



Pediatric
Critical Care
Learning



PCCL Session: Summary Report and Resources

PCCL session topic: *"A Floppy Baby: Acute Onset Hypotonia in an Infant"*

Date: January 16, 2026

Learning objectives:

1. Develop a structured differential diagnosis for an acutely hypotonic infant
2. Identify key intensive care considerations in the stabilization and ongoing management of infants with neurological impairment
3. Evaluate indications for transferring a neurologically impaired or hypotonic infant to a higher level of care

Case:

- Care Context:
 - Setting: Remote hospital with pediatric ward, special care/NICU beds.
 - Resources available: Respiratory therapists, anesthesiology, surgeons, emergency physicians, adult ICU.
 - Key system limitation: Transfers frequently delayed due to weather and distance, requiring prolonged local management of critically ill infants.
- Patient Demographics: Age: 3 months, Sex: Female, Weight: 4.8 kg
 - Birth history: Term, uncomplicated pregnancy and delivery. Negative newborn screen. Fully immunized.
 - Past medical history: Mild GERD symptoms, otherwise healthy.
- Initial Presentation:
 - Timeline: Seen in ED 2 days prior for mild viral illness. Re-presented with worsening symptoms.
 - Primary concerns: Poor feeding (25–33% of usual intake). Constipation (no stool x 5 days). Decreased urine output.
 - Absent symptoms: No fever. No vomiting or diarrhea. No clear infectious symptoms
- Initial Examination:
 - Mildly reduced axial and lower extremity tone. Normal reflexes.
 - Otherwise, normal physical exam.
- Investigations:
 - Laboratory findings: WBC: 4.5 (slightly low), Hb, glucose, ammonia, urinalysis all normal, Lactate: 2.1
 - Lumbar puncture: Clear, colorless CSF, No significant WBCs, BioFire panel negative for bacterial and viral pathogens
- Early Management:
 - Admitted to pediatric ward
 - IV fluids with combination of oral and NG feeds



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- Planned investigations: Head ultrasound. Brain MRI. EEG. Additional laboratory testing
- Clinical Deterioration (Hospital Day 2):
 - Progressive worsening tone and feeding
 - Neurology consultation (BC Children's Hospital) recommended EEG and MRI
 - **Exam at ~1700:** Marked axial and extremity hypotonia. Poor gag reflex. Copious secretions. Inadequate airway protection.
- Airway and Critical Care Management:
 - Deemed unsafe for sedated MRI
 - Presumed diagnosis: Infant botulism (based on clinical progression and prior experience)
 - Intubation: Medications: Rocuronium and ketamine
 - Atropine prepared but not routinely used
 - ETT: 3.5 mm, secured at 11 cm at lips. Easy ventilation.
 - Sedation/analgesia:
 - Continuous morphine and midazolam infusions
 - Heart rate used as primary indicator of pain/distress due to profound weakness
- Definitive Management: Admitted to PICU
 - Botulism immune globulin (BabyBIG®) administered on hospital day 2
 - Diagnosis later confirmed by CDC testing

Learnings:

Differential Diagnosis for a Weak/Floppy Infant

- Infant botulism (most consistent with the case presentation)
- Spinal muscular atrophy (typically slower progression)
- Encephalitis or meningitis
- Stroke
- Toxic/metabolic causes:
 - Aminoglycoside toxicity
 - Myasthenia Gravis
 - Hypermagnesemia (usually perinatal)
- Sepsis (must always be considered)
- Genetic: many causes

Infant Botulism: Key Clinical Points

- Typical age of presentation:
 - Median: 3-4 months
 - Range: Neonatal period to 12 months (youngest reported ~55 hours)
- Pathophysiology:



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- Ingestion of *Clostridium botulinum* spores
- Colonization of immature GI tract
- Toxin production due to lack of competitive gut flora
- Common sources:
 - Environmental dust or soil
 - Honey is a known risk but less common than environmental exposure
 - Construction and agricultural areas are higher risk
- Clinical progression:
 - Constipation and poor feeding
 - Cranial nerve dysfunction (poor suck/gag, ptosis, ophthalmoplegia, pupillary paralysis, weak cry/hoarse voice)
 - Progressive hypotonia and weakness
 - Respiratory failure

Recognition of Altered breathing pattern in an Infant with Botulism

1. Changes in Respiratory Pattern (early and reliable)

- Tachypnea (may be present early but later gives way to shallow breathing)
- Shallow respirations due to weakened diaphragm and intercostal muscles. Reduced chest/abdominal excursion—movements become minimal or asymmetric
- Soft, quieter cry (weakened respiratory and bulbar muscles)

2. Signs of Compensatory Fatigue

- Diminished or absent retractions. *Important:* Severely weak infants may NOT show retractions despite respiratory distress.
- Paradoxical breathing. Abdomen moves out while chest moves in due to weak thoracic muscles. Head bobbing may initially appear but then disappear as weakness progresses.

3. Bulbar Muscle Weakness Affecting Breathing

- Pooling oral secretions / drooling. Weak suck and swallow
- Risk of aspiration, leading to wet breath sounds or increased work

4. Red Flags for Impending Respiratory Failure

- Decreasing respiratory rate with shallow breaths (this is *not* improvement—it's fatigue.)
- Hypotonia with minimal spontaneous movement
- Color changes, duskiness, or intermittent desaturations
- Quiet chest with minimal air movement on auscultation

Key Learning Points for Clinical Teams

- Early recognition is critical: Rapid identification significantly improves outcomes



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- Treatment: Botulism immune globulin (BabyBIG®) should be initiated as soon as botulism is suspected
- Logistics: BabyBIG® is centrally distributed (via California), resulting in unavoidable delays
 - Early suspicion allows earlier ordering and faster treatment initiation
- Airway vigilance: Progressive bulbar weakness and secretions can rapidly compromise airway safety. Do not rely on retractions—absence does *not* rule out significant respiratory distress. Shallow breathing + fatigue = high-risk combination.
- Pain or distress assessment: Increased heart rate (tachycardia), flushing or pallor, sweating (less common in infants) can be seen. Quiet distress is common as weak infants cannot express typical agitation.

Summary:

This case highlights classic infant botulism with initial nonspecific symptoms progressing to rapid neuromuscular weakness and respiratory compromise. Early clinical suspicion, prompt airway management, and expedited access to botulism immune globulin were essential to appropriate care, particularly in a remote setting with delayed transfer capability

Resources:

- [Before intubation considerations](#)
- [Intubation checklist](#)
- [Virtual Support Pathways](#)
- [Critical Care Outreach RN and RT](#)
- [Weight based drug sheets](#)
- [ZOOM Calls](#)
- [Family resources while awaiting transport](#)

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
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.



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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>