



CAPTURING BEHAVIORS AND MOVEMENTS DURING POLYSOMNOGRAPHY

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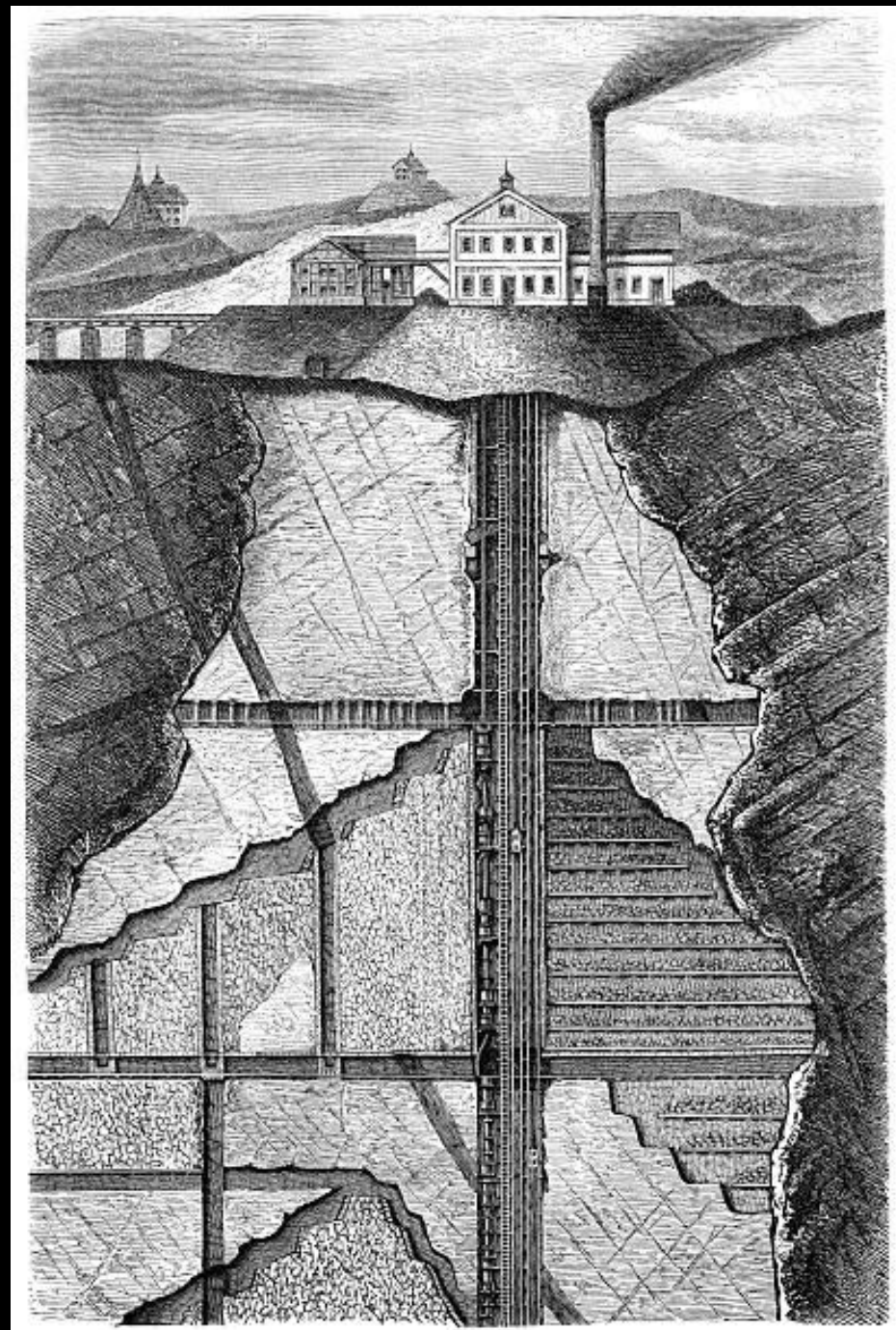
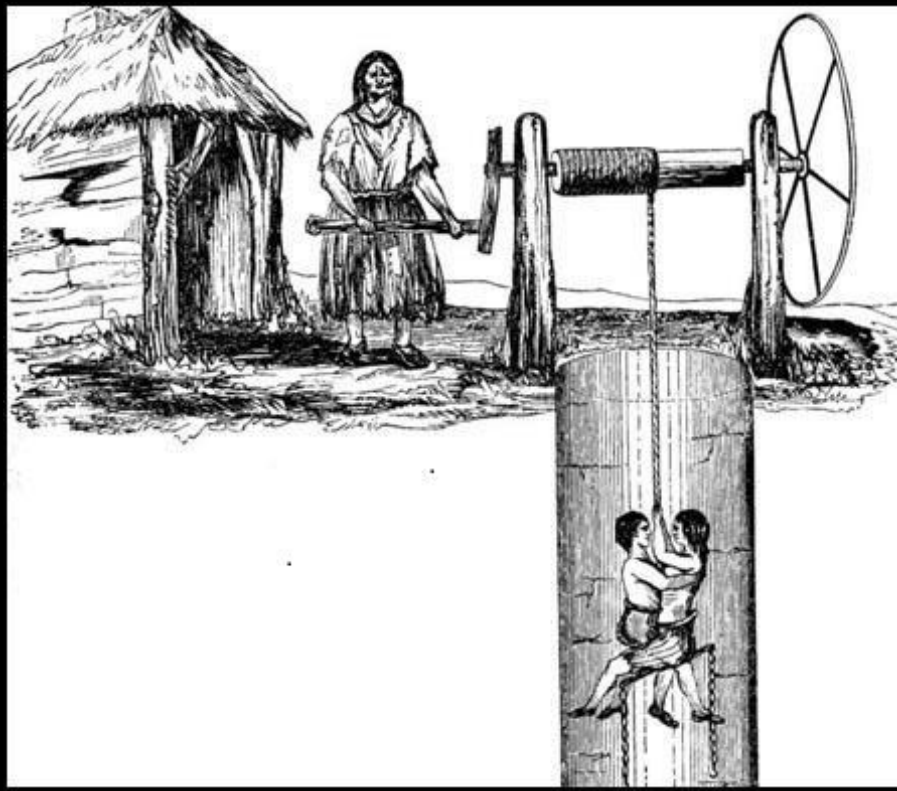
Western Michigan University School of Medicine



- Sounds of Increased Work of Breathing
- Sights
- I:E ratio

Objectives

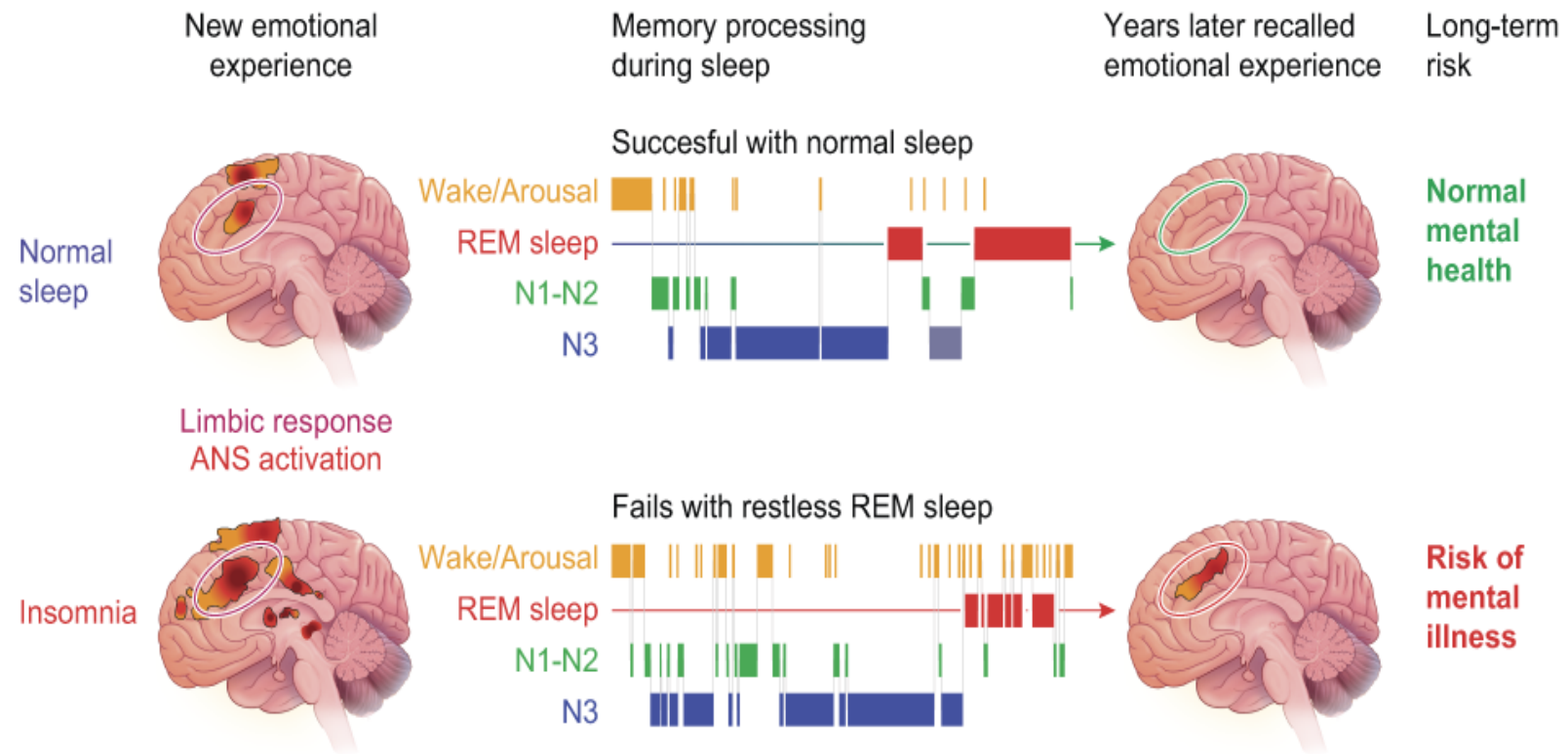
A Model of Sleep

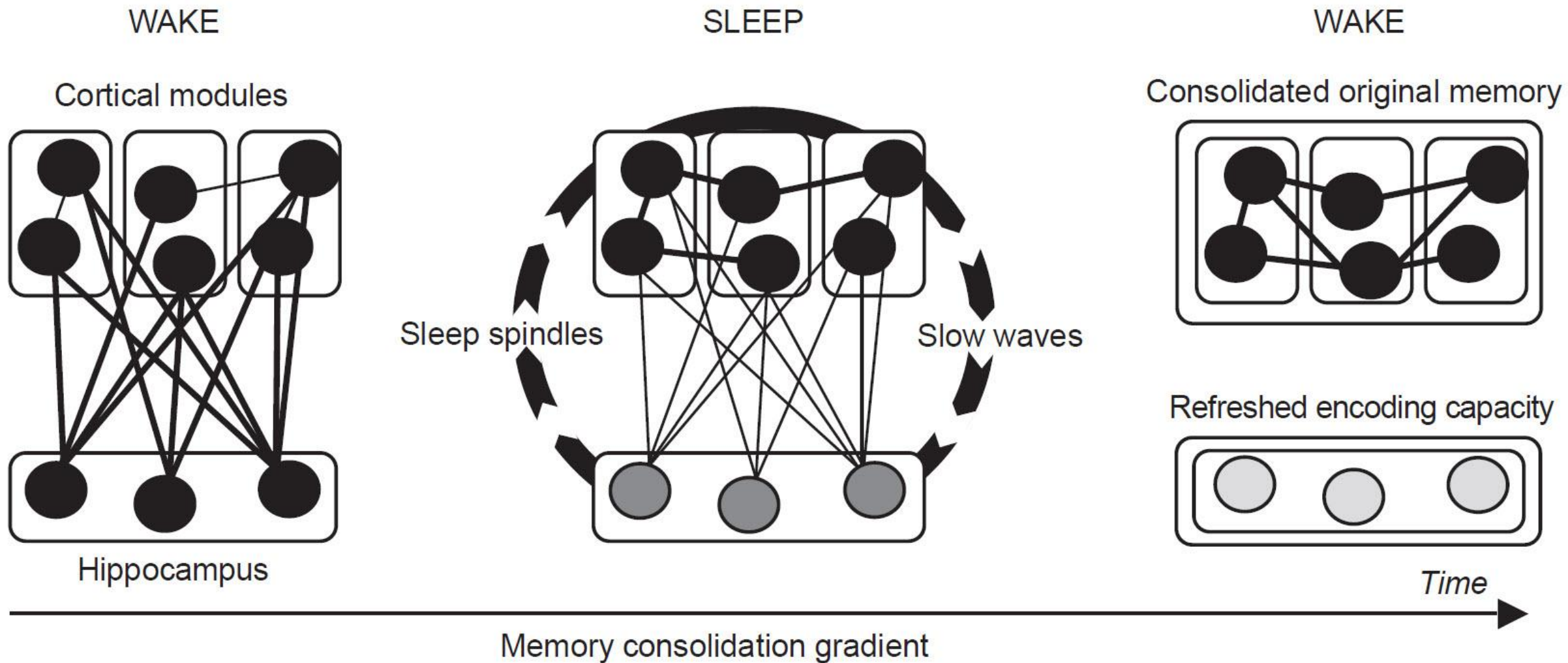


What Happens During Sleep

Metabolic restoration

Memory processing and consolidation





**Sleep stability is crucial
for learning and
emotional processing.**

Rhythmic Movement Disorder
Restless Legs Syndrome
Periodic Limb Movement Disorder
Restless Sleep Disorder

Rhythmic Movement Disorder

Rockers, rollers and bangers

Transition to sleep and back into
it

Disorder occurs in sleep and has
daytime symptoms



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Original Article

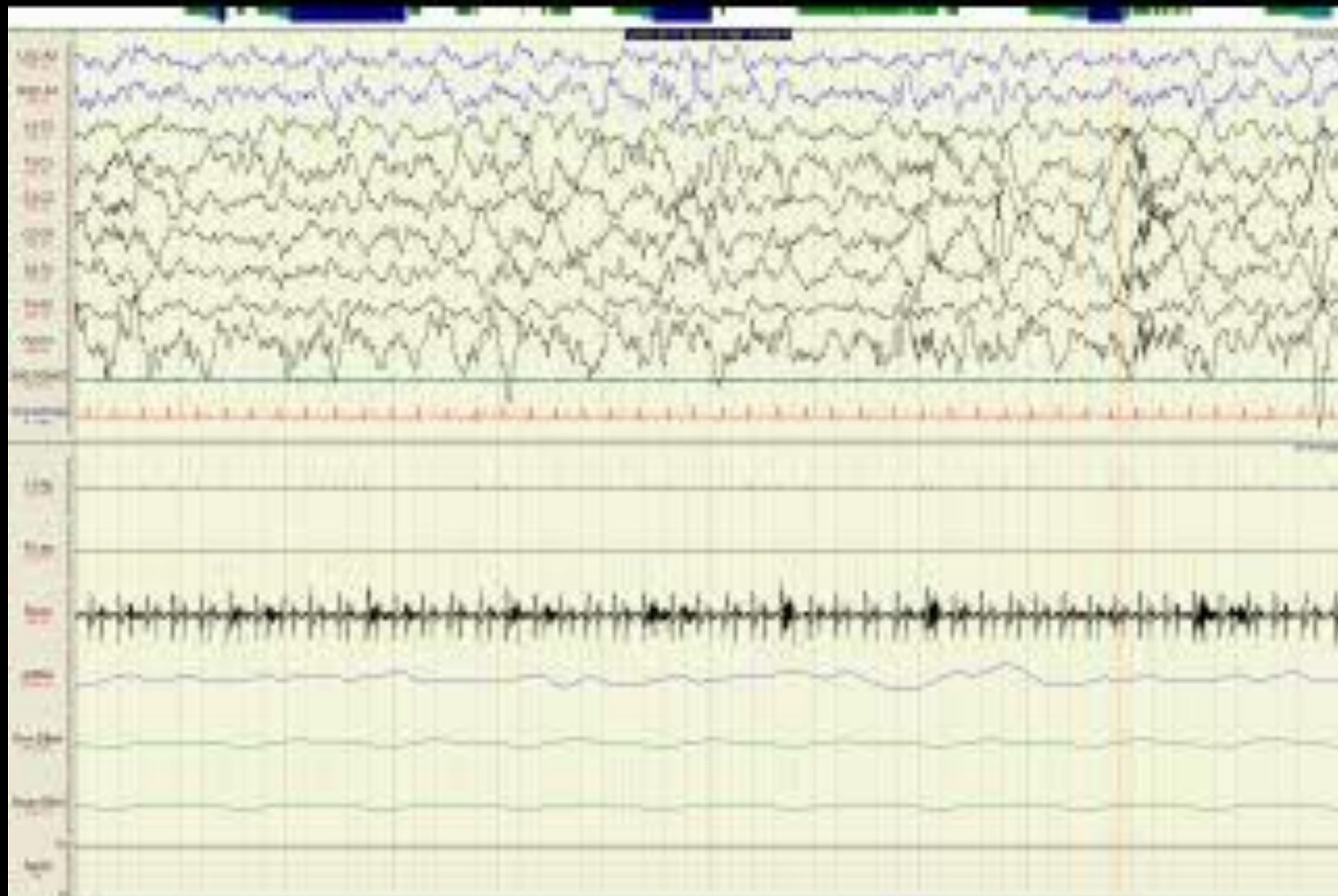
ORIGINAL ARTICLE

Disturbed nighttime sleep in children and adults with rhythmic movement disorder

Christine Laganière^{1,2,3}, Marie-Hélène Pennestri^{1,3,*}, Anna Laura Rassu⁴,
Lucie Barateau^{4,5}, Sofiène Chenini⁴, Elisa Evangelista^{4,5}, Yves Dauvilliers^{4,5} and
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Restless Legs Syndrome

1. Irresistible urge to rub, move or stretch
2. During quiescence
3. Circadian
4. Relieved with activity and alertness







Restless Legs Syndrome

1. About 1-2% of children
2. Associated with ADHD
3. Nocturnal leg pains
4. FHx often positive
5. Sleep study usually not needed

Brain iron concentration in childhood ADHD: A systematic review of neuroimaging studies

Hugo A.E. Morandini ^{a b}  , Prue A. Watson ^a, Parma Barbaro ^a, Pradeep Rao ^{a b c}

Show more 

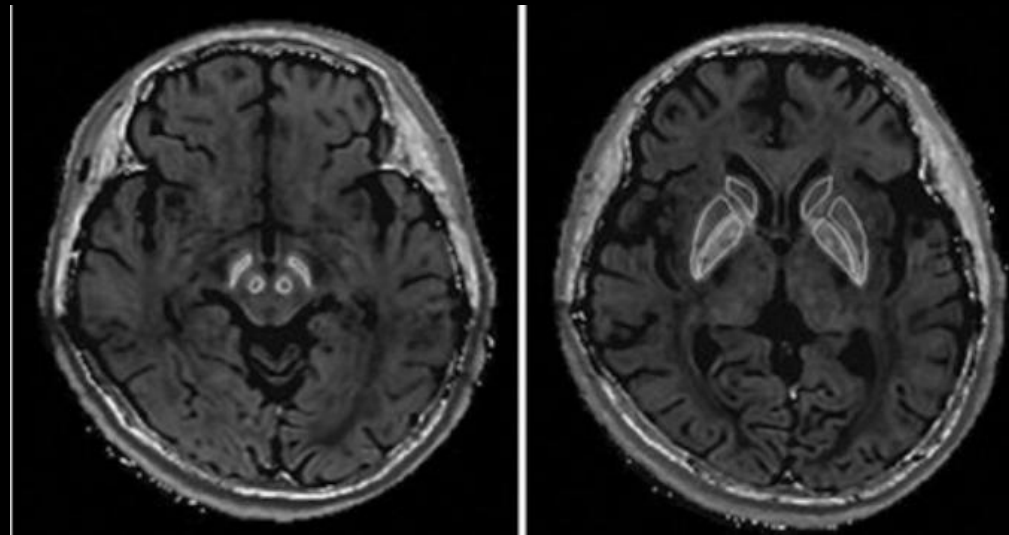
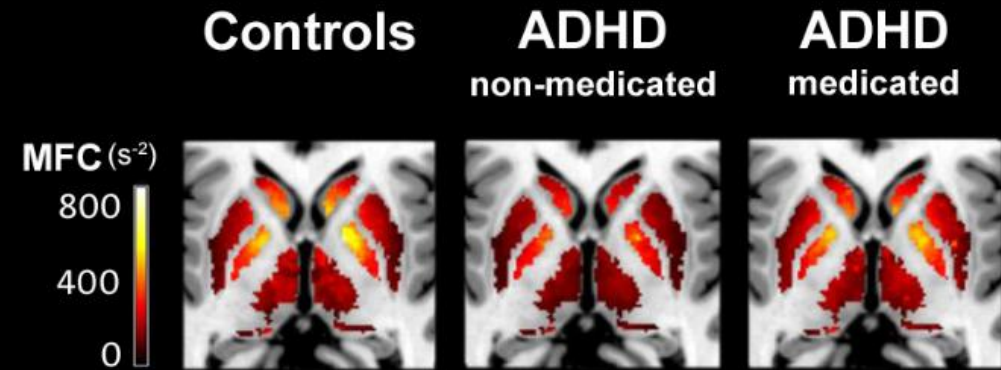
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<https://doi.org/10.1016/j.jpsychires.2024.03.035>

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Highlights

- Reduced brain iron indices in medication-naïve children with ADHD compared with NT.
- Psychostimulant use associated with higher brain iron indices in children with ADHD.
- Findings may lay the early foundation for the recognition of a potential biomarker.

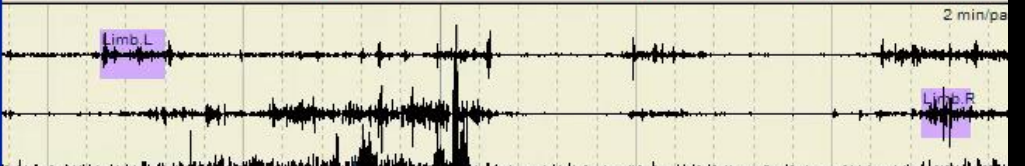
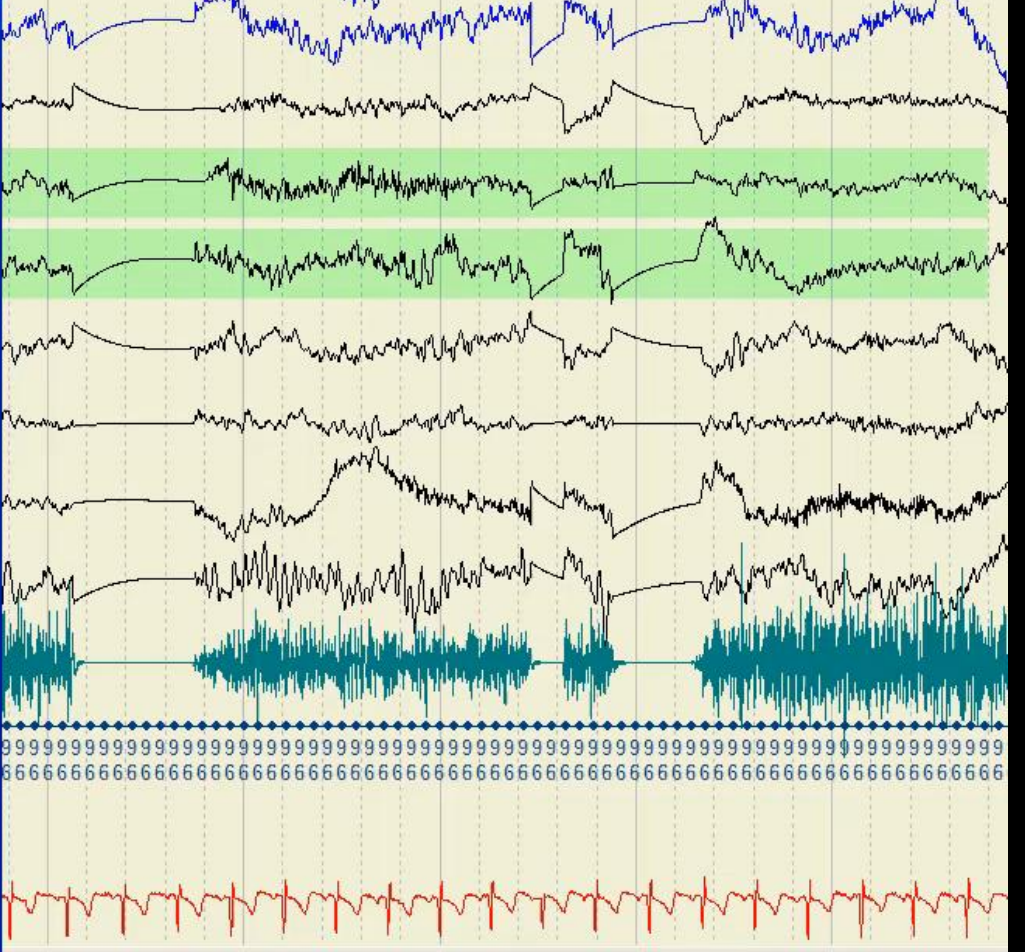


LOC-A2
128 uV



Digital Video

Close [playback controls]



128 uV

CPAP Flow
200 mV

Thor Effort
3.28 mV

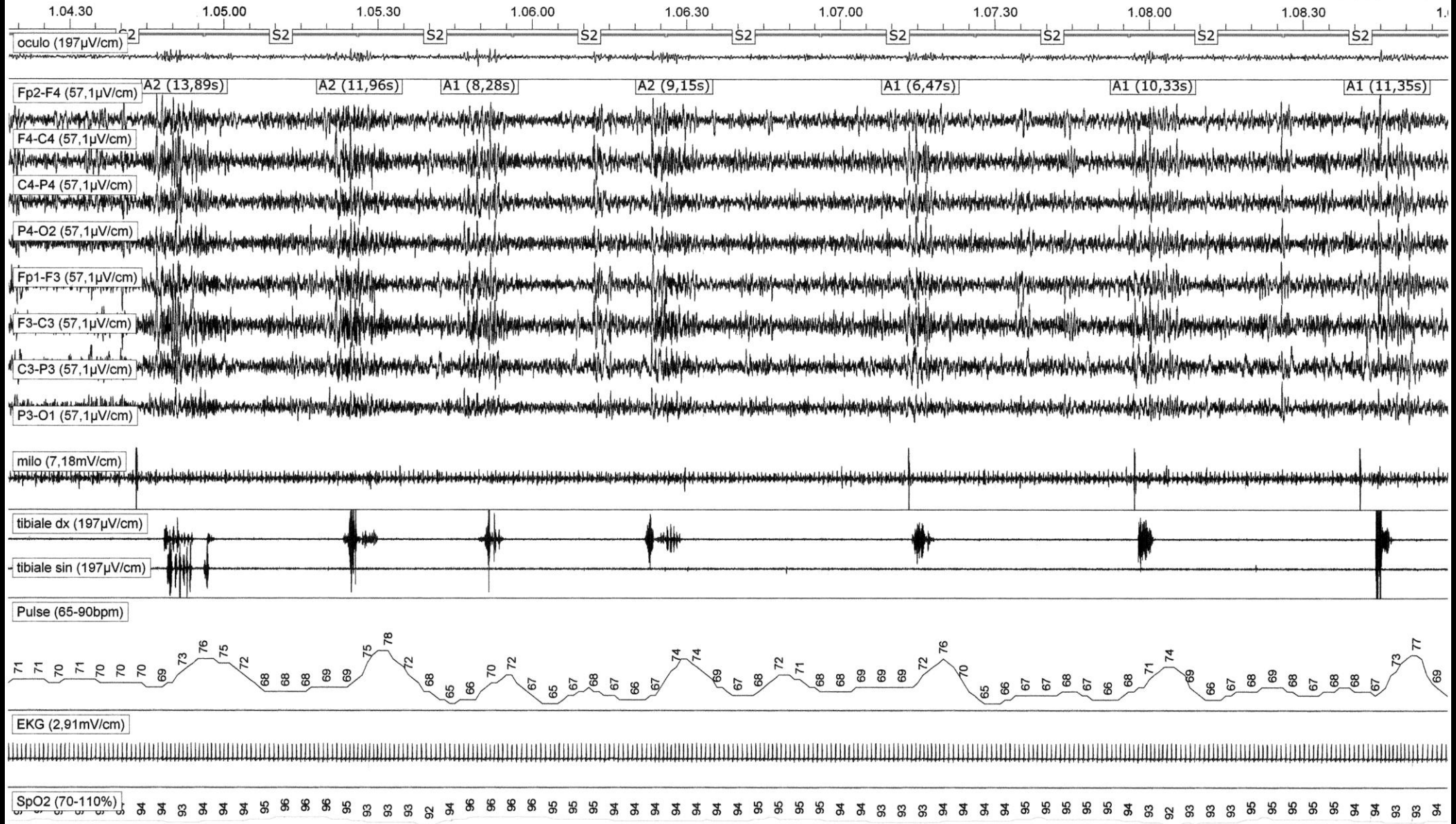
Abdo Effort





Periodic Limb Movement Disorder

1. Quasi-periodic muscle tone bursts
2. ANS bursts
3. 5 per hour or more
4. Most with RLS have this
5. Common in ADHD







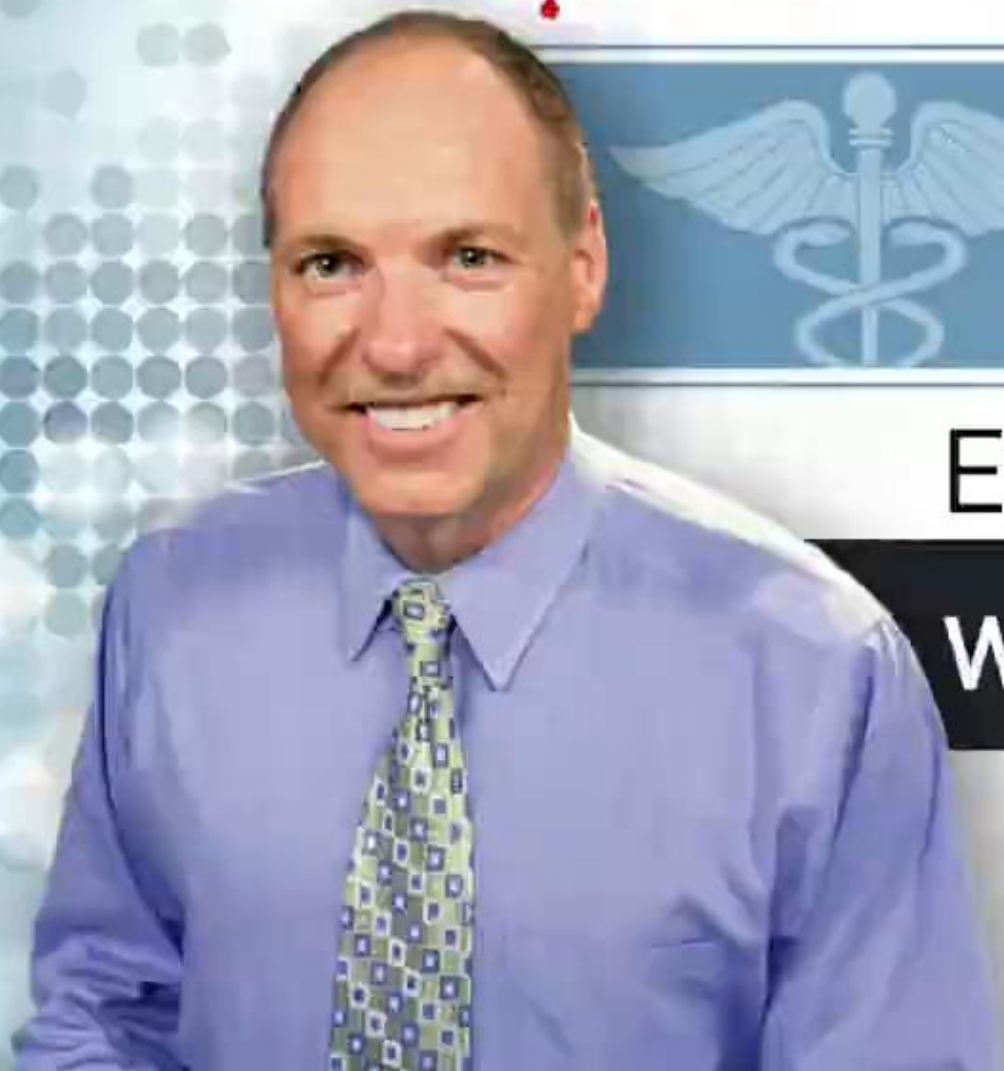
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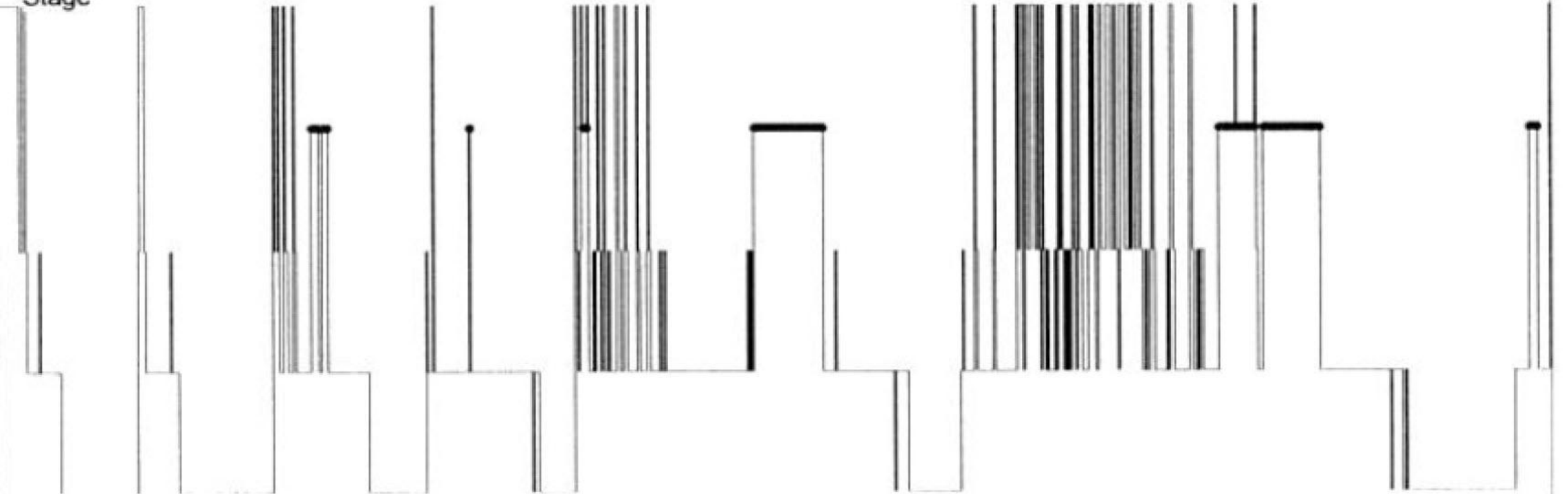


Restless Sleep Disorder

1. Frequency unclear
2. Typically 4-18 year olds
3. Associated with fatigue, ADHD, mood disorders
4. 5 or more movements per hour, not stereotyped



Stage



Room 12 06/10/2021 02:26:17 AM



Diagnostic Challenges

1. Pain, GERD, and OSA can mimic
2. Often disturbances unseen by parents
3. Depression, anxiety, tiredness and cognitive dysfunction non-specific
4. Parasomnias can be distracting

Polysomnography

1. OSA is suspected
2. Unresponsive restless legs syndrome
3. Suspected PLMD or RSD
4. Unnecessary with routine RLS and rhythmic movements

Role of Iron

- Brain/CSF iron low in RLS
- Iron deficiency associated with RLS and non-restorative sleep
- Brain endothelial iron stores low
- Dopamine high in day, low at night

Iron Testing

Normal studies are common

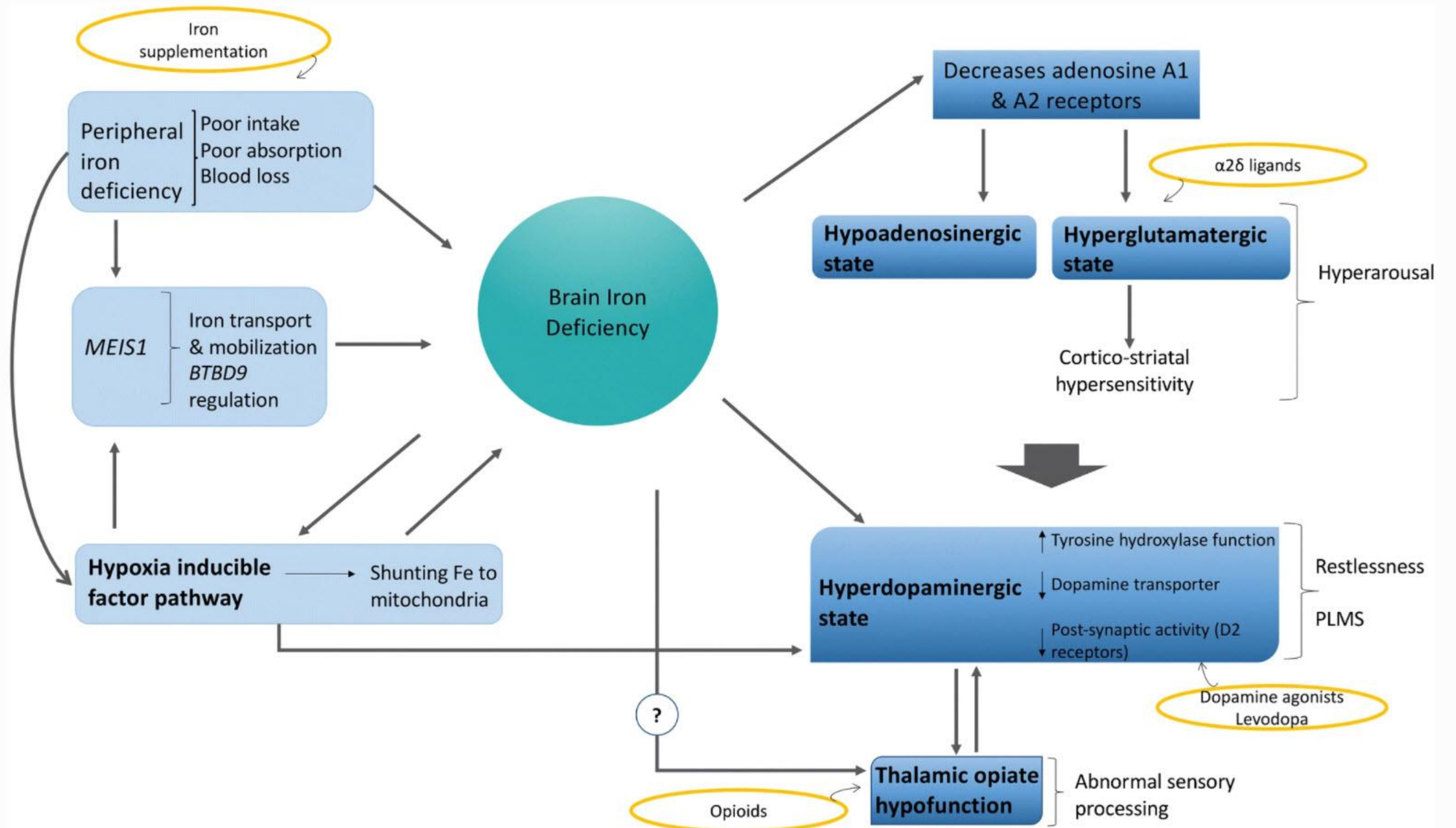
Ferritin useful

- Target >50 or asymptomatic

Transferrin saturation useful

- Fasting morning level

- Target > 20% or asymptomatic



Iron Therapy

- Dose in evening 1-5 mg/kg elemental iron
- No calcium or magnesium 2 hours before
- Co-administer vitamin C
- Slow response often
- May stain teeth



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Original Article

ORIGINAL ARTICLE

Comparison between oral ferrous sulfate and intravenous ferric carboxymaltose in children with restless sleep disorder

Lourdes M. DelRosso^{1,*}, Daniel L. Picchietti² and Raffaele Ferri³

¹Seattle Children's Hospital, Seattle, WA, ²University of Illinois School of Medicine, Carle Illinois College of Medicine, and Carle Foundation Hospital, University of Illinois School of Medicine, Urbana, IL and ³Sleep Research Centre, Oasi Research Institute—IRCCS, Troina, Italy

*Corresponding author. Lourdes DelRosso, Seattle Children's Hospital, 4800 Sand Point Way, Seattle, WA. Email: lourdesdelrosso@me.com.

Other Therapy

- Gabapentin before bedtime
- Dopamine agonists- nope
- Opioids



0:00 / 3:32 • Intro >



4X Diagnostics used RDI Technologies' IRIS M Motion Amplification camera and software system to observe the movement of a sleeping baby.

Parting Thoughts

- Fragmented sleep impairs learning and development
- Disorders of sleep instability can be identified and helped



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