

## Peri-operative outcomes of surgery in children with SARS-CoV-2 infection

Peri-operative SARS-CoV-2 infection is associated with increased postoperative mortality [1]. Based on our international, multicentre, prospective data for 13,652 children (aged <18 y) and 126,579 adults, we recommended that, where possible, surgery should be delayed for at least 7 weeks following SARS-CoV-2 infection [2]. However, we agree with Drs Austin and Miller that, as SARS-CoV-2 infection outcomes in children are less severe than in adults [3–5], further examination of our paediatric data is warranted [6].

First, the pooled 30-day postoperative mortality data for children (aged <18 y) with SARS-CoV-2 infection from two studies. The CovidSurg cohort collected data from February to July 2020 and CovidSurg-GlobalSurg Week collected data in October 2020; methodology for these studies has previously been published [1, 2]. No children

with SARS-CoV-2 diagnosis more than 7 days before surgery died, whereas 11 out of 393 (2.8%) children with SARS-CoV-2 diagnosis in the 7 days before or the 30 days after surgery died (Table 1).

Second, we used CovidSurg-GlobalSurg Week data to compare contemporaneous cohorts of children who had SARS-CoV-2 infection with children who did not. Patient characteristics are stratified by the timing of SARS-CoV-2 infection in online Supporting Information Table S1. Overall, in 13,625 children, both pre-operative, any timing,  $n = 157$  (1.2%) and postoperative,  $n = 50$  (0.4%) SARS-CoV-2 infection rates were low. Factors independently associated with SARS-CoV-2 infection were older age, malignant disease and emergency surgery (online Supporting Information Figure S1). In children with SARS-CoV-2, 30-day postoperative mortality was 0 out of 207 (0%)

**Table 1** Pooled 30-day postoperative mortality rates for children from the CovidSurg Cohort study and CovidSurg-GlobalSurg Week study. Values are proportion (fraction).

		<b>Pre-operative SARS-CoV-2 (diagnosis &gt; 7 days before surgery)</b>	<b>Peri-operative SARS-CoV-2 (diagnosis in the 7 days before or 30 days after surgery)</b>
Age	0–4 weeks	0% (0/1)	6.3% (1/16)
	5–52 weeks	0% (0/10)	2.4% (1/41)
	1–9 y	0% (0/35)	4% (5/126)
	10–17 y	0% (0/51)	1.9% (4/210)
ASA physical status	Grades 1–2	0% (0/82)	1% (3/308)
	Grades 3–5	0% (0/15)	9.6% (8/83)
Sex	Female	0% (0/33)	2.5% (4/157)
	Male	0% (0/64)	3% (7/235)
Indication for surgery	Benign disease	0% (0/74)	2.6% (8/312)
	Malignancy	0% (0/13)	8% (2/25)
	Trauma	0% (0/10)	1.8% (1/55)
Grade of surgery	Minor	0% (0/57)	2.3% (6/263)
	Major	0% (0/39)	3.9% (5/127)
Urgency of surgery	Emergency	0% (0/31)	3.5% (11/315)
	Elective	0% (0/66)	0% (0/77)
Country income	High	0% (0/36)	1.3% (3/232)
	Low/middle	0% (0/61)	5% (8/161)
30-day postoperative pulmonary complications*	No	0% (0/95)	1.2% (4/337)
	Yes	0% (0/2)	12.7% (7/55)

\*Composite outcome capturing pneumonia, acute respiratory distress syndrome and unplanned postoperative mechanical ventilation.

and 30-day pulmonary complications occurred in 10 out of 207 (0.5%). In children who did not have SARS-CoV-2, mortality was 125 out of 13,616 (0.9%) and pulmonary complications occurred in 267 out of 13,418 (2.0%).

Children with peri-operative SARS-CoV-2 infection do not appear to be at increased risk of postoperative pulmonary complications or mortality, and therefore delay in surgery appears to be unnecessary in this cohort. Our analysis included very few children with ongoing COVID-19 symptoms at the time of surgery, so caution may be required in this group. However, protective measures, such as COVID-19-free surgical pathways, should remain in place to reduce the risk of nosocomial infection.

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Appendix S1)

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## Supporting Information

Additional supporting information may be found online via the journal website.

**Table S1.** Patient characteristics and outcomes by the timing of SARS-CoV-2 infection in children.

**Figure S1.** Factors associated with SARS-CoV-2 infection in children.

**Appendix S1.** CovidSurg Collaborative, GlobalSurg Collaborative writing group.