

The Whole Child: Conditions Associated with Pediatric Epilepsy

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Outline

- Introduction to epilepsy management
- Define comorbidities
- Importance of comorbidities
- Relationship of comorbidities to epilepsy
- Evaluation of comorbidities
- Specific comorbidities
 - Cognition and behavior
 - Physical symptoms

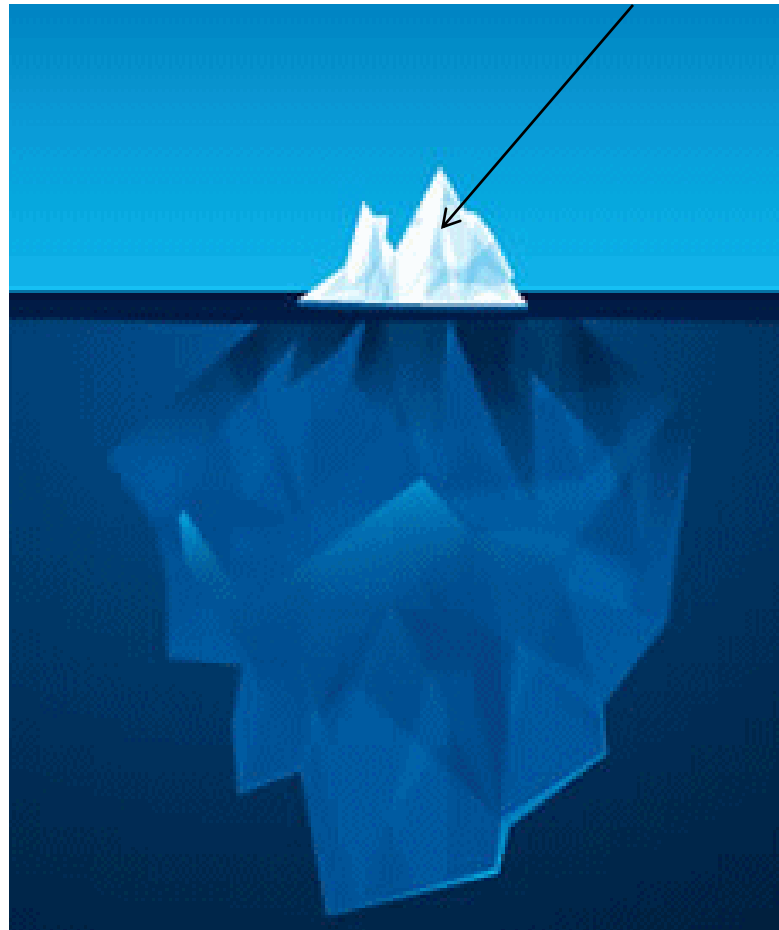


Epilepsy Management

- Identify and classify seizures
- Identify cause of seizures
- Decrease number of seizures
- Monitor therapy

Epilepsy

Seizures





Epilepsy Management

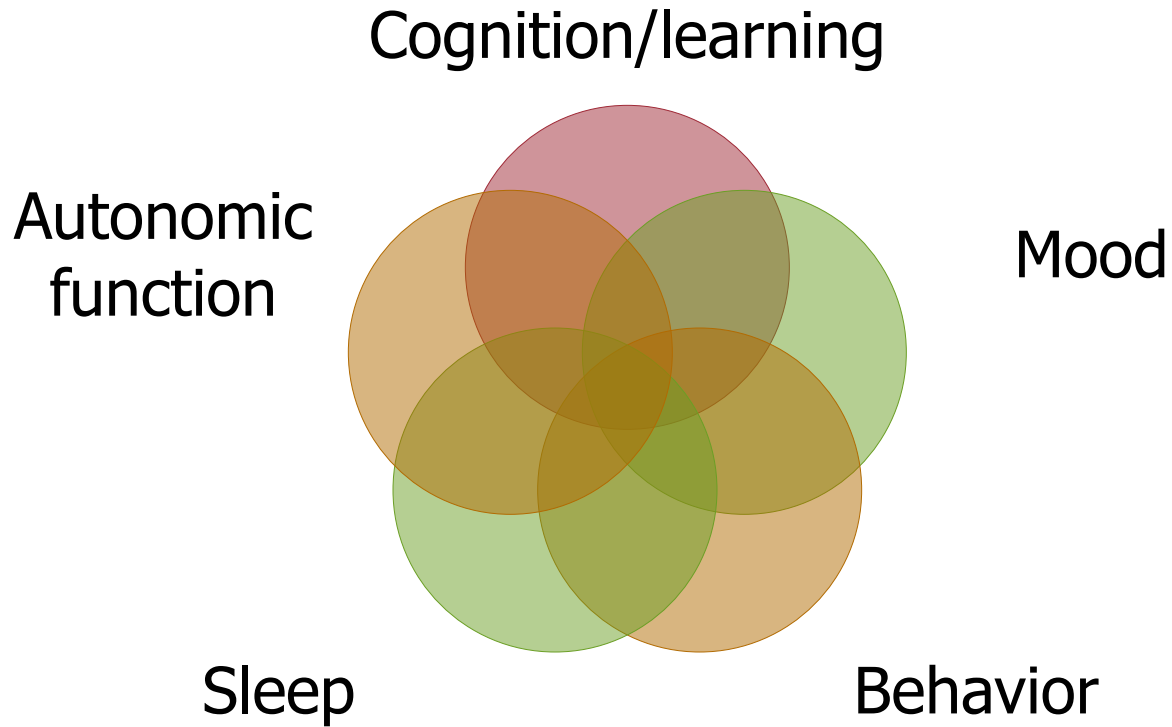
- Identify and classify seizures
- Recognize comorbid conditions
- Identify cause of seizures
- Decrease number of seizures
- Treat associated conditions
- Monitor therapy



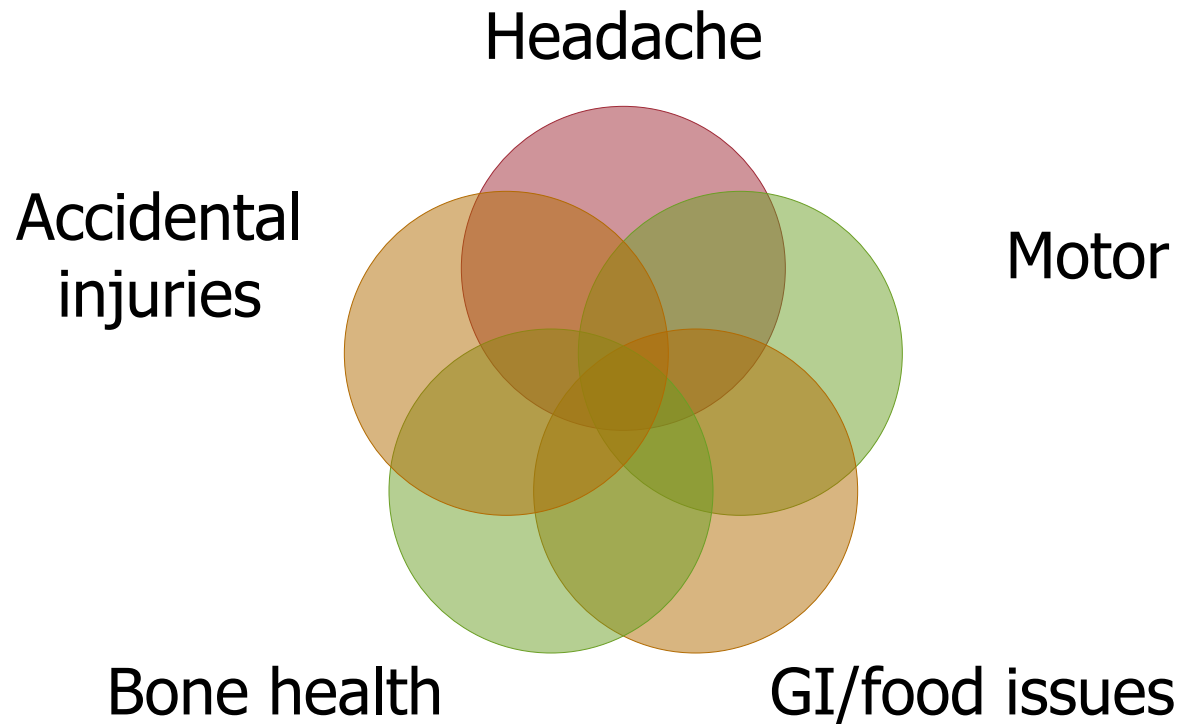
Definition of Comorbidities

- 2 conditions in the same individual
- More than coincidence
- Does not imply direction or causation
 - Share genetic factors
 - Share environmental factors
- Example
 - Epilepsy
 - Sleep disorders

Associated Conditions in Children with Epilepsy



Associated Conditions in Children with Epilepsy



Comorbidities in Epilepsy

- Comorbidities common
- Often present at seizure onset
- Inform underlying diagnosis
- May affect seizure treatment choice



Comorbidities in Epilepsy

- Potentially treatable conditions
- Can be more disabling than seizures
- Added stress to family
- Impact child's quality of life


Impact on Quality of Life

- Prevent best function in his/her
 - Family
 - Social groups
 - Work
 - School
 - Play
- Prevent greatest comfort
 - Physical
 - Emotional



How are comorbidities related to epilepsy?

- Underlying neurologic diagnosis: what causes the epilepsy (and the other problems)
 - Common biological mechanisms
- Direct effects of epilepsy
- Medication side effects

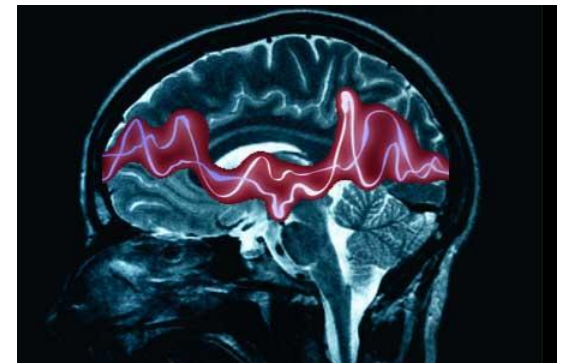


Underlying neurologic diagnosis: The cause of the epilepsy

- Strongest predictor for associated conditions
- Tells us “where to look” for potential problems
- Gives clues about a child’s future from experiences of children with similar disorders

Causes of Epilepsy

- Brain injury from prematurity
- Hypoxic-ischemic brain injury
- Brain malformation
- Genetic syndrome
- Infection
- Stroke
- Trauma
- Metabolic disorder
- Tumor



Direct Epilepsy Effects

- Seizure effects
 - Accidental injury
 - Sleepiness
 - Headache
- EEG abnormalities
 - Epileptic encephalopathy
 - Interruption in sensory input
 - Interruption in motor output



Medication Side Effects

- Very common
- Often missed
- Easiest to address




Evaluation of Comorbidities

- Clinical history
- EEG
- Brain imaging
- Laboratories
- Neuropsychology evaluation

Evaluation of Comorbidities

- Special studies
 - Sleep study
- Referral to
 - Medical specialists
 - Therapists (SLP, PT, OT)
 - Mental health providers



Why is Sammy having trouble keeping up with the other kids in his class?

Cognition: Thinking and Learning

- Global intellectual disability: “IQ”
- Language impairment
- Learning disability
- Specific neurocognitive domains
 - Attention
 - Executive functioning
 - Memory
 - Visual/spatial/motor



Attention Deficit Hyperactivity Disorder (ADHD)

- Symptoms
 - Inattention
 - Impulsivity
 - Hyperactivity
- Functional impairment across multiple activities
- Duration greater than 6 months

ADHD and Epilepsy

- >20% of children with epilepsy
- Inattentive type most common
- Treatment
 - Behavior therapy
 - Medication
 - Methylphenidate most studied



Why is Katie irritable and spending so much time alone in her room?

Behavioral and Psychiatric Comorbidities

- Mood
- Behavior
- Psychosocial stress
- Autism spectrum disorders





Why doesn't David play with other children his age?

Autism Spectrum Disorders

- Group of complex neurodevelopment disorders
- Cardinal features of autism
 - Social impairments
 - Communication difficulties
 - Restricted, repetitive, and stereotyped patterns of behavior

Autism Spectrum Disorders

- Prevalence of epilepsy 30% in ASDs
- Age of seizure onset
 - Early childhood
 - Adolescence
- High incidence of abnormal EEG
- Both autism and epilepsy reflect abnormal connectivity



Why are Sarah's hands shaking?



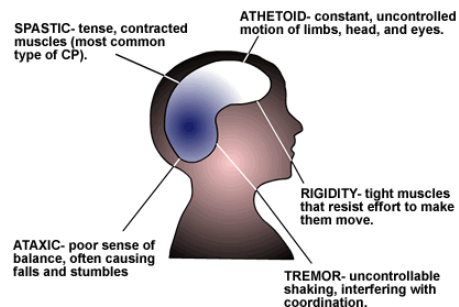
Motor impairments

- Low muscle tone (hypotonia)
- Gross or fine motor delays
- Balance impairments
- Motor planning problems
- Movement disorders
- Cerebral palsy

Cerebral Palsy

- Group of motor disorders (abnormal tone, posture, control of movement)
- Secondary to injury in the developing brain or brain anomaly
- Non-progressive and permanent lesion

TYPES OF CEREBRAL PALSY



Cerebral Palsy and Epilepsy

- 30% of people with CP have epilepsy
- Must distinguish seizures from involuntary movements and other non-epileptic events
- Severity of cerebral palsy correlates directly with severity of epilepsy
- Remission can occur



Why do Ryan's hands and feet get so cold?

Autonomic function

- “Automatic” functions
 - Heart rate
 - Breathing rate/control
 - Blood pressure
 - Body temperature (core, extremities)
 - Sweating
 - Pupillary control
 - Gastrointestinal function
 - Bladder function





Why is Annie so tired during the day?

Sleep

- Insomnia
- Sleep disordered breathing
- Excessive daytime sleepiness
- Behavioral
- Seizure related sleep disruption





Why does Jill complain of a headache when she has a seizure?

Headaches in Epilepsy

- Migraine
 - Partial epilepsy increased risk
 - Many antiepileptic drugs treat migraine
- Seizure-related headache
 - Peri-ictal headaches common
 - OTC pain meds effective





Why doesn't Ted want to eat?

Digestive Tract and Food

- Appetite changes
- Abdominal discomfort, nausea, vomiting
- Feeding intolerance
- Delayed gastric emptying





Should I be giving Laura calcium and vitamin D?

Bone Health and Epilepsy

- Increased risk of fractures
 - Injuries
 - Poor bone health
- Increased risk of vitamin D deficiency
 - Nonambulatory
 - Polypharmacy
 - Ketogenic diet
 - Poor nutritional status
 - Specific AEDs ↑ breakdown vit D
- Limited studies in children



Conclusions

- Comorbidities are common in childhood epilepsy.
- Comorbidities can negatively affect the well-being of a child and family.
- Treatment of seizures should reflect awareness of comorbidities.
- Treatment of epilepsy starts but does not stop with seizures.

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