

## Genetic Infidelity?

*To the Editor:* A study in the *Proceedings of the National Academy of Sciences* (PNAS) has reported a possible association between the genetic variant of a single gene to pair-bonding behavior in heterosexual men with women.<sup>1</sup>

It is well known that the hormone arginine vasopressin (AVP) plays a role in the monogamous behavior of some mammals (voles and other rodents). Now, the PNAS study tracks a variant (AVPR1A) of the vasopressin gene in 552 twin men regarding the quality of their marriage relationships (pair-bonding behavior). The study reports that men who were homozygous for the variant gene exhibit a double risk of marital crisis in comparison with their heterozygous cohorts. However, one of the quantitative instruments used—Partner Bonding Scale (PBS)—is a test that has been standardized in nonhuman primate social organization, but it is here used for the first time in humans. Even so, the categories are broad enough to be inclusive of human behavior. For example, PBS measures partner-specific affiliative interaction (e.g., play initiation), physical proximity comfort level, and intimate reciprocity between two individuals (e.g., kissing). If validated, this study will be the first one to correlate relational fidelity between a man and a woman down to a single gene.

From the ethical perspective, we maintain that the engagement of reason and will in the human are also essential elements of pair-bonding and marital fidelity. At most, then, one could conclude that some men—carriers of the AVPR1A variant—might have a lesser propensity for marital fidelity (interpreted as pair-bonding in this study). Similarly, it is known that certain ethnic groups might

have less tolerance for alcoholic beverages, which would not excuse inebriation.

It is interesting to note that the authors themselves concede that this study concludes nothing at the individual level, but rather, “by demonstrating a modest but significant influence of this gene on the studied behavior on the group level, we have provided support for the assumption that previous studies of the influence of the gene coding for V1aR on pair-bonding in voles are probably of relevance also for humans” (14155).

Another concern at the group or social level is that, in view of the increasing linkage between the human genome and propensities to an expanding number of physical and psychological predispositions, genetic diagnosis on the human embryo will continue to lead our society toward a eugenic mentality and practices.

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<sup>1</sup>Hasee Walum, “Genetic variation in the vasopressin receptor 1a gene (*AVPR1A*) associates with pair-bonding behavior in humans,” *Proceedings of the National Academy of Sciences* 105.37 (September 16, 2008): 14153–14156.

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## Non-Heart-Beating Organ Donation and Brain Death

*To the Editor:* Recently, several articles were published in the *New England Journal of Medicine* which address the issue of organ donation. One article was particularly interesting, written by Robert Truog and Franklin Miller and titled “The Dead Donor Rule and

Organ Transplantation" (*NEJM* 359.7 [2008]: 674–675). The authors argue that the so-called dead-donor rule should be abandoned. The argument essentially is as follows: traditional determinations of death are inadequate in terms of providing good evidence for death. In the case of brain death criteria, some claim that there are patients who give evidence of system-wide functioning even with a total absence of brain functioning. In the case of cardiopulmonary criteria, death is declared if the patient suffers the "irreversible" loss of cardiopulmonary functioning. However, the authors argue that in the case of non-heart-beating donation, if the heart can be restarted in the recipient's body, then the heart did not satisfy the "irreversible" criterion. The only way around this problem, they assert, is to define "irreversible" with reference to a decision not to attempt resuscitation on the donor. So on their interpretation of "irreversible," a patient satisfies irreversible cessation of cardiopulmonary functioning if the patient or the surrogate elect to withhold cardiopulmonary resuscitation (CPR) measures.

The authors assert that for both the brain death and non-heart-beating criteria, the ethical justification cannot be that the patients are really dead since, in their judgment, both fail to provide good evidence for death. "Brain dead" patients sometimes continue to give evidence of system-wide functioning. Non-heart-beating donors often do not satisfy the "irreversible" criterion understood in the sense that their hearts cannot be resuscitated. In many cases, they most certainly can be. The other way of interpreting "irreversible" is with reference to a decision by the patient or surrogate. If the patient (or surrogate for the patient) has made a decision not to be resuscitated, then when cardiopulmonary functioning ceases we should consider it irreversible. But this notion of irreversible does not capture our idea of death either, because it is based on a decision of the patient and not on the condition of the patient. Therefore, in the authors' judgments we already are killing patients to extract their organs. And if this practice is permissible, then why not expand the practice to include those who are in a persistent vegetative state or those who

are terminally ill? What is ethically relevant according to Truog and Miller is not whether the donors are dead, but whether they or their surrogates consent or decide to donate their organs. If so, then patients dependent on life support may, through a reliable surrogate or directly, elect to donate their organs even if such donation would in effect kill them. Summarizing this argument the authors state, "Whether death occurs as the result of ventilator withdrawal or organ procurement, the ethically relevant precondition is valid consent by the patient or surrogate" (675).

Truog and Miller offer some interesting reflections, and their argument raises important questions about how to interpret the term "irreversible" in the context of determining death by cardiopulmonary criteria. But their "solution" to the problem of how to interpret "irreversible" is, in the end, not a solution but a complete abandonment of the dead-donor rule. Clearly, this way out of the problem is really to dissolve it. What generates the ethical problem is that a just society would not endorse a policy which allows the killing of patients for their organs. By eliminating the dead-donor rule, Truog and Miller effectively undercut the reason for ethical concern in the first place. By so abandoning the dead donor rule, Truog and Miller recommend that it is permissible to kill patients for their organs so long as the patients consent to it. Obviously, we should resist this conclusion but at the same time thank Truog and Miller for pointing out a difficult issue regarding non-heart-beating organ donation.

How can this issue be resolved? It should be noted first that any determination of death should be based on the condition of the patient, not on what is technologically possible and not on a decision to withdraw life support. Neither way of articulating appropriate evidence for death will work, since death is a state of the *patient*. Knowing whether someone is dead requires knowing something about the patient's overall condition. Second, there is a distinction between what counts as good evidence for death, and what death means. The Catholic tradition considers death as the soul's separation from the body, and a person's soul is not some separate

ghost-like entity but a principle of organization. John Paul II tells us that death occurs “when the spiritual principle [the soul] which ensures the unity of the individual can no longer exercise its functions in and upon the organism, whose elements, left to themselves, disintegrate.”<sup>1</sup> The soul enables the organism to be an *organism*. Good evidence for death will be evidence that this separation has taken place in a given patient, and disintegration is key evidence.

With these points in mind we can ask, Is the irreversible cessation of cardiopulmonary functioning good evidence that someone is dead? And how should we interpret the term “irreversible”? The term “irreversible” must refer in part to whether the patient’s cardiopulmonary functioning is capable of *auto-resuscitation*. If a patient’s cardiopulmonary functioning loses the capacity for auto-resuscitation, this is evidence that the soul is not exercising its integrative function in the patient. Thus, we have good evidence that death has occurred if the patient’s cardiopulmonary functioning loses the capacity for auto-resuscitation.

Does this mean that a person who suffers an arrest and who *needs* CPR satisfies the “irreversible” criterion? Not necessarily. If the patient suffers an arrest due to a manageable infarction, for instance, then the heart itself remains capable of functioning and will function on its own once the infarction is bypassed. A better example may be an arrest due to drug use. We can expect that the heart functions fine without the drugs in the person’s system. Here, too, such a person would not satisfy the criterion of irreversibility even though the person may need CPR at the time of arrest. The heart retains the capacity to function on its own in some cases of an arrest, and in these cases does not satisfy the irreversible criterion.

In other cases of arrest, the heart does not retain this capacity. In the case of a non-heart-beating organ donor (NHBD), the donor requires ventilator support and in some cases pressure support. Such donors have, without exception, Do Not Resuscitate orders. If the ventilator is withdrawn, the donor’s cardiopulmonary functioning ceases and the heart

is not capable of functioning on its own—in *that patient*.<sup>2</sup> Once the heart or lung is transplanted in the recipient, however, cardiopulmonary functioning may return, but this is not evidence that the *donor* did not satisfy the “irreversible” criterion; rather, it is evidence that the recipient’s *soul* (i.e., the organizing principle) is still exercising its integrative functioning. After all, the donor and recipient differ in important ways. When life support is withdrawn from the donor, cardiopulmonary functioning ceases. When the heart or lung is transplanted into the recipient, cardiopulmonary functioning returns and is maintained. The best way to explain this asymmetry is that the donor’s soul, as the organizing principle, had departed, and the recipient’s soul remains. This asymmetry is not a counter-example to defining the “irreversible cessation of cardiopulmonary functioning” as the “incapacity to auto-resuscitate in patient X.” Again, any good evidence that death has occurred in a patient has to be tied to the condition of *that patient*, not to the condition of some other patient, not to what is technologically possible, and not to some decision by surrogates regarding transplant options.

Given what has been said, the irreversible cessation of cardiopulmonary functioning (understood as above) is good evidence that death has occurred in a given patient. Of course, we recommend along with the Institute of Medicine that in order to be morally certain that the cardiopulmonary functioning cannot auto-resuscitate, one must wait five minutes. Some centers only wait two minutes, but this may not be consistent with moral prudence. In the case cited by Truog and Miller, the transplant team based in Denver, Colorado, waited a mere seventy-five *seconds*. The donors and recipients were infants, and *no* evidence exists that an infant heart cannot auto-resuscitate in such a short time interval. If anything, we should expect younger hearts to be capable of longer intervals in which auto-resuscitation is possible. We applaud the bioethicists George Annas and Robert Veatch for repudiating the actions of the Denver team.

What about Truog and Miller’s comments on brain death? They claim that certain pa-

tients who satisfy whole-brain death manifest evidence of system-wide functioning (e.g., wound healing, and immunological defense). If so, is brain death good evidence for death? The answer to this question is yes, but to explain why requires making several distinctions.

First, there is a distinction between the persistent functioning of a *sub-system* (e.g., endocrine functioning) of a human being and the persistence of the *human being*. A human being may be dead and a sub-system may persist. Dead bodies may continue to grow hair and nails, and some bodies satisfying brain death criteria have certain larger sub-systems which continue to function, albeit under external support. Conversely, a sub-system may be “dead” or severely impaired, as in the cases of kidney failure or ventilator-dependent persons who otherwise are fully functioning. Such persons are fully alive. Consequently, to argue against brain death as an adequate determination of death, one must argue that in the setting of brain death the human being, not just a sub-system, still exists. Second, there is a distinction between sub-systems functioning, in a non-integrated manner, *because* of external life support and sub-systems functioning autonomously in an integrated manner with other sub-systems. Patients satisfying whole-brain death need external life support of some sort, typically ventilator support. Therefore, if the organism requires artificial life support due to permanent loss of the organism’s *own* ability to integrate and regulate vital functions, this is good evidence that the soul has departed that body. To admit that the body needs *external* support is just to admit that the body has lost its own resources to maintain vital functioning. This should be taken to be evidence for death, not life.

With these two distinctions in mind, I think it is clear that the persistent function-

ing of a sub-system requiring artificial life support does not indicate that a person is still alive. To see this clearly, consider an example from James Dubois.<sup>3</sup> Dubois has us consider a decapitated patient who arrives in the emergency department. Miraculously, the medical team succeeds in restoring cardio-pulmonary functioning with intensive life support. Is the decapitated patient a human being? Intuitively, we should say no. To say yes would reduce what it means to be a human being to a pitter-patter of disintegrated biological sub-systems.

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<sup>1</sup>John Paul II, “Discourse to the Participants of the Working Group,” in *Working Group on the Determination of Brain Death and Its Relationship to Human Death* (December 10–14, 1989), ed. R. J. White, H. Angstwurm, and I. Carrasco de Paula (Vatican City: Pontifical Academy of Sciences, 1992), xxv.

<sup>2</sup>In the analysis that follows, it is assumed that a non-heart-beating donor can donate the heart, but this is exceedingly rare for obvious reasons. The only cases we are aware of are cases of “uncontrolled” NHBBD. Uncontrolled donation typically involves a patient who arrives in the emergency department and for whom all efforts at resuscitation fail. Uncontrolled donors are typically young and are trauma victims. In rare cases, their hearts are capable of functioning in a person who has not experienced the same traumatic injuries. See Institute of Medicine, *Non-Heart-Beating Organ Transplantation: Medical and Ethical Issues in Procurement* (Washington D.C.: National Academies Press, 1997), 27ff.

<sup>3</sup>James DuBois, “Avoiding Common Pitfalls in the Determination of Death,” *National Catholic Bioethics Quarterly* 7.3 (Autumn 2007): 557. DuBois is commenting on the example as articulated in Kenneth V. Iserson, *Death to Dust: What Happens to Dead Bodies*, 2nd ed. (Tucson, AZ.: Galen Press, 2001), 19.