



Pediatric
Critical Care
Learning



PCCL Session: Summary Report and Resources

PCCL session topic: “Knife or Life? Definitive Surgery Versus Urgent Transfer in a Critically Ill Child”

Date: May 15, 2026

Learning objectives:

1. When not enough hands-on deck: balancing intubation and shock management.
2. Early surgery vs transfer-decision making.
3. How does transfer team availability influence early decision-making?

Case:

- Care Context:
 - Community hospital, emergency department, pediatric coverage 24/7 with inpatient pediatric ward. General surgery service for adults and pediatrics: mainly appendicitis and pilonidal disease
- Patient Demographics:
 - 8-year-old female, previously well
- History and Presenting Illness:
 - Chief complaint: Acute onset of multiple non bilious non bloody emesis overnight. Progressive work of breathing
- Presentation at Hospital (vitals and physical exam on arrival at 0630):
 - Ill-appearing, drowsy (GCS 14). **Severe work of breathing**
 - Poor perfusion, **capillary refill 7–8 sec.** Pale, clammy, **intermittently cyanotic**
 - T36.8C, **HR 180**, sat 97% (no BP recorded)
 - Glucose 16 mmol/L and metabolic acidosis (VBG 7.26/29/13)
 - **Lactate 8.9 mmol/L**
- Initial Management:
 - ED presentation
 - Suspicion of DKA, protocol initiated
 - Pediatrician on call notified
 - Pediatric assessment
 - **Shock:** HR 183, BP 74/65, poor perfusion
 - Abdomen severely distended, non-peritonitic
 - Initial impression: **hypovolemic shock** secondary to bowel obstruction or perforation. High suspicion for surgical etiology
 - Initial resuscitation
 - 40 mL/kg fluid bolus → transient improvement
 - POCUS: no free fluid
 - X-ray: dilated bowel loops
 - Ongoing management
 - Antibiotics: ceftriaxone, vancomycin, metronidazole. Second IV line. Preparation for vasopressors



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- Clinical deterioration
 - Persistent tachycardia, worsening shock. Additional fluids (total 60 mL/kg)
- Escalation
 - Coffee-ground emesis → NG tube (low intermittent suction). Pantoprazole
 - Refractory hypotension → epinephrine infusion quickly escalated
 - ITT arrival: persistent hemodynamic instability. Discussion regarding intubation
- Clinical Course:
 - Too unstable for transfer. In-house surgical consultation initiated and possible operative management
 - Diagnosis
 - CT scan: volvulus involving left colonic mesentery with ischemia and infarction
 - Hemodynamic deterioration despite epinephrine. Norepinephrine initiated. Preparation for intubation (performed in OR)
 - Surgical management
 - Transfer stat to OR. Intubated in OR without issue
 - Surgical management with small bowel resection and abdominal washout
 - Temporary abdominal closure (VAC). Femoral line inserted
 - Post-operative - Transfer via ITT

Learnings:

Recognition & Clinical Suspicion

- Volvulus - malrotation (often co-exist / common in pediatrics)
- Presentation exists on a spectrum of certainty:
 1. Possible volvulus
 - Unclear or absent bilious vomiting
 - Stable hemodynamics
 - Benign exam
 - Often older child
 2. Likely volvulus
 - Bilious vomiting (key red flag)
 - May still appear stable with benign exam
 - Can occur at any age
 3. Definite volvulus (surgical emergency)
 - Bilious vomiting + hemodynamic instability
 - Concerning abdominal exam
 - Most common in infants (<1 year; ~50% <1 month)

☒ Takeaway:

- Bilious vomiting = volvulus until proven otherwise
- Older children are harder to diagnose → may present later and less clearly

Timeliness & Outcomes



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- Delays at any step worsen outcomes:
 - Clinical recognition
 - Surgical intervention
- Longer symptom duration is associated with:
 - Increased bowel ischemia
 - Greater need for resection
 - Worse outcomes

☒ **Takeaway:**

- Time from presentation to OR is critical → aim for rapid recognition and escalation
- Do not allow diagnostic uncertainty to delay surgical consultation-involvement

Resuscitation & Shock Management

- Preferably 2 large bore IV's - in this age, 22 or even 20G/ call for anesthesia help/place IO if can't get a peripheral/use US guidance technique preferably
- Treat as hypovolemic ± distributive shock
 - Initial fluids appropriate (e.g., up to 60 mL/kg)

May need more – this is hypovolemic shock/sepsis guidelines talk about “up to 60mls/kg then adding a vasopressor”. This is not necessarily the same situation, so if they respond to a bolus, they may need more in excess of 60mls/kg until surgical intervention.

- If persistent shock → early vasopressors/low dose push doses while preparing infusions.
- Severe acidosis:
 - Use available fluids – saline or plasmalyte are both equivalent. Any hyperchloremia will correct once the primary problem has been addressed.
 - No role for bicarbonate bolus or infusion
- Vasopressors:
 - Epinephrine or norepinephrine acceptable
 - Priority = timely initiation, not agent choice

☒ **Takeaway:**

- Resuscitate aggressively, but don't delay surgery
- Shock in volvulus often reflects ischemic bowel + third spacing

Airway & Intubation

- Abdominal distention will predispose to low lung volumes, low functional residual capacity (FRC) and rapid onset of desaturation



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- High aspiration risk (bowel obstruction, gastric contents)
- Strong consideration for early intubation
 - intubation and aggressive resuscitation are not exclusionary and often done simultaneously
- Self-ventilation enhances venous return/positive pressure ventilation impedes venous return – shock exacerbation – so be prepared - ANTICIPATE
- Best setting = OR with anesthesia support, if feasible:
 - Safer environment
 - Immediate surgical access
- Challenges:
 - Distended abdomen → high ventilatory pressures required/rapid onset desaturation
 - LMA not appropriate because does not address the aspiration risk and cannot be used with high ventilating pressures

☒ **Takeaway:**

- Anticipate rapid onset desaturation +/- aspiration on induction - prepare pediatric-specific drugs/be prepared for possible aspiration – consider placement of large orogastric/nasogastric to decompress stomach prior to intubation
- Balance airway vs circulation priorities carefully – ANTICIPATE – preload child with fluids and low dose adrenaline prior to administration of induction agents – finger on the pulse/NIBP monitoring not reliable in hypotensive patients and the finger on femoral or carotid provides assurance of a perfusing BP

Surgery vs Transfer

- Key tension: early surgery vs waiting for transfer
- Major insight:
 - Transfer delays are unpredictable and often prolonged
- In unstable patients:
 - Local surgery may be lifesaving/early video conferencing with pediatric specialists for support
- Decision-making should include:
 - Patient stability
 - Distance to tertiary center
 - Local surgical capacity
 - Likelihood of delay

☒ **Takeaway:**

- Plan for “failure of transfer”
- Early surgical consultation is essential
- Connect via PTN zoom link with PICU transport advisor – lay eyes on the patient/can call in pediatric surgical specialties of any flavor depending on the surgical emergency



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Rural & Systems Considerations

- If no surgical services:
 - Urgent transfer to nearest surgical site
- Early support:
 - PICU / BCCH consults
 - PTN / CCON support
- Pediatric emergencies require:
 - Managing multiple competing priorities simultaneously
 - Working within limited staffing/resources

☒ Takeaway:

- Early outreach = better decisions and support
- Use available provincial systems early and often

Key Learning Points

- Bilious vomiting = surgical emergency until proven otherwise
- Volvulus can be subtle in older children → maintain suspicion
- Time delays (recognition → imaging → surgery) worsen outcomes
- Resuscitate aggressively but prioritize rapid surgical management
- Prepare early for airway challenges and aspiration risk
- Always plan for transfer delays and involve support teams early

Resources:

- [Intubation](#) – In a Hurry Resource
- [Intubation checklist](#) – In a Hurry Resource
- [Ventilation Goals](#) – In a Hurry Resource
- [Low Dose Epinephrine](#) – In a Hurry Resource
- [IO Access](#)
- [Virtual Support Pathways](#)
- [Critical Care Outreach RN and RT](#)
- [Weight based drug sheets](#)
- [Pedmed](#) – dosing of pediatric drugs

Here's how to download the free ZOOM App on your mobile device:

For Android (Chrome Browser):

1. Open the **Google Play Store**
2. Search **"Zoom Cloud Meetings"**
3. Tap **Install**
4. Open the app



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5. Sign in or Join a Meeting



For iPhone (Safari Browser):

1. Open the **App Store**
2. Search **"Zoom Cloud Meetings"**
3. Tap **Get**
4. Open the app
5. **Sign in or Join a Meeting**

Tip: Allow camera and microphone access for full meeting participation.

Here's how to **bookmark the [Pediatric Critical Care Resources Website](#) as a shortcut on your smartphone home screen**, depending on your device and browser:



For iPhone (Safari Browser):

1. **Open Safari** and go to the website you want to save.
2. Tap the **Share icon** (square with an arrow pointing up) at the bottom of the screen.
3. Scroll down and tap **"Add to Home Screen."**
4. You can edit the name if you like, then tap **Add**.
5. The shortcut will appear on your **Home Screen** like an app icon.

☒ *Only Safari supports this on iPhone (not Chrome or Firefox).*



For Android (Chrome Browser):

1. Open **Google Chrome** and go to the website.
2. Tap the **three-dot menu** in the upper-right corner.
3. Tap **"Add to Home screen."**
4. Edit the name if desired, then tap **Add**.
5. Confirm by tapping **Add automatically** or drag it to your preferred location.

☒ *Works with most Android devices using Chrome. Firefox has a similar option under its menu.*

The resources shared throughout this session are for reference purposes only. Please consult your health authority leaders for guidance on adoption and use of these resources within your local context. The advice provided during the PCCL sessions is not intended to replace the clinical judgment of the healthcare providers who are with the patient. While PCCL sessions may suggest recommendations, the final decisions regarding a child's care and treatment should always rest with the healthcare professionals involved in their care at both the referring and receiving centres.

If you need additional in the moment support refer to the Provincial Real Time Virtual Support Pathways: If you need additional in the moment support refer to the Provincial Pediatric Virtual Support Pathways: <https://childhealthbc.ca/pcc/provincial-pediatric-virtual-support-pathways>

AI was utilized in supporting development of summary documents from the session.