

Video Abstracts

## Primary Writing Tremor

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### Abstract

**Background:** Primary writing tremor (PWT) is a rare condition; tremor occurs primarily while writing rather than during other tasks.

**Phenomenology Shown:** We illustrate the phenomenology of PWT and point out associated subtle dystonic posturing on neurological examination.

**Educational Value:** PWT is a tremor disorder that shares clinical features with both dystonia and essential tremor.

**Keywords:** Primary writing tremor, writer’s cramp, essential tremor, dystonia

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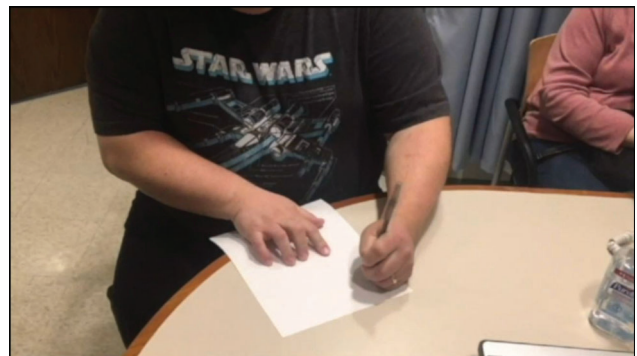
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**Ethics Statement:** All patients that appear on video have provided written informed consent; authorization for the videotaping and for publication of the videotape was provided.

A 48-year-old left-handed male with a 10-year history of left-hand tremor was evaluated at our center. He reported that tremor was present primarily when writing, but sometimes also when using a screwdriver at work. He denied tremor when shaving, pouring liquids, or holding other objects. His father and paternal grandfather had had isolated head tremor. He had previously received a diagnosis of essential tremor (ET) and was prescribed primidone and propranolol (doses unknown). Both were ineffective and were stopped. His neurological examination was consistent with primary writing tremor (PWT): a moderate degree of tremor was noted while writing and was minimally present or absent during other activities (e.g., finger-to-nose maneuver, drinking from a cup, pouring water between cups). Also, there was subtle dystonic posturing of the left hand during arm extension (Video 1). These observations, in association with a family history of isolated head tremor, were red flags that the disorder was not ET.

PWT has been defined as tremor that occurs only or predominantly during writing, but not during other tasks with the affected hand. The mean age of onset is 50.1 years. The disorder may be sporadic or have an autosomal dominant pattern of inheritance, with one-third of patients reporting a positive family history of writing tremor.<sup>1</sup> The pathophysiology of this tremor has been controversial, with some



**Video 1. Phenomenology of Primary Writing Tremor in a 48-year-old Left-handed Male. Segment 1.** There is a moderate-amplitude kinetic tremor of the left hand while writing. The tremor mainly involves the wrist. While writing with the right hand, tremor is barely discernable. **Segment 2.** No postural tremor is seen. However, there is mild dystonic posturing (i.e., flexion) of the left wrist in the wing-beat position (reproducibly seen three times). Even when asked to “keep your arms in a single plane, like airplane wings,” the abnormal (i.e., dystonic) flexed wrist posture is seen. There is no tremor while the arms are at rest in his lap, and only mild kinetic tremor during finger-to-nose maneuver and when drinking from a cup. Tremor is very apparent in a handwriting sample (“There are earthquakes in California”) and Archimedes spiral, drawn with the left hand.

proposing a dystonic origin similar to writer's cramp and others suggesting a relationship with ET. Some are of the opinion that it is a completely separate entity. Authors who propose a common origin with ET cite the fact that PWT and ET have a similar frequency (4–8 Hz) and similar response to alcohol (30–50% of patients report response).<sup>2</sup> However, PWT's unilateral nature and its task specificity argue against an ET-like syndrome and support a dystonic origin. Studies using transcranial magnetic stimulation mapping have shown reorganization and disinhibition of the corticomotor projections to the hand, similar to those reported in patients with writer's cramp.<sup>3</sup> Other electrophysiological studies have demonstrated differences between PWT and writer's cramp, such as an absence in PWT of overflow of electromyographic activity in the proximal musculature, which is characteristic of writer's cramp.<sup>2</sup> In the end, the origins of PWT are

unclear; further characterization of underlying pathophysiology may facilitate more targeted treatments.

### References

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