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MRI-Induced Telemetry Mode Change Misdiagnosed as Intrathecal Baclofen Pump Failure

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Introduction

- **Intrathecal baclofen (ITB) and deep brain stimulation (DBS)** are increasingly used concurrently for severe cerebral palsy.
- MRI electromagnetic interference can trigger **"telemetry mode"** in ITB pumps: drug infusion continues, but data logging is suspended.
- Failing to **interrogate the pump immediately post-MRI** can lead to **misinterpreting** unlogged periods **as pump inactivity.**

Case Presentation

- A 25-year-old male with cerebral palsy, stabilized on 170 mcg/day of intrathecal baclofen (ITB), underwent deep brain stimulation (DBS) implantation requiring MRI scans. **One month later, a routine interrogation erroneously logged the pump as "stopped" during the MRI period.**
- Assuming prolonged inactivity, the team reprogrammed the dose from a presumed 0 to 140 mcg/day. However, **the pump was actually in "telemetry mode,"** actively delivering 170 mcg/day. This inadvertent reduction caused severe clinical deterioration. Believing the dose had just been escalated from 0 to 140 mcg/day, the team critically misdiagnosed this worsening as a **paradoxical reaction**. Consequently, ITB was progressively tapered to zero, precipitating a **severe rebound spasticity.**
- DBS was temporarily deactivated to isolate the therapeutic effect. Following baclofen retitration to the original 170 mcg/day and DBS reactivation, **the patient fully recovered to his optimal baseline.**

Table 1. Changes in Modified Ashworth Scale (MAS) scores across treatment phases

Assessment	Pre-ITBP	Post-ITBP (Pre-DBS)	Telemetry Mode (Post-DBS)	Rebound Spasticity	Recovery
Baclofen Dose	-	170 μg/day	170 μg/day	-	170 μg/day
Left Muscle Group					
Shoulder flexor	3	0	0	3	0
Shoulder extensor	3	0	0	2	0
Elbow flexor	3	1	1	3	1
Elbow extensor	0	1+	0	0	0
Wrist flexor	1+	0	0	1+	0
Wrist extensor	1+	1+	1	1+	1
Hip flexor	1	0	0	1	0
Hip extensor	1	0	0	1+	0
Knee flexor	1	0	0	1	0
Knee extensor	1	1	1	1+	1
Ankle dorsiflexor	0	0	0	0	0
Ankle plantarflexor	1+	0	0	1+	0

Note. ITBP, intrathecal baclofen pump; DBS, deep brain stimulation; MAS, Modified Ashworth Scale.

Table 2. *Sequence of Events, ITB Dose, and Clinical Status*

Timepoint	Event / Intervention	Intrathecal Baclofen Dose (mcg/day)	Clinical Status / Observation
Stable Baseline	Stable Maintenance	170	Optimal symptom control; Minimal spasticity/dysto nia (MAS 0-1).
Perioperative DBS Period	**Multiple 1.5T MRI Scans & DBS Implantation**	170 (Intended/Actual)*	**Pump entered Telemetry Mode.** Drug infusion continued, but data logging was suspended. Clinical stability maintained.
1 Month Post-MRI (Index Event)	**Routine Pump Interrogation & Initial Dose Adjustment**	170 → 140	Interrogation log erroneously reported pump "Stopped" ~1 month prior. **Misinterpreted as pump failure.** Decided to taper dose. Spasticity did not worsen immediately.
Dose Tapering Phase	Misinterpretation of Deterioration & Continued Tapering	140 → 120 → 6.8	Patient exhibited worsening proximal limb spasticity and dystonia. **Critically misinterpreted as a paradoxical reaction** to baclofen, prompting further aggressive tapering
Complete Drug Cessation	ITB Removal	6.8 → NS	Baclofen completely evacuated from the pump and replaced with NS
Rebound Spasticity	**Onset of Severe Rebound Symptoms**	NS	**Rapid deterioration.** Massive surge in spasticity, severe extensor posturing, extreme agitation. Worsening dystonic movements.
Acute Rescue Intervention	**DBS deactivation & ITB Restart**	Off → 50	**DBS system turned OFF** to isolate the therapeutic effect of baclofen. Definite improvement in spasticity observed immediately upon restart.
Re-titration Phase	Rapid Dose Escalation	50 → 75 → 100 → 140	Gradual and significant resolution of spasticity and discomfort. DBS therapy subsequently restarted (Rt GPi ON).
Full Baseline Restoration	**Return to Original Settings**	140 → 170	**Full recovery to optimal baseline. Full DBS activated (Rt Vo, Lt GPi ON).**

Notes: **Post-hoc technical analysis revealed the pump was actively infusing the programmed 170 mcg/day dose during this period, despite the lack of logging.*
Abbreviations: DBS, Deep Brain Stimulation; ITB, Intrathecal Baclofen; MAS, Modified Ashworth Scale; NS, Normal Saline.

Table 3. *Changes in Dystonia Rating Scale Before and After DeepBrain Stimulation (DBS)*

Measurements	Pre-DBS Baseline (Apr 7, 2025)	Post-DBS 6-Month (Oct 20, 2025)
Dystonia movement scale		
Eyes	0.5	0.5
Mouth	1.5	1.5
Speech/swallowing	6	6
Neck	1	1
Right arm	3	2
Left arm	16	12
Trunk	6	4
Right leg	6	6
Left leg	16	12
Total	**56**	**45**
Disability scale		
Speech	2	2
Writing	1	1
Feeding	2	2
Eating	1	1
Hygiene	3	3
Dressing	3	3
Walking	5	4
Total	**17**	**16**

Note*. Concurrent ITB dose was 170 mcg/day at Pre-DBS baseline and 230 mcg/day at Post-DBS assessment.*

Discussion & Conclusion

- Uncritical reliance on flawed telemetry logs over clinical presentation creates a **dangerous diagnostic trap.**
- Paradoxical toxicity and rebound spasticity can present with overlapping symptoms; **prioritizing direct clinical assessment is critical.**
- Strict adherence to **mandatory post-MRI device interrogation protocols** requires robust multidisciplinary communication.