

ACPE# 0171-9999-18-064-H04-P &T
 Initial Release 9/10/18 Expiration Date 9/10/21

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Abstract

Goal: The purpose of this article is to inform pharmacists about the current need for organ, eye, and tissue donors and to prepare community pharmacists to implement donor registration in their pharmacy practices.

Summary: Only 54% of Americans are registered as organ, eye, and tissue donors.¹ While the Department of Motor Vehicles (DMV) has worked diligently to increase registration, more must be done. This article provides an overview of the donation process and examines the potential role of the community pharmacy in increasing donor registration. Further, this article prepares community pharmacists to introduce donor registration in the pharmacy and provides important donor counseling information.

Conclusion: As highly trusted professionals who are easily accessible by the public, community pharmacists are poised to promote organ, eye, and tissue donation. By providing donor registration and donor education, pharmacists can help reduce the growing transplant waiting list.

Key Words: community pharmacy, organ donation, donor registration, transplantation

Introduction

Over 100,000 people in the United States are currently waiting for an organ transplant.¹ It is estimated that 22 people die every day while waiting for a transplant.² The hope for a transplant lies in either a deceased or living donor. A total of 30,589 organ transplants were performed in 2016, of which approximately 82% involved a deceased donor.³ A

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single deceased donor can potentially save up to eight lives by possibly donating the following: heart, liver, pancreas, intestines, two kidneys, and two lungs. Most waiting list candidates need a kidney, followed by a liver and a heart. The donor can also donate corneas to two people and further enhance the lives of up to 75 people by donating tissues such as heart valves, bone, and skin.^{1,4} More than one million corneal and tissue transplants are performed annually.²

Disease States

An organ transplant is often the best treatment option for patients with end-stage organ failure. Patients with end-stage renal disease should be considered for a kidney transplant. Compared to dialysis, a kidney transplant offers better survival rates, quality of life, and cost-effectiveness.⁵



However, many kidney transplant candidates also have concomitant cardiovascular disease, which accounts for 30-42% of deaths following successful kidney transplantation.⁵ Therefore, the patient's cardiovascular disease outlook should be considered prior to transplantation.

Often performed in combination with a kidney transplant, a pancreas transplant is a long-term treatment option for patients with insulin-dependent diabetes mellitus. Unlike insulin therapy, a pancreas transplant restores glucose control without the risk of hypoglycemia. A transplant can also prevent or reverse secondary complications of diabetes and improve quality of life and life expectancy.⁵ A pancreatic islet transplantation is another less invasive option for diabetic patients and can be performed as an outpatient procedure. It may not result in long-term insulin independence, but can lead to fewer hypoglycemic events, reduced insulin requirements, and improved hemoglobin A1c levels.⁵ Two to four donors are needed per transplant as cells are lost during the islet separation process.

Liver transplantation is considered in patients with irreversible liver disease, including alcoholic liver disease, Hepatitis C, cholestatic disorders, and hepatic malignancies. Due to concerns of cirrhosis recurrence and inability to follow an immunosuppression regimen, patients with alcoholism are typically required to abstain from alcohol for at least 6 months prior to transplantation.⁵ For patients with Hepatitis C, it is important to first eliminate the viral infection prior to transplantation because the virus can recur following transplantation and the patient may again develop cirrhosis.⁵

The most common indications for heart transplantation include ischemic dilated cardiomyopathy, idiopathic dilated myopathy, and congenital heart disease. Common conditions leading to lung transplantation include chronic obstructive pulmonary disease (COPD), emphysema, and cystic fibrosis. In addition, simultaneous heart-lung transplants are possible for patients with idiopathic pulmonary fibrosis or primary pulmonary hypertension.⁵

Intestinal transplantation can be a treatment option for patients with irreversible intestinal failure with total parenteral nutrition failure, which is evidenced by liver injury, loss of central venous access, recurrent catheter infections, fungal infection, or recurrent severe dehydration.⁵ Transplantation can be risky due to increased

lymphoid tissue in the intestines. Increased immunosuppression is needed and rejection remains a major concern. Further, systemic infections are possible due to translocation of intestinal microorganisms.⁵

Donation Process

Deceased organ donation is only possible following brain death or cardiac death with irreversible brain injury.^{6,7} Thus, organ donation is a possibility in only 3 out of every 1000 deaths.² Most donations occur following confirmed brain death from a stroke, brain aneurysm, or trauma sustained in a car accident.⁶

The local Organ Procurement Organization (OPO) is notified by the hospital when any patient dies. If the organization determines that the deceased patient could possibly be an organ donor, the donation must be legally authorized. Authorization can be obtained by confirming registration within the organ donor registry or by gaining consent for donation from the patient's next of kin.⁷ An OPO representative is sent to the hospital to evaluate the potential donor while the organs are typically preserved via artificial support. If the patient is confirmed to be a donor candidate, the Organ Procurement and Transplantation Network (OPTN) is notified. As the manager of the national transplant wait list, the OPTN identifies the patient that best matches each available organ. The organ is offered to the specific patient's transplant team and the team must confirm that the patient is currently able to undergo the transplant. Once the recipients are determined, the organs and any authorized tissues are recovered in the operating room and are quickly transported to the pre-determined recipients.⁷

Matching Process

The major concern with organ transplantation is organ rejection, which occurs when the recipient's immune system interacts with the histocompatibility antigens on the donor's cells. These antigens are encoded by the major histocompatibility complex, a group of linked genes located on chromosome 6, which is further divided into three classes, or regions.⁸ Class I contains genes that encode components of the common transplant antigens, including genes HLA-A, HLA-B, and HLA-C.⁸ The HLA genotype consists of two haplotypes, one inherited from each parent. Therefore, there is a 25% chance that two siblings have the same HLA genotype.⁸ During organ rejection, the recipient's T cells recognize the donor's HLA antigens as

foreign which ultimately leads to inflammatory injury to the transplanted organ.⁵ To prevent rejection, pharmacologic immunosuppressive regimens are key and include drugs such as cyclosporine, tacrolimus, mycophenolate, azathioprine, and corticosteroids.

To predict a recipient's response to the donated organ, histocompatibility testing can be performed. First, serology can determine the HLA type of the recipient or donor. While HLA matching is not required for all organ transplants, it is preferred in kidney and pancreas transplants. HLA-matched kidney transplants are associated with a reduced need for immunosuppressive therapy and significantly greater long-term survival rates.⁸ Second, HLA antibody screening can detect antibodies in the recipient's serum from previous transfusions, pregnancies, or transplants.⁸ Third, lymphocyte crossmatching can determine if the recipient has preformed HLA antibodies against the donor-specific HLA antigens. The recipient's serum is mixed with the donor's lymphocytes and subsequent cell lysis indicates a positive crossmatch, which is typically a contraindication to transplantation. In addition, red blood cell ABO group compatibility is associated with better outcomes and is recommended (Rh factor compatibility is not necessary).⁸

Registration Process

Individuals currently have two main options to register as an organ donor. People can confirm their desire to be an organ donor by visiting a DMV office or by registering online at RegisterMe.org, which is a national database managed by Donate Life America (historically, organ donor registries were state-specific).^{9,10} Registering in the national database ensures that an individual's decision is still respected when travelling or moving to other states.⁹ Further, Apple recently introduced the ability to register in the national database within the iPhone Health Application.¹⁰

Anyone age 18 and older can register as an organ donor regardless of health status. In some states, an individual under 18 may also register their wish. However, a minor's parents or legal guardian must provide consent for donation.¹¹ Donor cards are also available. They are signed by the individual and are typically carried in a wallet to indicate an individual's desire to be an organ donor.¹² However, these cards can be lost or overlooked by medical personnel. Therefore, individuals should be encouraged to register their decision in a state or

national registry.

The Donor Gap

Despite the organ transplant waiting list totaling approximately 120,000 people, only 54% of Americans are currently registered as organ donors.¹ Thus, there is currently a great need to increase the number of registered donors. It is important to note that only 43% of recovered organs come from registered donors.² Most donations are made possible by permission from family or next of kin. Still, increasing the number of registered donors will alleviate stress on the family when they must make the decision on their loved one's behalf. Encouraging registration will also ensure that an individual's desire to serve as an organ donor is upheld since the family consent rate is typically only 54% to 62%.¹³

While only about half of Americans are currently registered donors, nationwide surveys show that more than 95% of Americans support organ, eye, and tissue donation.¹ This discrepancy between belief and action needs to be corrected, yet the overwhelming support for donation is encouraging. Since overall opinions surrounding organ donation are positive, it is appropriate to focus registration efforts on possible barriers to registration and uncertainty about the donation process.

Expanding to the Community Pharmacy

Nearly all registrations (about 98%) currently occur through the DMV.¹⁴ While the DMV has been instrumental in increasing the number of registered donors, other registration outlets are likely needed since about 48% of Americans remain unregistered. The community pharmacy could be an ideal location to promote donor registration by opening a dialogue with patients and addressing current barriers to registration.

The Ideal Educators

A 2012 National Survey of Organ Donation Attitudes and Behaviors led by the United States Department of Health and Human Services investigated why many Americans support organ donation but are not registered as organ donors.¹⁵ The survey asked participants who stated that they would definitely or probably want their organs to be donated after their death but are not willing to grant permission for organ donation by joining the state organ donor registry, "Why are you not willing to sign up to be a donor in your state donor

registry?” Results revealed that 21% of respondents answered “no reason in particular”, 17.6% were “undecided”, and 12.9% stated that they “need a better understanding or more information.”¹⁵ Further, 5.1% of respondents indicated mistrust of medical professionals and fear of diminished efforts to save his or her life.¹⁵

These responses suggest that additional education is needed to expand the registry. Pharmacists have unique advantages in educating the public about organ donation. First, the public has an overall positive image of pharmacists. A 2016 Gallup Poll found that 67% of respondents rated pharmacists as high or very high in honesty and ethical standards.¹⁶ Pharmacists were among the highest rated professionals for honesty and ethics, second only to nurses. Second, pharmacists routinely counsel patients on medications and health conditions. With minimal additional training about the organ donation and registration processes, trusted pharmacists with counseling expertise can educate those hesitant to join the registry.

Easily Accessible

In addition to educating those who are hesitant to register as donors, pharmacies can also assist those who are willing to register but simply have not yet registered. The 2012 National Survey of Organ Donation Attitudes and Behaviors revealed that 60.1% of respondents who were not registered as organ donors would be willing to join the state organ donor registry.¹⁵ This finding suggests that many people are willing to be an organ donor but may not know how to join the registry or have not been recently asked to join the registry.

The community pharmacy serves as an ideal location to approach a large population about organ donation. In the United States, 89% of the population lives within five miles of a pharmacy.¹⁷ The National Association of Chain Drug Stores estimates that a total of 4.1 billion prescriptions were filled in 2015. Further, they anticipate that value to increase to 4.7 billion by 2021.¹⁸ Given the United States Census Bureau’s record for the United States population, an average of 12 prescriptions were filled per person in 2015.¹⁹ It is clear that Americans frequently visit the pharmacy. Given the large volume of business and accessibility, pharmacies are well-equipped to assist and encourage the many Americans who have not yet registered.

Older adults comprise a large proportion of pharmacy customers. Using data collected between 1999 and 2012 from the National Health

and Nutrition Examination Surveys, one study found that 90% of survey participants age 65 and older had taken a prescription drug in the past 30 days.²⁰ Adults age 66 and older were the least likely age group to be registered as an organ donor in the 2012 National Survey of Organ Donation Attitudes and Behaviors.¹⁵ As the elderly population continues to grow, community pharmacies have a special opportunity to educate older adults about organ donation and assist with registration.

Implementing Registration

Discussion about organ donation registration can be initiated in the community pharmacy via many methods, dependent upon the practice site and time availability. Overall, it is important to note that an individual’s role should be to educate and not persuade individuals. Still, pharmacists, pharmacy technicians, and pharmacy students can respectfully provide resources to those unwilling to register and encourage every patient to share his or her decision regarding donation with family members. Electronic registration is available at RegisterMe.org or via the iPhone Health Application or the pharmacy may prefer to use paper forms. Paper forms, as well as informational brochures, can typically be obtained from local organ, eye, and tissue donation awareness organizations. Organizations in South Carolina include: Sharing Hope SC, Donate Life SC, and The Heather Trew Foundation. Contact information for these organizations can be found in Table 1.

While it may not be feasible for all pharmacies, it would be ideal to approach each patient about his or her interest in registering as an organ donor. For example, pharmacy employees or students could ask patients if they are interested in learning more about registering to be an organ donor when patients are retrieving and purchasing medications. Pharmacies that do not have enough flexibility to approach each patient about registration may consider asking patients about registration status on patient intake forms and then initiate discussions with those patients who are unregistered. A sample patient intake form is presented in Figure 1. Other options including placing informational brochures detailing registration steps in each patient’s bag along with their medications for the patient to read at home. Similarly, the pharmacy could display brochures near the checkout and waiting areas for interested patients.

To promote organ donor registration,

pharmacies could also expand existing programs or initiate registration-specific programs. First, pharmacies that already participate in health screenings, immunization drives, or medication therapy management (MTM) services could easily ask patients that participate in these programs about their interest in registering as organ donors either verbally or by adding an additional field to existing program-specific forms. Second, pharmacies could host individual organ donor registration drives. To increase interest, pharmacies might choose to align these drives with national events including National Donate Life Month in April or National Minority Donor Awareness Week in August.²¹ Pharmacy technicians and students can serve as leaders in promoting organ donation registration by helping plan and promote registration events.

It is important to note that living donor programs are also available. The National Marrow Donor Program operates the Be the Match Registry to identify living bone marrow and peripheral blood stem cell donors for patients with blood disorders and cancers. Pharmacists interested in promoting marrow donation registration may find further information at bethematch.org. A living donor can also possibly donate one kidney, one lobe of the liver, and a section of the lung, liver, or intestines. Individuals interested in living donation should be encouraged to contact a local transplant center.

Many community pharmacies have already begun promoting organ donation, using strategies like those previously mentioned. For example, Walgreens Pharmacy has partnered with the national organization Donate Life to increase donor registration. Through this partnership, Walgreens is inserting information into pharmacy bags directing patients to register online in the national donor registry.¹⁰ In addition, the DMV in Utah advertises that organ donation registration forms are available in many community pharmacies in the state.²²

Patient Education

It is important to consider appropriate language when discussing organ donation with patients. The Donor Family Council of the Association of Organ Procurement Organizations suggests emphasizing or avoiding certain words and phrases when discussing organ donation, including: “recover” not “harvest”, “mechanical support” or “ventilator support” not “life support”, “donated organs and tissues” not “body parts”, and “deceased donor” not “cadaver”.²³ To serve as the ideal educators, pharmacy employees also need to be prepared to answer patient questions

regarding organ donation. Pharmacy technicians and students who do not feel comfortable answering a patient’s specific question about donation can direct the patient to the pharmacist for further counseling. Below are common patient questions and appropriate responses. Pharmacists can also refer unique patient questions to the “Contact Us” form at donatelife.net.

Will registering as a donor affect my medical care? No, a medical professional’s priority is to save your life. Donation is only considered after making all attempts to save your life.

Am I too old or too ill to register as a donor? No, people of all ages and health statuses are encouraged to register as donors. The transplant team will determine what organs and tissues are suitable for donation given your age and illnesses.¹¹

Do my religious beliefs prevent organ donation? Personal beliefs may vary, but most major religions consider organ donation to be a generous act.²⁴

Can I have an open-casket funeral? Yes, the transplant team respects the donor body and all incisions are closed.^{11,24} An open-casket funeral is possible for organ, eye, and tissue donors.

Will my family be charged for my donation? No, your family may be responsible for your original medical costs but will not be responsible for any charges related to the donation. The recipient is responsible for the donation costs.¹¹

I want to be an organ donor, but I do not want to donate my corneas, etc.? Donors can specify which organs or tissues they do not wish to donate.⁹ Individuals who register through Donate Life’s online national database may update their information, including donation restrictions, at RegisterMe.org.

Will my organs be allocated fairly? Factors considered during the matching process include recipient health status, body size, blood and tissue type, wait time, and location.²⁴ Factors not considered include income, social status, and gender.²⁴

Can my organs be donated to someone from a different racial or ethnic group? While possible, success rates are higher when transplants occur among people from the same racial or ethnic group. People from minority groups comprise over half of the current waiting list, so there is great need for minorities to consider registering as organ donors.¹

Conclusion

Community pharmacies are perfectly poised to address the growing transplant waiting list. As

trusted professionals with counseling expertise, community pharmacists are prepared to assist those hesitant to register; their accessibility also enables them to help those who support donation but have not yet acted on their intentions. With minimal education and a desire to save lives, community pharmacists, technicians, and students can easily promote organ, eye, and tissue donation registration in their pharmacy practices.

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25. Tables, Graphs, Illustrations

Figure 1. Sample Patient Intake Form

Patient Information

Name _____

Address _____

City _____ **State** _____ **Zip** _____

Male **Female** **DOB** _____ **Phone** _____

Drug Allergies _____

Other Allergies _____

Current Medications _____

Over-the-Counter Medications _____

Are you a registered organ donor? **Yes** **No** **Unsure**

Insurance Provider _____

Are you the patient? **Yes** _____

Patient Signature, Date

No **Relationship** _____

Signature, Date

Table 1. Organ, Eye, and Tissue Donation

Awareness Organizations in South Carolina

Organization	Website	Phone Number
Sharing Hope SC	www.sharinghopesc.org	(843) 763-7755
Donate Life SC	www.donatelifesc.org	(843) 609-5270
The Heather Trew Foundation	www.theheathertrewfoundation.org	(843) 363-2303

Promoting Organ, Eye, and Tissue Donation in Community Pharmacies

Corresponding Course Program Number: 0171-9999-18-064-H01-P&T

1.Complete and mail entire page. SCPHA members can take journal CE for free; \$15 for non-members. Check must accompany test. You may also complete the test and submit payment online at www.scrx.org. or Mail to: Palmetto Pharmacist CE, 1350 Browning Road, Columbia, SC 29210-6309.

2.Continuing Education statements of credit will be issued within six weeks from the date of the quiz, evaluation form and payment are received. Notification will be sent via email if you have not successfully completed the quiz. Participants scoring 70% or greater and completing the program evaluation form will be issued CE credit.

3.Participants receiving a failing grade on any examination will have the examination returned. The participant will be permit-ted to retake the examination one time at no extra charge.

4.South Carolina Pharmacy Association is accredited by the Accreditation Council for Pharmacy Education as providers for continuing education. Th is article is approved for 1 contact hour of continuing education credit (ACPE: UAN: 0171-9999-18-064-H04-P&T). Th is CE credit begins 9/10/18 and expires 9/10/21.

CE credit will be uploaded to the CPE Monitor System.

Name _____ License # _____ Birth Month/Day (MM/DD)_____ Address _____
_____ Phone _____ Email _____ NABP eID _____

EVALUATION (circle the appropriate response)

- 1. Did the article achieve the stated objects? (Note at all) 1 2 3 4 5 (Completely)
- 2. Overall evaluation of the article? (Poor) 1 2 3 4 5 (Excellent)
- 3. Was the information relevent to your practice? (No) 1 2 3 4 5 (Yes)
- 4. How long did it take you to read the article and complete the exam? _____

CE credit will ONLY be awarded when a submitted test is accompanied by completing the evaluation above or online at www.scrx.org.

Self-Assessment Questions

1. A single donor can potentially donate eight organs, two corneas, and enhance the lives of up to __people through tissue donation.

- A. 25
- B. 50
- C. 75 D. 100

2. Compared to a kidney transplant, dialysis is associated with improved.

- A. Quality of life
- B. Survival rates
- C. Cost-effectiveness
- D. None of the above

3. Which of the following is an advantage of islet transplantation versus pancreatic transplantation for a diabetic patient?

- A. Less invasive surgery
- B. One donor can typically provide enough islet cells for two transplants
- C. Results in long-term insulin independence
- D. No need for immunosuppressive therapy

4. Which of the following is considered the least effective registration method?

- A. Online at RegisterMe.org
- B. Signed donor card
- C. iPhone Health Application
- D. Paper registration form

5. More than _____% of Americans express support of organ, eye, and tissue donation.

- A. 60
- B. 80
- C. 90
- D. 95

6. Which of the following is an appropriate word to use when counseling a patient about organ donation?

- A. Cadaver
- B. Life support
- C. Harvest
- D. Ventilator support

7. Which of the following is an important donor counseling point?

- A. Individuals over age 65 are not able to register as organ, eye, and tissue donors.
- B. The medical team will make all attempts to save your life prior to the donation.
- C. Your family may be charged for the donation if your insurance does not cover the donation.
- D. You will not be able to have an open-casket funeral following donation.

8. A factor considered when allocating donated organs is_____.

- A. Body size
- B. Income
- C. Gender
- D. Social status