

# How Technology Helps in Diagnosing Functional Neurological Disorder

Author: Zai Gao Date: 01/08/2025

Technology has revolutionized how doctors diagnose and treat medical conditions. For many neurological disorders, tools like MRI scans and EEG tests provide detailed insights into the brain and nervous system, helping pinpoint structural or electrical issues that cause symptoms. For example, MRIs can reveal strokes, tumors, or multiple sclerosis, while EEGs can detect abnormal brain activity linked to epilepsy. These tools often give doctors clear, objective answers. But Functional Neurological Disorder (FND) is a little different.

FND doesn't have a clear structural cause—there's no visible damage to the brain or spinal cord, no tumor, no stroke (click [here](#) to learn more about symptoms of FND). It's not something you can spot on an MRI like you would for some other conditions. However, [recent studies](#) have shown that there are some differences between the brains of FND patients and others, particularly in neurometabolites. These findings are promising, but further research is needed to explore the details. So, in general, just as there's no single biomarker for FND, there's also no single test that can definitively confirm, "This is FND."

High-tech tools play an important role in diagnosing FND. They help rule out other conditions that might mimic FND and, in some cases, give subtle clues about what's happening in the brain. This combination of advanced technology and skilled clinical observation is what makes diagnosing FND such a unique process. So, how do these tools work, and what can they really tell us about FND? Let's explore!

## The Role of MRI in Diagnosing FND

MRI, or Magnetic Resonance Imaging, is one of the most advanced tools doctors have for looking inside the brain and spinal cord (learn what happens during an MRI and how to prepare for an MRI [here](#)). It uses powerful magnets and radio waves to create detailed pictures, showing everything from soft tissues to blood vessels. For many neurological conditions, like strokes, brain tumors, or multiple sclerosis, an MRI can reveal structural damage or abnormalities that explain a patient's symptoms (see which parts of body could go through a MRI scan [here](#)). But here's the twist: when it comes to FND, MRI scans almost always come back normal.

At first, this might feel frustrating or confusing—how can your symptoms be real if the test shows nothing wrong? But a normal MRI result is actually a critical step in diagnosing FND. Why? Because it helps rule out other serious conditions that could be causing similar symptoms. For instance, if someone experiences sudden muscle weakness, numbness, or tremors, an MRI can confirm that there's no physical injury, tumor, or disease affecting the brain or spinal cord. This reassurance allows doctors to shift their focus to functional issues. It's like crossing off other possibilities on the list, narrowing the path toward a better understanding of your condition.

## EEG: Testing Brain Activity

Another tool doctors commonly use is an EEG, or Electroencephalogram ([here](#) is an EEG demonstration video if you're curious). This test measures the brain's electrical activity by placing small sensors on your scalp to detect and record patterns. It's often used for patients who experience seizures, as it helps determine whether the seizures are caused by epilepsy or another condition.

For [epilepsy](#), an EEG typically shows abnormal electrical activity, such as spikes or waves, that indicate disruptions in how the brain is functioning. But with FND, the EEG usually shows normal brain activity—even during an episode. This difference is a key clue for doctors. It helps them rule out epilepsy and focus on diagnosing FND.

Doctors may even use EEGs alongside other tests, like video monitoring, to observe your symptoms in real-time. For example, if a functional seizure occurs during the EEG, the recording can show how your brain's activity stays normal despite the outward symptoms. This combination of tools helps doctors better understand what's happening and strengthens their confidence in the diagnosis.

## Functional MRI (fMRI) and Emerging Tools

Functional MRI, or fMRI, takes traditional MRI to a whole new level by measuring brain activity in real time. Unlike a standard MRI, which captures detailed images of the brain's structure, an fMRI tracks changes in blood flow, revealing which areas of the brain are more active during specific tasks. This allows doctors and researchers to "see" the brain in action. Although fMRI isn't yet used as a routine diagnostic tool for FND, it's opening up exciting possibilities for the future. Researchers are continuing to study these brain activity patterns, hoping to develop more precise ways to diagnose FND and tailor treatments based on how the brain functions in individual patients.

fMRI isn't the only emerging tool. Technologies like magnetoencephalography (MEG) are also being explored. MEG measures the magnetic fields produced by the brain's electrical activity and can provide incredibly detailed maps of how the brain is working in real time. Other advanced neuroimaging techniques, like diffusion tensor imaging (DTI), which maps how different parts of the brain are connected, are also being studied. While these technologies aren't widely available for diagnosing FND yet, they represent a glimpse of the future. Imagine a day when we can use these tools to not only understand the unique way your brain functions but also to develop personalized treatments that target the specific pathways involved in your symptoms. For now, emerging tools remain at the cutting edge of research, but their potential to transform how we understand and manage FND is truly inspiring.

(For more information, [here](#) is a comprehensive study published in 2021 summarizes the output of the first International FND Neuroimaging Workgroup meeting on June 17th, 2020. It outlines many novel biologically and psychologically-informed treatments.)

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