

Involuntary Movements in Children and Adolescents: Is it Seizure, Tic or Something Else?

California Association of
Nurse Practitioners
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Paroxysmal Involuntary Movements



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Paroxysmal Involuntary Movements

Definition

- Episodic involuntary body movements which are present only during attacks
 - http://www.dystonia-foundation.org/pages/more_info/68.php
- Other terms for paroxysmal involuntary movements
 - Paroxysmal dyskinesia
 - Movement disorder

Paroxysmal Involuntary Movements

Description of Symptoms

- ❑ Stereotypic appearance
- ❑ Not associated with a change in level of consciousness
- ❑ Abate or disappear during sleep
- ❑ Not accompanied by EEG changes

Paroxysmal Involuntary Movements

Etiology

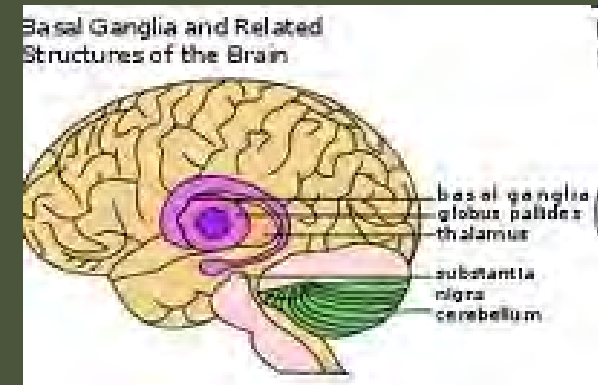
- Hereditary conditions – Family History?
 - “Uncle Jack”
- Medications
 - Metoclopramide
 - Stimulant
 - Neuroleptic
- Toxicity
- Seizures*
- Illnesses and unusual diseases
 - Thyroid disease
 - Hypoglycemia
 - Lupus
 - Streptococcal infections

* While seizures are in the differential diagnosis of paroxysmal involuntary movements they will be covered more thoroughly in another presentation

Paroxysmal Involuntary Movements

Pathophysiology

- Usually associated with abnormalities of the basal ganglia
 - The basal ganglia are paired masses of gray matter in each cerebral hemisphere of the brain
 - Control large subconscious movements of the skeletal muscles
 - Regulate muscle tone required for specific body movements



Paroxysmal Involuntary Movements Evaluation

- Description of involuntary movements
 - Verbal description is inadequate
 - Best evaluation: direct observation
 - Video of movements helpful if abnormal movements are infrequent
- Number of movements
- Body parts involved
- Bilateral or unilateral
- Rhythmic or non-rhythmic
- Suppressible or non-suppressible

Paroxysmal Involuntary Movements

Evaluation

- Are there associated features with the abnormal movement?
 - Alteration of consciousness
 - Eye fluttering
 - Facial contortion
 - Twitching
 - Drooling
 - Other sensations
 - Fatigue
 - Weakness
 - Pain
 - Interference with motor activities

Paroxysmal Involuntary Movements Evaluation

- Further history
 - Onset
 - Frequency
 - Timing
 - Duration
 - Pattern
 - Exacerbating factors
- Noises (with or without abnormal movements)
- Additional symptoms

Paroxysmal Involuntary Movements: Hyperkinetic

□ Tic

- Complex, stereotypic movements or utterances that are brief, sudden and purposeless

□ Tremor

- Involuntary, oscillating movement with a fixed frequency

□ Myoclonus

- A sudden, shock-like muscle contraction
- Myoclonic jerks may occur singly or repetitively
- Unlike tics, myoclonus cannot be controlled even briefly

Paroxysmal Involuntary Movements: Hyperkinetic

□ Dystonia

- Repetitive muscle contractions that are often sustained at the peak

□ Chorea

- Rapid movements affecting any body part
- Incorporates into a voluntary movement to hide, giving the appearance of restlessness
- Movement is random but, neither rhythmic or stereotyped
- Movement migrates from side to side and limb to limb

Paroxysmal Involuntary Movements: Hyperkinetic

- Ballismus
 - High amplitude, violent flinging of a limb from shoulder or pelvis
- Ataxia
 - Disturbances of fine control of posture and movement
- Athetosis
 - Withering movements of the hands
- Akathisia
 - Restlessness and a desire to move to relieve uncomfortable sensations

Paroxysmal Involuntary Movements: Hypokinetic

- Bradykinesia
 - Slowness of movement
- Freezing
 - Inability to begin a movement or involuntary stopping of a movement before completed
- Rigidity
 - Increase in muscle tension when an arm or leg is moved by an outside force
- Postural Instability
 - Loss of ability to maintain upright posture
 - Caused by slow or absent righting reflexes

Paroxysmal Involuntary Movements

Medications and Treatments

- Detailed medication history:
 - Stimulants
 - Neuroleptics
- OTC:
 - Supplements (vitamins, herbal, homeopathic, nutritional)
- Additional Assessment:
 - Weight/BMI

Paroxysmal Involuntary Movements

Medical Update:

- Past history of illness related to the onset of movements
- Current illness associated with the onset or exacerbation of symptoms
- Fever
- Rash
- Sore throat
- Cough
- URI
- Ear pain
- GI complaints
- Dehydration
- Weight loss

Paroxysmal Involuntary Movements

Medical Update:

- Past and recent laboratory testing:
 - CBC
 - Thyroid analysis
 - Electrolytes
 - Cultures (Although controversial, history of positive streptococcal infection)
- Also consider:
 - Co-morbid medical problems
 - Environmental risk factors

(Swedo, 2004; Kaplan, 2000)

Paroxysmal Involuntary Movements

General Health and Psycho-Social Issues

□ Behavior

- Temperament (age appropriate)
- Worsening or new behaviors & triggers
- Behavior management

□ Psychiatric/Neuro-Psychological

- ADD/ADHD
- Obsessive-compulsive disorder
- Anxiety
- Autism spectrum disorder
- Other mental illness or disorder
- Counseling or psychiatric care

Paroxysmal Involuntary Movements: School and Therapy Programs

- Therapeutic interventions
 - OT, PT, ST, Adaptive PE
 - Frequency
 - Length of sessions
 - Response to interventions
- Impact of disease process at school:
 - Severity and frequency of movements
 - Effects of medication upon ability to perform:
 - Focus/attention
 - Interaction with teacher or peers
 - Movements interference with motor activities or tasks
 - Safety assessment

Paroxysmal Involuntary Movements

Management: Medications

- Anti-epileptic
 - Primidone
 - Phenytoin
 - Valproate
 - Carbamazepine
 - Phenobarbital
- Benzodiazepines
- Anti-cholinergic
 - Levodopa
 - Flunarazine
 - Tetraabenazine
- Muscle Relaxants:
 - Baclofen
 - Tizanidine

Paroxysmal Involuntary Movements

Management: Treatments

- Treatments
 - Botulinim toxin injections
 - Physical therapy
 - Occupation therapy
 - Splinting/Bracing
 - Surgical implants
- Alternative therapies
 - Relaxation
 - Biofeedback
 - Acupuncture
 - Homeopathy
 - Touch therapy
 - Postural alignment therapy

Resources

- ❑ Worldwide Education and Awareness for Movement Disorders (We Move)
 - <http://www.wemove.org/syd/pediatric/>
- ❑ Movement Disorder Virtual University
 - <http://www.mdvu.org/library/pediatric/>
- ❑ Pediatric Neurotransmitter Disease Association
 - <http://www.pndassoc.org>
- ❑ United Cerebral Palsy Association
 - <http://www.ucp.org>
- ❑ United Mitochondrial Disease Foundation (UMDF)
 - <http://www.umdf.org>
- ❑ International Rett Syndrome Foundation
 - <http://www.rettssyndrome.org>
- ❑ Brain Injury Association of America
 - <http://www.biausa.org>
- ❑ Wilson's Disease Association International
 - <http://www.wilsonsdisease.org>