



# Anesthetic management for an infant with neonatal encephalopathy receiving therapeutic hypothermia for myelomeningocele repair

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## Background

- 72 hours of therapeutic hypothermia (TH), core temperature 33-34°C, begun within 6 hours of life is the standard of care to reduce death/disability after neonatal encephalopathy (NE)
- Neonates with an acute perinatal event that exhibit moderate or severe encephalopathy within 6 hours of birth are eligible
- This report presents a neonate with myelomeningocele (MMC) who underwent surgical repair while receiving TH
- 39 week 2 day old 2.9 kg male with known MMC was born following stat c-section for non-reassuring heart tones
- Due to the acute perinatal event, encephalopathic exam, and cord blood gas pH<7, he met criteria for TH
- Surgical repair of MMC pursued to maximize chance at appropriate neurodevelopment and prevent infection

	Mild Encephalopathy	Moderate Encephalopathy	Severe encephalopathy
Level of Consciousness	Alert	Lethargic	Coma
Spontaneous Activity	Normal	Decreased activity	No activity
Posture	Normal, mild distal flexion	Distal flexion/full extension	Decerebrate
Tone	Normal	Hypotonic	Flaccid
Primitive Reflexes	Weak suck strong Moro	Weak suck incomplete Moro	Absent suck and Moro
Autonomic Nervous System	Normal pupils, tachycardia	Constricted pupils, periodic breathing, bradycardia	Dilated/non-reactive pupils, variable HR, apnea

Table 1 Criteria for mild to severe encephalopathy based on immediate neonatal physical exam

## Peri-Operative Course

- TH with target T 33-34°C was initiated and maintained by a Blanketrol III cooling device with hanging mattress heat sink
- At 30 hrs of cooling, he was transported to OR for MMC repair, his vital signs were normal, with T 32°C. After positioning, T 31.5°C noted. Moderate active warming instituted until T 34°C
- ASA standard monitors and intra-arterial catheter were used
- T maintained by adjusting the underbody Bair Hugger™ approximately every 30 minutes (Figure 1)
- Hemodynamics stable without vasopressors and no arrhythmias or bradycardia events observed
- ROTEM showed no coagulation deficiency, although mild clinical coagulopathy was observed (Figure 2)
- 30cc PRBC given for preexisting anemia and blood loss
- The patient was kept intubated and cooled for 72 hours total
- 10cc/kg of plasma and PRBCs were transfused for oozing, fibrinogen 150, and INR 1.3
- EEG showed no seizures, MRI showed no HIE changes
- He has demonstrated appropriate neurodevelopment since discharge (~7 months old)

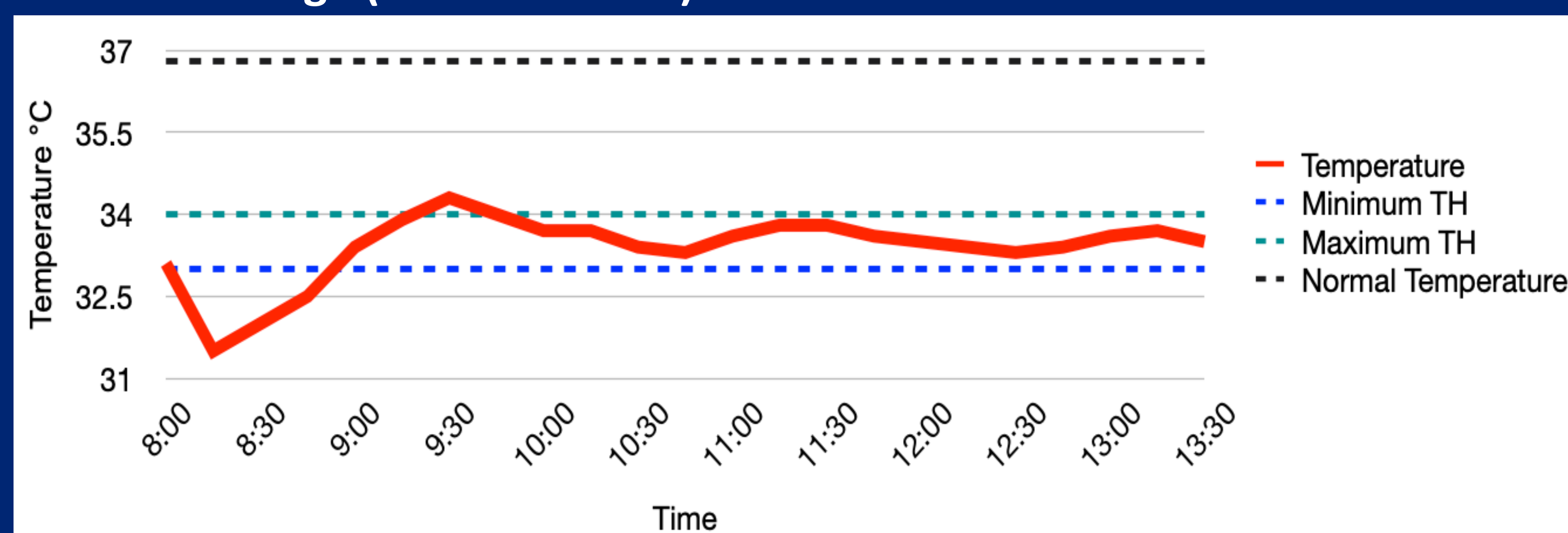


Figure 1. Maintenance of intra operative TH with TH range in dotted colored lines and normal temperature in dotted black line

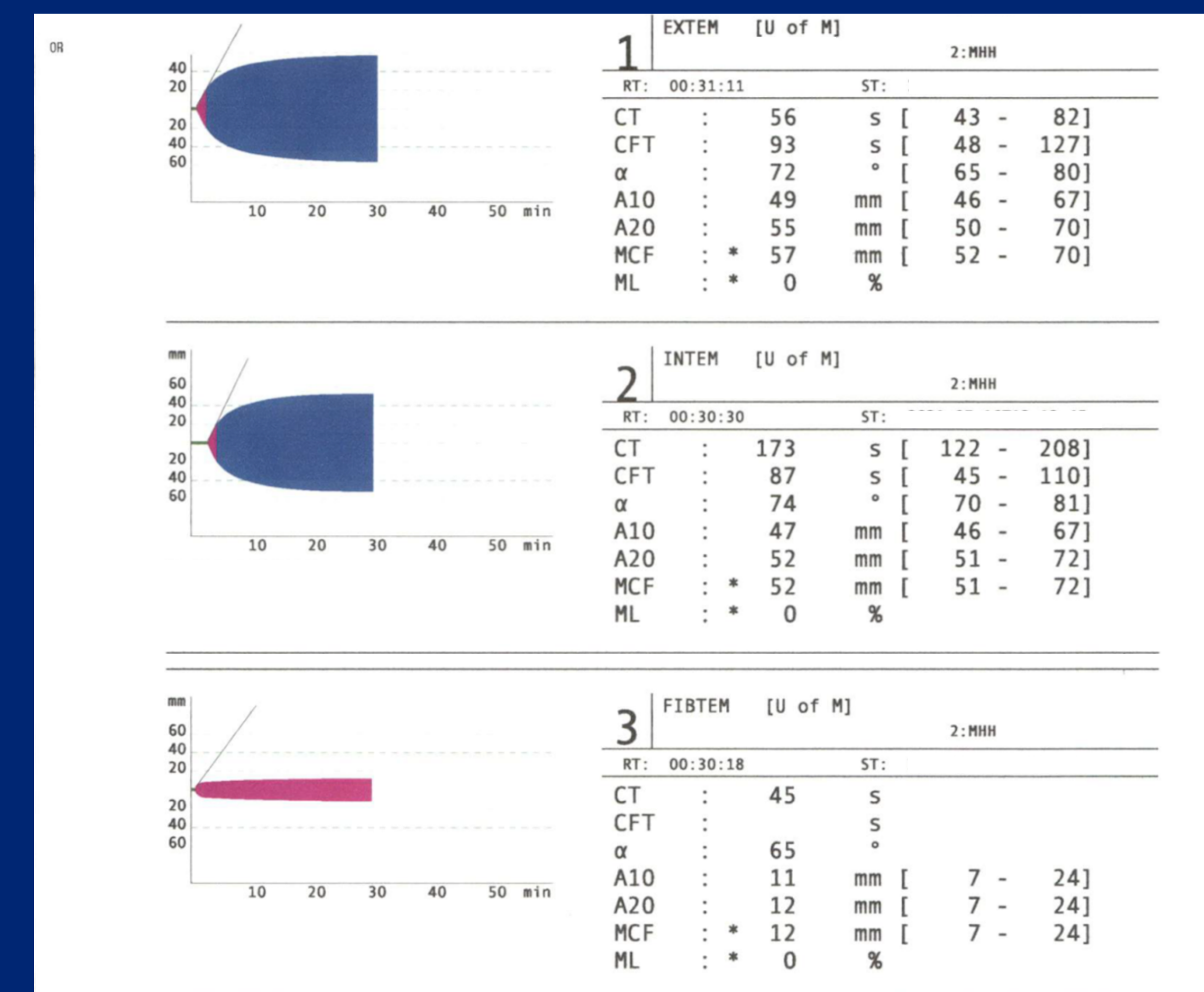


Figure 2. ROTEM analysis of intra-operative coagulation profile

## Learning Points

- Safe to operate while maintaining TH for infants with NE
- Continuous moderate warming with manual adjustments are required to prevent rapid temperature decline in the OR
- Observing and correcting coagulopathy during intra-operative TH is crucial and may continue in the post-operative phase
- Intra-arterial monitoring is recommended for hemodynamic and coagulation monitoring, especially for invasive procedures
- Collaboration with neonatologists and surgeons is imperative

## References

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