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FIVE KEY PRACTICE ASPECTS

Tremor management

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Abstract

"Five Key Practice Aspects" is a thoughtfully curated series of articles authored by expert neurologists to distill and highlight the most critical facets of everyday clinical practice within various neurology subspecialties. Each article in this series identifies and elaborates on the five most essential considerations in the diagnosis and management of neurological conditions, combining robust evidence-based insights with the seasoned clinical experience of specialists in the field.

The goal of this series is to serve as a concise yet comprehensive reference that caters to both the trainee seeking foundational knowledge and the seasoned neurologist looking for a practical refresher. By focusing on the aspects that are most relevant and actionable in real-world practice, this series offers a streamlined guide that supports informed decision-making across diverse clinical scenarios.

Designed for ease of access and utility, "Five Key Practice Aspects" is a portable resource for busy clinicians who need reliable information on the go. Whether navigating complex cases or honing subspecialty skills, this series aspires to become an indispensable companion in the pursuit of excellence in neurological care.

Tremor, defined as an involuntary, rhythmic, oscillatory movement of a body part, most frequently affects the hands and represents the most common movement disorder in clinical practice. Although most cases are mild and may not require intervention, some patients experience significant functional impairment that necessitates treatment. Proper diagnosis is essential for effective management.

This article outlines five key practice aspects of tremor diagnosis and classification to aid clinicians in achieving optimal outcomes for patients with tremor disorders.

1. A precise classification of tremor disorders, based on clinical features and aetiology, is fundamental for diagnosis and management

The Movement Disorders Society (now the International Parkinson's and Movement Disorders Society, IPMDS) first established consensus criteria for tremor classification in 1998.[1] Recognizing limitations in the previous criteria, the IPMDS task force released an updated classification in 2017.[2]

This classification involves two axes: Axis 1 focuses on clinical history, tremor characteristics, associated clinical features, and, when necessary, laboratory investigations (Figure 1).[1] The anatomical distribution is considered, but tremor activation is pivotal in categorising tremor as either rest or action tremor.[1,2] Action tremors are further subdivided into postural, kinetic (simple and intentional), task-specific, and isometric. The primary division into rest or action tremor has remained unchanged since 1998, underscoring its clinical relevance (Figure 2).

Rest tremor is defined as tremor of a part of the body when not activated voluntarily and assessed only when the part of the body involved is given sufficient time to relax.[1,2] In contrast,

action tremors occur when voluntarily maintaining a posture against gravity. For example, postural tremor or tremor during voluntary movement.

Axis 2 addresses aetiology, categorising tremors as genetic, acquired, or idiopathic. Integrating Axis 1 and 2 features allows for a more specific tremor diagnosis. Tremor syndromes confined solely to tremor are termed "isolated tremor syndromes," while those with additional neurological or systemic features are classified as "combined tremor syndromes."

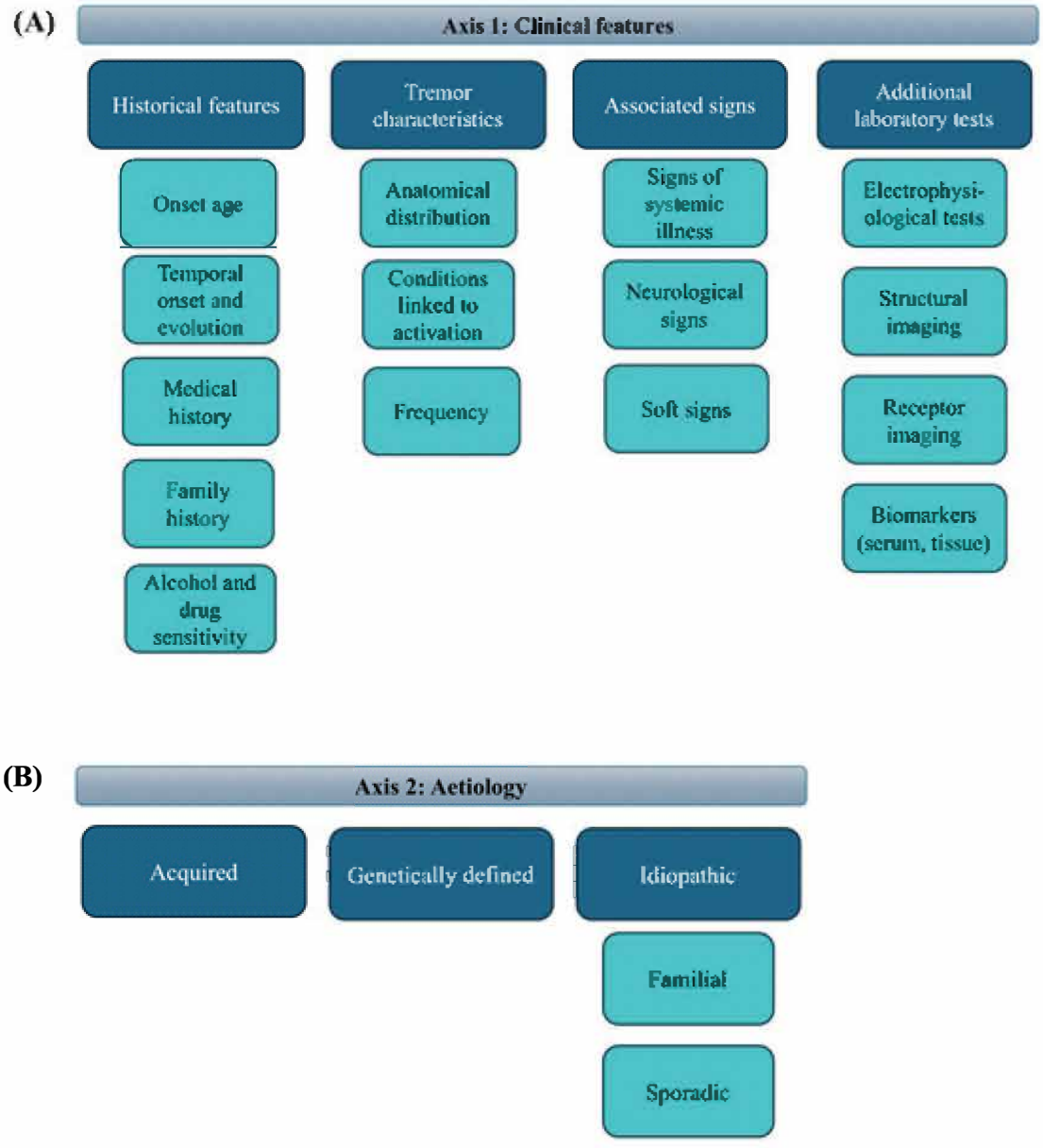

FIGURE 1 **(A) Axis 1 classification of tremor is based on clinical features from the patient's medical history and physical examination. Additional tests are sometimes useful. (B) Axis 2 classification is aetiology. A syndrome in Axis 1 may have multiple aetiologies, and a particular aetiology may produce multiple syndromes. (Adapted from Bhatia et al., 2018).[2]**

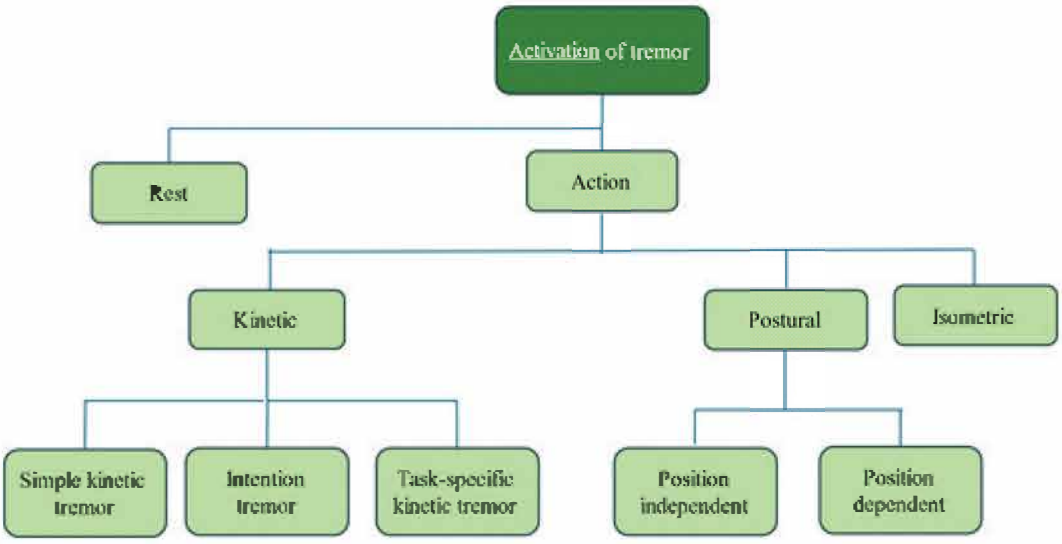

FIGURE 2 **Activation conditions and related nomenclature. The terms action tremor and kinetic tremor are frequently used interchangeably, but they have different meanings. (Adapted from Bhatia et al., 2018).[2]**

2. Consider the possibility of enhanced physiological tremor in cases of large amplitude visible tremors and be aware of the factors that can exacerbate physiological tremor

Physiological tremor, typically an 8-12 Hz postural tremor affecting the upper limbs and presenting without other clinical signs, can be exacerbated to produce visibly large-amplitude tremor, termed enhanced physiological tremor.[2] This differential diagnosis is particularly relevant for isolated tremor syndromes, with essential tremor (ET) as another major differential.

Conditions such as medication use, fatigue, anxiety, hypoglycemia, and thyrotoxicosis may intensify physiological tremor.[2] A 1000g load test using an accelerometer can differentiate various physiological hand tremors, including ET, though this test is primarily used in research settings.

3. Always consider essential tremor (ET) when evaluating an isolated postural action tremor

ET, the most common movement disorder, has a prevalence approximately 20 times that of Parkinson's disease (PD), affecting 300-450 per 100,000 individuals.[3]

ET is defined as an isolated tremor syndrome and comprises the following diagnostic criteria.[2,4]

1. Bilateral hand action tremor.
2. Duration of at least three years.
3. With or without tremor in other location (e.g. head, voice or lower limbs).
4. Absence of other neurological signs (e.g. dystonia, parkinsonism or ataxia).

Additional features, though not part of the formal criteria, include a positive family history and symptomatic relief with alcohol, which aid in diagnosis (Axis 1).[2,5,6] Cases meeting the ET criteria but also exhibiting other neurological signs of uncertain significance (e.g., mild memory impairment, possible dystonic posturing, impaired tandem gait) are classified as ET-plus.[2]

Isolated focal tremors (e.g. voice, head), orthostatic tremor with more than 12 Hz frequency, task- and position-specific tremors, sudden onset and stepwise deterioration are exclusion criteria for ET.[2,4]

ET's impact on quality of life is substantial, associated with cognitive changes, mood disturbances, psychiatric comorbidities, and gait abnormalities, prompting a shift away from the term "benign ET"[7,8,9] ET management focuses on symptomatic control with beta-blockers, primidone, and benzodiazepines in selected cases.[6]

4. Always consider Parkinsonism when evaluating an asymmetrical upper limb rest tremor

Parkinsonism is a syndrome with variable combinations of rest tremor, bradykinesia, extra-pyramidal rigidity and postural imbalance.[1,2]

Rest tremor in Parkinsonism typically presents as a low-frequency (4-6 Hz), pronation-supination tremor often described as "pill-rolling." It commonly begins unilaterally, affecting the opposite hand over time but remains asymmetrically more severe on the initial side.[1,2] Some patients may also exhibit a postural action component known as re-emergent tremor, which appears after a few seconds of holding a posture and shares waveform characteristics with the Parkinson's disease (PD) rest tremor.[10,11,12]

The term *benign tremulous parkinsonism* is now seldom used to describe cases of long-standing, isolated, asymmetrical rest tremor that present with minimal or no bradykinesia. A subset of these patients may also report a positive family history. Imaging studies, particularly F-dopa positron emission tomography (PET) scans, have demonstrated reduced dopamine uptake in these individuals, supporting the interpretation that this condition represents a tremor-dominant variant of PD rather than an alternative aetiology.

Treatment for Parkinsonian rest tremor includes L-dopa, anticholinergics, and dopamine agonists. Beta-blockers and benzodiazepines may be effective for ET and the postural component of Parkinsonian tremor, though they are generally less effective for Parkinsonian rest tremor.

5. Consider dystonic tremor in cases of isolated head tremor

Dystonic tremor is defined as tremor associated with dystonia. This diagnosis should be considered when there is head tremor with no associated tremor in any other part of the body.[2,13,14] Neck pain is a diagnostic clue that may favor dystonic tremor over other tremor types.

Isolated head tremor is characterized by a 4-8 Hz postural tremor, which may manifest as "yes-yes," "no-no," or variable directional movements.[15,16] The differential diagnosis of head tremor includes ET, titubation, and cervical dystonia.[15] If a sensory trick (geste antagoniste) is present, it helps to differentiate dystonic tremor from ET.[1,2,16].

CONCLUSION

Adherence to these five key practice aspects can help clinicians improve the diagnostic accuracy and deliver appropriate treatment for patients with tremor disorders.

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