

[Ninth Circuit, Appeals Court rules on ineffective assistance of counsel claims based on failure to introduce brain scan evidence in an Arizona case \(Smith v. Ryan\)](#)

Rules on the prejudicial value of the failure to introduce brain scans as mitigating evidence in a criminal appeal.

Updated last **December 15, 2016**
for the 5/26/16 decision.

WHAT IT DOES

[Smith v. Ryan](#) (823 F.3d 1270) informs the debate on the value of various types of brain scan evidence in the courtroom. In *Smith*, the court considered whether the failure of Smith’s counsel to introduce a positron emission tomography (PET) scan and diffusion tensor imaging (DTI) studies potentially showing organic brain damage, known also as organic brain syndrome, in the penalty phase of the trial constituted [ineffective assistance of counsel](#). Specifically:

- The [Ninth Circuit Court of Appeals](#) held the PET and DTI scans of the defendant would have been largely [cumulative of testimony](#) by defendant’s neuropsychiatric expert. This testimony had already placed Smith in the “brain-damaged range,” indicating mild to moderate impairment. Since the brain scans were cumulative of testimony already heard, the court held that their introduction would not have had a reasonable probability of reversing the decision.

THE FACTS

In 1973, Joseph Smith was convicted of a woman’s rape. While on probation for that crime, Smith raped another woman and killed two others. After being convicted of the second rape and the two murders, he was sentenced to death.

In 1999, following several appeals, the Ninth Circuit Court of Appeals heard Smith’s writ of [habeas corpus](#) appeal and held that his counsel acted deficiently by failing to present evidence of Smith’s mental impairment that could have lessened his sentence. In light of this, the Court [remanded](#) the lower court’s sentence and ordering the district court to resentence Smith.

At the next sentencing hearing in 2004, Smith’s counsel did present [mitigating evidence](#) of mental impairment, including of dissociative identity disorder, but the [aggravating](#) natures of his crimes overrode this mitigating evidence. Smith was again sentenced to death by lethal injection. In 2012, Smith’s counsel filed a writ of habeas corpus that led to the current case being heard by the Ninth Circuit Court of Appeals.

DECISION POINTS

In this case, the court had to determine if, had the PET and DTI scans showing mild to moderate brain damage been introduced, there would have been a reasonable probability of a different sentencing outcome.

Of specific import in this decision were the facts that:

- Expert testimony heard in the original case determined that the defendant had mild to moderate brain damage through the use of neuropsychiatric testing alone.
- The brain scans showing organic brain syndrome added no new information beyond the neuropsychological testing.

Because the brain scans were cumulative of other evidence—i.e., they represented the totality of the evidence already

presented—the court found there would not have been a reasonable probability of a different outcome had the scans be introduced, and Smith remained sentenced to death.

RELEVANT SCIENCE

Over the last two decades, neuroscience has played an increasingly important role in the courts. In particular, brain scans are the most common type of neuroscience evidence introduced into the court room.

These neuroimaging techniques can produce ‘maps’ of the brain, capturing brain matter, blood vessels and the overall structure of the brain; or tracing brain activity using different [biomarkers](#). This case featured two types of brain scans: PET and DTI scans. [PET scans](#) (positron emission tomography) use a radioactive biomarker that produces detailed images of tissues and organs by tracing metabolic activity in the body over time. PET scans can reliably image structural features of a brain, such as tumors or physical brain damage. DTI scans (diffusor tensor imaging) are a type of [magnetic resonance imaging](#) that image [white matter](#), the connecting fibers between the neurons in the brain. Aging, many types of neurodegenerative disorders, like Alzheimer’s, and/or damage that results in organic brain syndrome, affect the white matter of the brain, and those changes can be detected by DTI scans.

[Organic brain syndrome](#) (OBS), which is synonymous with organic brain damage, describes a decrease in mental functioning for a reason other than a psychiatric illness. Detecting OBS—which includes diseases as diverse as alcoholism and epilepsy, as well as other conditions like concussions—can be done with a range of brain scans or neuropsychiatric testing looking for mental impairment. In the courtroom, brain scans and [neuropsychiatric testing](#) are used, sometimes alone and sometimes in combination, to determine the presence and degree of brain damage and related mental impairment. Brain scans like those listed above are used to detect brain injury, either by tracing the brain’s metabolic functioning or looking for physical signs of damage. Diagnosis of impaired mental state depends on the location and severity of brain damage detected by the scan; however, often more cognitive testing is needed to confirm a diagnosis. Neuropsychiatric testing, in contrast, identifies mental impairment through cognitive tests and then implicates the location and degree of brain damage based on the results.

WHERE & WHEN

The United States Court of Appeals for the Ninth Circuit published their opinion on May 26, 2016.

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