



Tremor

Upstate Toxicology Lecture
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Disclosures

None



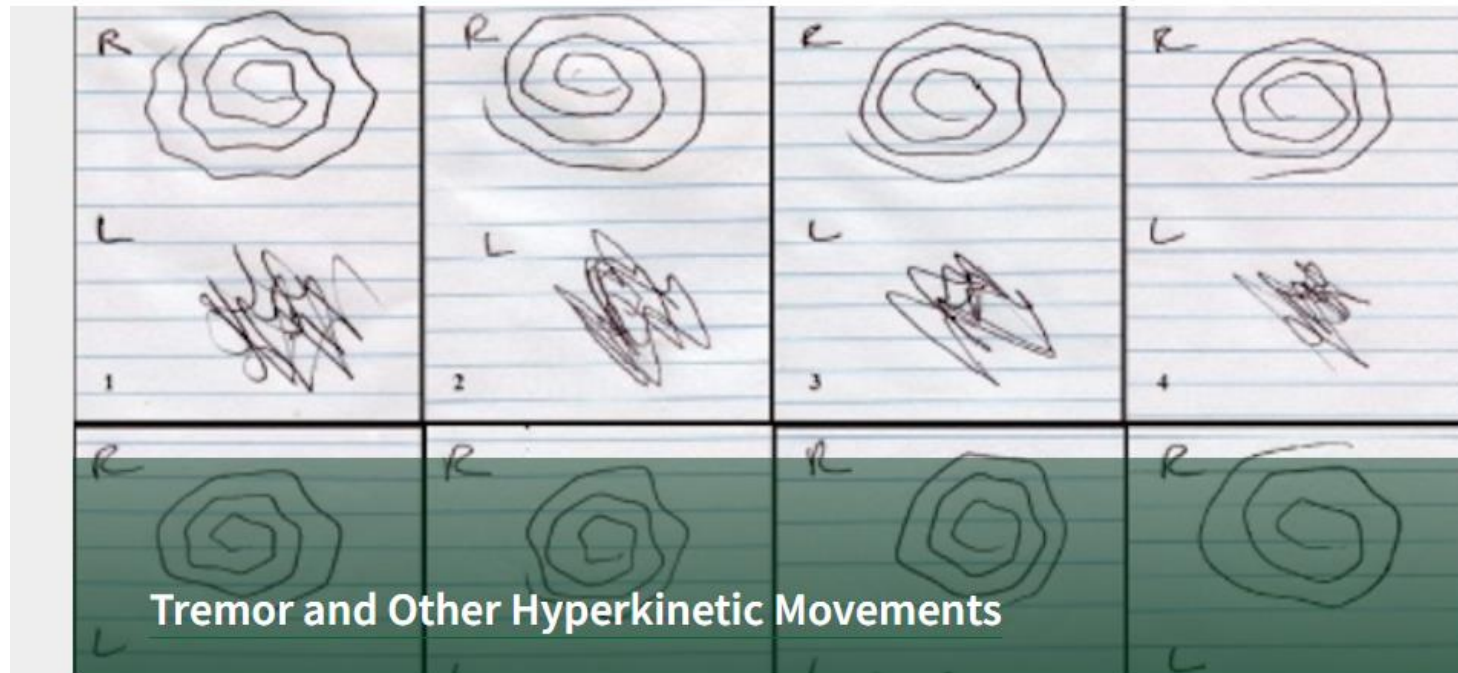


Outline

- Definition of tremor
- Phenomenology of tremor
- Several important tremor types
- Useful resources

Tremor

and Other Hyperkinetic Movements



<https://tremorjournal.org/>

TREMOR



Essential tremor is usually most noticeable when performing activities

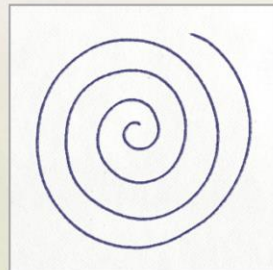
Eating and drinking



Getting dressed

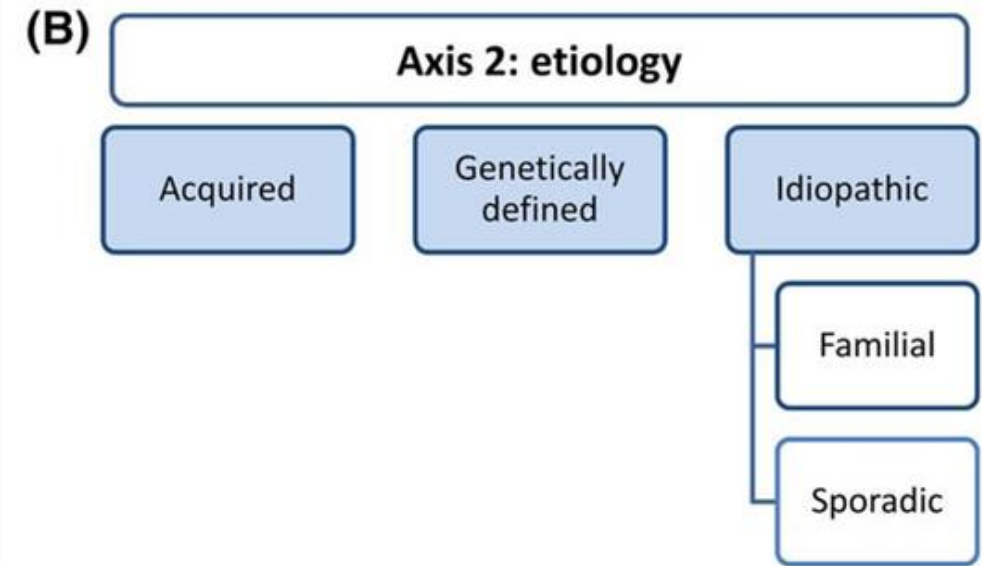
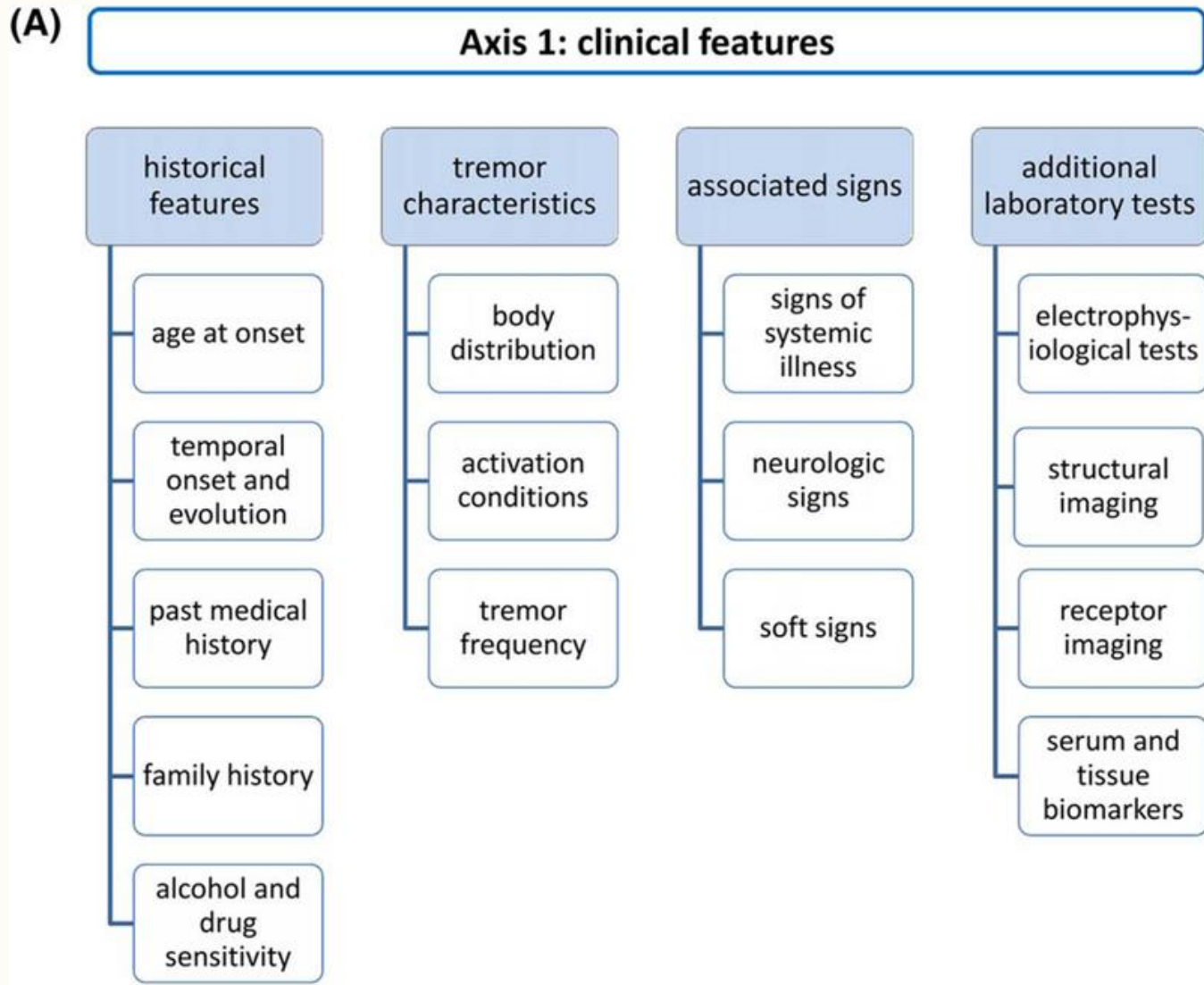


Writing and drawing
Spiral drawings



What is tremor?

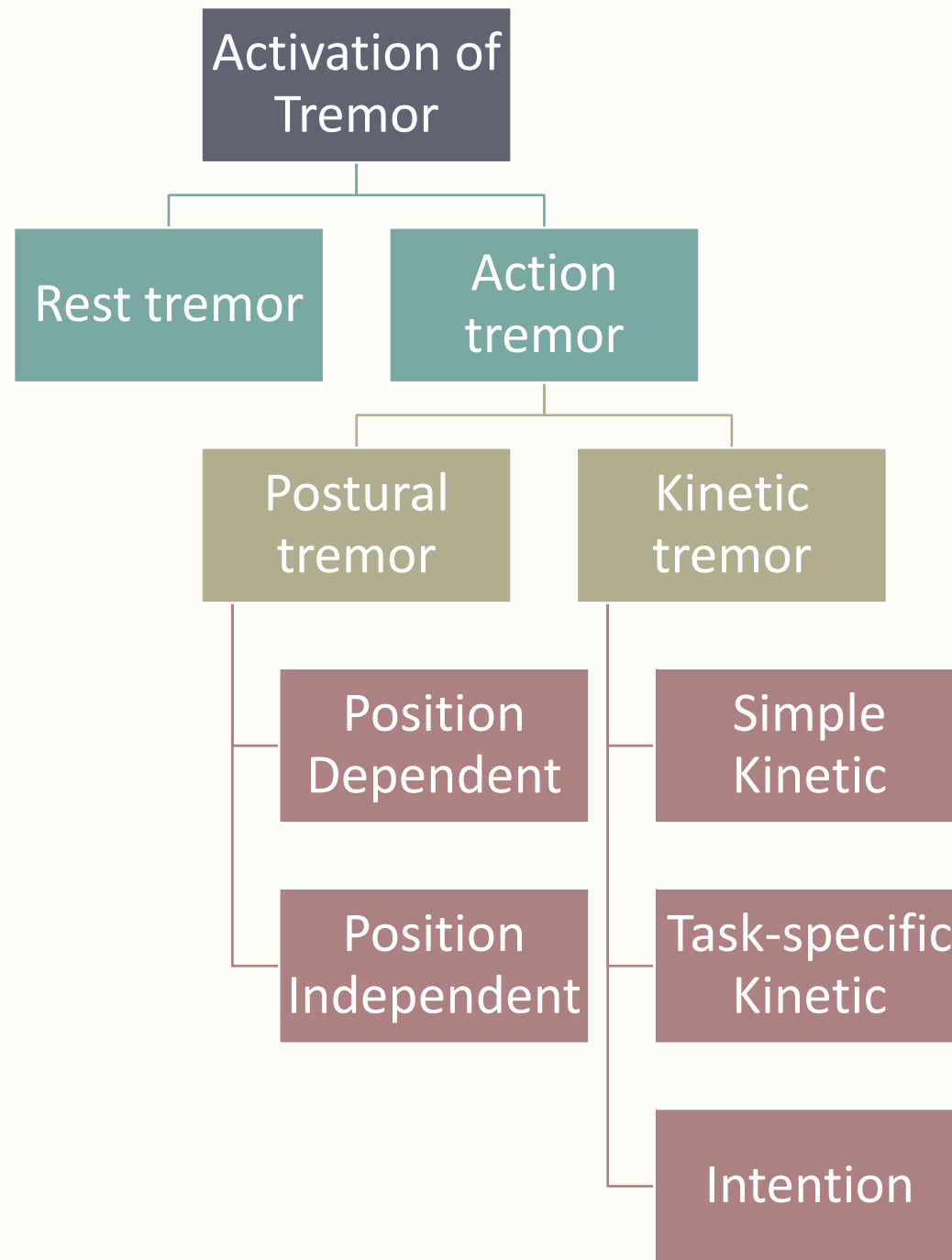
- An involuntary, rhythmic, oscillatory movement of a body part.



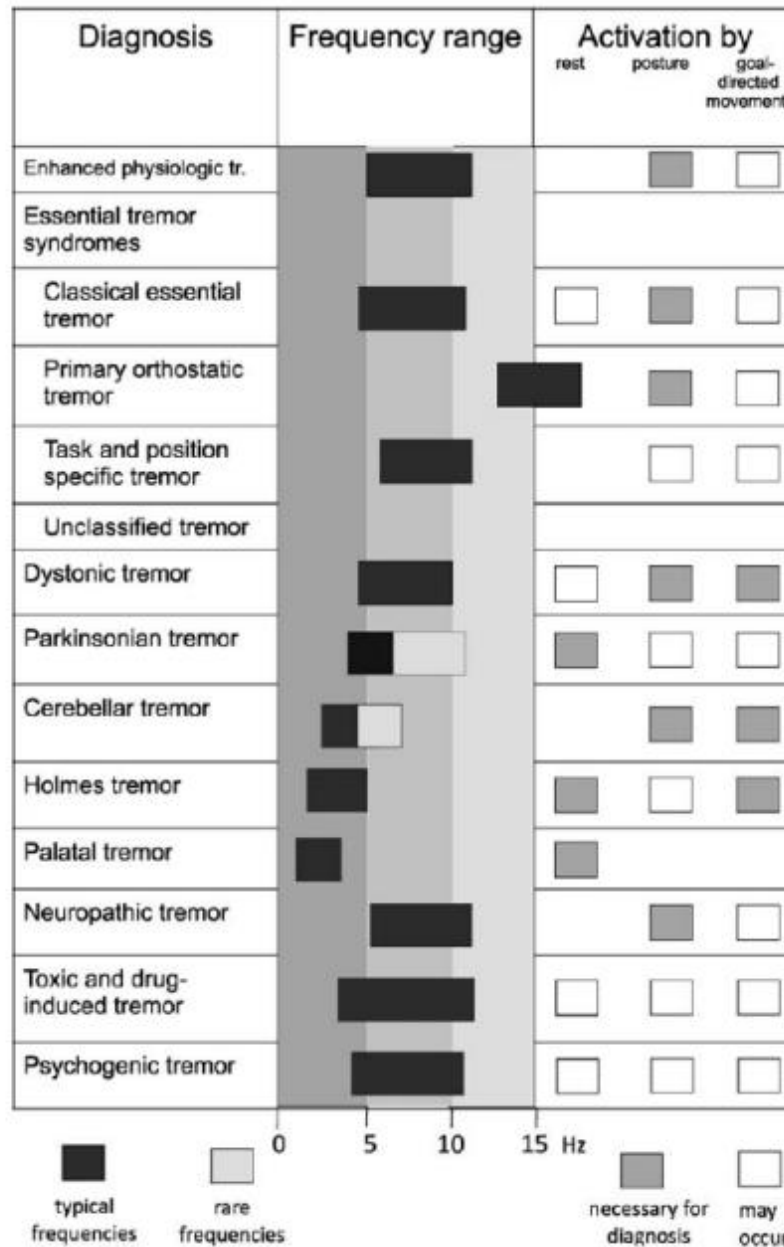


Phenomenology of Tremor

- Often described based on activation state:
 - **Rest tremor**
 - **Action tremor**
- Other features:
 - Frequency (Hz)
 - Body part affected
 - Occurrence of associated medical conditions
 - Brain region from which the tremor arises (more rarely used)



Activation conditions and frequencies



Essential Tremor: a common action tremor

- Prominent **kinetic tremor**, usually slightly asymmetric
- May have a family history of a similar tremor
- ~50% have an intention tremor component
- Often have a postural tremor, generally out of phase in each arm
- Tremor at rest occurs in up to 35% of cases, but as a **late** feature
- Tremor worsens over time, often spreading



Enhanced Physiologic Tremor

- An action tremor in the hands of virtually everyone
- A high frequency, lower amplitude postural and kinetic tremor
- No intention tremor and no neck tremor (*neck tremor is always pathologic*)
- Worsens with anxiety, hyperthyroidism, caffeine, lack of sleep, etc.



Drug-induced Action Tremor

- Medications can produce or exacerbate action tremors
- Lithium
- Immunosuppressants (cyclosporine)
- Hormones (levothyroxine)
- Antiseizure medications (valproic acid)
- Methylxanthines (theophylline)
- Arsenic, manganese, and mercury toxicity

- Should NOT have head tremor
- Should NOT progressively worsen with stable medication dose





Rest (aka resting) tremor- Parkinson's disease

- Generally asymmetric, affecting one side of the body to start
- May also affect the jaw (typically while mouth closed/relaxed)



Drug-induced rest tremor

- Dopamine blocking medications (anti-psychotics, metoclopramide, prochlorperazine) and dopamine-depleting agents (tetrabenazine, reserpine)
- Rarely:
 - Valproic acid
 - Lithium
- Tremor begins after exposure
- Typically improves and ceases within a year after stopping the offending drug
- Generally, *not* progressive



Drugs of abuse and parkinsonism

- MPTP (1-methyl-4-phenyl-1, 2, 3, 6-tetrahydropyridine)
- Methamphetamine
- ? Cocaine



Functional Tremor

- Often has an abrupt beginning with maximal tremor at onset
- May fluctuate with periods of remission
- The exam is key!
 - Distractibility
 - Suggestibility
 - Variability
 - Entrainment

<https://youtu.be/MC5uOFZN83Q>



Conclusions

- Tremor is a rhythmic, oscillatory movement
- Tremors are classified as action or rest tremors
 - Kinetic and postural tremors are the 2 main types of action tremors
- The major conditions with action-predominant tremors:
 - Essential tremor, enhanced physiologic tremor, and drug-induced tremor
- The major conditions with rest-predominant tremors:
 - Parkinson's disease and drug-induced tremor



Tremor Resources

- *Continuum* Article on Tremor
- Consensus Statement on the Classification of Tremors
 - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6530552/>
- Yale Movement Modules
 - <http://movementmodules.yale.edu/>



References

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