1. The most likely diagnosis for a 4-yr-old child with ataxia, rapid eye movements, vomiting, and no loss of consciousness is:
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(C) Meningitis
(D) Breath-holding spell

2. Which of the following is rarely associated with a seizure?
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(C) Pallor
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3. Which of the following is the most likely cause of vertigo that lasts for several days in a child?
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(B) Benign paroxysmal vertigo
(C) Meningitis
(D) Otitis media

4. Which of the following is used to diagnose benign paroxysmal positional vertigo?
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(B) Barany maneuver
(C) Audiometry
(D) Computed tomography

5. Which of the following is characterized by a sudden loss of tone?
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6. Which of the following is a typical head circumference for a girl at 1 yr of age?
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7. Path of __________ is a sign of increased intracranial pressure.
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8. For a child with suspected increased intracranial pressure and a systolic blood pressure of 130 mm Hg, nifedipine should be given immediately to lower the blood pressure.
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10. Muscle weakness in a child that begins in the upper part of the body and moves downward indicates which of the following?
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(B) Myasthenia gravis
(C) Botulism
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Answers to Audio-Digest Pediatrics Volume 58, Issue 11: 1-C, 2-C, 3-A, 4-D, 5-B, 6-C, 7-B, 8-D, 9-A, 10-A

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Dr. Fisher and other clinicians discuss the most common causes, differential diagnosis, workup, and management of common paroxysmal events in children that may produce a sensation of motion. Several of these conditions, such as benign paroxysmal positional vertigo, may improve with vestibular suppressants. Seizures, however, are never a benign sign and require prompt evaluation.

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Narcolepsy and cataplexy:

Head circumference:

Night terrors:

Other paroxysmal events:

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3 wk, if patient not improving, consider diagnoses other than transient vertigo disorder

Sleep Disorders

Types: night terrors; nightmares; somnambulism; hypnagogic hallucinations; insomnia; delayed phase syndrome (DSP); sleep-disordered breathing; narcolepsy and cataplexy

Night terrors occur at 3 to 5 yr of age; child screams, appears diaphoretic, has no memory of event; may respond to low-dose diazepam; may occur with somnambulism, self-limited

Sleep-disordered breathing: snoring; apnea; abnormal breathing patterns; headache; recurrent nightmares; treatment—tonsillectomy

Narcolepsy and cataplexy: narcolepsy—excessive daytime somnolence; cataplexy—sudden loss of tone; typically occurs as entering random eye movement sleep (lasts 30-120 sec); causes vivid hallucinations; associated with sleep paralysis; usually idiopathic and self-limited; rarely secondary to brain tumor or Normann-Pick disease

Management: DSPS—repeat internal clock; melatonin, 3 mg daily (nototropic, not bovine); narcolepsy—stimulants (methylphenidate, modafinil [not approved for children]); cataplexy—flusoxetine; clonipramine

Tics
Diagnosis: typical onset 6 to 7 yr of age; simple—eg, eye blinking, grimacing, complex—involves whole body, movements often incorporated into normal daily movements; vocal tics usually throat clearing or clicking (coprolalia rare); most tics in children benign and transient; Tourette syndrome—motor and vocal tics for 10 sec; familial, may be comorbid with attention-deficit/hyperactivity disorder (ADHD) and obsessive-compulsive disorder (OCD)

Treatment: only necessary if interfering with daily function, child stabilized at baseline on behavior; medications—clonidine 0.1 mg orally bid or patch; may take 3-6 wk to take effect; gabapentin, clonazepam; habit reversal therapy; treat accompanying ADHD or OCD

Other
Paroxysmal events: neonatal sleep myoclonus; hyperekplexia (infantile spasms) usually benign attacks—appears as “ice water poured down back”; self-limited; spasms neonatorum—head nodding, torticollis, and nystagmus

Kernicterus: kernicterus and its sequelae: has preserved consciousness; diagnosis—opossum (possible harbinger of neuroblastoma)

A Practical Approach to Neurologic Emergencies

Increased Intracranial Pressure
Case: 18-mo-old infant with macrocephaly (head circumference 54 cm) and right-sided weakness (primarily lower limb); child sitting with walking; drowsed with cerebral palsy by neurologist; CT and coronal MRI revealed medulloblastoma; tumor resected

Head circumference: measurement 34 to 35 cm = normal; increases 2 cm for boys; from 1 to 3 mo of age; 1 cm/year from 3 to 6 mo of age; 0.5 cm/cm from 7 to 12 mo of age; 1 yr of age; +4 cm at birth and +4 cm7 for boys

Eye movements: cranial nerve VI palsy—abducent paresis; papilledema; increased intracranial pressure (ICP); cranial nerve III palsy—down and out position of eye; typically seen with aneurysm; entrapment of cranial nerve III; nystagmus; asymmetric crying facies associated with renal and cardiac defects; asymmetry extending upward from below suggests Guillain Barre syndrome; syndrome of inappropriate antidiuretic hormone (SIADH) causing hyponatremia; hypotonicity; weakness extending upward from below suggests Guillain Barre syndrome; weakness extending downward from above suggests cerebral aneurysm; head tilt suggests myasthenia gravis

Case: 4-mo-old infant brought for evaluation of bilateral droopy eye; recently started taking cereal; diagnosis—botulism

Suggested Reading
Dr. Fisher was recorded at 33rd Annual Las Vegas Seminars: Pediatric Update, held November 17-20, 2011, in Las Vegas, NV, and sponsored by the American Academy of Pediatrics, California District, Chapters 1, 2, 3, and 4. To Attend 34th Annual Las Vegas Seminars—Pediatric Update, November 15-18, 2012, in Las Vegas, NV, please visit www.aap-ca.org. The Audio-Digest Foundation thanks Dr. Fisher and the American Academy of Pediatrics, California District, Chapters 1, 2, 3, and 4 for their cooperation in the production of this program.
1. The most likely diagnosis for a 4-yr-old child with ataxia, rapid eye movements, vomiting, and no loss of consciousness is:
   (A) Benign paroxysmal vertigo
   (B) Complex partial epilepsy
   (C) Meningitis
   (D) Breath-holding spell

2. Which of the following is rarely associated with a seizure?
   (A) Dizziness
   (B) Loss of consciousness
   (C) Pallor
   (D) Open eyes during the event

3. Which of the following is the most likely cause of vertigo that lasts for several days in a child?
   (A) Benign paroxysmal positional vertigo
   (B) Benign paroxysmal vertigo
   (C) Meningitis
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4. Which of the following is used to diagnose benign paroxysmal positional vertigo?
   (A) Romberg maneuver
   (B) Barany maneuver
   (C) Audiometry
   (D) Computed tomography

5. Which of the following is characterized by a sudden loss of tone?
   (A) Hypnagogic myoclonus
   (B) Narcolepsy
   (C) Cataplexy
   (D) Sleep-disordered breathing

6. Which of the following is a typical head circumference for a girl at 1 yr of age?
   (A) 35 cm
   (B) 42 cm
   (C) 46 cm
   (D) 52 cm

7. Palys of _______ is a sign of increased intracranial pressure.
   (A) Cranial nerve II
   (B) Cranial nerve III
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8. For a child with suspected increased intracranial pressure and a systolic blood pressure of 130 mm Hg, nifedipine should be given immediately to lower the blood pressure.
   (A) True
   (B) False

9. Which of the following is the most common cause of acute ataxia in a child?
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   (B) Hydrocephalus
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   (D) Otitis media

10. Muscle weakness in a child that begins in the upper part of the body and moves downward indicates which of the following?
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    (B) Myasthenia gravis
    (C) Botulism
    (D) Polyneuropathy

Answers to Audio-Digest Pediatrics Volume 58, Issue 11: 1-C, 2-C, 3-A, 4-D, 5-B, 6-C, 7-B, 8-D, 9-A, 10-A

Not Everything That Shakes Is a Seizure

Case:
A 2-yr-old girl presents to emergency department (ED) 10 min after sudden onset of ataxia and refusal to walk; vomited twice; experienced similar episode 3 times in past 6 mo; results on previous otoscopic examination testing and computed tomography (CT) of head normal; diagnosis — benign paroxysmal vertigo

Benign paroxysmal vertigo: migraine variant; episodic; not seizure; typically occurs in children 2 to 6 yr of age (same as typical ages for febrile seizures); child appears frightened with pallor; may appear dizzy and ataxic, with rapid eye movements; vomiting; child recovers quickly; not associated with loss of consciousness (LOC)

Case: baby stiffs, often after feeding; exhibits some posturing; diagnosis — reflux (ie, Sandifer syndrome)

Sandifer syndrome: associated with episodic extension and flexion of neck; usually occurs in first few months of life

Paroxysmal events: 66% of seizures do not recur (some self-limited; others, possibly misdiagnosed); paroxysmal events — neonatal apnea, breath-holding spells, dizziness, migraine; sleep disorders, tics, shuddering attacks; cardiac problems (eg, prolonged QT syndrome, Wolff-Parkinson-White syndrome; Brugada syndrome); psychiatric disorders; conversion disorders, nonelectrical seizures

Evaluation: history and physical examination; hyperventilation; electrocerebral on electroencephalography (EEG); pH probe (concern for electroencephalography (EEG) with photic stimulation and hyperventilation; video EEG monitoring

Pearls: home video useful tool for episodes that occur frequently; eyes open not closed during seizure; patients with new-onset daily seizures rarely have normal EEG readings; seizures rarely produce negative phenomena (eg, pale, cold, opalescent, brady-cardia); if present, consider syncope, breath-holding spells, prematurity; directs acts of violence not feature of epilepsy; conversion disorder and to lingering unconscious in first decade of life

Case: girl with gas gushing to left and posturing; child spoke during and immediately after event; during generalized tonic-clonic or complex partial seizures; patient usually impaired or has LOC; child had partial focal seizure (in occipital lobe); look of relief at end of event typical of partial and complex partial seizures

Educational Objectives
The goal of this program is to improve the recognition and management of paroxysmal events and neurologic emergencies in children. After hearing and assimilating this program, the clinicians will be better able to:

1. Diagnose paroxysmal events that may be mistaken for seizures, such as breath-holding spells, dizziness, sleep disorders, and tics
2. Evaluate and treat disorders that cause paroxysmal events
3. Distinguish among syncope, dizziness, and vertigo
4. Recognize neurologic emergencies, such as increased intracranial pressure, shock or ventriculostomy malfunction, acute ataxia, encephalopathy and coma, and spinal cord compression
5. Begin management of emergent pediatric neurologic conditions in the office

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