Parasomnias

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**Parasomnias** - undesirable behavioral (physical & mental) phenomena that occur mainly (or exclusively) during sleep - disorders of arousal, partial arousal, and sleep-stage transition.

* feature of many of parasomnias is ***abnormal muscle activation behaviors*** during sleep.
* main presenting complaint is related to behavior itself (i.e. parasomnias do not cause insomnia or daytime sleepiness).

## I. Arousal disorders - behaviors related to sleep stages 3-4 (occur during first third of night when deep sleep predominates):

1. **Confusional Arousals**
2. **Sleepwalking (s. Somnambulism)**
3. **Sleep Terrors (s. Pavor Nocturnus)**
* usually affect *children & adolescents*; resolve during adulthood (sometimes may carry over into adulthood or arise secondary to medications).

## II. Sleep-Wake Transition disorders - occur at sleep onset, during transition from wakefulness to sleep (some also occur during wakefulness):

* + - 1. **Rhythmic Movement Disorder** (nocturnal head banging [jactatio capitis nocturna], body rocking, head rolling)
			2. **Hypnic Jerks (s. Sleep Starts)**
			3. **Sleep Talking (s. Somniloquy)**
			4. **Nocturnal Leg Cramps**
* often affect *healthy individuals*.

## III. Parasomnias associated with REM Sleep - occur later in night, when REM sleep predominates:

1. **Nightmares**
2. **Sleep Paralysis**
3. **REM Sleep Behavior Disorder (RBD)**
4. **Impaired Sleep-Related Penile Erections**
5. **Sleep-Related Painful Erections**
6. **REM Sleep-Related Sinus Arrest**

## IV. Other parasomnias

1. **Sleep Bruxism**
2. **Sleep Enuresis**
3. **Sleep-Related Abnormal Swallowing**
4. **Nocturnal Paroxysmal Dystonia**
5. **Sudden Unexplained Nocturnal Death Syndrome**
6. **Primary Snoring**
7. **Infant Sleep Apnea**
8. **Congenital Central Hypoventilation Syndrome**
9. **Sudden Infant Death Syndrome**
10. **Benign Neonatal Sleep Myoclonus**
11. **Other Parasomnia NOS**

Arousal Disorders

- impaired ability to **arouse fully** from slow-wave sleep → confusion and amnesia during and following arousal.

* related to **sleep stages 3-4** - occur during first third of night (when deep sleep predominates).
* peak incidence at *ages 4-10 years* (esp. boys) - amount of slow-wave sleep is at its peak
* increased prevalence in first-degree relatives - genetic factors may play role.
* almost always self-limited - ***resolve during adulthood*** (sometimes may carry over into adulthood\* or arise secondary to medications).

\* underlying psychologic disorder or alcoholism should be considered.

* risk factors: Tourette syndrome, post-traumatic stress disorder, violent & abusive families.
* may be precipitated / aggravated by stress, sleep deprivation, fever, sleep apnea, noise.

N.B. most affected children do not have severe psychopathology!

Clinical Features

- exist as continuum (with considerable overlap):

1. **Confusional arousals** - low levels of motoric and autonomic activation.
2. **Sleepwalking** - motoric activation with little autonomic activation; affects 10% children.
3. **Sleep terrors** - pronounced motoric, autonomic, and emotional activation; affects 1-6% children.

Sleep terrors (s. Pavor Nocturnus)

– abrupt ***fearful agitation*** with decreased responsiveness (to parents or surroundings) and inconsolability.

* + accompanied by loud, high-pitched ***screaming*** and attempts to leave bed or room.
	+ patients may fall down stairs and may react violently to attempts to restrain them.
	+ accompanied by ***autonomic changes*** (tachycardia, hyperventilation, sweating, pupillary dilation).
	+ after several minutes patient calms down and returns to sleep.
	+ *morning recall is absent* (some patients have vague recollection of terrifying situation); vs. **nightmares** (occur in REM sleep) – clear graphically remembered dreams.

Sleepwalking (s. Somnambulism)

- ***complex automatisms*** during sleep (typically getting out of bed and walking).

* + some patients sit or stand in bed without getting out of bed.
	+ some patients prepare food and eat.
	+ subgroup of patients (usually young adult men) perform acts that are destructive or harmful to themselves, e.g., breaking furniture, throwing objects, climbing out or walking through window → ***injuries***.
	+ although sleepwalkers often respond inappropriately, they sometimes follow instructions to return to bed.

N.B. somnambulists walk with open eyes and avoid obstacles; difficult to arouse, but when awakened cannot recall episodes.

Confusional arousals (s. sleep drunkenness, severe sleep inertia)

- confusion and disorientation, with inappropriate behavior (talking / moaning / agitation) during or following arousals from sleep, typically from slow-wave sleep in the first part of the night, but also upon awakening in the morning.

* episode can be triggered by a forced awakening and may even cause violent behavior during sleep or amnesia of the episode.
* it is not considered a disorder in DSM-V.

Diagnosis

* can usually be made based on **clinical criteria**.
* if diagnosis is uncertain → **polysomnography** with simultaneous **video monitoring** and several **additional EEG channels** (onset of episodes during stage 3-4 sleep).

N.B. standard polysomnography is generally insufficient for definitive diagnosis!

***psychogenic dissociative episodes*** – EEG shows waking activity;

***RBD*** – EEG shows REM sleep activity;

***nocturnal epilepsy*** – EEG shows seizure activity.

Management

Treatment is required if behaviors are ***potentially injurious*** or ***excessively disruptive to family***.

* confusional arousals rarely require treatment.
1. Good **sleep hygiene**!
2. Ground floor bedrooms, window locks, absence of sharp objects or toys on bedroom floor.
3. Bedtime diazepam, imipramine, clonazepam.
4. **Hypnosis** (or other behavioral treatments) may be helpful for some patients.

Sleep-Wake Transition disorders

## - occur at sleep onset, during transition from wakefulness to sleep (some also occur during wakefulness).

* often affect *healthy individuals*.

Hypnic Jerks (s. Sleep Starts)

- myoclonic jerks at sleep onset.

* do not recur periodically.
* simultaneously run through most of body.
* sometimes associated with sensation / illusion of falling.
* normal phenomenon (experienced by most people on occasion).

Rhythmic Movement Disorder

* 1. **Nocturnal head banging (s. jactatio capitis nocturna)**
	2. **Head / body rocking**
	3. **Head / body rolling**

Sleep Talking (s. Somniloquy)

- talking during sleep (usually during arousals); little clinical significance.

Nocturnal Leg Cramps

- painful cramps of foot / calf that produce awakenings. see Mov3 p.

Parasomnias associated with REM Sleep

## - occur later in night, when REM sleep predominates:

REM Sleep Behavioral Disorder (RBD)

1. intermittent **loss of normal muscle atonia** during REM sleep.
2. **motor automatisms** (vocalizations, nocturnal shouting, movements, violent behavior, jumping out of bed) - patients appear to act out their dreams (dream-enacting behavior).
* episodes usually last few minutes.
* patients can easily be awakened from episode without confusion and with vivid imagery reported (vs. sleep terrors).
* timing and duration of episodes parallel distribution of REM sleep across night.
* causes ***frequent*** ***injuries*** to patient or bed partner!
* “**Jekyll and Hyde syndrome**” - ***quiet peaceable behavior*** during day + ***violence*** during REM sleep.
* resemble *oneiric activity* in animals following selective *lesions of pontine nuclei controlling motor atonia*.
* chronic disorder with few if any remissions.
* occurs mainly in *older persons* (vs. other parasomnias!); men > women.
* associated disorders: Parkinson's disease, Alzheimer's disease, multi-infarct dementia, multiple system atrophy, olivopontocerebellar degeneration, narcolepsy, focal brain stem lesions.

N.B. 50% patients have no major abnormality on neurological examination or MRI (but substantial proportion of patients *develop Parkinson's disease* over next several years!!!)

* **polysomnography** - during REM sleep atonia is disrupted by periods of increased tone and increased phasic muscle activity (even without apparent disruptive behavior).
* principal differential diagnosis - nocturnal seizures.

Treatment

* 1. bedtime doses of clonazepam!!! – almost universally effective.
	2. alternatives - imipramine, levodopa-carbidopa, diazepam, temazepam, clonidine, carbamazepine.

Nightmares

- frightening dreams during ***REM sleep*** (vs. sleep terrors – NREM sleep).

* + motor activity is limited, vocalization is much less intense (than in sleep terrors).
	+ patients are ***easily fully aroused*** with ***vivid dream recall***; child can be comforted by parent.
	+ occasional nightmare is normal, but persistent or frequent nightmares warrant evaluation.
	+ affect children more frequently than adults.
	+ precipitating factors:
		1. frightening experiences (e.g. scary stories, television violence), particularly in 3-4 year olds who cannot readily differentiate fantasy from reality.
		2. fever
		3. excess fatigue
		4. alcohol ingestion.

Other Parasomnias

Hypnogenic (s. nocturnal) Paroxysmal Dystonia

- rare disorder of sudden, brief, highly stereotyped dystonic posturing and ballistic choreoathetoid movements, arising from ***NREM sleep***.

* violent movements are ***usually bilateral***, but they may predominate on one side and ***patient is already awake*** with eyes open during episode.
* occur 10-40 times per night.
* *resemble partial seizures* originating in supplementary motor area (also arise from NREM sleep).
* major risk factors - lesions of supplementary motor area or mediobasal regions of frontal lobe.
* **polysomnography with video-EEG monitoring** - abrupt onset from sleep with stereotyped behavior.
* may respond to carbamazepine and other antiepileptic agents.
* course is variable;
	+ spontaneous remissions may occur;
	+ others have numerous nightly episodes that are refractory to all treatments.

Sleep Bruxism

- involuntary stereotyped repetitive forceful teeth grinding during sleep or during arousals from sleep → disfiguring destruction of tooth enamel and dentinum.

* patient is usually unaware of problem.
* affects 10-20% of population.
* typical age of onset is 17-20 years; spontaneous remission by age 40.
* pathophysiology:
1. dental abnormalities (e.g. malocclusion).
2. central neural mechanisms.
3. psychological factors
* treatment is dictated by risk of dental injury - **rubber tooth guard**; effective pharmacologic therapy has not been described.

Sleep Enuresis

- bedwetting during ***slow-wave sleep*** (more specifically, during arousal from slow-wave sleep) beyond expected age for bladder control; [see also Psy41 p.](http://www.neurosurgeryresident.net/Psy.%20Psychiatry%5CPsy41.%20Elimination%20%28Toileting%29%20Disorders.pdf)

**primary enuresis** – bladder control was never achieved.

**secondary enuresis** – bedwetting in patient who have been fully continent for 6-12 months.

* normal before age 5-6 yrs; spontaneously improves at puberty.
* prevalence of primary enuresis - 30% at age 4 yr, 10% at age 6 yr, 3% at age 12 yr, 1% at age 18 yr; rare in adulthood.
* boys > girls.
* etiology: see also 2590 p. (urogenital)
1. most cases of primary enuresis - ***delay in neuromuscular maturation*** (treatment is not recommended - ***resolves spontaneously*** before 6 yrs; spontaneous resolution rate after age 6 is 15%/yr).
2. individual or family ***psychopathology*** – more common in secondary enuresis.
3. 1-2% cases have ***organic etiology*** (usually UTI; rare causes - congenital anomalies, sacral nerve disorders, diabetes mellitus or insipidus, pelvic mass) – more common in secondary enuresis; accompanied by daytime symptoms!
* age threshold for treatment initiation depends on parental and patient concern (e.g. embarrassment) about problem (usually > 6 yrs):
	1. **treat primary disorder** (e.g. psychotherapy).
	2. **enuresis buzzer alarms** (triggered by few drops of urine) are ***most effective treatment***!; requires *several weeks for success*; alarm should not be discontinued until 3 wk beyond last wetting episode.
	3. **do not consume fluids** 2-3 h before going to bed (caffeinated beverages should be strictly limited); **awaken child to urinate** after 1-2 hours of sleep.
	4. **bladder training exercises** (child must hold urine during day for progressively longer periods of time).
	5. **behavioral therapy** - child assumes active role (urinating before going to bed, recording wet and dry nights, changing wet clothing and bedding himself);positive reinforcement for dry nights (e.g. star calendar, other age-appropriate rewards); child is counseled about etiology and prognosis to remove blame and guilt.
	6. **symptomatic pharmacotherapy** (if unresponsive to counseling and alarms) for short-term relief to prevent embarrassment (camp, overnights, vacations):
		1. after-school imipramine in less than antidepressant dose - response usually occurs in first week of treatment; after no enuresis for ≥ 1 mo, drug is tapered over 2-4 wk and discontinued; relapses are very common (H: 3-mo course).
		2. oral desmopressin - effective for short term (4-6 wk); use cautiously (risk of hyponatremia! – better interrupt during acute illnesses).

N.B. since 2007-12-04 intranasal desmopressin is no longer indicated for primary nocturnal enuresis (risk for developing severe hyponatremia → seizures → death)

* + 1. oxybutynin

Because of time-limited nature of disorder, use ***drug holidays*** at least q 6 months to assess need for continuing pharmacologic intervention.

Bibliography see [p. S40 >>](http://www.neurosurgeryresident.net/S.%20Symptoms%2C%20Signs%2C%20Syndromes%5CS40-48.%20Sleep%20disorders%5CS40.%20GENERAL%20-%20Sleep%20Disorders.pdf)

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