
were ‘SARS CoV-2’, ‘COVID-19’, ‘guidelines/practice guidelines/
ENT’, ‘paediatric otolaryngology’, ‘pediatric otolaryngology’, ‘head &
neck surgery’ and ‘elective surgery’.
The only set of guidelines (as of 19 April 2020) on local resumption
of elective surgery was from the American College of Surgeons. Using
these guidelines and augmenting them with resources drawn
from this pandemic, previous epidemics, and management of resource
constraints in low- to middle-income countries, this article provides
an evidence-based approach to safely reintroducing elective clinical
and surgical procedures.

Discussion
COVID-19 awareness
Community prevalence and incidence rates
The maximum incubation period for COVID-19 is estimated to
be 14 days, and the 75th percentile is 7 days. It is therefore
recommended that a decrease in COVID-19 incidence be recognised
for at least 14 days before embarking on reintroducing elective clinical
and surgical procedures.

Screening
Children most commonly present with features of acute respiratory
infections, including fever, cough, sore throat, myalgia and fatigue.
Telephonic screening, inquiring whether there has been a COVID-19
infection, including fever, cough, sore throat, myalgia and fatigue.

Diagnostic testing
Currently the National Health Laboratory Service is using molecular
tests based on polymerase chain reaction methodology to detect the
virus. The turnaround time is 24 - 48 hours. The GeneXpert
test (Cepheid), which should be introduced shortly, is a molecular
test that has a faster processing time. Although it is referred to as a point-of-care test, it still requires laboratory machinery and
is not a bedside test. The hope is that it will increase laboratory
testing capacity and expedite results for children in whom surgery is
necessary. Because false-negative results have been reported to be as
high as 30%, in patients in whom the index of suspicion is high, it
would be reasonable to retest or postpone surgery for at least 2 weeks
for clarification of the diagnosis.

A particular concern regarding health worker safety is the
transmission potential in asymptomatic individuals or individuals
who have recently recovered from the illness. Viral RNA remains
in stool for >30 days after respiratory samples are negative. The
clinical significance of this finding is not understood, but attention
should be paid to meticulous hygiene practices.

Governance committee
A multidisciplinary governance committee should be assigned to
oversee the reintroduction of elective clinical and surgical proce-
dures. The members of this committee will vary depending on the
hospital’s requirements, but generally in South Africa (SA) should
consist of members of hospital management, clinicians (surgeons
and anaesthesia team), nurses, and members of the procurement
department and the central sterile services department (CSSD).
Nursing shortages are a notorious problem in our region. Procurement
of essential equipment for surgery needs to be ensured prior to
implementation of services. CSSDs may have additional responsibilities
during the outbreak, and their capacity should be assessed prior to
implementing services.

Service delivery in SA was a major concern in the public health
sector prior to the COVID-19 crisis. This situation will be compounded
once services are reinstated, and it is going to be extremely challenging
to address. Clinicians and hospital management need to risk-stratify
patients booked into clinics. Clinical priorities need to be carefully
devised and adhered to in order to slowly relieve the patient and
community backlog without overwhelming the system, while mini-
mising complications related to delays.

Reintroduction of elective surgical procedures
Prioritisation
Prioritising surgery should be sensitive to the institution’s capacity and
resources, as well as patients’ needs. The process is a collaborative
one that requires input from all the surgical disciplines, anaesthesia and
nursing. An adaptable approach is advisable, as there are likely to be
surges in community transmission and staff shortages due to illness.

An objective scoring system like the medically necessary time-
sensitive (MeNTS) scoring system (Fig. 1) is ideal because it helps
prioritise patients objectively and may facilitate interdepartmental
agreement. The MeNTS scoring system does not take into account
obstructive sleep apnoea syndrome (OSAS) in children. It may be
appropriate to use the MeNTS score of ‘4’ in children with moderate
OSAS (confirmed by an OSAS grading measure of disease severity: McGill oximetry score 2). However, bear in mind that the surgery
will alleviate the OSAS in these particular children.

Protocol
Preoperative considerations. A sustained decrease in the incidence
of COVID-19 cases for 14 days coincides with a public health policy
to slowly re-open the ‘lockdown’ response. Maintaining social
distancing; material face masks for all; and meticulous hygiene
practices in the waiting room, during consultations, on the ward and
in the theatre complex are essential. Children should be entitled to
have a single caregiver stay with them in the hospital, but cancellation
of visiting hours should be sustained. Regular temperature checks
in the paediatric ward should already be routine practice.

Routine temperature checks and COVID-19 screening should also
be performed on staff members in the facility (including clinicians,
nursing staff, and housekeeping, delivery and cleaning staff).

Intraoperative considerations. Regular review of current
COVID-19 guidelines for risk and screening is necessary. Ensure that
appropriate personal protective equipment (PPE) is being used and
that PPE guidelines are being followed. Buddy systems of pairing up
with PPE have been shown to be effective.

Postoperative considerations. Adhere to standardised care proto-
cols. This is particularly important because staffing personnel may
vary depending on shortages due to illness.
### Managing limited resources

**Personal protective equipment**

Adequate PPE is necessary, especially if the surgical caseload is expected to increase. It is recommended that the hospital have sufficient PPE for both aerosol and droplet precautions for at least 30 days of surgery before elective surgery is implemented. The Centers for Disease Control and Prevention has a PPE calculator to help hospitals determine their PPE requirements. PPE guidelines should include recommendations for COVID-19-positive patients, patients under investigation and COVID-19-

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**Table 1: Procedure Prioritisation Worksheet**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR time (minutes)</td>
<td>&lt;30</td>
<td>30 - 60</td>
<td>60 - 120</td>
<td>120 - 180</td>
<td>&gt;180</td>
</tr>
<tr>
<td>Estimated length of stay</td>
<td>Outpatient</td>
<td>23 h</td>
<td>24 - 48 h</td>
<td>≤3 d</td>
<td>&gt;4 d</td>
</tr>
<tr>
<td>Postop. ICU need, %</td>
<td>Unlikely</td>
<td>&lt;5</td>
<td>5 - 10</td>
<td>10 - 25</td>
<td>≥25</td>
</tr>
<tr>
<td>Anticipated blood loss (mL)</td>
<td>&lt;100</td>
<td>100 - 250</td>
<td>250 - 500</td>
<td>500 - 750</td>
<td>≥750</td>
</tr>
<tr>
<td>Surgical team size</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>&gt;4</td>
</tr>
<tr>
<td>Intubation probability, %</td>
<td>≤1</td>
<td>1 - 5</td>
<td>5 - 10</td>
<td>10 - 25</td>
<td>≥25</td>
</tr>
<tr>
<td>Surgical site</td>
<td>None of the following</td>
<td>Abdominopelvic</td>
<td>Abdominopelvic open surgery, infraumbilical</td>
<td>Abdominopelvic open surgery, supraumbilical</td>
<td>OHNS/upper GI/thoracic</td>
</tr>
</tbody>
</table>

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**Table 2: Disease Prioritisation Worksheet**

<table>
<thead>
<tr>
<th>Disease</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-operative treatment option EFFECTIVENESS</td>
<td>None available</td>
<td>Available, &lt;40% effective as surgery</td>
<td>Available, 40 - 60% effective as surgery</td>
<td>Available, 60 - 95% effective as surgery</td>
<td>Available, equally effective</td>
</tr>
<tr>
<td>Non-operative treatment option RESOURCE USE/EXPOSURE RISK</td>
<td>Significantly worse/not applicable</td>
<td>Somewhat worse</td>
<td>Equivalent</td>
<td>Somewhat better</td>
<td>Significantly better</td>
</tr>
<tr>
<td>Impact of 2-week delay in disease outcome</td>
<td>Significantly worse</td>
<td>Worse</td>
<td>Moderately worse</td>
<td>Slightly worse</td>
<td>Minimally worse</td>
</tr>
<tr>
<td>Impact of 2-week delay in surgical difficulty/risk</td>
<td>Significantly worse</td>
<td>Worse</td>
<td>Moderately worse</td>
<td>Slightly worse</td>
<td>Minimally worse</td>
</tr>
<tr>
<td>Impact of 6-week delay in disease outcome</td>
<td>Significantly worse</td>
<td>Worse</td>
<td>Moderately worse</td>
<td>Slightly worse</td>
<td>Minimally worse</td>
</tr>
<tr>
<td>Impact of 6-week delay in surgical difficulty/risk</td>
<td>Significantly worse</td>
<td>Worse</td>
<td>Moderately worse</td>
<td>Slightly worse</td>
<td>Minimally worse</td>
</tr>
</tbody>
</table>

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**Table 3: Patient Prioritisation Worksheet**

<table>
<thead>
<tr>
<th>Patient</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>&lt;20</td>
<td>20 - 40</td>
<td>40 - 50</td>
<td>50 - 65</td>
<td>&gt;65</td>
</tr>
<tr>
<td>Lung disease (asthma, COPD, cystic fibrosis)</td>
<td>None</td>
<td>Minimal (rare inhaler)</td>
<td>&gt;Minimal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obstructive sleep apnoea</td>
<td>Not present</td>
<td>Mild/moderate (no CPAP)</td>
<td>On CPAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease (HTN, CHF, CAD)</td>
<td>None</td>
<td>Minimal (no medication)</td>
<td>Mild (≤1 medication)</td>
<td>Moderate (2 medications)</td>
<td>Severe (≥3 medications)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>None</td>
<td>Mild (no medication)</td>
<td>Moderate (oral medication)</td>
<td>&gt;Moderate (insulin)</td>
<td></td>
</tr>
<tr>
<td>Immunocompromised*</td>
<td>No</td>
<td>Moderate</td>
<td>Severe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ILI symptoms (fever, cough, sore throat, body aches, diarrhoea)</td>
<td>None</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Exposure to known COVID-19-positive person in past 14 days</td>
<td>No</td>
<td>Probably not</td>
<td>Possibly</td>
<td>Probably</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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**Fig. 1: MeNTS surgical procedure prioritisation worksheet**

(MeNTS = medically necessary time sensitive; OR = operating room; ICU = intensive care unit; OHNS = otolaryngology, head and neck surgery; GI = gastrointestinal; COPD = chronic obstructive pulmonary disease; CPAP = continuous positive airway pressure; HTN = hypertension; CHF = congestive heart failure; CAD = coronary artery disease; ILI = influenza-like illness; IVIG = intravenous immunoglobulin; *Haematological malignancy, stem cell transplant, solid-organ transplant, active/recent cytotoxic chemotherapy, anti-TNFα or other immunosuppressants, >20 mg prednisone equivalent/d, congenital immunodeficiency, hypogammaglobulinaemia on IVIG, HIV with CD4 count <200 cells/µL.)
negative patients.\textsuperscript{17} PPE guidelines may need to be regionally specific owing to availability of resources and innovation to circumvent these challenges. In Africa, a recommended PPE guideline is the PENTAFRICA COVID Guidelines for the Paediatric ENT Surgeon.\textsuperscript{19}

**Resources and supplies**

The hospital should have appropriate levels of surgical consumable supplies before elective surgery commences.\textsuperscript{17} The usual supply chain should be functional, and sufficient cleaning supplies should be available.\textsuperscript{17}

**Conclusions**

Once the incidence of new COVID-19 cases has decreased for 14 days, we recommend reintroduction of elective paediatric otolaryngology procedures, adhering to the above measures and commencing with adenotonsillectomy for moderate OSAS; microlaryngoscopy for airway disease; tympanomastoid surgery for selected patients with adenoid hypertrophy; ventilation tubes for recurrent HAD; tympanoplasties for locally advanced cholesteatoma; and tympanoplasties for children with chronic supplicative otitis media with at least bilateral moderate hearing loss. It is then possible to proceed to expanding surgical procedures to include more comprehensive elective surgery.

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