NRL News
Page 17
September 2006
Volume 33
Issue 9

More Encouraging Signs that Severely Brain-Injured Patients Can Improve

BY Dave Andrukso

"The findings follow recent studies by [Dr. Nicholas] Schiff and others that suggest some brain injury patients may be more responsive than anyone realized. And scientists have long known that patients in a vegetative state sometimes regain at least some awareness."
Washington Post, September 8

"At a minimum, the report demonstrates that clinical exams may not be sufficient to establish that all elements of consciousness have been extinguished in someone who gives no outward appearance of responsiveness."
Chicago Tribune, September 8

"But the vegetative state isn't what it used to be. A new study promises, or threatens, to overturn medical dogma about what is happening in the minds and brains of at least some patients in such a state. It also raises new questions about the meaning of consciousness, one of the deepest mysteries in all of science."
Wall Street Journal, September 8

A report in the September 8 issue of Science has given additional impetus to mounting evidence that we know far less about patients with severe brain damage, whether the label be "minimally conscious" or "persistent vegetative state" (PVS).

What researchers found was that the brain activity of a 23-year-old British woman, said to be in a PVS, almost exactly paralleled the responses researchers found in the brains of 12 volunteers. As the Washington Post's Rob Stein put it, she "showed clear signs of conscious awareness on brain imaging tests."

The story begins in July 2005 when the woman suffered a head trauma which left her in a coma. About two weeks later, she opened her eyes and started experiencing sleep-wake cycles.

However (as is so often the case), after only five weeks of testing suggested "no signs of awareness or consciousness," the PVS label was affixed to her.

But brain researchers, led by Adrian Owen at the Medical Research Council Cognition and Brain Sciences Unit in Cambridge, England, studied her brain for five months. They used a sophisticated piece of imaging equipment called an fMRI which actually shows the brain in operation. "The technique highlights areas of the brain that receive increased blood flow when in use," according to the Los Angeles Times.

The researchers prodded her with increasingly difficult levels of questioning. "When the scientists spoke to her, advanced imaging showed, her brain registered activity in regions responsible for decoding language, just as the brains of normal volunteers do," according to the Wall Street Journal's Sharon Begley. "When they used sentences with homonyms, which

require more complicated semantic processing, the appropriate parts of her brain lit up, again just like healthy brains."

However, either response, Begley wrote, "might be dismissed as automatic and therefore unconscious." But Owens and his team raised the ante.

"So they asked her to imagine playing tennis," Begley wrote. "Remarkably, this made neurons fire in the premotor cortex, a region that hums with activity when you mentally practice sophisticated movement, from a jump shot to a backhand." But they were just getting started.

"Then they asked her to imagine walking through each room of her house," according to Begley. "This time her parahippocampal gyrus, which generates spatial maps, became active, again just as in healthy volunteers."

Owens explained the significance. "We know from extensive research that brain responses of this type do not occur automatically," he said, but "require the willed, intentional action of the participant."

As they should have, all the stories included cautionary notes. Worth noting, however, is that the Associated Press went way overboard. ("It's far too soon to raise hopes," "There's no way to know" this or that, and "Her brain injury may not be typical of patients in a vegetative state.")

The authors of the study concluded, "Her decision to cooperate ... by imagining particular tasks when asked to do so represents a clear act of intention, which confirmed beyond any doubt that she was consciously aware of herself and her surroundings."

"It was an absolutely stunning result," Owen told the Washington Post. "We had no idea whether she would understand our instructions. But this showed that she is aware."

Owen went further in other statements. "These are startling results," he said. "They confirm that, despite the diagnosis of a vegetative state, this patient retained the ability to understand spoken commands and to respond to them through her brain activity, rather than through speech and movement."

Referring to the assessment techniques used, John Connolly, a University of Montreal neuroscientist, said, "If it was a relative of mine, I know I'd demand it."

There are two downsides, one already on display and one potential. There was the consistent attempt in virtually all accounts to distinguish Terri Schiavo's condition from the 23-year-old woman's, to write as if Terri's diagnosis of PVS was uncontested (it was a matter of intense debate) and as if she died when "life support" was removed (rather than because she was denied food and water).

The other difficulty is the suggestion that eventually they will be able to make even finer distinctions—create a kind of gradated series of diagnoses for those who supposedly fall between those who are supposedly "minimally conscious" condition and those said to be in a PVS.

Not only is such clarity, in all likelihood, impossible, there is a vague implication that some/many/most of these patients can ethically be starved to death. Given how more and more sophisticated tests are revealing more and more capability among more and more patients who've essentially been written off, doctors should err on the side of caution.

Moreover, in another sense, this almost begs the question. What would happen if such patients—including Terri Schiavo—were given vigorous, ongoing therapy? Often it doesn't happen at all, and, when it does, too often the therapy is prematurely ended.

All that notwithstanding, the report from Science is wonderfully encouraging.

"One always hesitates to make a lot out of a single case, but what this study shows me is that there may be more going on in terms of patients' self-awareness than we can learn at the bedside," Dr. James Bernat, a professor of neurology at the Dartmouth Medical School, who was not involved in the study, told the New York Times. "Even though we might assume some patients are not aware, I think we should always talk to them, always explain what's going on, always make them comfortable, because maybe they are there, inside, aware of everything."