

## Head Injuries: Proceed with Caution?

In the wake of John Paul II's March 2004 allocution on "Life-Sustaining Treatment and the Persistent Vegetative State," a number of commentators expressed doubt and even challenged some of the allocution's more scientifically-oriented statements. Several studies in the ensuing years,<sup>1</sup> however, and the attention being given to them,<sup>2</sup> should perhaps give critics and non-critics alike some pause.

One of the most recent such studies is a publication in the February 18, 2010 issue of the *New England Journal of Medicine*, "Willful Modulation of Brain Activity in Disorders of Consciousness," (Monti, et al.). The article reports a study of 54 patients with disorders of consciousness (vegetative state and minimally conscious state) who underwent functional magnetic resonance imaging (fMRI) to determine whether or not they were able to generate willful responses to two mental-imagery tasks—playing tennis and walking from room to room in their home. As the authors note, "Such a capacity, which suggests at least partial awareness, distinguishes minimally conscious patients from those in a vegetative state and therefore has implications for subsequent care and rehabilitation, as well as for legal and ethical decision making" (580). Of the 54 patients studied, the researchers found five who could willfully modulate their brain activity. Four of the five had been diagnosed as being in a vegetative

state. All five suffered a traumatic brain injury. There were no such responses in patients with non-traumatic brain injuries. The authors observe that in "a minority of cases, patients who meet the behavioral criteria for a vegetative state have residual cognitive function and even conscious awareness" (585). In other words, some patients seem to have a limited degree of awareness despite the lack of any behavioral responsiveness on bedside examination. As a result, the diagnosis of vegetative state "did not accurately reflect the patient's internal state of awareness and level of cognitive functioning at the time" (588). Currently, clinical audits put the number of misdiagnoses of vegetative state at "approximately 40%" (580) though some place it as high as 43%.

In another recent study (M.R. Coleman, et. al., "Towards the Routine Use of Brain Imaging to Aid the Clinical Diagnosis of Disorders of Consciousness," *Brain* 132 (2009): 2541-2552), the authors observe that the "accurate assessment of persons with impaired consciousness following brain injury is a considerable challenge for any clinician. At present a diagnosis is made largely on the basis of the patient's clinical history with further support gleaned from the observation of the patient's behavior in response to stimulation" (2542). The assessment procedure has remained essentially unchanged since Jennett and Plum coined

the term “vegetative state” in 1972. It is highly subjective, note Coleman and colleagues, and completely dependent upon the patient’s exhibited behavior. As a result, some patients who do retain some degree of awareness fall victim to attitudes and behaviors associated with patients deemed to be in a vegetative state. In their neuroimaging study, two of 22 patients judged to be in a vegetative state were found to have some higher order function.

The clinical conclusions of both of these studies (among several others, see below) is that functional MRI can provide both diagnostic and prognostic information about brain injured patients, helping to distinguish between patients who are truly vegetative and those in a minimally conscious state. “In patients without a behavioral response, it is clear that functional MRI complements existing diagnostic tools by providing a method for detecting covert signs of residual cognitive function and awareness” (Monti, 588). Or, as Coleman and colleagues put it: “hence this study reiterates the conclusions of many fMRI studies—namely, appropriately designed fMRI paradigms may provide additional information to inform the clinical diagnostic decision-making process that is not available from standard bedside behavioral assessments” (Coleman, 2550).

But this is not all. Coleman and colleagues found that “the higher the level of speech processing demonstrated by a patient during fMRI investigation, the more likely they are to demonstrate an improvement in their behavior profile six months post-

investigation” (Coleman, 2550). Hence, neuroimaging may also provide prognostic information for the medical team which, in turn, might affect the attitudes of caregivers and families, as well as care plans. Monti and colleagues further suggest that neuroimaging, at some point, might be able to be used to assist some patients to express themselves and to have some control over their lives and their environment (Monti, 589).

The clinical implications of these and other studies are indeed fascinating and promising. But what about the ethical implications? Do all these studies, along with the very high rate of misdiagnoses of vegetative state, suggest anything about the appropriate and ethical care of patients deemed to be in such a state—decisions about treatment and about rehabilitation efforts? At some point, should fMRI become part of the ordinary response to patients who suffer traumatic brain injury? Perhaps these are conversations we need to begin in our organizations as well as within society. At minimum, these studies suggest that we proceed cautiously diagnostically, prognostically, and therapeutically with brain injured patients. John Paul II may have been on to something.

R.H.

#### Notes

<sup>1</sup> Among these studies are the following: M. M. Monti et al., “Willful Modulation of Brain Activity in Disorders of Consciousness,” *New England Journal of*

*Medicine* 362, no. 7 (February 18, 2010): 579-589; M. R. Coleman et al., "Towards the Routine Use of Brain Imaging to Aid the Clinical Diagnosis of Disorders of Consciousness," *Brain* 312 (2009): 2541-2552; M. R. Coleman et al., "A Multimodal Approach to the Assessment of Patients with Disorders of Consciousness," *Progress in Brain Research* 177 (2009): 231-48; S. Marino and P. Bramanti, "Neurofunctional Imaging in Differential Diagnosis and Evaluation of Outcome in Vegetative and Minimally Conscious State," *Functional Neurology* 24, no. 4 (2009): 185-88; H. Di et al., "Neuroimaging Activation Studies in the Vegetative State: Predictors of Recovery?" *Clinical Medicine* 8, no. 5 (October 2008): 502-07; A. Owen, et al., "Functional Neuroimaging of the Vegetative State," *National Review of Neuroscience* 9 (2008): 235-43; A. Owen et al., "Using Functional Magnetic Resonance Imaging to Detect Covert Awareness in the Vegetative State," *Archives of Neurology* 64, no. 8 (August 2007): 1098-1102; M. R. Coleman et al., "Do Vegetative Patients Retain Aspects of Language Comprehension? Evidence from fMRI," *Brain* 130 (2007): 2494-2507; S. Laureys et al., "Cortical Processing of Noxious Somatosensory Stimuli in the Persistent Vegetative State," *Neuroimage* 17 (2002): 732-41.

<sup>2</sup> For example, the use of neuroimaging with brain injured patients was discussed at three professional meetings that I attended over the past six months.

## Catholic Hospitals and Ectopic Pregnancies

On Wednesday, January 19, 2011, the *Washington Post* published an article titled "Religious Hospitals' Restrictions Sparking Conflicts, Scrutiny." In the article, the author lists several examples of "limitations on care [for women] available at Catholic hospitals." Among these is how Catholic hospitals deal with ectopic pregnancies. "Standard of care for ectopic pregnancies, which are life-threatening, is to inject the drug methotrexate or to remove the embryo surgically while leaving the fallopian tube intact, both procedures that are intended to preserve fertility. But some Catholic hospitals refuse to perform either and will extract the embryo only by taking out the fallopian tube."

In saying this, the author echoes a 19-page report (*Below the Radar: Ibis Study Shows that Health Care Providers' Religious Refusals Can Endanger Pregnant Women's Lives and Health*) published by the National Women's Law Center on Thursday, January 20, 2011. The press release announcing the report states that "certain religiously affiliated hospitals put women's health and lives at risk by restricting doctor's ability to provide the best medical care to pregnant women experiencing miscarriages and ectopic pregnancies." The hospitals do this, supposedly, because of their interpretation and application of the ERDs.

What do the ERDs say about ectopic pregnancies? Directive 48 speaks to this issue: "In case of extrauterine pregnancy, no intervention is morally licit which constitutes a direct abortion." What are the possible interventions? There are actually four approaches to addressing these situations. The first consists in expectant management, i.e., simply monitoring the situation to see if the tubal pregnancy resolves on its own. The second consists in the partial or complete removal of the fallopian tube, which also contains an embryo (salpingectomy). The third involves slitting the fallopian tube and "stopping the destructive activity of the trophoblast by removing the invasive trophoblastic cells along with the damaged tubal tissue."<sup>1</sup> The embryo is also necessarily removed in the process (salpingostomy). And the fourth consists in administration of the drug methotrexate which prevents the trophoblastic cells from continuing to divide and doing damage to the tube that could result in severe hemorrhaging. The embryo also eventually dies. Its demise is foreseen, but not intended.<sup>2</sup> The physician's action is directed at the pathological and harmful tissue, and not at the embryo. Medically, the use of methotrexate tends to be the preferred treatment because it does not involve surgery and leaves the woman's fertility intact. In light of Directive 48, the question is whether any of these procedures constitutes a direct abortion.

While the first approach results in the death of the embryo, nothing is done to bring about that death. There is no direct

abortion here; the embryo is simply permitted to die. Virtually all theologians agree that the second approach constitutes an indirect abortion (the procedure is aimed at removing a pathological organ and is necessary to save the life of the mother) and so is morally licit. The demise of the embryo is foreseen, but not intended. Among Catholic theologians and ethicists, there is disagreement regarding the third and fourth procedures. Some see them as a direct attack on the embryo and, so, a direct abortion,<sup>3</sup> while others see them as aimed at removing pathological tissue—the trophoblast—and, unavoidably and concomitantly the removal of the embryo. They judge this to be an indirect abortion.<sup>4</sup> *The magisterium has not resolved this controversy.* Hence, neither Church teaching nor the ERDs forbid the third or fourth approaches (so long as these approaches can legitimately be argued as not constituting direct abortions). Currently, both opinions are in play.

Hence, if some Catholic hospitals have policies that prohibit salpingostomy and the use of methotrexate, this is not because these procedures are forbidden by Church teaching or by the ERDs. Rather, it is because an individual or individuals decided either to take the safer course or personally believed that salpingostomy and the use of methotrexate constitute direct abortions and are, therefore, in conflict with Directives 48 and 45. However, given the on-going debate, it is permissible for Catholic hospitals to employ both the third and fourth approaches. As the editors of the National

Catholic Bioethics Center's *Catholic Health Care Ethics* note: "Resolution of this debate will depend on further specification of the exact nature of these medical procedures and further refinement of the arguments about the moral object of each act. Generally, if there are two competing but contrary bodies of theological opinion about a moral issue, each held by experts whose work is in accordance with the magisterium of the Church, and if there is no specific magisterial teaching on the issue that would resolve the matter, then the decision makers may licitly act on either opinion until such time that the magisterium has resolved the question."<sup>5</sup>

R.H.

#### Notes

<sup>1</sup> Albert S. Moraczewski, "Ectopic Pregnancy: B. Arguments in Favor of Salpingostomy and Methotrexate," in Edward J. Furton, et al., eds., *Catholic Health Care Ethics: A Manual for Practitioners*, Philadelphia, PA: The National Catholic Bioethics Center, 2009, p. 122.

<sup>2</sup> Ibid., p. 123.

<sup>3</sup> See, for example, William E. May, "Ectopic Pregnancy: A. Arguments against Salpingostomy and Methotrexate," in Edward J. Furton, et al., eds. *Catholic Health Care Ethics: A Manual for Practitioners*, Philadelphia, PA: The National Catholic Bioethics Center, 2009, pp. 119-121; Edward Furton, "The Direct Killing of the Innocent," *Ethics and Medics* 35, no. 10 (October 2010): 1-2.

<sup>4</sup> In addition to the article by Moraczewski cited above, see Germaine Grisez, *The Way of the Lord Jesus*, vol. 2, *Living A Christian Life* (Quincy, IL: Franciscan Press, 1993), pp. 499-503; Kevin O'Rourke, "Applying the Directives: The Ethical and Religious Directives Concerning Three Medical Situation Require Some Elucidation," *Health Progress* 79, no. 4 (July-August 1998): 64-66; Martin Rhonheimer, *Vital Conflicts in Medical Ethics: A Virtue Approach to Craniotomy and Tubal Pregnancies*, edited by William F. Murphy, Washington, D.C.: Catholic University of America Press, 2009, especially pp. 83-121.

<sup>5</sup> Edward J. Furton, et al., eds., *Catholic Health Care Ethics: A Manual for Practitioners*, Philadelphia, PA: The National Catholic Bioethics Center, 2009, p. 123.