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Contact Hours: **1**

## Organ and Tissue Donation and Recovery

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**LEARNING OUTCOME AND OBJECTIVES:** Upon completion of this continuing education course, you will be able to describe the clinical aspects of organ and tissue donation and recovery. Learning objectives for this course to address possible knowledge gaps include:

- Discuss the organs, tissues, and parts that can be donated.
- Discuss the issue of supply and demand of donor organs and tissues.
- Outline the process of organ and tissue donation and recovery.
- Describe barriers to successful organ and tissue procurement among the public and healthcare professionals.
- Outline the role of nursing in the organ and tissue donation process, including collaboration with organ procurement organizations.

### INTRODUCTION

In 2018, 36,527 transplants were performed in the United States, setting an annual record (for the sixth straight year), according to data from United Network for Organ Sharing (UNOS). Almost 6,900 living donor transplants were performed in 2018, which was the highest total since 2005. The year 2018 was also the eighth consecutive record-breaking year for deceased donors, with more than 10,700 (UNOS, 2019b).

### What Can Be Transplanted?

Most organ donations come from deceased donors, but a living donor can donate as well. Tissues can also be transplanted. The following table shows what organs and tissues can be donated from deceased and living donors.

<b>ORGANS, TISSUES, AND BODY PARTS THAT CAN BE TRANSPLANTED</b>		
	<b>From Deceased Donors</b>	<b>From Living Donors</b>
<b>Organs</b>	<ul style="list-style-type: none"> <li>• Heart</li> <li>• 2 lungs</li> <li>• Liver</li> <li>• Intestines</li> <li>• 2 kidneys</li> <li>• Pancreas</li> </ul>	<ul style="list-style-type: none"> <li>• 1 kidney</li> <li>• 1 lung</li> <li>• Portion of the liver, pancreas, or intestine</li> </ul>
<b>Tissues</b>	<ul style="list-style-type: none"> <li>• Heart valves</li> <li>• Bone</li> <li>• Cornea*</li> <li>• Skin</li> <li>• Ligaments</li> <li>• Tendons</li> <li>• Cartilage</li> <li>• Veins</li> <li>• Middle ear</li> </ul>	<ul style="list-style-type: none"> <li>• Blood</li> <li>• Platelets</li> <li>• Blood stem cells from bone marrow, the bloodstream, or a baby's umbilical cord</li> </ul>
<b>Body Parts</b>	<ul style="list-style-type: none"> <li>• Hands</li> <li>• Face</li> <li>• Skull</li> <li>• Scalp</li> <li>• Penis (first total penis and scrotum transplant performed in 2018)</li> <li>• Uterus (trials have begun in U.S.)</li> </ul>	<ul style="list-style-type: none"> <li>• Uterus</li> </ul>
<p>* Corneal donors are universal, i.e., do not have to “match” recipients like organ donors must. Many people can donate corneas, except for people with infections or highly communicable diseases such as HIV or hepatitis. Corneas can be recovered several hours after death and can be stored; a corneal transplant can be performed within 3–5 days after donation.</p>		
(Horsager-Boehrer, 2019; HRSA, n.d.-a)		

## Supply and Demand

The need for organ and tissue donation is critical. It is estimated that someone is added to the national transplant waiting list every 10 minutes and that about 20 people die every day while waiting for a transplant. One donor can save the lives of up to eight people (DMV.org., 2019; UNOS, 2019a).

As of January 2019, there were more than 113,000 candidates for transplant on the U.S. national waiting list. Additionally:

- Two out of every three people on the waiting list are over the age of 50.
- Almost 2,000 people on the waiting list are children under 18.



- Almost 70,000 people (59%) on the list are ethnic minorities. (HRSA, 2019)

## Legislative Efforts

To address the issue of supply and demand in the United States, the National Organ Transplant Act (NOTA) was passed by Congress in 1984. This act established the **Organ Procurement and Transplant Network (OPTN)** to guarantee the fair distribution of donated organs. A contract with the federal government to oversee the OPTN was granted to the United Network for Organ Sharing. The goals were to:

- Increase the number of transplants
- Provide equity in access to transplants
- Promote efficiency in donation and transplant
- Promote living donor and transplant recipient safety
- Improve waitlisted patient, living donor, and transplant recipient outcomes (USDHHS, n.d.)

In 1998 the Centers for Medicare and Medicaid Services issued its Hospital Condition of Participation, requiring participating hospitals to refer all deaths and imminent deaths to the local **organ procurement organization (OPO)** so that families could be approached to be given the opportunity to donate tissues and organs (CMS, 2003).

Individual states' efforts to increase the supply of donor organs have also been undertaken. In 1968 the first OPO was established in Massachusetts. Today there are 58 state OPOs that arrange for the recovery of all organs and tissues that become available for transplant. These organizations are members of the OPTN, federally designated, nonprofit, and state-licensed. (*See "Resources" at the end of this course.*)

## DONATION AND RECOVERY PROCESS

The donation process begins by making the decision to be an organ donor and then registering. Registration can be completed in various ways:

- Online at [registerme.org](http://registerme.org)
- In person when applying for or renewing a driver's license or state ID card
- By completing and signing a donor card, available through the state's OPO (links to each state's OPO websites can be found at [organdonor.gov/awareness/organizations/local-opo.html](http://organdonor.gov/awareness/organizations/local-opo.html))



There are other ways to register online, such as using health apps on mobile phones (NJ Gift of Life Program, 2016; NJSN, n.d.-a).

Once an individual decides to become a donor, family members should be informed so that they can cooperate with the hospital staff regarding the donor's wishes.

## Determining Brain Death

Brain death statutes in the United States differ by state and institution. The Uniform Determination of Death Act of 1981 provides states with whole-brain criterion of death (Find Law, 2019; ULC, 2014). (See "Resources" at the end of this course.)

The **three essential findings** in death that are declared by neurological criteria are:

- Irreversible coma
- Absence of brain stem reflexes
- Apnea (suspension of breathing)  
(NJSN, 2014; Wijdicks et al., 2010)

When brain death has been confirmed, the hospital notifies the local organ procurement organization (OPO). If the patient is a potential donor, an OPO representative immediately goes to the hospital and searches the state's donor registry for legal consent. If the patient is not registered and there is no other legal consent, consent from the family will be required. When this is obtained, medical evaluation continues.

## Donation after Cardiac Death

Anyone who has brain function that has been deemed incompatible with life but who does not meet all criteria for brain death is a potential candidate for donation after cardiac death (DCD). DCD may be discussed as an option with families when they have accepted that their loved one cannot survive and have made the decision to remove that person from life support (CORE, 2018). There is a 90-minute time frame in which organs can be recovered after extubation to the pronouncement of death. If the patient does not progress to cardiac death within this time, organ donation cannot occur. Tissue donation may still be an option after death (NJSN, n.d.-b).

If the family agrees to DCD, the patient is removed from the ventilator in an operating room. When the heart stops beating, a physician declares death and organs are recovered. Note that DCD is the original method of managing organ donation, and it has increased donations by as much as 25% in some geographic locations in the United States (CORE, 2018).

## Completing a Medical Evaluation

Screening of a potential donor is essential to determine whether the donor has an infection that could be transmitted to recipients through transplanted organs and/or tissues. The Organ Procurement and Transplantation Network policies (for OPOs) and FDA regulations and



guidance (for tissue and eye banks) require a medical and social history interview to be conducted with the deceased donor's next of kin or another knowledgeable person (CDC, 2019).

**Interviews** are designed to assess the donor for:

- Risk behaviors that may have exposed the donor to certain diseases
- The donor's past medical history
- Relevant travel history (which can be important for exposure to certain pathogens)

OPTN policy requires OPOs and living donor recovery centers to perform the following **tests** to determine if the donor has certain infections:

- Human immunodeficiency virus (HIV)
- Hepatitis B virus (HBV)
- Hepatitis C virus (HCV)
- Syphilis
- Cytomegalovirus (CMV)
- Epstein Barr virus (EBV)
- Toxoplasmosis

Living potential kidney donors who are at increased risk for tuberculosis are also tested for this infection (CDC, 2019).

Historically, transplant centers were prevented from accepting and transplanting organs from donors infected with HIV. However, in 2013 the federal HIV Organ Policy Equity Act was passed. This act allows transplantation of solid organs from HIV-positive donors to HIV-positive recipients when following specified research protocols established by the National Institutes of Health (CDC, 2019).

FDA regulations require that tissue and eye banks test donor specimens for risk associated with HIV, HBV, HCV, and syphilis. Living tissue donors must also be tested for West Nile virus. Donor tissues that may contain live white blood cells, such as semen and hematopoietic stem/progenitor cells, are also screened for human T-lymphotropic virus (HTLV) and CMV. A donor who tests positive for any of these pathogens, but not necessarily CMV, is not eligible to donate (CDC, 2019).

Once a potential donor has been evaluated and accepted, additional assessments are done for the donation of specific organs.



<b>CONTRAINDICATIONS TO DONATION*</b>	
<b>Absolute</b>	<ul style="list-style-type: none"> <li>• Age older than 80 years for corneal transplant only</li> <li>• Age older than 60 years for heart valves and tendon donations</li> <li>• Presence of HIV infection* (except, HIV positive patients may donate transplantation of solid organs to HIV-positive recipients when following specified research protocols established by the NIH)</li> <li>• Encephalitis</li> <li>• Creutzfeldt-Jakob disease</li> <li>• Malaria</li> <li>• Tuberculosis</li> <li>• Active metastatic cancer</li> <li>• Prolonged hypotension or hypothermia</li> <li>• Disseminated intravascular coagulation</li> <li>• Sickle cell anemia or other hemoglobinopathy</li> </ul>
<b>Relative (use caution)</b>	<ul style="list-style-type: none"> <li>• Malignancy other than in the central nervous system or skin that is in remission (&gt;5 years)</li> <li>• Hypertension</li> <li>• Diabetes mellitus</li> <li>• Age older than 70 years</li> <li>• Hepatitis B or C infection</li> <li>• History of smoking</li> </ul>
<p>* Very few absolute contraindications to donating organs exist, and most potential donors are evaluated on a case-by-case basis. OPOs have sole responsibility for determining the medical suitability for donation.</p>	
<p>(CDC, 2019; Finger, 2016)</p>	

## The Matching Process

Following medical evaluation for contraindications, the OPTN is contacted by the OPO in order to begin a search for matching recipients. The OPTN matching process includes:

- Blood type
- Body size
- Severity of patient's medical condition
- Distance between the donor's hospital and the patient's hospital



- Patient's waiting time
- Whether the patient is available
- Tissue type  
(HRSA, n.d.-d)

## Organ Recovery

During the above process, the donor is maintained on artificial support. The condition of every organ is monitored by hospital medical and nursing staff along with the OPO coordinator, who also arranges arrival and departure times of both surgical teams. When the surgical team arrives, the donor is taken to the OR, and under sterile technique, organs and tissues are recovered and all incisions closed.

The tissue and organs are then transported rapidly by commercial or contracted airplanes, helicopters, and/or ambulances to the hospital where the transplant recipient is waiting and may be prepped and ready in the OR (HRSA, n.d.-d).

## BARRIERS TO DONOR RECRUITMENT

Although a very high percentage of Americans say they support organ and tissue donation, the percentage of those who have taken steps to become a donor is quite low. According to Donate Life America (2019), 95% of Americans are in favor of being a donor but only 58% are registered as donors.

### Common Reasons Individuals Decide Not Donate

There are many reasons given by individuals for not becoming a donor. Multiple surveys have been done to uncover those reasons and have found the following:

**Religious belief systems.** Many people feel their religion encourages donations as an altruistic act, but many nondonors cite religious beliefs as the basis for not registering to be organ donors. Although the donation or receipt of organs from living or deceased donors is not forbidden by most major religions, it can be a barrier when people are simply unaware of their religion's stance regarding organ donation and believe their religion does not allow it.

Some people believe that donating organs is interfering with God's plans—that if a person is dying it is “meant to be” and should not be interfered with. Others believe that the body must remain whole after death in order to enter the next life. Still others believe that God is the rightful owner of their body and that they do not have the right to give away parts of it.

**Cultural beliefs.** Cultural beliefs are not connected to any particular stance on religion but involve broader concerns regarding healthcare, death, and dying. Often these beliefs are based on superstition. Such superstitions may be that talking about death or signing a donor card can lead



to one's own demise (the "jinx" factor). Others believe that the spirit will transfer from the donor to the recipient.

**Family influences.** Family members can strongly influence the decision to be an organ donor, and some people feel the need to ask permission from family members before making a choice. Many others believe that organ donation will significantly impair the family's grieving process.

**Body integrity.** Unconnected to religion, many people see removing organs, even after death, as a violation of physical integrity. Some are concerned that family members would be traumatically affected by the thought of an organ removal process that involves "being cut up" (the "ick" factor). And still others mistakenly believe that donating organs necessarily precludes an open coffin wake, especially if the eyes are removed for donation of the corneas.

**Mistrust of the healthcare system and professionals.** Because some people have had negative experiences with the medical system (e.g., discrimination, racism), they have negative views concerning organ donation. The most commonly expressed concern is that being a registered donor will negatively affect the treatment one receives in the hospital (e.g., that healthcare personnel will declare death prematurely for the sole purpose of harvesting the patient's organs).

Another often-mentioned concern involves fear about the validity of brain death determination and suspicion of the providers who make that decision. There are others who do not believe that brain death, a requirement for organ donation, can be considered true death, while others believe that a brain-dead person can recover.

Another fear is that one's organs might go to an "undeserving" recipient or be used for research instead of saving lives. These beliefs are most often expressed among minority populations, who have a greater sense of being marginalized from the healthcare system.

**Misconceptions about the organ donation process.** Although in the United States it is illegal to buy or sell organs, people fear a black market that is eager to harvest organs or that their organs may be sold without their receiving compensation.

Lack of knowledge is apparent when individuals state that their age, illness, or physical or mental defects can prevent them from being an organ donor, or that people who are rich or are celebrities move up the waiting list more quickly. Others may mistakenly think their families will incur the cost of donating (Mayo Clinic, 2019; Harrison & Sanders, 2016; HRSA, n.d.-e; Quick et al., 2016).

## **Lack of Clarity about Decision-Making Authority**

An important barrier to donation involves the ultimate responsibility for making the decision to donate. In the United States, the system of deceased-donor organ donation is based on "explicit consent." That means an individual is assumed **not** to be a donor unless they have indicated their wishes by registering to donate (i.e., "opt in"). Some countries have a system whereby all individuals are assumed to be donors unless they have "opted out," however research does not indicate a clear consensus on whether an opt-out system results in increased donations over an opt-in system.





The Uniform Anatomical Gift Act (UAGA) of 2006 provides the legal framework for determining consent for organ donation. Most states, including New Jersey, have enacted some form of this act, which specifically prevents any family member or otherwise responsible party from revoking an individual's first-person consent (State of NJ, 2017; USLegal, 2019).

## Process Breakdowns among Healthcare Professionals

When best practices are not followed, a deviation from the organ donation protocol may jeopardize organ recovery. These deviations are known as *process breakdowns* and include:

- **Missed referrals** due to the failure to notify the OPO about the deceased
- **Untimely referrals**, when the OPO is not notified about an imminent death within one hour of such determination or within one hour of a patient's death
- **Suboptimal request** for donation due to a poorly timed request or because a requester is untrained
- **Hemodynamic stability not maintained** and life-saving measures discontinued despite a timely referral
- **Patient withdrawn from a ventilator** and extubated before the family is offered the opportunity to donate  
(Razdan et al., 2015)

### THE JOINT COMMISSION STANDARDS

The Joint Commission has specific standards for compliance with written policies, protocols, and procedures for donating and procuring organs and tissue. Quality assurance and performance play an important role in compliance. Data to be collected include the answers to the following questions and statements (TJC, 2014):

- Are the organ, tissue, and eye donation programs integrated with the hospital's Quality Assurance Performance Improvement (QAPI) program?
- Is the effectiveness of record reviews monitored as part of the hospital's QAPI program?
- Does the hospital have QAPI mechanisms in place to ensure that the families of all potential donors are informed of their options to donate?



## Healthcare Professional Attitudes and Perceptions

While there is little research or consensus, limited studies indicate certain ethical concerns and conflicts among both physicians and nurses that interfere with the organ donation process. Such concerns and conflicts include the following:

- Lack of knowledge about the organ donation process, causing a negative impact on attitudes that can lead to failure to identify potential donors
- Difficulty accepting brain death as death (i.e., belief that as long as a patient's heart is beating, the patient is still alive and should continue to receive care)
- Difficulty removing a ventilator for a donation after cardiac death when there is still minimal brain activity (i.e., belief in the possibility that the person may recover)
- Difficulties among the multidisciplinary team during the organ donation process related to:
  - Lack of commitment on behalf of healthcare professionals to the process
  - Lack of knowledge regarding how to carry out the brain death protocol and doubt about when to begin the process
  - Resistance to starting the brain death protocol due to personal difficulties dealing with death

(Araujo & Massarollo, 2014; Umana et al., 2018)

## ROLE OF THE NURSE IN ORGAN RECOVERY AND TRANSPLANT

Nurses are critical members of the interdisciplinary team involved in organ recovery and transplantation. Nurses skilled in caring for transplant donors and recipients include the following:

### Critical Care and Emergency/Trauma Nurses

The nurses in critical care or emergency/trauma settings are essential in the collaborative process of organ donation and recovery. These nurses are often the first professionals to identify a potential donor and make a referral to the local OPO. They are also involved in:

- Partnering with the local OPO by introducing themselves to the coordinator, asking for information and resources, and working collaboratively to implement changes
- Participating in activities to increase awareness of organ donation among colleagues and in the community
- Advocating for patients and their families and honoring the patient's last wishes



- Upholding the family’s right to be offered the option of organ donation
- Promoting compassionate communication between the healthcare team and families
- Being knowledgeable about the relevant issues surrounding organ donation  
(Jawoniyi & Gormley, 2015; O’Leary, 2018)

## Designated Requestors

It is a federal regulation that a specially trained, designated hospital staff member, known as a *designated requestor*, approach the family to discuss the option of organ donation. Many requestors are registered nurses who have completed a course offered or approved by the OPO. The requestor lets the family know the patient is registered to be an organ donor and that those wishes will be carried out after death is pronounced. The family is also given clarification of the definition of brain death and informed that the patient will remain on life support after death is pronounced (CFR, 1998).

## Clinical Transplant Nurses

Clinical transplant nurses provide patient care primarily at the bedside, in inpatient units, and in operating rooms.

## Transplant Nurse Coordinators

Transplant nurse coordinators provide direct as well as indirect patient care and are responsible for synchronization of all aspects of transplant care across all settings to ensure high-quality, effective, and safe care. These nurses focus on the provision of care for recipients or donors. They are responsible for evaluating a patient’s condition, developing a treatment plan for the patients, and following up with their care (GMU, 2019).

## Procurement Nurse Coordinators

Procurement nurse coordinators may practice in intensive care, emergency and trauma, or operating room settings. They may also travel to outlying centers to provide patient and staff education and to assist in organ procurement. They have a major role in the provision of follow-up support and advocacy for donor families.

## Living-Donor Nurse Coordinators

The living-donor nurse coordinator practices primarily in clinics or outpatient settings, preparing and educating potential donors about organ donation. Following donation, the nurse follows patients for varying lengths of time to help promote full recovery both physically and mentally.



## Advanced Practice Transplant Professionals

The advanced practice nurse works in multiple settings, including inpatient units, outpatient clinics, and the community. These nurses are generally the most experienced and deliver an advanced level of patient care within the specialty of transplantation (NATCO, 2019).

### CASE

Dianne is a nurse in the emergency department (ED). Late one night, Roland, a 35-year-old man, is admitted following an auto accident. He has suffered multiple head injuries and is unresponsive, with no respirations or heartbeat. The patient's driver's license does not indicate he is an organ donor. Dianne alerts the ED physician of this fact.

Jackie, Roland's wife, arrives while resuscitation efforts are underway. Dianne provides her with a quiet place to sit and talk while the team works to save her husband. After the team declares Roland brain dead, Jackie is given a thorough explanation of this diagnosis and how it was determined. Dianne sits with Jackie, holding her hand while she cries and listening to her talk about her husband. After Jackie is a little calmer, Dianne calls the local OPO to make a referral.

Following referral to the OPO, Anthony, the designated nurse requestor for the hospital, is notified. Anthony meets with Jackie to discuss consent for organ donation. At first, Jackie is unsure about donation and expresses concern about the physical appearance of her husband after organs are obtained. Anthony reassures Jackie that if her husband's organs are donated, he can still have an open-casket funeral. Anthony empathizes with Jackie about how difficult this is and offers her printed material on organ donation. He asks if Jackie needs anything else and states he will return later. He gives Jackie his cellphone number and tells her to call if she has any questions.

A while later, Anthony returns to the ED and takes Jackie to see her husband one last time. Jackie expresses concern that he does not look dead and seems to be breathing. Anthony again discusses the diagnosis of brain death and the need to keep Roland's organs and tissues healthy through artificial respiration. Jackie pulls the sheet over her husband's face as a final goodbye and says that her husband will live on in other people if his organs and tissues are donated. She agrees to sign the consent.



## NURSES BREAKING DOWN THE BARRIERS

All nurses can play an active, integral part in breaking down barriers and increasing the donation rate by:

- Increasing awareness about the need for organ and tissue donation among colleagues, friends, and family
- Advocating for or organizing a unit- or hospital-wide formal education plan about the organ donation process and nurses' roles in the process
- Learning about criteria for organ donation
- Being familiar with the local protocols for in-hospital deaths (i.e., calling the OPO for every death)
- Understanding issues surrounding brain death
- Understanding ethical concerns regarding organ donation (particularly withdrawal of life support)
- Dealing with their own personal feelings about death and mortality
- Registering to be an organ donor

## CONCLUSION

Organ transplants have offered the gift of life to many people over the years. But without cooperation and collaboration among healthcare professionals, federal and state governments, and society, the benefits of transplantation would not be possible.

The issue of supply and demand is quite complex. It is dependent upon understanding and providing education to dispel individual attitudes, myths, and other barriers that stand in the way of organ and tissue donation.

Nurses and other healthcare professionals must increase their knowledge about becoming a donor, the process of organ and tissue donation and recovery, and in particular the concept of brain death. These individuals must learn to become advocates for their patients and families; they can also demonstrate their advocacy for the donation process by registering themselves to be organ donors.

Nurses are an integral part of and have significant roles in the process of organ procurement and transplantation, requiring specialized skills and training. They are effective collaborators within the transplantation team, and transplant nurses often have the most one-on-one contact with transplant patients.





## RESOURCES

Anatomical Gift Act (Uniform Law Commission)

<https://www.uniformlaws.org/committees/community-home?CommunityKey=015e18ad-4806-4dff-b011-8e1ebc0d1d0f>

Donate Life America

<http://www.donatelife.net>

Organ Procurement and Transplantation Network

<https://optn.transplant.hrsa.gov>

Uniform Declaration of Death Act

<https://healthcare.findlaw.com/patient-rights/what-is-the-uniform-declaration-of-death-act-or-udda.html>

U.S. Government information on organ donation and transplantation (USDHHS)

<http://organdonor.gov>

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## TEST

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1. Which organ or tissue can be transplanted from a living donor to a recipient?
  - a. Veins
  - b. Ligaments
  - c. Portion of a liver
  - d. Middle ear
  
2. Which is **not** an accurate statement regarding the supply and demand for organ donations?
  - a. One person is added to the national transplant waiting list about every 10 minutes.
  - b. An estimated 100 people die every day while awaiting a transplant.
  - c. Almost 2,000 people on the waiting list are children under 18.
  - d. A single donor can save the lives of up to eight people.
  
3. Which is **not** one of the three essential findings required to declare death by neurological criteria?
  - a. Irreversible coma
  - b. Absence of brain stem reflexes
  - c. Apnea (suspension of breathing)
  - d. No detectible heartbeat
  
4. Which is considered to be an **absolute** contraindication for organ donation?
  - a. Being treated for hypertension
  - b. Being treated for tuberculosis
  - c. Smoking several cigarettes a day
  - d. Age of 75 years
  
5. Which is a **correct** statement about barriers to donor recruitment?
  - a. Most major religions forbid transplant donations.
  - b. The cost of the donation process is too high for most potential donors to afford.
  - c. There is a significant black market in the United States for the buying and selling of organs.
  - d. Patients are often suspicious about the validity of brain death determination.



6. Which person is often the first to identify a potential donor and make a referral to the local OPO?
- a. Clinical transplant nurse
  - b. Designated requestor
  - c. Critical care and emergency/trauma nurse
  - d. Clinical transplant coordinator
7. Which nurse is responsible for synchronizing all aspects of transplant care across all settings?
- a. Transplant nurse coordinator
  - b. Clinical transplant nurse
  - c. Procurement nurse coordinator
  - d. Advanced practice transplant professional

