

Neurological Symptoms (Non-Cancer)

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Care: a Global Gathering**

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Minnesota
Or
Massachusetts?

Neurological Symptoms

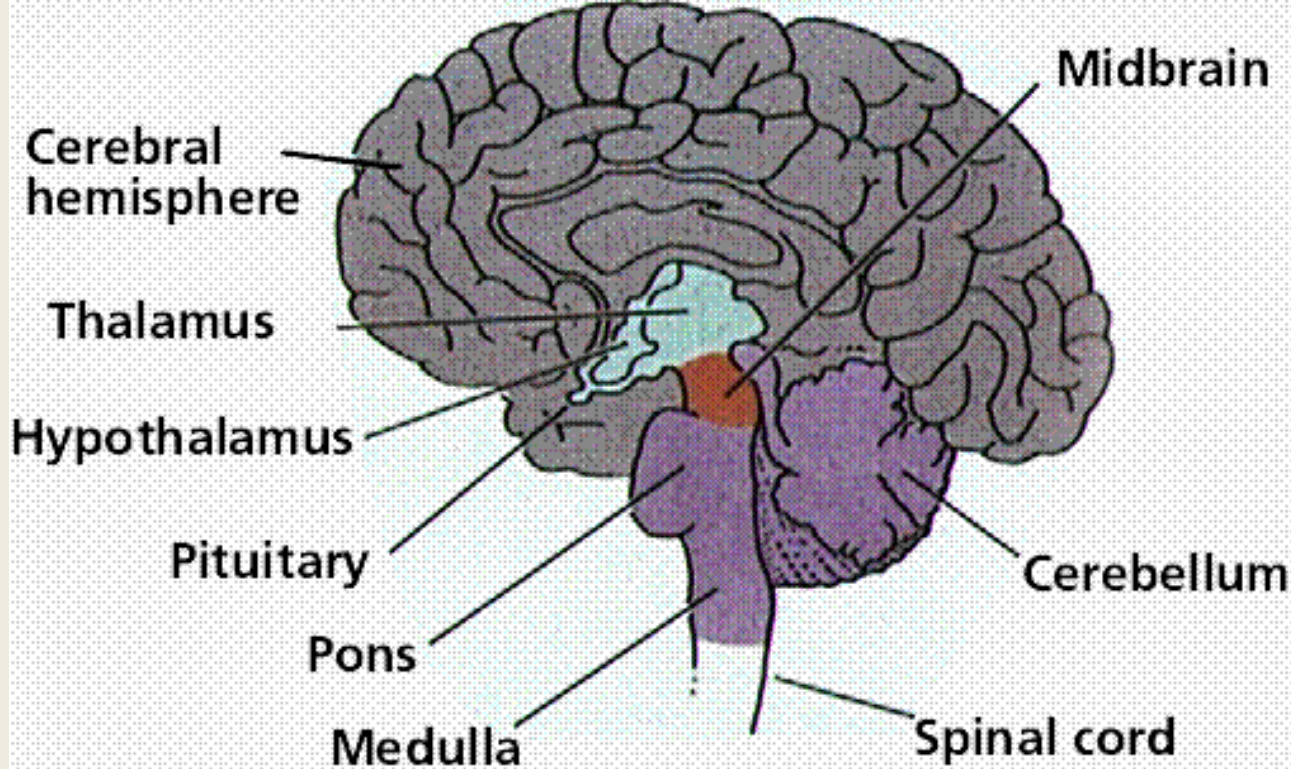
- Neurological impairment = NI
 - Seizures
 - Spasticity
 - Autonomic dysfunction
 - Dystonia
 - Myoclonus
 - Central neuropathic pain

General Principles

- Different neurological symptoms have similar features
- Risk for several problems to coexist
- Pain can worsen any neurological symptom



--Spasticity --Muscle spasm	--Velocity dependent --Intermittent
Myoclonus	Brief, abrupt, sudden contraction of one or more muscles
Dystonia	Muscle contractions with twisting and repetitive movements, abnormal postures, or both
Dysautonomia, PAID, Storms	Facial flushing, sweating, hyperthermia, vomiting, gut pain
Central Pain	Abrupt onset of pain “out of the blue,” gut pain



- Cerebrum: inhibition
- Thalamus: somatosensory transmission (somatic, visceral), arousal and sleep
- Basal ganglia: control of movement
- Hypothalamus: regulation of heart rate, blood pressure, temperature, sleep

Pain Behaviors

- Vocalizations: crying, moaning
- Facial expression: grimacing
- Consolability
- Interactivity: withdrawn, less active
- Physiological responses: pale, sweating
- **Movement: pulls legs up, restless**
- **Tone and posture: arching, stiffening**
- **Idiosyncratic behaviors: laughing**

General Principles

- Consider involvement from more than one area of the CNS
- Prioritize problems
- Is it bothering the child?
- Assess for pain behaviors
- Identify medications for each problem

Empirical Treatment

Gabapentin	Central neuropathic pain, Dysautonomia, Spasticity
Clonidine	Dysautonomia, Spasticity
Tricyclic (TCA)	Central Neuropathic pain
Baclofen	Spasticity, Dystonia
Benzo	Myoclonus, Dystonia
Beta blocker	Autonomic dysfunction
Benzo, opioid	Autonomic storm

Empirical Treatment

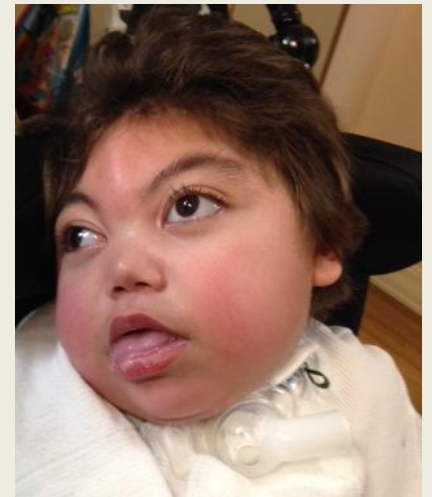
Anticholinergics: --Trihexyphenidyl --Benztropine	Dystonia
Dopamine agonist --Bromocriptine	Dystonia
Dopamine depletor --Tetrabenazine	Chorea, Dystonia
Cannabinoids	Central neuropathic pain
Phenobarbital	Seizures, irritability at EOL

Integrative/Supportive Management

- Rocking, massage, repositioning, music
- **Vibratory stimulation (mats, pillows)**
- Supportive equipment (seating, pillows)
- Calm environment, sleep
- Pools, massage, aromatherapy

Case #1

- 3 year old with severe NI
- Intractable focal epilepsy on 4 antiepileptic drugs
- Severe daily episodes with facial flushing, sweating, tachycardia, hypertension, arching and posturing
- Some with focal seizures



Case #1 – Care Plan

- Gabapentin and clonidine: 75% improved
- Events with arching and/or tremors
 - Reposition
 - If no stool
 - Ibuprofen
 - Calm, dark room



Case #1 – Care Plan

- Event with flushing and agitation
 - As needed clonidine
- If movement suggests seizure
 - Rectal diazepam
- Not critical to determine if event is seizure or if discomfort is triggering tremors, allow experience when not possible to know with certainty

Case #2

- 3 year old with hypoxic/hypotensive event, MRI basal ganglia
- Dystonic movement and daily irritability
- Meds: clonazepam, lorazepam gabapentin, methadone, baclofen (trihexyphenidyl stopped due to side effects)

Drug	Problems treated	Patient mg/kg/day (14.6 kg)	Typical dose mg/kg/day
Baclofen	Spasticity	1.8	1.9*
Clonazepam	Dystonia, Spasticity	0.05	0.015-0.03
Lorazepam	Dystonia, Spasticity	0.2	0.08-0.2
Gabapentin	Autonomic dysfunction, Neuropathic pain, Spasticity	10	35-45**

*Lubsch 2006, **Korn-Merker 2000

Case #3

- Potential for return of symptoms
 - Unable to remove source of problem
 - Hoping and preparing
 - Transient, new plateau, intractable with ongoing decline

The Face of Palliative Care



Case #3

- Discussion: it is permissible to discontinue any technology that is prolonging suffering
- Introduced with no need for decision

Summary

- Overlap in features of each problem
- More than one neurologic symptom can co-exist in a child with global involvement of the CNS
- Treatment is empiric
- Neuro symptoms can be intractable

Prognosis



You Betcha'

Be well

Do good work

And keep in touch

Garrison Keillor

Julie Hauer

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References

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