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# PVS--TO DIE OR NOT TO DIE?

# A COMPREHENSIVE ANALYSIS OF THE

# PERSISTENT VEGETATIVE STATE

JONNY KELLY

Becky and Joy were returning home from the blind dates they had been on that night. Becky's cousin had introduced the two girls to his two buddies from college.

The evening had started out nervously as the two girls anticipated meeting their dates, but when they saw the two guys standing next to Becky's cousin they knew a good time lay ahead. Becky's date was six feet tall, muscular, and had baby blue eyes. Joy's date was six feet three inches tall, brown hair, and a great build. Becky and Joy hit if off with the two guys immediately and everyone was at ease.

The night was filled with laughs and things were going well for Becky and Joy. They first went to dinner at a fancy restaurant. Joy was embarrassed, however, when she reached to pick up her glass full of water and tipped it over. Everyone laughed, including Joy, and the tension quickly left.

The couples left the restaurant and went to a night club to dance. Joy and Becky were having a great night and were starting to fall for their two dates. The two guys were true gentlemen and very attentive to Becky and Joy.

The evening ended with a kiss and future plans were made for another date with the guys. The two girls floated back to their car and headed for home. Becky normally would have buckled her seat belt, but in all the excitement she

forgot. Joy turned the car onto the secluded highway accelerating to cruising speed.

Joy and Becky were laughing and discussing the night's events. The two were going over every word and action the two guys had said or done. Joy looked down to select a tape to play. Unknown to Joy, her brief five second glance downward would change her life and Becky's forever. When Joy looked up the furthest thing from her mind immediately became all too vivid.

Becky let out a blood-curdling scream and Joy's foot slammed the break pedal to the floor. Joy's intentions were to no avail because the Geo Metro splattered into a tree. Becky was thrown from the car upon impact.

Luckily, about a mile behind, a car was approaching the fresh accident. This car, now fast approaching, screeched to a halt and Becky's cousin stepped out of the car. His gut was twisted in knots as he ran to the wreckage and saw the damage that had occurred.

He quickly stooped down to asses Becky's injuries and suddenly felt sick. Becky lay on her back, her legs were contorted under her, and blood was flowing profusely from her head. Becky's cousin quickly checked for a pulse, but there was none. He also noticed Becky was not breathing, and his EMT training took control. He started CPR and prayed out loud for help. Tears began to flow abundantly from his eyes.

Another car had stopped now and the driver yelled to Becky's cousin asking if they could help in any way. Becky's cousin told them to call for an ambulance quickly.

Before Becky arrived at the hospital the doctors had been informed of her injuries. They were aware that Becky was found unconscious, no heart beat, and not breathing. The doctors were most concerned about her severe head injury when she was wheeled through the emergency door. Becky's heart had been started again and she was breathing with the assistance of a physician using a manual ventilator.

Becky's parents arrived at the hospital hysterical. A physician stepped out of the emergency room and informed the parents that Becky was not expected to live. Becky, however, proved the physician's prediction to be wrong. She survived the night, and the next morning was transferred to a larger metropolitan hospital for extensive testing.

Becky was slowly weaned from the respirator and her condition seemed to stabilize. She still had a nasogastric feeding and hydrating tube to assist in her survival.

At four weeks, Becky seemed to 'wake up.' She would open her eyes and appear awake, but her eyes did not seem to focus on any particular object. Becky's parents tried faithfully to gain her attention, but Becky would not respond.

Test results concluded that massive damage had occurred to the cerebral hemispheres. Neurological experts,

familiar with this type of condition, were assigned her case. Becky's condition was eventually diagnosed as persistent vegetative state. Becky's parents were informed that her condition would not improve and she may live for years in her present state before death occurred.

What were Becky's parents to do? Joy had recovered from her injuries, but Becky was still lifeless. The doctors explained that Becky's brain had been severely damaged and only the lower portion of the brain remained functional. Her parents were confused! Was Becky alive, or was she dead? Was that still their daughter laying in the hospital bed, or had she long ceased to exist?

Throughout medical history, the basic determination of death has been constant. If a person were discovered unconscious, basic procedures were conducted to determine the victim's physical state. Someone, not always a physician, would feel for the pulse, listen for breathing, hold a mirror before the nose to test for condensation, and look to see if the pupils were fixed (President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1981).

The past procedures for the determination of death have had some loopholes and imperfections. Many recorded incidents in the eighteenth century of exhumed skeletons were found to have clawed at the coffin lids (President's Commission for the Study of Ethical Problems in Medicine and

Biomedical and Behavioral Research, 1981). These unlucky victims of death may have awakened from their sleep and clawed at the coffin, perhaps in a desperate attempt to escape their eternal bed. Claw marks on the coffin led to skepticism and apprehension of death. It is recorded that coffins were developed with elaborate escape mechanisms and speaking tubes to the world above, to help anyone who had awakened from death escape (President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1981).

There are other interesting accounts of corpses reviving during funerals. As a result of this phenomena, mortuaries employed guards to monitor the corpses and legislatures passed laws requiring a delay before burial (President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1981).

New technology of the nineteenth century brought peace to public fears. The invention of the stethoscope in the early nineteenth century allowed the physician to detect the absence of a heartbeat and gave them more confidence with the pronouncement of death on an individual.

The advent of the twentieth century has helped further solidify the definition of death. Complicated machines, such as the EKG (electrocardiograph), the EEG (electroencephalograph), CAT scans, and PET (positron

emission tomography) help in the determination of the cessation of life.

The advent of new technology, which stretches and bends the current definition of death, has caused mass confusion for the medical community and families of patients. The persistent vegetative state (PVS) is one such case which is hotly debated and pries into the grey areas of the current definition of death. It is widely accepted that life-sustaining treatments may be withdrawn when the burdens to the patient outweigh the benefits. PVS patients, however, push our commitment to this patient-centered standard to the limit (Wolf, 1988). Families are torn about what to do and the medical community has its hands up in the air as to the solutions.

PVS tests the traditional boundary between withdrawing life- sustaining treatment and assisted suicide or active euthanasia (Wolf, 1988). PVS patients usually die because of an underlying disease. Because these patients may live for years, the withdrawal of artificial nutrition and hydration tubes remains a controversial issue. Many professionals have considered these two elements, food and water, to be the basic substances of life. Upon removal of these essentials, society may have appeared to give up hope!

PVS patients raise challenging questions that society must confront. Modern technology has changed the rules on the diagnosis of death, and PVS patients challenge these

rules head on. Rules on who should be considered dead and who alive, rules governing treatment decisions, and rules on what we owe those lingering on the very edge of life (Wolf, 1988).

Perhaps a major part of the solution lies a careful delineation of terms. The medical community is often vague or inconsistent in the terminology circumventing PVS. If the medical profession persists in failing to understand these syndromes and continues using inconsistent and incorrect terminology, how can the rest of society begin to unravel the complexities of neurology and lay the foundation for a moral and legal analysis of the issues emanating from these neurologic conditions (Cranford, 1988)? A full understanding of the medical facts encompassing PVS is necessary before ethical and legal principles can be discussed. Similarities and differences between PVS and other syndromes will be determined and defined within this paper, which may help to abolish inconsistencies and unclarity.

The brain has traditionally been separated into three anatomical sections for simplification: the cerebrum; the cerebellum; and the brain stem, composed of the midbrain, the pons, and the medulla oblongata. Each anatomical section is responsible for important respective functions, which allows normal functioning.

The cerebrum, which includes the cerebral hemispheres and the cerebral cortexes, has traditionally been referred to as the 'higher brain' because it has primary control of consciousness, thought, memory, and feeling (President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1981). This is the center where emotions such as pleasure, pain, love, hate, joy, and anger are integrated and interpreted. Speech and language are also formulated in this region of the brain.

The cerebellum has traditionally been referred to as the 'mini brain.' Although the cerebral cortex, part of the cerebrum, initiates motor impulses, the cerebellum is responsible for coordinating and modulating these impulses into unconscious coordination of movement. This region also maintains posture, balance, and hand-eye coordination (Kaplan, 1990).

The brain stem has traditionally been called the 'lower brain.' It is located at the lower center of the brain and basically controls vegetative functions such as respiration and primitive stereotyped reflexes, such as the pupillary response to light. This anatomical region also contains the activating or arousal system for the entire brain called the ascending reticular activation system (Cranford, 1988). These arousal or activating functions would include respiration, swallowing, yawning, and sleep-wake cycles.

The differentiation of these three anatomical regions will help in the following diagnoses of three conditions: brain death; coma; and persistent vegetative state. The vegetative state has often been confused with the two other major categories of sustained and total loss of consciousness (Orentlicher, 1989).

Brain death occurs when higher cerebral functions cease. All brain stem functions are lost such as eye movements, pupillary response to light, and the most primitive protective reflexes such as the cough, gag, and swallowing, and spontaneous respiration (Cranford, 1988). Brain death is complete and irreversible (Adams, 1981).

The diagnosis of brain death is not difficult for a neurological specialist. Accepted criteria were established by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research in 1981. These standards outline clinical criteria and recommend specific confirmatory studies to aid in a diagnosis. These steps allow physicians the freedom of making a reliable diagnosis that is consistent with the current definition of death.

The Presidents Commission outlined three points to specifically distinguish brain death and added a fourth point to provide confirmatory data of the diagnosis. The first point addresses unreceptivity and unreponsitivity. There is a total unawareness to externally applied stimuli

and inner need and complete unresponsiveness. Even the most intensely painful stimuli evoke no vocal or other response, not even a groan, withdrawal of a limb, or quickening of respiration (Ad Hoc Committee of Harvard Medical School, 1968).

The second point involves no movements or breathing. Observations covering a period of at least one hour by physicians is adequate to satisfy the criteria of no spontaneous muscular movements, or spontaneous respiration, or response to stimuli such as pain. The respirator should be turned off for three minute intervals to determine total absence of spontaneous breathing (Ad Hoc Committee of the Harvard Medical School, 1968).

The third area deals with no reflexes. The pupil will be fixed and dilated and will not respond to a direct source of bright light. Ocular movement and blinking are absent. There is no evidence of postural activity. Swallowing, yawning, vocalization are in abeyance. Corneal and pharyngeal reflexes are absent. Tendon reflexes cannot be elicited (Ad Hoc Committee of the Harvard Medical School, 1968).

A flat electroencephalogram circumvents the fourth point. This test is of great confirmatory value. At least ten full minutes of recording are desirable, but twice that would be better (Ad Hoc committee of the Harvard Medical School, 1968).

All of the above tests shall be repeated at least twenty four hours later with no indication of change for a consistent and reliable diagnosis.

Since complete and irreversible damage has occurred to the brain, the brain is no longer able to regulate the body's vegetative functions, which include the functions of the heart, lungs, kidneys, and intestinal tract and certain reflex actions. Mechanical support, such as a respirator, can maintain a heartbeat in the patient who is brain dead temporarily, but only for a few days or occasionally for a few weeks (Plum, 1982).

Many definitions exist of coma, and the medical community may be confused with conflicting terminology. Coma is an intermediate between brain death and the persistent vegetative state. The brain stem retains some function of activity, but not the range of activity seen in the vegetative state (Orentlicher, 1989). It is a state of sleep-like (eyes closed) unarousability due to extensive damage to the reticular activating system of the brain. Patients often have impaired cough, gag, and swallowing reflexes (Cranford, 1988). Coma rarely lasts more than two to four weeks, by which time the patent either dies, enters a vegetative state, or regains some degree of consciousness (Orentlicher, 1989).

These patients are the cases that cause widespread fascination with stories of people reviving after long

periods of time, often contrary to predictions by physicians. A study in the Annals of Internal Medicine in 1981 showed that the longer a coma lasted, the less were the chances of regaining independent function. Only one patient who survived in coma for a week achieved a good recovery within a year. Good recovery implied the ability to resume a normal life.

After trauma or lack of oxygen flow, the patient may fall into a coma state that will last for days or weeks. This transient coma results from a temporary dysfunction of the brain stem, which is not totally immune to the effects of hypoxic-ischemic injury (Cranford, 1988). The patient will awaken or evolve into a condition of PVS.

PVS is not coma. PVS patients have a relatively normal brain-stem function (Plum, 1982). These patients can breathe, digest food, and produce urine without any assistance (Orentlicher, 1989). The major damage to these patients has occurred in the cerebral hemispheres. This condition often is a result of cardiac arrest or major trauma to the cerebral hemispheres. Lack of oxygen or intracranial pressure cause deprivation of oxygen, glucose, and blood to the cerebral cortex, which requires metabolic rate. The brain stem is spared, however, because it is fairly resistant to lack of these vital fluids.

The PVS syndrome is characterized by many symptoms. Patients experience cycles of sleeping, in which their eyes

are closed, and waking, in which their eyes are open (Doughery, Rawlinson, Plum, 1981). The eyes wander, but without sustained visual pursuit, and the pupils respond to light.

PVS patients are completely unconscious, that is completely unaware of him or herself or the surrounding environment (Plum, 1972). Voluntary reactions or behavioral responses reflecting consciousness, volition, or emotion at the cerebral cortical level are absent (Cranford, 1988).

PVS patients require vigorous therapeutic efforts initially such as a respirator, but technology is usually unnecessary within a few days or weeks. The diagnosis of a persistent vegetative state can be made with a reasonably high degree of medical certainty (American Academy of Neurology, 1989). The degree of certainty about the diagnosis of this syndrome is less absolute than a diagnosis of brain death (Cranford, 1988). The PVS condition currently has no broadly accepted published set of medical criteria, such as brain death, to assure certainty of the diagnosis.

There currently are no laboratory studies to assist in the clinical diagnosis of PVS. Time seems one of the physicians' greatest tools in the diagnosis of PVS. Some experts would not characterize a vegetative state as persistent until it has lasted for one year (Berrol, 1986). After a period of time, weeks to months, MRI and CAT scans

will show massive damage to the cerebral hemispheres. Perhaps the best test is the PET (positron emission tomography) scan. This test measures in a quantitative fashion the metabolic rates of glucose and oxygen in various parts of the brain, including the cerebral cortex, an important index since consciousness cannot be sustained below certain quantifiable levels of metabolism (Cranford, 1988). Recent data utilizing positron emission tomography indicates that the metabolic rate for glucose in the cerebral cortex is greatly reduced in persistent vegetative state patients, to a degree incompatible with consciousness (American Academy of Neurology, 1989).

An interesting occurrence has been found consistently in all persistent vegetative state patients. In all PVS patients studied to date, postmortem examination reveals overwhelming bilateral damage to the cerebral hemispheres to a degree incompatible with consciousness or the capacity to experience suffering (American Academy of Neurology, 1989). These findings obviously do not help in diagnosing PVS, but it does confirm the theory of the extent of damage to the cerebral hemispheres. These studies also may support the American Academy of Neurology's position on the state of PVS patients. They state PVS patients do not have the capacity to experience suffering. Suffering is an attribute of consciousness requiring cerebral cortical functioning,

and patients who are permanently and completely unconscious cannot experience these symptoms (1989).

An EEG (electroencephalogram) does not provide absolute certainty in the diagnosis of a vegetative state. A wide degree of variability in cases causes some confusion. Some EEG tests appear normal, considering the extent of damage to the cerebral hemispheres. In a small percentage, probably less than five percent, of persistent vegetative cases, the EEG will display no electrical activity whatsoever, that is, electrocerebral silence, as in brain death (Cranford, 1988). It is possible for a patient who experiences sleep/wake cycles, with eyes movements during the waking cycle, to exhibit a flat EEG.

The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, in 1983, outlined four conditions that are not to be considered a PVS case. The first scenario are those cases which are unresponsive after brain injury, or hypoxia, and which do not recover sufficient brain stem functioning to stabilize into a vegetative state. It has been found that most of these cases die within a few weeks after the brain damage has occurred. These cases are probably many, since more than half the individuals for whom cardiac resuscitation is initially successful, die without recovering consciousness, most in the first few days.

The second group results from degenerative neurologic conditions such as Jakob-Creutzfeldt disease and severe Alzheimer's disease. This state is often referred to as dementia where progressive cerebral cortical functions are lost. In the final stages of these diseases, complete unconsciousness occurs, after which the life span of the patient is only a few weeks. In PVS catastrophic injury results in a complete loss of cerebral cortical functions over a period of minutes. Patients in a persistent vegetative state are not simply demented, but amented (Cranford, 1988).

The third condition of permanent unconsciousness is in cases of intracranial mass lesions from neoplasms or vascular masses. Many cases of lesions or neoplasms can be corrected, and patients might have restoration of some consciousness. In those cases of no available effective therapy, the patient usually survives for a few days or weeks.

The fourth source of permanent unconsciousness is in cases involving congenital hypoplasia of the central nervous system. Many cases are caused by abnormalities of the cranium at birth, but some appear normal physiognomically. Most babies whose anencephaly precludes development of any consciousness die within a few days of birth, and none survive for more than a few months.

Prognosis of patients in a vegetative state depends on a number of factors, primarily the cause and duration of the condition, as well as the extent of brain-stem function detected in the early period after the injury (Orentlicher, 1989). It is not uncommon for patients in a persistent vegetative state to survive long periods such as five, ten, and twenty years. The longest case of PVS on record is that of Elaine Esposito, who never recovered consciousness after receiving general anesthesia for surgery on August 6, 1941. She died thirty seven years and one hundred eleven days later (Cranford, 1988). The most commonly cited estimate of PVS patients in the United States is gathered from highly unscientific data. An estimate of between 5,000 and 10,000 patients at one time in the United States is based on epidemiological studies from Japan. These studies showed approximately 2,000 to 3,000 patients in this condition in that country, and an extrapolation of this data to the United States, taking into account both a doubling in population and our more advanced life support systems. There has been no quantitative study done nationally, in the United States, of persistent vegetative state patients.

A study appeared in the Archives of Internal Medicine, in the May 1991 issue, confronting the topic of "Clinical Characteristics of Patients in the Persistent Vegetative State." In this study, fifty-one patients from four Milwaukee, Wisconsin nursing homes were identified as being

in a PVS state. This represented about 3 percent of the total patients in these nursing homes. The study found the mean age of the patients was 64.8 plus or minus 3.2 years, with a range between nineteen to ninety-six years old. The mean duration of the PVS condition was 3.3 plus or minus 5.0 years, with a range between 1.0 to 16.8 years duration. Thirteen patients were found to have been in a PVS state longer than five years.

This study revealed that thirty-two of the cases, about 63 percent, were caused by cerebrovascular accidents. In the younger patients; cerebral trauma, secondary to motor vehicle accidents, was the most common cause of their PVS state.

An interesting part of this study showed that all fifty-one patients were fed via tube feeding and thirty-five patients had urinary catheters, or about 75 percent. All fifty-one patients were receiving daily medications, and greater than 50 percent were prescribed vitamins. A fascinating fact revealed that antipsychotic agents were prescribed in fourteen cases of PVS. This seems to be a clear contradiction to a diagnosis of PVS and the statements the American Academy of Neurology has issued. If PVS patients are incapable of suffering and unaware of their surroundings, these drugs seem wastefully prescribed.

Transfer patients to an acute hospital of were found to be common. Thirty-one patients, about 61 percent, had

required sixty-three acute-care hospitalizations during their stay in the nursing homes. Infections were the main cause of acute hospitalization, but fifteen of the patients were hospitalized for surgical procedures. These surgical procedures varied from surgery for fractures to cardiac pacemaker-generator replacement.

Only twenty-seven patients, about 53 percent, had a specific resuscitation status designation in the medical chart. It was interesting to note neither presence of a chart designation nor specific resuscitation order was related to the patient's age or the cause or duration of PVS. Of the twenty-seven patients who had a specific resuscitation status designation, 93 percent were labeled "no code".

The persistent vegetative state is not prevalent numbers as indicated by the study above. Other studies of this condition show how rare it is in the United States.

In the Annals of Internal Medicine, 1983, a study of "Neurologic Recovery After Out of Hospital Cardiac Arrest" showed PVS is not high in number of cases. In this study, 459 consecutive patients resuscitated and admitted to teaching hospitals over a period of ten years were studied. This study found 180 patients who did not awaken and died, had a median survival of 3.5 days. It was found the longer a patient survived without awakening, the smaller the probability of ever awakening, and awakening without

defects. Eight patients survived beyond sixty days, and one patient beyond five years.

Another study that appeared in the Annals of Internal Medicine, in 1981, emphasized "Prognosis in Nontraumatic Coma." This study conducted serial neurologic examinations on 500 patients in nontraumatic coma. It showed eighty-one patients either died, without recovery from coma, about 61 percent, or never improved beyond a vegetative state, about 12 percent, or regained consciousness, but remained dependent on others for daily activities, about 11 percent. It was found that eighty-two patients survived to three months, sixty-five patients survived to six months, and sixty patients survived in a PVS state to one year. A follow-up study was not conducted on the PVS patients after one year of survival.

Perhaps one of the most widely known cases of PVS in the United States involved Karen Ann Quinlan, a New Jersey resident. On the night of April 15, 1975, for reasons still unclear, Karen stopped breathing for at least two fifteen-minute intervals. She was administered ineffective mouth-to-mouth resuscitation from friends who were present. She was transported, by ambulance, to Newton Memorial Hospital. At this hospital her temperature was found to be slightly over 100 degrees, her pupils were unreactive, and she was unresponsive, even to deep pain. Unfortunately, her medical

history, taken at the time of her admission to the hospital, was incomplete and vague.

After three days, Dr. Morse, a neurology specialist, took over her case. He found her comatose, with evidence of decortication. This condition is characteristic of the brain causing a physical posture in which the upper extremities are flexed and lower extremities are extended. This condition is caused by the derangement of the cortex of the brain.

Dr. Morse determined prolonged lack of oxygen in the bloodstream, or anoxia, was the cause of her condition. After she was transferred to Saint Clare's Hospital she was still unconscious, on a respirator, and a tracheotomy had been performed. Dr. Morse conducted extensive neurological tests on Karen. An EEG was performed and the result was abnormal, but showed some brain activity. Other significant tests, such as brain scans, an angiogram, and a lumbar puncture were all normal considering her condition.

Karen was originally in a sleep-like unresponsive condition, but soon advanced into a sleep-wake cycle. During periods of awake, she would cry out violently and also blink her eyes, but was totally unaware of her surroundings or anyone present.

Dr. Morse, and other experts brought in to evaluate her case, determined she did not meet the current definition of death identified by the Ad Hoc Committee of Harvard Medical

School report. The doctors concluded that Karen met none of the criteria specified in that report and was therefore not brain dead its (New Jersey Reports, 1976).

It was determined to continue the use of the respirator that was keeping Karen alive. An attempt to wean her from the respirator failed. It was conceded that removal of the respirator would not conform to medical practices, standards, and traditions.

Karen's parents took this case to court and a landmark decision was reached giving judicial sanction for the removal of her ventilator support. The court stated:

> 'Upon the concurrence of the guardian and family of Karen, should the responsible attending physicians conclude that there is no reasonable possibility of Karen's ever emerging from her present comatose condition to a cognitive, sapient state and the life-support apparatus now being administered to Karen should be discontinued, they shall consult with the hospital "Ethics Committee" or like body of the institution in which Karen is then hospitalized. If that consultative body agrees that there is no reasonable possibility of Karen's ever emerging from her present comatose condition to a cognitive, sapient state, the present life-support system may be withdrawn and said action shall be without any civil or criminal liability therefore on the part of any participant, whether guardian, physician, hospital, or others (New Jersey Reports, 1976).

As a result of Karen Ann Quinlan's case, fifty courts in sixteen states have considered issues surrounding the termination of life-sustaining treatment. These sixteen states include: Arizona, California, Colorado, Connecticut,

Delaware, Florida, Georgia, Louisiana, Maine, Massachusetts, Minnesota, New Jersey, New York, Ohio, Pennsylvania, and Washington (Murphy, 1990). Nearly all states ruled that the individual's constitutional right to privacy limited the power of government to control treatment. Judicial opinion generally has tended to support the decisions of competent adults and the families of incompetent adults to discontinue life-sustaining treatment if there was little chance of recovery. One case, however, involving a girl name Nancy Cruzan, pushed the judicial system to the limit.

At 12:54 a.m. on January 11, 1983, the Missouri highway patrol was called to the scene of a single car accident. The highway patrolmen arrived at about 1:00 a.m., about six minutes after the reception of the emergency call. They found Nancy Cruzan lying face down in a ditch thirty-five feet from her overturned car. The patrolmen quickly assessed Nancy's condition and found she was not breathing and had no pulse. At approximately 1:09 a.m. paramedics arrived on the scene and began cardiopulmonary resuscitation. At approximately 1:12 a.m. spontaneous respirations and cardiac function were restored.

Nancy was immediately transported to a hospital, after which she had an exploratory laparotomy. This exploratory surgery showed a lacerated liver. A CAT scan of her brain revealed no significant abnormalities. Her physician, however, diagnosed a probable cerebral contusion, compounded

by significant anoxia of unknown duration. The highway patrolmen arrived at the scene at 1:00 a.m., but Nancy was not revived by the paramedics until 1:12 a.m., about twelve minutes later. She, therefore, was in a state of anoxia for at least twelve minutes, probably longer because the call came in at 12:54 a.m.

Nancy remained in a coma for three weeks following her near- fatal accident. During this three-week period she showed very slight improvement. She was able to take nutrition orally, but to ease feeding and at the consent of Nancy's husband, a gastrostomy tube was inserted on February 7, 1983. The insertion of this tube, however, did not promote recovery and efforts to rehabilitate Nancy were to no avail.

Nancy's doctors diagnosed her condition as PVS. Nancy remained oblivious to her environment except for reflexive responses to sound and perhaps painful stimuli. Her brain scans revealed massive enlargement of the ventricles. Cerebral spinal fluid had filled the area where the brain had degenerated. The doctors determined her cerebral cortical atrophy was extensive and irreversible. Nancy's extremities were permanently contracted and she was a spastic quadriplegic.

The tube feedings were the issue in Nancy's case. The gastro tubes kept her body full of nutrients and

functioning. The feeding tubes could not, however, reverse her persistent vegetative state.

Nancy's parents believed she did not want to be forced to stay in the state she was in. Before her accident, Nancy had related to a roommate that she did not want to live like a vegetable. Nancy's parents requested court permission to stop the artificial feeding in 1987 because the hospital would not cease the feeding without a court order.

The judge granted the parent's petition to remove the feeding tubes after listening to the case. The judge heard the testimony of Nancy's roommate that she would not want to continue her life unless she could live halfway normal. With other evidence, the judge concluded Nancy would not want to continue with nutrition and hydration and that her constitutional right to liberty outweighed any state's interest in preserving life or preventing suicide (Murphy, 1990).

The attorney general for the state of Missouri disagreed with the court's decision and appealed it to the Missouri Supreme Court. The Missouri Supreme Court overturned the lower court's decision by a majority vote of four to three. The court held that the family in this situation was not entitled to order the termination of Nancy's medical treatment. The court chose to error on the side of life, respecting the rights of incompetent persons who may wish to live despite a severely diminished quality

of life (Cruzan v Harmon, 1988). This decision was appealed to the United States Supreme Court and the decision was upheld. The Supreme Court held that Nancy had a right to life and her family did not have the right to make a choice for her.

PVS patients foster many ethical questions that raise fundamental moral conflicts over basic principles. Should these patients be considered dead? Should all medical care be withdrawn and the patients be allowed to die? If we allow these patients to die, what ramifications lay ahead in other related conditions?

In response to these concerns and questions, the American Academy of Neurology issued their report on certain aspects of the care and management of the persistent vegetative state patient. The Academy initially set some basic guidelines concerning PVS. The Academy recognized that the decision to discontinue the artificial provisions of fluid and nutrition may have symbolic and emotional significance for the parties involved and for society. Nevertheless, the decision to discontinue this type of treatment should be made in the same manner as other medical decisions, ie, based on a careful evaluation of the patient's diagnosis and prognosis, the prospective benefits and burdens of the treatment, and the stated preferences of the patient and family (1989).

In conjunction with respecting a patient's right to self-determination, a physician must also attempt to promote the patient's well-being, either by relieving suffering or addressing or reversing a pathological process. Where medical treatment fails to promote a patient's well-being, there is no longer an ethical obligation to provide it (American Academy of Neurology, 1989). Treatments that provide no benefit to the patient or the family may be discontinued. Medical treatments that offer some hope for recovery should be distinguished from treatment that merely prolongs or suspends the dying process without providing any possible cure. Medical treatment provides no benefit to patients in a persistent vegetative state, once the diagnosis has been established to a high degree of medical certainty (American Academy of Neurology, 1989).

The artificial provision of nutrition and hydration is analogous to other forms of life-sustaining treatment, such as the use of a respirator. The administration of fluids and nutrition by medical means, such as a G-tube, is a medical procedure (American Academy of Neurology, 1989).

The Academy further elucidates that when a patient has been reliably diagnosed as being in a persistent vegetative state, and when it is clear that the patient would not want further medical treatment, and the family agrees with the patient, all further medical treatment, including the

artificial provision of nutrition and hydration, may be foregone (1989).

One of the last interesting points brought out by the Academy relates to the distinction between withholding and withdrawal of medical treatment. They state that a major medical or ethical distinction between the withholding and withdrawal of medical treatment belies common sense and good medical practice, and is inconsistent with prevailing medical, ethical and legal principles (1989).

The Academy has taken a bold stand and disclosed many interesting points. Many times when an ethical issue is debated in the ring of philosophy, there is an immediate exoneration of possible ramifications in other cases. This technique, perhaps, follows a slippery slope dogma and must not be applied to the PVS cases. Perhaps every medical case should be treated differently in ethical terms. A physician does not treat measles the same as a heart attack. The same may hold true in the PVS ethical issue. PVS patients should not be lumped into categories of Alzheimer's disease, severely retarded children, or other conditions, as has been pointed out previously by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical Research. These cases may have some similarities, but should be treated separately ethically, just as they are treated separately medically. The circumstances surrounding PVS are completely separate from other conditions, and are

perhaps completely separate in ethical terms. For instance, in Alzheimer's disease the individual is disorientated and confused. They may even have the mentality of a two year old, or a severe mentally handicap patient, but the point is that they do retain some small fraction of cognition. In the PVS cases, the patients do not have the ability of cognition, nor will they ever have this capability.

Many ethical arguments have been made relating to PVS, both for and against the withdrawal of treatment. One argument, by David Wikler, involves the laymen in a provocative cognitive experiment. Consider this thought experiment: a man is decapitated and physicians are able to keep both the head and the body functioning more or less as normal. They cannot, however, reconnect them. Which is the patient (Wikler, 1988)?

When answering this stimulating question you most likely would not say both the head and body were the patient. I conducted a very informal survey of this scenario and found that everyone responded that the head was the person. The body, although still living, could not be considered to be the person. The majority who read this thought experiment may agree the head is the patient.

The correlation to the PVS state may be direct in this thought experiment. The conditions, however, must be altered in order for the experiment to work. In PVS, the higher brain functions are completely lost and the body

survives. When asked again which is the patient, it is hard to choose the body. Although brain and body remain physically intact, they are functionally severed. If the brain is severely damaged in higher cognitive functions, perhaps the patient may be considered dead and treatment should cease. If treatment continues, only the body is benefitted, and this is clearly not the patient.

This argument has some serious loopholes. The term 'person' or 'patient' seems very abstract and hard to concretely define in agreeable terms. Person is not a biological concept, but rather a concept defined in terms of certain kinds of abilities and qualities. It is inherently vague (Culver & Gert, 1982). When you consider what exactly constitutes a person, many problems arise. Is it speech, cognitive ability, humor, consciousness, or genuineness that make up a person? A complete list of agreeable terms may be difficult to formulate. We must not confuse the death of an organism, which was a person, with an organism's ceasing to be a person (Culver & Gert, 1982).

Perhaps a sounder argument can be made referring to a biological reasoning of PVS. There is overwhelming evidence that damage to the cerebral hemispheres has occurred in PVS patients. In all PVS patients studied to date, postmortem examinations have revealed overwhelming bilateral damage to the cerebral hemispheres to a degree incompatible with consciousness, or the capacity to experience suffering

(American Academy of Neurology, 1989). Although postmortem evaluations do not help a living PVS patient, it does provide more certainty for proper diagnosis and understanding of PVS. The single best current test utilizes the positron emission tomography for the diagnosis of PVS. This test indicates that the metabolic rate for glucose in the cerebral cortex is greatly reduced in PVS patients to a degree incompatible with consciousness (American Academy of Neurology, 1989).

If the cerebral hemispheres have been severely damaged and suffering is not possible for the patient, any treatment given may fail to promote well-being. Well-being may relate to the American Academy of Neurology's statement of either relieving suffering of addressing or reversing a pathological process (1989). The PVS patient has no hope of any type of recovery or even a slight improvement. These patients cannot, and never will, be able to experience any of the events occurring in the world or in their bodies. This requires the higher cognitive functions which have been severely damaged in a PVS patient. When the diagnosis is exceedingly clear, we sustain their lives vigorously mainly for their loved ones and the community at large (Lynn & Childress, 1983).

If no possible benefit lay ahead for a PVS patient, whether medically or personally, then perhaps the withdrawal of all fluids and nutrition should occur. Usually the

withholding of fluids and nutrition will result in death within one to thirty days. If given adequate nursing care during this withdrawal, including good oral hygiene, PVS patients will not manifest the horrible signs ascribed to this process by some, nor will they experience consciously any symptoms (Cranford, 1988).

The withdrawal of nutrition and hydrating tubes should not be considered barbaric or uncaring. Withdrawal of nutrition and hydrating tubes cannot be considered active euthanasia. These treatments are medical procedures as recognized by the American Academy of Neurology. If one follows common sense, as suggested by the Academy, then withdrawal of these essential elements may provide more good than harm.

Food and water are considered the basic elements of life, and withholding them may seem inhumane, but air and blood are also essential elements for survival. We, as a society, withhold air and blood by turning off respirators. The only difference between a brain dead patient and a PVS patient may be the time of death permitted. They both will die, it is only a matter of time. The brain dead patient has the respirator turned off and is allowed to die. The PVS patient should be allowed the same respect and have the nutrition and hydrating tubes removed.

Physicians may agree with the diagnosis of PVS and understand that no benefit lay ahead for the patient and

still refuse to allow a choice to forego food and fluids. They may view that option as a death sentence, and it may be hard to distinguish from other forms of medical therapy. There are appropriate cases that parallel to nutrition and hydrating tubes. Dialysis in a patient without kidney function or transfusions in a patient with severe aplastic anemia are obvious examples. The dying that awaits such patients often is not greatly different from dying of dehydration and malnutrition (Lynn and Childress, 1983).

Society, families, and the medical profession perhaps should step back and view the PVS patient in a broad sense. No benefits seem to exist for the continued treatment of a PVS patient. Again, benefits may relate to the relieving of suffering or addressing or reversing a pathological process. PVS patients cannot suffer, and any treatment given will not reverse their condition. Food and water may sustain the patient, but they do not reverse the condition.

Becky's life, in a PVS state, was confusing to her parents. They did not know which way to turn for answers. After studying about PVS, the parents concluded that it was in Becky's best interest, society's best interest, and the medical profession's best interest to allow Becky to die. Shouldn't we all also conclude the same?

## References


President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, "Defining Death", 1981:13-20.

Wolf, Susan M., "The Persistent Problem of PVS", Hastings Center Report, Feb/Mar, 1988:26.

Cranford, Ronald E., "The Persisten Vegetative STate: The Medical Reality (Getting the Facts Straight)," Hastings Center Report, Feb/Mar, 1988:27-32.

"Prognosis in Nontraumatic Coma," Annals of Internal Medicine, March, 1981;94:293-301.

"Position of the American Academy of Neurology on certain aspects of the care and management of the persistent vegetative state patient," Neurology, 1989;39:125-126.

Culvert, Charles and Gert, Bernard, "The Definition and Criterion of Death", Philosophy in Medicine, Oxford University Press, Inc., 1982.

Wikler, Daniel, "The Definition of Death and Persistent Vegetative State," Hastings Center Report, Feb/Mar, 1988;18:44-47.

Lynn, Joanne and Childress, James F., "Must Patients Alway Be Given Food and Water?", Hastings Center Report, October, 1983;13:17-21.

Ad Hoc Committe of the Harvard Medical School, "A Definition of Irreversible Coma," Journal of the American Medical Association, August, 1968;205;6:337-340.

Plum, Jennett B. and F., "Persitent Vegetative State After Brain Damage," The Lancet, April, 1972;1:734-737.

"Neurlogic Recovery After Out of Hospital Cardiac Arrest," Annals of Internal Medicine, 1983;98(part 1):588-592.

"Clinical Characteristics of Patients in the Persistent Vegetative State," Archives of Internal Medicine, May 1991;151:930-932.

Adams, R.D., Principles of Neurology, McGraw Hill International Book Co., 1981:234

Plum, F., The Diagnosis of Stupor and Coma, FA Davis Co Publishers, 1982

Berrol, S., "Evolution and the persistent vegetative state," Journal of Head Trauma Rehabilitation, 1986;1:7-13

Orentlicher, David, "Cruzan v Director of Missouri Department of Health: An Ethical and Legal Perspective," Journal of American Medical Association, November 24, 1989;262;20:2928-2930

Dougherty JH Jr, Rawlinson D, Levy DE, Plum F., "Hypoxic-ischemic brain injury and the vegetative state," Neurology, 1981;31

"In the Matter of Karen Quinlan, an Alleged Incompetent," New Jersey Reports, March 31, 1976

Murphy, Ellen K., "US Supreme Court to hear firs right to die case," AORN Journal, May, 1990;51;5:1391-1394