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# Organ donors: Your care is critical

*Transplantation is the sole hope for many patients with end stage organ failure. You can help them—by identifying donor patients early and keeping their organs viable.*

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Every day, more than 50,000 Americans awaiting an organ transplant wake up hoping to receive the phone call that may save their lives.<sup>1</sup> For more than half of them, that call never comes.

Of the roughly 14,000 potential organ donors annually, only some 4,500 actually become donors.<sup>2</sup> They provide 18,000 patients—about 40% of those on the organ transplant waiting list—with the chance for a new life.

Increasing the supply of transplantable organs requires the expertise, sensitivity, and close cooperation of hospital staff and local organ procurement organizations (OPOs). Nurses may be involved in any or all of phases of the donation process—from identification of the potential donor to organ recovery. But they play an especially important role in one phase—management of the donor patient.

Many staff nurses don't realize that they need to provide the same general nursing care, intense monitoring, and timely interventions to the donor as they do to a critically ill patient. That is because the physiological changes that fol-

low brain death can make the donor hemodynamically unstable and quickly jeopardize organ viability.

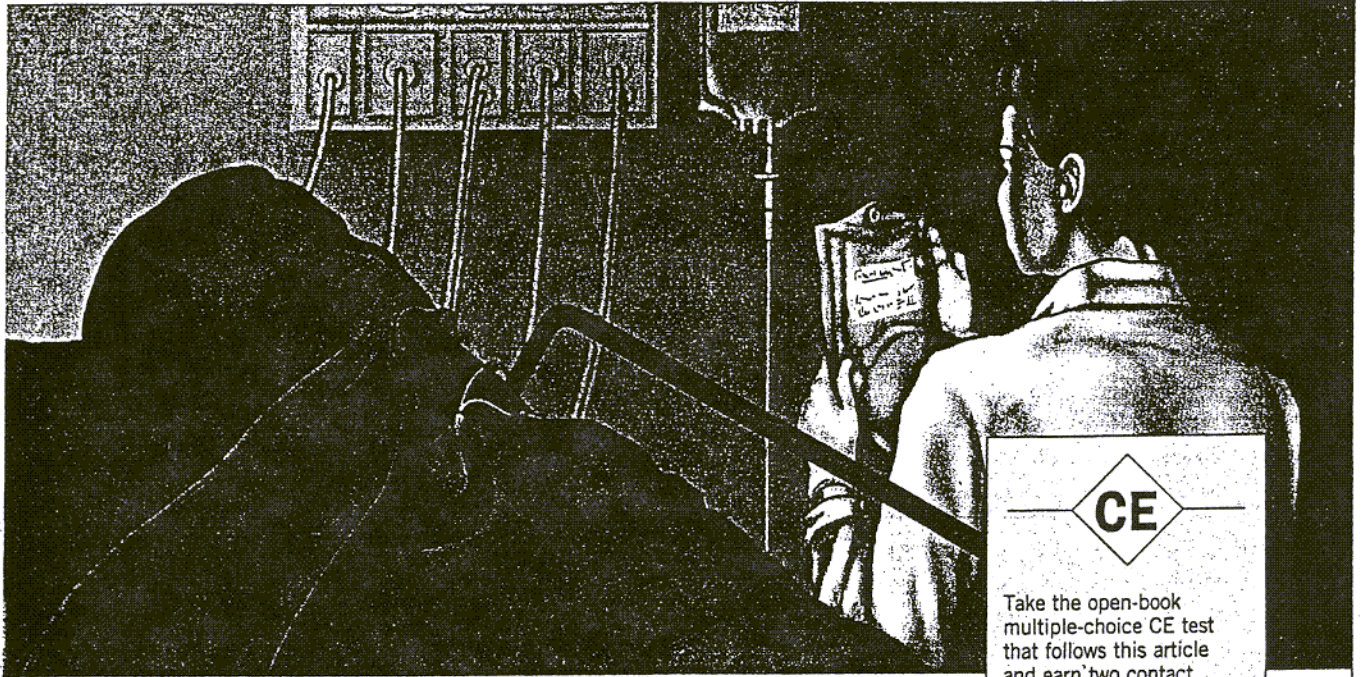
## Who is considered a potential donor?

Any patient who no longer has neurological function but still has cardiopulmonary function is a prospective organ and tissue donor. A patient without cardiopulmonary function can still donate tissues, but loss of perfusion makes it impossible to transplant organs from such a patient. (The box on page 49 lists transplantable organs and tissues.)

Neurologic injury that leads to brain death—defined as the complete loss of cortical and brain stem function—most often results from head trauma, cerebrovascular accidents, brain tumors, and conditions that cause cerebral anoxia, such as drowning, smoke inhalation, or prolonged cardiac arrest.

Identifying patients like these early is the first step in the organ donation process. Doing so allows you to alert the OPO to the possibility that a donor candidate exists.<sup>3</sup> The earlier you contact the OPO,





**CE**

Take the open-book multiple-choice CE test that follows this article and earn two contact hours from the RNAUHS Home Study Program. You should be able to:

1. Formulate a plan of care for organ donor patients.
2. Describe interventions designed to preserve the function of organs for potential donation.
3. Identify strategies to enhance organ donation.

Other CE options are explained on page 45.

the greater the likelihood that a patient will become an organ donor.

The OPO, along with local transplant centers, decides whether a patient is a suitable donor. The criteria they use to make this determination has changed over time, largely to broaden the donor pool.

For instance, whereas once most donors were under age 45, today about half are older—organs have even been transplanted from donors in their 80s.<sup>4</sup> Organs are also now recovered from donors with diabetes, hypertension, or hepatitis.

The emphasis today is placed on the physiological function of each of the potential donor's organs and the degree of illness of those on the transplant waiting list—not on a list of criteria that's followed blindly. In fact, there are currently only two real contraindications to donation: a positive HIV status and metastatic cancer.

### **Approaching the family: A two-step process**

A 1993 Gallup Poll showed that nearly 85% of Americans strongly favor donation and almost 70%

would like to donate their own organs.<sup>5</sup> Yet only about half of all next of kin consent to donation when asked.

Besides the existence of signed donor cards, advance directives, and driver's license designations, three critical factors influence a family's decision: the timing of the request, the place where the family is approached, and the person making the request.

Proper timing alone can increase the consent rate to as much as 60%.<sup>6</sup> In fact, the "request" should be handled in a two-step process; your participation is critical in the first step—making sure the family understands that the patient is dead. They need time to assimilate and accept this devastating news before they can make any sort of decision.

Many families have trouble understanding the concept of brain death—especially when their loved one still has a heartbeat, his chest wall is moving as a result of mechanical ventilation, and his skin is warm. You can help them understand by describing brain death—and the often long, test-

filled process that must be fulfilled before it's declared—using simple terms, not medical terminology. Using visual aids such as diagrams or confirmatory test results may also be useful.

You should begin this explanatory process at the time you contact the OPO about the possibility that a donor may become available. That way, you're setting the stage for a request for organ donation while the OPO is evaluating the patient to determine if he's a suitable candidate for donation. (You'll find a list of all the tests required for a complete evaluation in the box on page 50.) If he is a can-



didate, the actual donation request can be made to a family who already fully understands the concept of brain death and has come to terms with the fact that their loved one is dead.

The donation request is best handled by the transplant coordinator, who's trained in just the right language and has handled many of these situations. If, for whatever reason, you have to handle the request, never question the family about organ donation at the bedside. Bring them to a private comfortable area—a room or a hospital chapel—that allows them to think more clearly and you to communicate without interruption.

Consent is most likely if the transplant coordinator, in collaboration with the hospital staff, makes the primary request for donation. Physicians, nurses, social workers, or chaplains who have developed a rapport with the family are helpful throughout the process to field questions and provide moral support.<sup>7</sup>

### Meeting the demands of donor management

Once the family has given their consent, all efforts should be focused on managing the donor and preparing him for organ recovery.

You may have to care for the donor patient for up to 24 hours after he's been pronounced brain dead—an admittedly difficult task when you know that this patient will never get well. The care you give, however, may be even more intensive than that you give your other patients.

Monitor vital signs, EKG readings, oxygen saturation levels, and fluid intake and output hourly. Continue to turn and suction the patient every two hours. Ensure gastric decompression with a naso-

gastric tube hooked up to low-intermittent suction, and perform oral care and any necessary dressing changes.

The patient should have a central line and two large bore peripheral IV sites. An arterial line is helpful for blood pressure monitoring and frequent lab sampling.

Discontinue steroids, barbiturates, and anti-seizure drugs, but continue with antacids, histamine blockers, and broad spectrum antibiotics. Begin blood transfusions if hematocrit falls below 30 and hemoglobin drops below 10.

In the event of cardiac arrest, follow advanced cardiac life support protocol according to your hospital's policy.

In addition to these general measures, there are several specific complications that you need to guard against. Although not all of them will occur, many of them are interrelated.

**Hypothermia.** The hypothalamus of a brain dead patient no longer regulates temperature. Unless you maintain it artificially, the blood will cool as it circulates through the peripheral tissues. To maintain body temperature, warm the patient with blankets or a hypothermia blanket, if necessary.

Use warmers for bags of IV fluid and blood prepared for infusions. Turn on the warming lights above the patient's bed to keep his core temperature higher than 96.8° F (36° C). Also keep the room temperature moderately high if possible—70°–80° F (21°–26° C).

Other options to maintain adequate body temperature include using a Baer Hugger, Level I Infusor, and warm saline irrigation or lavage.

**Hypoxemia.** Many factors can compromise oxygenation—pulmonary edema, barotrauma, infection, airway obstruction. Since it's

imperative that blood flowing to the organs is adequately oxygenated, you'll need to optimize ventilator settings.

Often, patients have been hyperventilated to decrease intracranial pressure. After brain death, there is no longer a need to concentrate on neurologic function, so you will need to normalize ventilatory status. The goal is to maintain PaO<sub>2</sub> at greater than 100, using the lowest setting FIO<sub>2</sub> and, if needed, adding PEEP.

**Hypotension.** Destruction of the brain's vasomotor center results in the complete dilation of systemic vasculature. In addition, once the hormones triiodothyronine (T3), thyroxine (T4), and cortisol have been metabolized, they can't be replaced by the normal feedback mechanisms. The resulting anaerobic metabolism and depressed myocardial function cause a drop in cardiac output and BP.

Hypotension is also volume-related. The pituitary gland no longer produces antidiuretic hormone (ADH), resulting in diabetes insipidus, in which the kidneys can no longer hold water. Osmotic diuretics given to the patient earlier to treat neurological injury contribute to the problem.

Fluid administration is always your first line of action. Your goal is to maintain central venous pressure (CVP) at 8–10 mm Hg. Start with a bolus of Ringer's lactate or 0.9% normal saline—5 cc/kg over 15 minutes. Continue the infusion at this rate until both CVP and pulmonary capillary wedge pressure reach 8 mm Hg, but don't exceed two liters per hour. Monitor sodium levels, though, to be sure they aren't too high. A high sodium concentration may make organs unusable.

To replace fluid loss, administer dextrose-electrolyte solution—



## Guidelines for donation: Who, when, and what

### Neurological death

Patient is maintained on a ventilator and hemodynamically supported. Organs are removed in the operating room while organ function is maintained with a ventilator, fluid therapy, and pharmacology.

#### Acceptable donations: Organs and tissue

Transplantable organs	Transplantable tissues	
Heart	Skin	Ligaments
Kidney	Bone	Cartilage
Liver	Dura	Heart valves
Lungs	Veins	Eyes/Corneas
Pancreas	Fascia	
Small intestine		

### Cardiopulmonary death

Patient has no cardiac or respiratory activity. The body must be kept cool if tissues are not removed immediately. Most tissues are removed within 24 hours of death.

#### Acceptable donations: Tissue only

Transplantable tissues	
Skin	Ligaments
Bone	Cartilage
Dura	Heart valves
Veins	Eyes/Corneas
Fascia	

Source: Chabalewski, F. (Ed.). (1996). *UNOS donation and transplantation - Nursing Curriculum*. Richmond, VA: UNOS.

D<sub>5</sub>/2 or D<sub>5</sub>/4—in an amount equal to the volume of urine output. Adjust the content of the replacement fluid to ensure proper electrolyte balance.

In the case of hypernatremia, for example, replace the fluid deficit with hypotonic solution—D<sub>5</sub>/2. If hypokalemia is the problem, administer D<sub>5</sub>W with 20–30 mEq of potassium chloride to prevent arrhythmias. To compensate for low magnesium values, initiate an infusion of magnesium sulfate—4 g of magnesium sulfate in 250 cc of D<sub>5</sub>W—over the course of five hours, or as ordered by a physician.

If at any point CVP drops to less than 2 mm Hg and systolic BP falls below 90 mm Hg, you'll give volume expanders—either albumin (Albutein, Buminate, Plasbumin) or hetastarch (Hespan), though albumin is usually preferred in organ donor patients because there are fewer coagulation problems with it when administered over time.

If CVP rises above 10 but systolic blood pressure is still low—less than 100 mm Hg—continue with fluids but prepare to adminis-

ter vasopressors as well. You'll need to begin with a dopamine (Intropin) infusion at 5 mcg/kg/min. Titrate to maintain systolic BP at 100 mm Hg, but do not exceed 20 mcg/kg/min.

When you need to go higher than this, consider administering an epinephrine drip (Ana-Guard Epinephrine, Ardecaine), norepinephrine bitartrate (Levophed), or phenylephrine hydrochloride (Neo-Synephrine HCl). Although these drugs raise blood pressure, they do so at the expense of hepatic and renal blood flow, so use them as a last resort: Compromised blood flow can impair organ function and make transplantation impossible.

If vasopressors can't maintain blood pressure, you need to replace ADH and control urine output by administering vasopressin (Pitresin)—25 units added to 250 cc of D<sub>5</sub>W. Begin at a rate of 5 units per hour and then titrate it to maintain urine output at 2–4 cc/kg/hr. Discontinue this drug four hours before organ recovery to reduce secondary vasoconstriction.

To keep urine output at normal levels without an IV drip, adminis-

ter 2–6 mcg of desmopressin acetate (Stimate, DDAVP) subcutaneously every six to eight hours.

In those donors who are hemodynamically unstable or have not responded to vasoactive drugs, T4 replacement may be considered: Inject an IV push of 1 amp of D<sub>50</sub> (50 ml Abboject syringe), 20 units of regular insulin, 10 mcg of levothyroxine sodium (Levoxine, Synthroid), and 100 mg of hydrocortisone sodium succinate (A-hydro-Cort, Solu-Cortef).

Then start an IV drip—200 mcg of levothyroxine sodium in 500 cc of D<sub>5</sub>W—at a rate of 4–12 mcg/min. Continue with 100 mg of hydrocortisone sodium succinate every hour for 12 hours.

**Oliguria.** Low urine output is usually volume related. Check the Foley catheter for kinks or clots. If there are none and CVP is low, give the patient a crystalloid bolus—5 cc/kg of D<sub>5</sub>W or Ringer's lactate. If CVP is low and sodium values are higher than 145 mg/dL, the bolus should contain D<sub>5</sub>W with 0.45% sodium chloride.

Oliguria in combination with high CVP can indicate acute renal failure. That calls for an IV push of

## Evaluating a potential organ donor

A complete evaluation includes a detailed medical and social history and an extensive physical examination. Staff of the organ procurement organization use the fol-

lowing diagnostic and lab tests to assess the overall health of the donor and the suitability of the organs for transplantation.

### General evaluation

Age	Blood
Sex	Urine
Race	Sputum cultures
Height	Past medical history
Weight	Past surgical history
ABO type	Social history

### Infectious disease profile

HIV 1/HIV 2  
 HTLV 1  
 Hepatitis (B and C)  
 Syphilis (RPR/VDRL)  
 Cytomegalovirus (CMV)

### Organ specific evaluation

Heart	Lung	Liver	Kidneys	Pancreas
Chest X-ray, arterial blood gases, 12-lead EKG, cardiac catheterization (in older donors or those with coronary risk factors), echocardiogram	Chest X-ray, arterial blood gases, oxygen challenge (place the donor on 100% FIO <sub>2</sub> and 5 cm H <sub>2</sub> O PEEP for 20 - 30 min, obtain ABGs and return ventilator to prior settings), sputum gram stain, lung measurements, bronchoscopy (if indicated)	Liver enzymes, total and direct bilirubin, prothrombin time (PT), partial prothrombin time (PPT)	Serum creatinine, blood urea nitrogen (BUN), urinalysis	Serum amylase, serum lipase, serum glucose

Source: Phillips, M. G. (Ed.). (1991). *UNOS: Organ procurement, preservation and distribution in transplantation*. Richmond, VA: William Byrd Press.

furosemide (Lasix)—5 - 200 mg to prevent anuria. Do not, however, give it faster than 20 mg/min.

When you finally turn responsibility for the patient over to the operating room staff for organ recovery, make sure to give them an accurate report of the donor's condition and all interventions you've taken to preserve it.

### Death and life go hand in hand

It's now been many hours since you placed the initial call to the OPO. Organ recovery has been completed and the organ transplant team has left the hospital. The organ donation process has taken its toll both emotionally and

physically on the family, the transplant coordinator, and the hospital staff.

You have just been privy to a devastating moment in a family's life. And as the patient's nurse, you might also be experiencing a feeling of loss. What you have not been able to see is the patient whose life you have just helped save.

Clearly, the success of the organ donation process depends on the joint involvement of nursing, medical, and OPO staffs. Your ability to identify potential donors early, maintain the viability of their organs, and offer information and solace to families can make all the difference. Someone, somewhere, is waiting for the gift of life. □

### REFERENCES

1. Cossitt, C. M. (1996, May/June). Transplants, top 20,000 per year. *UNOS Update*, 5.
2. Evans, R. W., Orians, C. E., & Ascher, N. L. (1992). The potential supply of organ donors. *JAMA*, 267(2), 239.
3. Chabalewski, F. (Ed.). (1996). *UNOS donation and transplantation - Nursing Curriculum*. Richmond, VA: UNOS.
4. Alexander, J. W., & Vaughn, W. K. (1991). The use of "marginal" donors for organ transplantation. The influence of donor age on outcome. *Transplantation*, 51(1), 135.
5. Partnership for Organ Donation. (1993). *Gallup Poll: The American public's attitudes toward organ donation and transplantation*. Boston, MA: Author.
6. Garrison, R. N., Bentley, F. R., et al. (1991). There is an answer to the shortage of organ donors. *Surg. Gynecol. Obstet.*, 173(5), 391.
7. Klieger, J., Nelson, K., et al. (1994). Analysis of factors influencing organ donation consent rates. *Journal of transplant coordination*, 4(3), 132.





2 CONTACT  
HOURS

RN/AUHS Home Study Program

# Continuing Education Test #399

"Organ donors: Your care is critical"

Circle the one best answer for each question below. Transfer your answers to the card that follows page 64.  
Save this sheet to compare your answers with the explanations you'll receive.

1. Brain death is best defined as:
  - a. Complete loss of cortical and brain stem function.
  - b. Cessation of the carotid pulse.
  - c. Decerebrate posturing with loss of spontaneous breathing.
  - d. Unresponsiveness with dilated pupils.
2. How many Americans are awaiting organ transplant? Approximately:
  - a. 10,000.
  - b. 26,000.
  - c. 43,000.
  - d. 50,000.
3. The annual potential organ donor pool in the United States is approximately:
  - a. 5,000.
  - b. 9,000.
  - c. 14,000.
  - d. 25,000.
4. Which condition is contraindicated in organ donation?
  - a. Diabetes.
  - b. Advanced age.
  - c. Positive HIV status.
  - d. Hepatitis.
5. The best location to approach a patient's family regarding organ donation is:
  - a. At the patient's bedside.
  - b. In the nurses station.
  - c. In the hospital chapel.
  - d. In the visitors' lounge.
6. The request for organ donation is best handled by the:
  - a. Chaplain.
  - b. Nurse.
  - c. Physician.
  - d. Transplant coordinator.
7. Loss of hypothalamic function leads to:
  - a. Hypothermia.
  - b. Corneal abrasion.
  - c. Peripheral edema.
  - d. Venous congestion.
8. Which medication should be discontinued after brain death has been diagnosed?
  - a. Antacids.
  - b. Antibiotics.
  - c. H<sub>2</sub> blockers.
  - d. Steroids.
9. The central venous pressure of the donor patient following brain death should be maintained at:
  - a. 2 - 5 mm Hg.
  - b. 8 - 10 mm Hg.
  - c. 12 - 15 mm Hg.
  - d. Over 20 mm Hg.
10. Proper timing can increase the donation consent rate by as much as:
  - a. 20%.
  - b. 40%.
  - c. 60%.
  - d. 80%.
11. Desmopressin acetate (DDAVP) may be given to a donor patient subcutaneously to:
  - a. Enhance cardiac function.
  - b. Maintain urine output.
  - c. Preserve the appearance of the donor.
  - d. Prevent formation of clots.
12. The nurse can best contribute to the adequate oxygenation of organs in a donor patient by:
  - a. Performing chest physical therapy.
  - b. Warming the IV fluids.
  - c. Suctioning frequently.
  - d. Maintaining a PaO<sub>2</sub> greater than 100 with the least amount of FIO<sub>2</sub>.
13. When a cardiopulmonary death has occurred, the nurse can expect tissues will be removed within how many hours of death?
  - a. Six.
  - b. 12.
  - c. 24.
  - d. 48.
14. Fluid administration for a donor patient should not exceed:
  - a. 100 cc/hour.
  - b. 500 cc/hour.
  - c. 1,000 cc/hour.
  - d. 2,000 cc/hour.
15. Which IV solution should be administered if a donor patient becomes hypernatremic?
  - a. D<sub>5</sub>W.
  - b. D<sub>5</sub>W with 0.45% sodium chloride.
  - c. Normal saline solution.
  - d. Lactated Ringer's solution.
16. Oliguria combined with a high CVP in a donor patient can indicate:
  - a. Acute renal failure.
  - b. Clots in the renal artery.
  - c. Muscular collapse of the bladder wall.
  - d. Inadequate fluid administration.
17. Vasopressors are used as a last resort in the management of hypotension because they:
  - a. Are costly to administer.
  - b. Constrict the coronary arteries.
  - c. Affect hepatic and renal blood flow.
  - d. Require constant monitoring.
18. How long before organ recovery should Vasopressin be stopped?
  - a. Two hours.
  - b. Four hours.
  - c. Six hours.
  - d. Eight hours.

This unit was prepared by Marie O'Toole, RN, EdD, CRRN, and Anne Robin Waldman, RN, C, MSN, AOCN.