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# Why Did Captain Miller's Hand Tremble in the Movie *Saving Private Ryan*? Where Medicine influences Art & Art influences Medicine

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If one types “Why Did Captain Miller’s Hand Tremble in *Saving Private Ryan*?” on Google Search, nearly all the results cite post-traumatic stress disorder (PTSD) as the cause. Likewise, Google’s Generative AI output[1] lists a number of causes including “Combat fatigue, Stress and nervousness, Intense anxiety, Anticipation of warfare, Previous memories of fighting,” and so on. Querying ChatGPT yields a similar result:[2]

In the movie “Saving Private Ryan,” Captain Miller’s hand trembles during certain scenes due to post-traumatic stress disorder (PTSD). The character, played by Tom Hanks, is a veteran of the D-Day invasion at Omaha Beach during World War II. The intense and brutal nature of the battle, as depicted in the film’s opening sequence, takes a toll on Miller’s mental and emotional well-being. ... The hand tremors specifically emphasize the lasting effects of trauma on Captain Miller’s life, even after the immediate danger has passed.

## Notes

[1] [https://www.google.com/search?q=Why+Did+Captain+Miller%E2%80%99s+Hand+Tremble+in+Saving+Private+Ryan%3F&rlz=1C1UEAD\\_enUS1070US1070&oq=Why+Did+Captain+Miller%E2%80%99s+Hand+Tremble+in+Saving+Private+Ryan%3F&gs\\_lcrp=EgZjaHJvbWUyBg-gAEEUYOTIICAEQABgWGB4yCAgCEAAyFhgeogEJNjQyMGowajEiqAIAAsAIA&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=Why+Did+Captain+Miller%E2%80%99s+Hand+Tremble+in+Saving+Private+Ryan%3F&rlz=1C1UEAD_enUS1070US1070&oq=Why+Did+Captain+Miller%E2%80%99s+Hand+Tremble+in+Saving+Private+Ryan%3F&gs_lcrp=EgZjaHJvbWUyBg-gAEEUYOTIICAEQABgWGB4yCAgCEAAyFhgeogEJNjQyMGowajEiqAIAAsAIA&sourceid=chrome&ie=UTF-8)

[2] ChatGPT query: <https://chat.openai.com/c/9975377a-7510-4783-83c5-589f32e4a6d6>

All of these are wrong, and the likely correct diagnosis, based on applying the basic principles of medicine, will be presented in this article. Given that these conclusions contradict generative AI, it should be clear that this article has *not been written by ChatGPT* or by any other of highly fashionable but clearly fallible AI systems. Beyond getting the answer right, a thoughtful medical analysis of this artistic twist—the “trembling” of Captain Miller’s hand—also provides insight, as all great art profoundly does, on the human condition—the deeper meaning of this iconic film.

The 19th century physician, Sir William Osler is famously quoted as saying, “Listen to your patient; [they] are telling you the diagnosis.” In the spirit of that wise advice, let us listen, then, to the movie’s lead, Captain Miller (Tom Hanks), imagining ourselves as his doctor. Our patient describes his symptoms in this 30-second clip [here](#)[3] and below are the corresponding lines from the screenplay[4]:

CAPTAIN HAMILL

I mean it. Find him. Get him home.

Miller is a bit taken aback by Captain Hamill’s forceful sincerity. Then he shakes it off and motions to his men.

....

EXT. FRENCH COUNTRY SIDE - NIGHT The FINAL RUMBLES of the DISTANT ARTILLERY fade away. The night is dark. Sarge eases up alongside Miller and speaks quietly to him.

SARGE

How long’s your hand been shaking?

MILLER

A couple of weeks. It started in Portsmouth when they brought us down for loading.

#### Notes

[3] 30 second video clip: [https://drive.google.com/file/d/1AXACsenamL\\_SXsgBA\\_7D5hYkRkBLyED8/view](https://drive.google.com/file/d/1AXACsenamL_SXsgBA_7D5hYkRkBLyED8/view)

[4] <https://foo4.backblazeb2.com/file/screenplays/posts/saving-private-ryan-1998/scripts/Saving%20Private%20Ryan%20-%20Screenplay.pdf>

SARGE

Is it getting worse?

MILLER

No. It comes and goes. It stops when I look at it.

SARGE

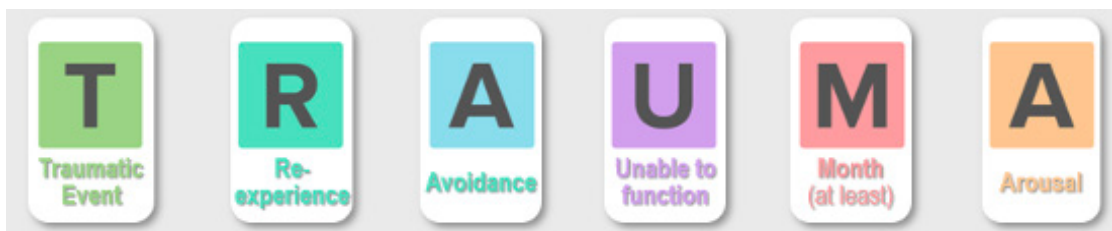
You may have to find yourself a new line of work, this one doesn’t seem to agree with you anymore.

MILLER

I’ll be alright.

From a medical perspective, this brief patient history, sparse as it may seem, has tremendous diagnostic value and clearly points *away from PTSD*, or even plain “nervousness,” as the cause of Captain Miller’s hand tremor. While the formal diagnosis of PTSD is beyond the scope of this article, it suffices to note that PTSD has six canonical components, conveniently associated with the mnemonic “TRAUMA”[5]:

Figure 1. The Six Components of PTSD – T R A U M A



Notes

[5] Note that all graphics are adapted (unless otherwise cited) from the author’s own work with the [mini-MD program](#). In this case, this is from the *Act II – Neuroscience – Forebrain* section and as adapted from Khoussam HR (2001) *West J Med* 174(6):424.

The first and most important element of PTSD — namely, the existence of a prior traumatic event— is clearly lacking as the hand shaking “started in Portsmouth,” before Captain Miller landed on the beaches at Normandy. Any psychiatrist—any generally trained physician for that matter—would, unlike ChatGPT, eliminate PTSD as a possible cause[6]. Also relevant is that the shaking “comes and goes,” and stops when Captain Miller looks at it, facts to which we will return later. To summarize:

<b>Key points from the history</b>	<b>1. Recent onset hand shaking (~ two weeks)</b>
	<b>2. No associated traumatic event</b>
	<b>3. Sporadic</b>
	<b>4. No mention of associated pain or other symptoms</b>

The history is typically followed by a physical examination, which begs the question, How can one examine a character in a movie? While we often associate the physical exam with poking and prodding (or listening with the stethoscope), the initial (and most important part) is observation[7]. In observing Tom Hanks, then, we note the following features.

<b>Key points from the exam</b>	<b>1. The hand shaking is unilateral</b>
	<b>2. Right hand</b>
	<b>3. General shaking of the hand</b>
	<b>4. Patient appears calm; behavior absent of acute distress or pain</b>

#### Notes

[6] Unless, of course, there was some other *trauma* in Captain Miller’s life that could serve as the inciting event for PTSD. As far as we know, no such prior trauma was described by our patient.

[7] Also termed “inspection.” Incidentally, this is one reason why appreciating art and art appreciation offer such valuable skills for being a good clinician.

Of course, these few seconds from a movie clip are necessarily incomplete as far as a physical exam is concerned. But points #1 and #2 are indisputable and will be, as we shall see, very important in making the presumptive diagnosis. For one thing, entities such as PTSD and its closely related cousins, panic disorder and generalized anxiety disorder, often present with generalized symptoms, namely, symptoms that are bilateral or even affecting the entire body. In other words, PTSD, while often instigated by specific psychological triggers, is manifested by general physiological effects[8]. With PTSD one would not expect just the right hand to shake, as is seen with Captain Miller. Regarding point #3, "General shaking of the hand," it should be noted that movement disorders are complex, manifesting with a great variety of abnormal movements, and thus their diagnosis often requires specialized training[9]. Moreover, we are not observing a real patient, but rather Tom Hanks acting as one, and while he was brilliant in the role[10] there are limits to how one can realistically simulate serious neurologic conditions. That being said, Steven Spielberg[11] was likely aware of these subtleties and directed Tom Hanks to shake his hand in this more intermediate (and unilateral) manner[12]. Finally, regarding point #4, notwithstanding the lack of a full mental status exam, we can be fairly confident that Captain Miller's mind is generally normal. In other words, there are no signs of mood disturbance, anxiety, psychosis (thought disorder), dementia, delirium or other such conditions.

To summarize: the history and physical rule out PTSD or other similar anxiety disorders and the focal nature of the symptoms point to some sort of neurological condition. Furthermore, the unilateral localization and character of the "shaking" is not typical of more complex movement disorders. We are left, then, with the most likely cause being a **focal** (also called **partial**) **seizure**. Focal seizures, as outlined in the schematic below,[13] manifest as focal symptoms, which can be sensory or motor, or even behavioral. In the case of Captain Miller, his shaking of the right hand can be described as a **focal motor seizure**. Such partial seizures can be further categorized as being

#### Notes

[8] The reason for this is that the psychological triggers (such as re-experiencing previous trauma) activate a generalized anxiety circuit which subsequently activates the sympathetic nervous system, the so-called "Fight or Flight" response.

[9] There are, for example, different types of "trembling," from the "pill-rolling" tremor seen in Parkinson's disease, to the fine movements in essential tremors, to intention tremors, to the flapping tremors (asterixis) as seen in liver failure, etc.

[10] Nominated for an Academy Award for Best Actor.

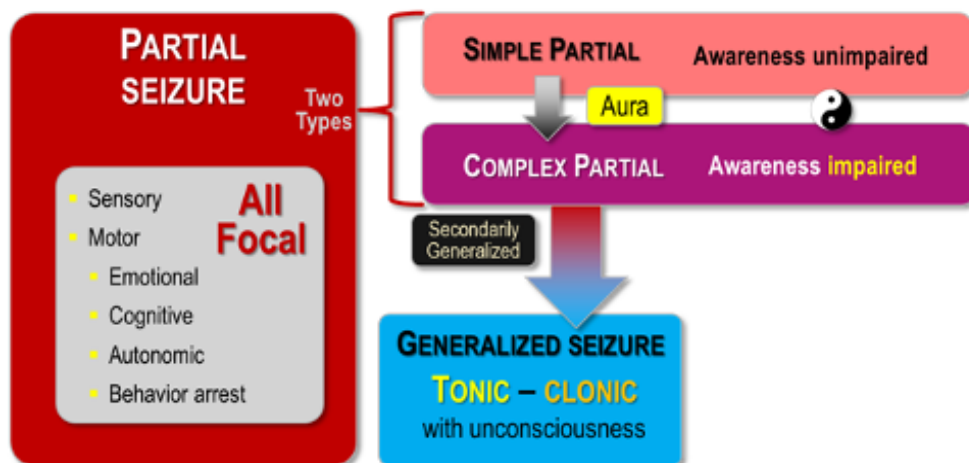
[11] Won an Academy Award for Best Director.

[12] Imagine Steven Spielberg telling Tom Hanks, "Shake your hand kind of in between a fine tremor and a large flapping." In other words, the directorial instructions may have been, "Not too fine, as in essential tremor, and not a large amplitude as with asterixis or the cerebral palsies."

[13] From the [mini-MD Act III – Neurology – Epilepsy](#).

“simple,” in which awareness (consciousness) is unimpaired and “complex,” in which awareness (consciousness) is impaired[14]. Putting all this together, we confidently say Captain Miller is suffering from a **simple partial motor seizure**, without apparent secondary generalization.

Figure 2 Seizure Disorders can Manifest as either Focal or Generalized



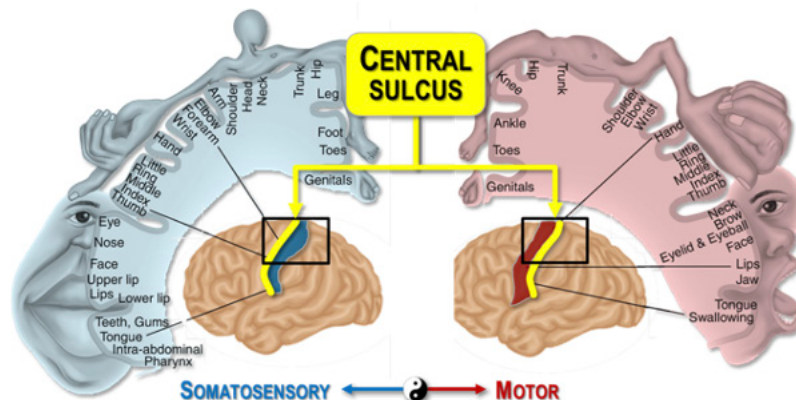
Focal findings suggest focal lesions. In other words, this fundamental principle of neurology tells us that a **localized problem** such as “right hand shaking” strongly suggests **localized pathology** within those specific brain regions responsible for movements of the right hand. Indeed, we can be confident, even without a brain CT or MRI, what part of Captain Miller’s brain is affected. It turns out that along what is termed the **central sulcus** there are regions responsible for motor activity (*anterior* to the central sulcus) and regions responsible for sensory activity (*posterior* to the central sulcus). Furthermore, these motor and sensory functions are systematically distributed anatomically from head to toe (inferiorly to superiorly) according to the following schematic, termed the **homunculus**. [15]

#### Notes

[14] The latter can sometimes become secondarily generalized to produced generalized (tonic-clonic) seizures.

[15] From the [mini-MD Act II Neuroscience – Forebrain](#); adapted from Malinowski MN (2019) In: Deer T et al (eds) *Deer’s Treatment of Pain*. Springer.

Figure 3 The Homunculus - Motor and Sensory Functions are Systematically Distributed over the Brain



Movements and sensations related to the feet, for example, are localized superiorly along the central sulcus, while functions corresponding to the face are distributed further inferiorly and laterally, close to the temporal lobe. In Chapter 21 of the novel, *Waves*[16], the protagonist, Tomas, identifies the *exact region of the brain* responsible for Captain Miller's malady.

TOMAS:

Yes. Captain Miller's problem was in the left side of his brain, the cerebral cortex, halfway up the central sulcus and just about a half-centimeter in front of that. This is what would have killed John H. Miller if he had survived Normandy.

What Tomas has described is the first part of any neurologic diagnosis, namely, an **anatomic** diagnosis, according to what might be called the Neurologic Method [17]. Following this framework, the next step then would be to identify the presumptive **pathologic** diagnosis[18], ultimately leading to elucidating the mechanism and cause, hence **etiologic** diagnosis. In short: a neurologist progresses in diagnostic specificity from the anatomic to the pathologic to the etiologic.

#### Notes

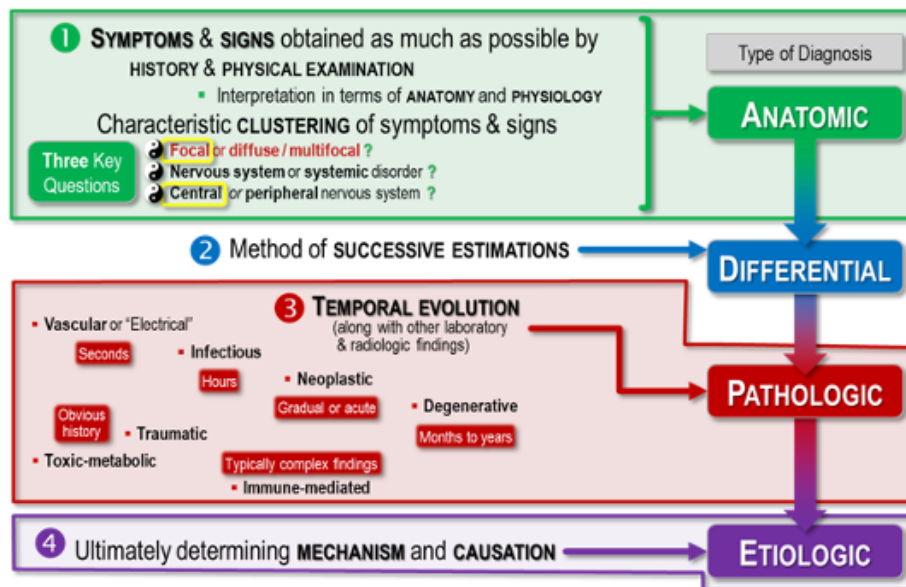
[16] Gurel O (1989) *Waves*.

[17] From the [mini-MD Act III Neurology – Principles](#).

[18] A key hint pointing at the pathophysiologic diagnosis is the time (or temporal) evolution of disease. For example, with a “vascular” or “electrical” pathophysiology, as in a stroke or epilepsy, the disease will manifest its symptoms within seconds. In contrast, a neoplastic (cancer) related pathophysiology as in a brain tumor, might manifest gradually, as in weeks. Sometimes it can be acute if the cancer grows into a critical area of the brain or, as is likely the case with Captain Miller, inciting a seizure syndrome—secondary epilepsy. In any case, this “acute” presentation of cancer is unlikely to unfold in seconds as would be the case with a stroke or primary epilepsy.



Figure 4 Outline of the Neurologic Method



In medical school one learns that a **new-onset, focal, adult seizure** is a brain tumor unless proven otherwise. Indeed, the time course recounted by Captain Miller, being in **gradual / acute**, suggests a neoplastic (cancer) pathophysiology. Putting all this together leads us to conclude that Captain Miller was not suffering from PTSD, as ChatGPT would have us believe, but rather from a brain tumor, as nearly any observant doctor would conclude. In the absence of an MRI to provide further clues or a biopsy to confirm, we cannot, of course, know what type of brain tumor that might be, but suffice to say that in 1944, the survival rate of malignant brain tumors was quite low[19]. My sense is that Captain Miller had a feeling something serious was brewing within his body. Indeed, he may have understood that if the Nazis weren't to kill him, he might, in fact, be dying from this insidious force brewing within. He tells Sargeant Horvath, "I'll be alright," but one gets the impression that Captain Miller isn't really convinced that "He'll be alright."

Notes

[19] Even though, the statistics are not so favorable. For a malignant brain tumor the 5-year survival rate is approximately 36% ([cancer.net - https://www.cancer.net/cancer-types/brain-tumor/statistics](https://www.cancer.net/cancer-types/brain-tumor/statistics)) while for some other types of brain cancer, such as meningioma the survival rates are much better, ranging around 80%. Of course, the prognosis for any particular individual depends highly on such factors as the location of the tumor, the histologic grade, and other parameters.

This may very well be the ultimate message—the fundamental moral imperative—that Steven Spielberg aims to share: namely, that while all of us die sooner or later, whether from battling disease or battling evil, what is important is how we pass on our life to others. In this way, Steven Spielberg wished to portray the metaphor of the “shaking hand” being, like a brain tumor or other such illness, something that can be found in anybody, not just the valiant on the battlefield. Captain Miller’s moral imperative becomes very much our own. Evidence for this can be found in the very last moments of the film as Captain Miller lies dying, telling Private Ryan (Matt Damon) this famous line, “Earn this.” In that final, poignant scene, Steven Spielberg directs the camera to specifically focus for several seconds on the dying man’s trembling right hand, emphasizing his connection to all of our mortal selves. After Miller dies, Spielberg directs the camera to shift focus and linger (yes, for several seconds!) on Matt Damon’s right hand, rock steady and not shaking. The focus is not on the captain’s battle injury, but rather on his inherent mortality—connecting his plight to all of us—which is then emphasized by the focus on the private’s hand, devoid of apparent disease. Captain Miller didn’t just save Private Ryan’s life; he gave that young life a true and lasting purpose. Like a great doctor, study this last [clip](#)[20] and make your own conclusion, bearing in mind that an artistic genius like Steven Spielberg wastes precious little camera time on that which is not significant.

The deeper—human—meaning, therefore, of *Saving Private Ryan* is wrapped up in the medical diagnosis of Captain Miller’s shaking right hand. And from a strictly medical standpoint, any aspiring doctor should watch these scenes so that the important message that a “new-onset, adult, focal seizure is a brain tumor unless otherwise ruled out” will, like the movie,

or any great art,  
never be forgotten[21].

#### Notes

[20] 60 second video clip: <https://drive.google.com/file/d/1-ydX5SZa5tiMIXKebUXUBLLo-fxwHpPz/view>; the video is cut off but if you watch the movie you can see that the focus on Matt Damon persists for several seconds!

[21] From this article we also have seen how primitive and limited generative AI can be. But that is an entirely different (and important issue). For my own part, cognizant of my own mortality, one lesson I wish to pass on to future generations of doctors is that we cannot exclusively depend on such AI systems and that the power of human thought remains valuable and essential.

