

An assessment of the knowledge and attitudes of Ohio physician assistants regarding organ donation and transplantation

Jena Rae Smith
The University of Toledo

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2008

Dedication

This project is dedicated to my sister, Lyn Therese Christianson. After her untimely passing at the early age of twenty-five, she donated her organs and tissues to improve the lives of others. Without the impact of her life and memory I might not be where I am today. I would like to thank her for her inspiration.

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My mother and father deserve thanks and recognition for their continual love and support throughout my time in graduate school and through the completion of this scholarly project. And for his constant patience and support, I would especially like to say thanks to my husband, Adam Smith.

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Introduction

Organ transplantation has become an increasingly successful and common therapeutic intervention for individuals with end stage organ diseases. Technology and advances in medicine have contributed to the success of transplantation for these patients; however, the greatest limitation to the potential life-saving benefits of transplantation is the lack of available transplantable organs. In the United States, the number of individuals waiting for an organ transplant far surpasses the number of donor organs recovered each year (Port, Merion, Finley, Goodrich, & Wolfe, 2007). As of December of 2007 there were more than 97,000 individuals on the United States transplant candidate waiting list (United Network for Organ Sharing, 2007).

The rising number of candidates waiting for an organ has provided impetus for extensive research over the past few decades and has identified and evaluated various areas impacting the rates of organ donation. Although many contributing factors have been suggested and identified, the following contributing factors are consistently found in the literature: the lack of successful identification of potential organ donors, the failure to obtain consent for organ donation (Sheehy et al., 2003), and insufficient medical management of potential donors (Jenkins, Reilly, & Schwab, 1999). Lack of successful potential organ donor identification as well as failure to obtain consent for donation may be significantly impacted by knowledge and attitudes toward organ donation and transplantation among health care providers and the public.

A significant amount of research has focused on the assessment of knowledge and attitudes regarding organ donation among the public and health care professionals and has identified areas where additional education and research is needed. Increasing knowledge and awareness of organ donation among the patient population may lead to an increased number of designated organ donors and thus positively impact the rate of organ donation. One way to increase

knowledge among the patient population is via health care professionals directly providing information to patients about organ donation. Encouraging patients to make decisions regarding their wishes to donate, to designate that decision in legal documents, and to discuss their wishes with family members could have a significant impact on the organ shortage. In order for health care professionals to confidently provide patients with up-to-date and accurate information it is necessary for them to know the answers to common pertinent organ donation questions or to have access to such information to distribute to patients. As the number of patients who discuss organ donation with their doctors and families increases, the number of designated donors will rise and will likely result in increased organ donation rates (DuBois & Anderson, 2006).

Physician assistants are becoming increasingly important health care providers and are extensively involved in patient education. A number of studies have evaluated health care providers' knowledge and attitudes toward organ donation including physicians, critical care providers, organ procurement coordinators, and nurses (Chernenko, Jensen, Newburn-Cook, & Bigam, 2005; DuBois & Anderson, 2006; Ettner, Youngstein, & Ames, 1988; Molzahn, 1997; Prottas & Batten, 1988; Youngner, Landefeld, Coulton, Juknialis, & Leary, 1989). However, no studies of physician assistant knowledge and attitudes of organ donation and transplantation have been undertaken. The necessity of this study to evaluate the physician assistant population's knowledge level and attitudes toward organ donation and transplantation arises from the prior lack of assessment in this increasingly influential group of health care providers.

Physician assistants play an important role in patient care and education. They have the potential to make an impact on organ donation awareness by assisting patients in addressing this issue with family members and helping the community to understand the concepts surrounding donation more thoroughly. The purpose of this study is to assess the level of knowledge and the

attitudes of physician assistants practicing in the state of Ohio regarding organ donation and transplantation. This assessment will attempt to fill in the deficit of knowledge in this area and may potentially reveal areas that require further investigation. This study will provide the organ procurement organizations and the physician assistant organization in Ohio with current, valuable information about the level of knowledge and attitudes regarding organ and tissue donation among its practicing physician assistants. The results may help to determine what educational gaps may need to be addressed among physician assistants. Areas of further investigation may be identified in order to reveal how these factors may influence patient decisions to donate and how the state might best address the study's conclusions. The identified educational gaps may engender the development of professional education initiatives and programs customizable to specific groups of physician assistants in the state. New programs may increase awareness among physician assistants and in turn lead to improved organ donation rates across the state.

Literature Review

The History of Organ Donation and Transplantation

Transplant professionals might say that Alexis Carrel was the pioneer of the field of organ transplantation. His work developing and mastering vascular anastomosis techniques contributed significantly to making organ transplantation possible. Carrel is responsible for performing the first experimental kidney autotransplants with long-term survival in animals. For his work on vascular suturing and transplantation of blood vessels and organs he received the Nobel Prize in 1912 (Rudow, Ohler, & Shafer, 2006). Peter Brian Medawar was the first to demonstrate the immune response of rejection in his work with temporary skin grafts on burn victims in the 1940s. Medawar received the Nobel Prize in 1960 and 1965 for his work that engendered the field of transplantation immunology (Rudow et al., 2006). Many experimental transplants took place during the twentieth century involving both human and animal grafts for various ailments, which continued to inspire health care professionals to smooth out the rough edges of organ transplantation in order to make procedures successful. Kidney dialysis machines were developed in the mid 1900's but were scarcely available and left large numbers of ideal dialysis candidates untreated. Looking for alternative ways to treat patients with chronic kidney failure who didn't have access to dialysis was a significant impetus to push for the success of kidney transplantation. Today, kidney transplantation is by far the most frequently transplanted organ. In fact, based on data from the Organ Procurement Transplantation Network (OPTN) as of January 11, 2008, there were 13,937 kidney transplants out of a total of 23,700 organs transplanted in 2007.

The improved immunosuppressant medication azathioprine became available in 1963, which was responsible for increased graft survival and the drastic increase in living related and

volunteer kidney donations and transplantations during that time period (*Organ Procurement, Preservation and Distribution in Transplantation*, 1996; Rudow et al., 2006). Genetic matching was also implemented in the 1960s to increase graft survival of kidneys and soon led to the sharing of kidneys between transplant centers. In attempts to meet the ever-increasing need for organs, the United Network for Organ Sharing (UNOS) was created to match kidneys and all other transplantable organs throughout the nation (Rudow et al., 2006).

Recent Trends in Organ Donation

From 1996 to 2006 the number of deceased organ donors increased by forty percent; whereas prior to 2000 the rate remained relatively constant (Port et al., 2007). Port et al. suggested that recent increases in deceased donors may most notably be attributed to the Organ Donation Breakthrough Collaborative, which, through efforts to improve the efficiency of organ recovery, brought attention to best practices in both hospitals and organ procurement organizations throughout the nation. Moreover, the number of patients put on the transplant waiting list rose from 14 percent to 29 percent from 1996 to 2005. This net change reflects an increase in demand with an unmatched increase in supply. Changes in allocation policy and wait-listing practices account for some part of the narrowing gap between the number of patients on the active waiting list and the number of transplants performed (Port et al., 2007). However, the number of individuals on the transplant waiting list is still unacceptably high and provides significant motivation to continue research efforts and to improve policies and best practices. From 2004 to 2005 there was a four percent overall increase in the number of transplants reflecting an increase of 986 transplants to reach a total of 27, 527 transplants (Port et al., 2007). Given the fact that there are more than 98,000 people currently on the waiting list, significant

changes still need to be made along with substantial research in order to narrow the gap between wait-listed patients and the number of transplants performed annually.

The development of organ donor registries has led to greater data and integration capabilities and has increased the number of registered organ donors over the past several years. Newer online database registries allow individuals to update their preferences at any time. These databases have multiple access points to facilitate online registration. As registries continue to improve, the number of registered donors may be expected to increase alongside the number of available organs for transplantation. Donor registries also may contribute to more targeted public education as the ability to link donor registration to actual rates becomes possible (Punch, Hayes, LaPorte, McBride, & Seely, 2007).

Brain Death Criteria and Definitions

The development of medical technology has led to the ability to sustain bodily functions long after the cessation of brain function. This development has drastically changed the concept and definition of brain death among medical professionals and the public and can complicate the issue of organ donation. Of the three main concepts of brain death including whole-brain, higher brain, and brain stem formulations, the most widely accepted concept is whole-brain death (Bernat, 2005). The whole-brain death criterion is irreversible loss of all brain function. The legal definition of death according to Ohio law is as follows: “an individual is dead if he has sustained either irreversible cessation of circulatory and respiratory functions or irreversible cessation of all functions of the brain, including the brain stem, as determined in accordance with accepted medical standards” (Youngner et al., 1989, pp. 2206 - 2207).

Knowledge and understanding of the concepts regarding brain death and potential organ donors are essential for health care providers to confidently manage patients, educate families,

and discuss organ donation. How individuals interpret brain death and understand criterion for determining brain death may impact attitudes significantly. In a cross-sectional survey of 195 physicians and nurses it was found that those who previously participated in a formal teaching program about brain death or organ donation and retrieval had more knowledge of brain death concepts and criteria. The individuals who previously participated in formal training were also more likely to respond correctly to whole-brain death criterion questions. The researcher suggested that having higher levels of knowledge of brain death, however, may not lead to other cognitive changes such as increased comfort in approaching and discussing the issue with families (Youngner et al., 1989).

A review of empirical studies of attitudes toward brain death criteria was published by Dubois and Anderson in 2006. This review brought to light that despite public polls which have revealed that 75 percent of Americans would be willing to donate their organs, far fewer choose to donate a family member's organs when approached. Attitudes toward the dead donor rule and uncertainty with death criteria hinder the confidence of individuals as well as health care personnel as to when organ donation is ethically acceptable (DuBois & Anderson, 2006). However, more recent studies of health care personnel and the public reveal a higher level of acceptance toward these issues despite a lingering confusion of brain death (DuBois & Anderson, 2006). In fact, Youngner's survey study revealed that only 35 percent of respondents correctly identified medical and legal criteria for determining death (Youngner et al., 1989). Youngner suggested in 1989 that technology is no longer the rate-limiting factor of organ donation and transplantation, but instead it is the ability to obtain organs from suitable donors. These conclusions stress the importance of increasing formal training and education for health care providers, especially for those who are likely to be involved in the organ donation process.

Overall, Dubois and Anderson's (2006) review concluded that there were many similar inconsistencies between surveys of the public and health care professionals. Support for maintaining the dead donor rule was high, while at the same time it was not uncommon for respondents to support donation in cases with doubts of the death criteria being used (DuBois & Anderson, 2006; Youngner et al., 1989). If health care providers are not sufficiently knowledgeable of these concepts and criteria in organ donation, how can they be expected to provide education to patients or the public? This is the impetus to continue both public and health care provider education of organ donation and transplantation to dispel myths and bolster confidence in patient and provider decision-making.

Knowledge and Attitudes of Health Care Providers

Prottas and Batten (1988) conducted a survey of health professionals and hospital administrators in organ procurement and found that virtually all of these professionals supported organ donation. Although predominantly positive attitudes were found, the study revealed that dealing with donor families was associated with serious hesitation especially among physicians. In another 1988 survey of 545 transplant professional's attitudes toward organ donation done by Ettner et al., attitudes were also found to be overwhelmingly positive; however, knowledge of donation, brain death, donor maintenance, and transplant statistics were low. Specifically, lack of knowledge that brain death criteria equates to death of the entire person was found, which should thus be emphasized in educational programs for health care professionals (Ettner et al., 1988). It was also found that positive attitudes did not correspond to high confidence levels. The authors note that previous studies have found that low confidence level and lack of adequate knowledge are deterrents to organ recovery. In spite of this, 84 percent of doctors did say that they would approach a family for consent. Approximately 10 years later, a study of 831

physicians in Canada were surveyed and the results revealed that 95.4 percent agreed that they strongly approved of organ donation (Molzahn, 1997). This Canadian study also revealed that 80 percent of physicians have not discussed their wishes with family, many physicians were unaware of brain death legislation, and only 55 percent reported that they knew how to refer an organ donor. Attitudes were found to be important in predicting personal commitment to and professional involvement in organ donation and thus the author suggested that educational programs should focus on training physicians to facilitate discussion of brain death and to obtain consent from families. A more recent survey of 135 critical health care professionals in nontransplant hospitals in Canada revealed that respondents had little knowledgeable about transplant statistics. Other knowledge inconsistencies were found regarding when donation occurs, the criteria for donor candidacy, and religious positions on donation. In spite of this, overall attitudes revealed positive support for organ donation (Chernenko et al., 2005).

A survey of 188 physicians and nurses working in critical care hospitals in northwest Ohio performed by Casper in 2006 demonstrated a strong positive correlation between critical care provider attitudes toward organ donation and their level of knowledge on the subject. Knowledge was defined to be greater than or equal to 70 percent correctly answered questions in the knowledge section of the survey and critical care provider respondents on average answered 76 percent correct (Casper, 2006). Those with higher levels of knowledge also had more positive attitudes in support of organ donation and were more likely to indicate that they would be willing to donate their own organs and the organs of a family member (Casper, 2006).

The current study should bring insight into whether or not physician assistant education and training is accomplishing the goal of addressing this topic sufficiently and whether programs should be implemented to increase education.

Public Knowledge and Attitudes

The most recent national public survey of organ and tissue donation attitudes and behaviors was completed by the Gallup Organization in 2005. The survey was conducted as telephone interviews of 2315 Americans over the age of 18. The survey over-sampled minority populations and it weighted demographic variables to adjust for the over sampling (Gallup Organization, 2005). In comparison to the last national public survey in 1993, the proportion of respondents who supported or strongly supported organ donation rose from 93.5 to 95.4 percent. Drastic increases in respondents indicated that they have granted permission to donate or are willing to do so with 55 percent in 1995 rising to 72 percent in 2005. If family member's wishes were known, the percentage of respondents who said they would be very likely to donate their organs was 93 in 1993 and rose to 96.7 percent in 2005. A dramatically-improved 71.2 percent of respondents said that they would donate their family members organs even if their wishes were not known compared to only 47 percent in 1993.

Another important topic to address with the public is whether they have shared their wishes about organ donation with family members. It brings comfort to some families to know in advance that organ donation was what their loved one wanted. Families who have not previously discussed organ donation may be unprepared to make a decision when donation is requested. An encouraging 71 percent of Americans had told a family member their wishes according to the 2005 Gallup survey; whereas only 52 percent had in 1993 (2005). The report claims the following:

Beliefs based on correct information are associated with a greater likelihood of organ donation. Changing beliefs that have a high impact on donation but are based upon

misinformation provides a valuable opportunity for increasing willingness to donate and actual donation. (p. 3)

In a similar survey study of 383 northwest Ohio residents, Sander and Kopp Miller found that individuals who were more knowledgeable about organ donation also had more positive attitudes and that both knowledge and attitude were positively correlated with willingness and commitment to donate organs (Sander & Kopp Miller, 2005). The study revealed that health care providers were infrequently reported as sources of information about organ donation, but 60 percent of respondents indicated they would like to have that discussion with their provider. These results suggested that health care providers can play a critical role in organ donation through patient education.

The predominant influence that health care providers have on patients and the public logically leads to their ability to educate people in order to resolve misinformation about organ donation. Health care professionals have the power to positively impact the rates of actual organ donation by encouraging patient-provider and patient-family discussions. The positive findings of these studies of public attitudes and behavior should provide motivation for health care professionals to become knowledgeable of organ donation and should encourage them to confidently address this issue in the health care arena.

The Role of Primary Care Practitioners

Primary health care practitioners can provide support and donation information to patients and families to help them make end-of-life decisions prior to a crisis event (Coolican & Swanson, 1998). Understanding and active involvement in the donation process by the primary care provider may also be important for both recipient and donor families. Primary care providers often have long-term relationships with patients, which places them in a unique

position to discuss organ donation in a low-stress environment prior to the occurrence of a crisis. It is especially important for primary care providers to encourage patients to discuss organ donation with their families, which may make the decision-making process easier in the event of a crisis for both the family and the primary care provider. By providing education and support to these families prior to, during, and after organ donation, primary care providers may help many families through a difficult time through this continuity of care. The importance of initiating discussion of organ donation should be stressed to primary care practitioners in order to provide patients the opportunity to get questions answered and to make decisions about donation. Research has shown that primary care providers may also increase organ and tissue donation rates by increasing awareness and discussion among the patient population (Coolican & Swanson, 1998). Coolican and Swanson suggested that primary care practitioners present organ and tissue donation as an option prior to death in order to avoid the potential role conflict of hospital-based physicians requesting donation from family members immediately after a crisis event. Encouraging the availability of organ donation materials in primary care environments and the discussion of organ donation among family members may also help practitioners feel more responsible, decrease conflict, and counteract practitioner reluctance.

Role for Physician Assistants in Organ Procurement

The potential role for physician assistants in organ procurement and transplantation may be direct or indirect. Some physician assistants are functioning as organ procurement coordinators and are qualified to play a unique role as they combine their skills as clinicians, educators, consultants, donor and family liaisons, and researchers to meet the needs of the organization (Anderson, 2001). Although most physician assistants will never function as organ procurement coordinators or work directly in the transplant community they may directly educate their

patients in appropriate clinical situations. Physician assistants have a professional responsibility to patient education and advocacy and should, therefore, provide information on organ donation and transplantation to patients with inquiries and to those who are formulating advanced directives such as durable power of attorneys for health care and living wills. Physician assistants should be knowledgeable enough to dispel common myths regarding organ donation in order to fulfill their responsibility to patients with these inquiries or concerns. These crucial roles of primary care providers emphasize the need for educational programs.

The discussion of advanced directives and end-of-life care decision-making should logically include a decision about organ donation (Coolican & Swanson, 1998). It can be argued that patients and families who have had these discussions and made documented arrangements are better equipped to make end-of-life care decisions in the event of a crisis. Families are more receptive to donation when offered the opportunity to donate by health professionals with whom they had established rapport (Coolican & Swanson, 1998). Coolican and Swanson suggested that prior knowledge and rapport together may be an important factor in increasing the number of actual donors. The ideas of establishing rapport and prior knowledge of organ donation can be applied to the advanced directive discussion. If health care practitioners initiate this discussion with established patients during routine office visits in conjunction with other end-of-life preferences, it may have a positive effect on organ donation rates.

In a 1998 study of Orange County California residents with 378 respondents, Saub, Shapiro, and Radecki found that both having spoken with a physician and wanting to speak with a physician about organ donation were associated with an increased likelihood to donate (Saub, Shapiro, & Radecki, 1998). However, of the one-third of respondents who wanted to discuss organ donation with their physicians, only five percent had done so. The two-thirds of

individuals who indicated they did not want to speak with their physician left the researcher unable to conclude that patient-provider discussion of organ donation should be encouraged. However, physicians and other health care practitioners could certainly be more proactive in initiating this discussion. An analysis of why patients do not want to have this discussion is essential before implementing strategies to encourage these discussions and further break down of patient-physician barriers occurs (Saub et al., 1998). In light of this study it is important to note that the preferences noted here may not reflect national attitudes due to the possibility of geographic and cultural biases. Patients who prefer not to have the organ donation discussion with physicians may also be more willing to respond to physician inquiry rather than to initiate discussion themselves. Also, preferences regarding willingness to discuss organ donation may differ significantly from willingness to discuss advanced directives, which may provide a natural progression to the discussion of organ donation. In contrast to the study performed by Saub, Radecki, and Shapiro back in 1998, the results of Sander and Miller's study in 2005 found that 60 percent of respondents would, in fact, like to discuss donation with their health care providers. The differences in these two studies suggest that preferences to discuss donation may be highly dependent on the individual or community as well as on a multitude of other factors yet to be determined. In spite of this information, encouraging providers to be educated about and to discuss organ donation with their patients may still have a positive impact on donation rates overall.

The Current Study

No published studies of physician assistant knowledge and attitudes of organ donation and transplantation have been undertaken to date. The necessity of this study to evaluate physician assistant knowledge and attitudes toward organ donation and transplantation arises from the prior

lack of assessment in this increasingly influential group of health care providers. This study will provide organ procurement organizations and the physician assistant organization in Ohio with current, valuable information about the level of knowledge and attitudes regarding organ and tissue donation among its practicing physician assistants. This assessment will attempt to fill in the deficit of knowledge in this area and may potentially reveal areas that require further investigation.

Methods

Participants

The population for this study included all physician assistants licensed to practice in the state of Ohio. The Ohio State Medical Board provided 1863 names and addresses of physician assistants licensed to practice in Ohio. Physician assistants with out-of-state addresses were excluded from the study which resulted in 1570 surveys mailed to Ohio physician assistants.

Materials

This study utilized a 54 question survey. Please see Appendix A. The survey instrument was developed from two previous survey studies: a survey of critical care providers in Ohio from 2006 (Casper, 2006) and a survey of the general public of northwest Ohio from 2005 (Sander & Kopp Miller, 2005). Permission was obtained from these authors to modify and use the two instruments for this study.

Procedure

Surveys were mailed to all of the in-state addresses provided by the Ohio State Medical Board. A cover letter accompanied the survey to explain the purpose of the study, to explain confidentiality, and to give instructions for completion and return of the survey. Please see Appendix B. A reminder postcard was sent to all subjects two weeks after the survey was mailed to encourage participation and increase the response rate. Please see Appendix C.

Design

Descriptive needs assessment research was conducted to provide a detailed assessment of current organ donation knowledge levels among physician assistants practicing in Ohio as well as a thorough depiction of the attitudes they possess according to the survey data obtained. This assessment of physician assistant knowledge and attitudes toward organ donation and

transplantation was carried out with the potential to determine future implementation of educational interventions needed in this population. Descriptive methodology was used to depict facts ascertained from this study and to investigate relationships among the variables.

Results

Demographics

Of the 1570 surveys that were distributed by mail, 522 valid questionnaires were obtained. Eighty-two surveys were returned to sender as undeliverable or as unable to forward. Therefore, based on 1488 potential participants, the response rate for this study was 35.08%.

Respondents were 32.2% male and 67.8% female. For age, 518 of 522 valid responses were obtained. The mean age of responding participants was 39.60 ($SD = 10.53$) with a range from 22 to 71 years. The average number of years in practice as a physician assistant was answered by 520 of the 522 surveys collected and was found to be 9.95 years ($SD = 8.29$) with a range from 0.5 to 40 years. The majority of respondents reported their ethnicity as White (98.7%), followed by African American (1.3%), Asian (1.1%), and Hispanic (0.8%). One percent of respondents reported their ethnicity as other and 3 people failed to report their ethnicity (0.6%). In regard to religious preference, 83.5% were Christian, 11.3% indicated no religious preference, 3.4% indicated other, 1% were Jewish, 0.2% were Muslim, and 0.6% were missing. Most respondents ($N = 307$) indicated their highest educational degree to be a master's degree (58.8%). A bachelor's degree was claimed by 26.2% ($N = 137$), an associate's degree by 12.5% ($N = 65$), a doctoral degree by 1.7% ($N = 9$), and other by 0.8% ($N = 4$). In regard to formal training, twelve percent of the respondents indicated they had received formal training in family grief counseling (12.8%), twelve percent of respondents indicated that they had also received formal training in explaining brain death (12.3%), and ten percent of respondents had received formal training in how to request organ donation (10.3%). The mean number of times that respondents had participated in organ donation or transplantation was 3.52 ($SD = 20.30$)

with a range of 0 to 300. These demographic characteristics of the respondents are shown in Table 1.

Description of Knowledge Scores

Data was analyzed for questions 1 – 16 on page 2 of the survey. Knowledge scores were calculated for the overall sample. Four respondents were excluded from the mean knowledge score due to failure to complete the knowledge section (N = 518). The mean knowledge score for the sample was 14.04 out of a possible 16 ($SD = 1.57$), which correlates to a mean percentage correct of 87.7%. Minimum knowledge score was one and maximum score was sixteen. The vast majority of respondents were aware that there are more than 98,000 people on the transplant waiting list (95.0%), organ and tissue donation does not disfigure the body to prevent an open casket funeral (98.3%), and that families of organ donors do not end up paying extra medical bills (97.1%). Twenty-eight percent of respondents incorrectly believed that a person declared dead by cardiac criteria can only donate tissues and not vital organs. Fifty-one percent of people incorrectly believed that joining the Ohio Donor Registry guarantees that a person's wishes to become an organ donor would be honored. Seventeen percent of respondents incorrectly believed that most organ donations result from cardiac death. Fourteen percent of respondents incorrectly answered that rich and famous people on the transplant waiting list get organs before other people. Table 2 shows the results for each knowledge question.

Description of Knowledge of Organs and Tissues that Can Be Donated

Data from question 17 of the survey were analyzed regarding knowledge of individual organs and tissues that can be donated following death (N = 522). The organs and tissues that the vast majority of respondents agreed could be donated following death were: cornea (99.0%), kidneys (96.0%), heart (95.6%), skin (91.8%), liver (90.4%), and lungs (89.5%). Fourteen

percent of respondents incorrectly indicated that reproductive organs could be donated following death (14.6%) and fifteen percent of respondents incorrectly indicated that the brain could be donated (15.1%). Thirty-nine percent (39.1%) of respondents were unaware that the pancreas can be donated after death. There were significant discrepancies in knowledge of whether the following organs and tissues can be donated: small intestine (33.9% yes), bone marrow (65.1% yes), blood (32.8% yes), veins (48.3% yes), cartilage (66.9%), and fascia (48.9%). Refer to Table 3 to view the results for each item on question 17.

Description of Attitude Scores

Data was analyzed for questions 18 – 32 on pages 3 and 4 of the survey. To assess internal consistency and reliability, Cronbach's alpha was calculated for the 15 items assessing attitude ($\alpha = .745$). A Cronbach's alpha value between .70 and .80 is considered respectable and therefore our alpha value of .745 indicates internal consistency between the attitude questions (Devellis, 1991).

Attitude scores were calculated for the overall sample ($N = 487$). Thirty-five of the attitude section scores were excluded from the overall sample mean due to partial completion or failure to complete the entire attitude section. The mean attitude score for the overall sample was 57.76 ($SD = 5.97$). A score of 60 – 75 would indicate that the respondent answered agree or strongly agree to all questions in the attitude section. Given this consideration, the overall sample had relatively favorable attitudes toward organ donation. Refer to Table 4 for responses to each individual attitude question. Nearly all respondents (97.9%) agreed or strongly agreed that they support organ and tissue donation for transplantation, while only 0.4% disagreed or strongly disagreed. Virtually all respondents (98.7%) agreed or strongly agreed that it is important for their family members to know their decision about organ and tissue donation.

More than nine out of ten respondents (91.8%) agreed or strongly agreed that they are willing to donate their organs and tissues after their death. More than nine out of ten respondents (92.9%) also agreed or strongly agreed that the option of organ and tissue donation should ideally be discussed along with end-of-life decisions in the primary care setting prior to the event of a crisis.

Although most questions had a mean score of 3.5 or greater out of 5 indicating overall favorable attitudes, a few questions reflect less than favorable attitudes. Question 23 revealed that the average responder did not believe he or she had adequate knowledge to provide education to patients regarding their decision to become an organ donor ($\mu = 2.45$, $SD = 1.08$). Question 26 revealed that the average responder is not aware of his or her facility's protocol for organ and tissue donation ($\mu = 2.84$, $SD = 1.08$). Question 32 revealed that the majority of respondents do not routinely inquire about organ and tissue donation preferences when discussing end-of-life issues ($\mu = 2.80$, $SD = .82$).

Relationship between Knowledge and Attitudes

To determine whether a correlation existed between total knowledge scores and total attitude scores, a two-tailed Spearman correlation was performed for this nonparametric data. A positive correlation was found to be significant, with a p value $< .003$ ($r_s = .133$), indicating that participants who had higher total knowledge scores also tended to have more favorable attitudes toward organ and tissue donation.

Additional Analyses

More than two-thirds of respondents (69.7%) had designated their wish to be an organ and tissue donor by joining the Ohio Donor Registry. Eighty-four percent had shared their preferences about organ and tissue donation with their family while only sixty-nine percent

indicated that a family member had shared their preferences regarding organ donation with them. Fifty-four percent of respondents had discussed funeral arrangements or specifics of their wills with family members and only thirty-eight percent of respondents had a living will and/or durable power of attorney for health care. Seventy-five percent of respondents indicated that they were aware of how to become an organ donor. More detailed information regarding these questions can be found in Table 5.

Two questions were used to address the issue of giving consent for donation of a family member's organs and tissues upon death. The first question revealed that thirty-seven percent of respondents would be very likely to consent to donate even if they had not previously discussed organ donation, an additional 38.5% indicated they were somewhat likely, 10.7% were not very likely, and 1.1% were not at all likely to give consent to donate in this situation. It is important to note that sixty-six respondents did not give a response to this question ($N = 456$). In contrast, nearly nine out of ten (89.3%) respondents would be very likely to give consent if the family member had already requested that his or her organs be donated upon death, another 8% indicated that they were somewhat likely, 0.4% were not very likely, and no respondents indicated they were not all likely to give consent in this situation. Overall, participants indicated that they were more likely to give consent to donate a family member's organs and tissues if that family member's wishes were already known. These questions and responses can also be found in Table 6.

Analysis of the mean attitude score and the mean knowledge score for both non-designated donors and for designated donors was performed. The mean attitude score for non-designated donors was 54.45 ($SD = 5.36$) while the mean attitude score for designated donors was 59.24 ($SD = 5.35$). A Mann-Whitney U test was executed to compare the non-parametric

group data. A statistically significant difference to the .001 level was found for the designated donor group with a Z-score of -8.215, indicating that there were more positive attitudes toward organ and tissue donation among designated donors. The mean knowledge score for non-designated donors was 13.79 ($SD = 1.53$) while the mean knowledge score for designated donors was 14.19 ($SD = 1.42$). A Mann-Whitney U test was again executed to compare the non-parametric group data. A statistically significant difference to the .005 level was also found for the designated donor group with a Z-score of -2.810, indicating that designated donors had more knowledge of organ and tissue donation.

A two-tailed Spearman correlation was performed to determine whether a correlation existed between age and total attitude score. A positive correlation between age and total attitude score was significant at the .003 level ($r_s = .132$), indicating that older respondents had more favorable attitudes toward organ and tissue donation.

A two-tailed Spearman correlation was also performed to determine whether a correlation existed between age and total knowledge score. There was no significant relationship between age and total knowledge score.

Discussion

Considering the fact that no known published studies have surfaced to date that have analyzed physician assistant knowledge and attitudes toward organ and tissue donation, this study certainly serves as a starting point for further analysis. This study was designed to obtain descriptive data pertaining to the overall knowledge and attitudes toward organ and tissue donation among physician assistants licensed to practice in the state of Ohio. The findings here within, although only reflective of the region of Ohio, have implications for health care practitioners, the public, and organ donation and transplantation professionals nationwide.

Knowledge of Organ and Tissue Donation

Overall, this study revealed that physician assistants in the state of Ohio are certainly knowledgeable about organ and tissue donation; however, there are still some areas where there appear to be gaps in knowledge. One example is that fifty-one percent of physician assistants in Ohio incorrectly believed that joining the Ohio Donor Registry guarantees that a person's wishes to become an organ donor would be honored. Although joining a donor registry is considered legal consent to donate one's organs, most people do not realize that "surviving family permission is required for one's organs to be donated" (Saub et al., 1998). This often means that patients' next-of-kin are the ultimate decision-makers and that joining a registry does not guarantee that one's wishes will be granted. This reinforces the importance of discussing organ donation preferences with family prior to the event of a crisis.

The second example is that seventeen percent of respondents incorrectly believed that most organ donations result from cardiac death when in fact the vast majority of organ donations take place after brain death. In addition, twenty-eight percent of respondents incorrectly believed that a person declared dead by cardiac criteria can only donate tissues and not vital

organs. However, donation after cardiac death often results in the donation of major solid organs as well as tissues. It is also important to point out that fourteen percent of respondents incorrectly answered that rich and famous people on the transplant waiting list get organs before other people. This question may be more controversial than informative as it may reflect attitudes more than awareness of facts.

Knowledge of Organs and Tissues that Can Be Donated

Although this study reveals that most physician assistants in Ohio are aware of most of the major organs that are eligible for transplant, it also reveals that there are significant areas of uncertainty. Question 17 instructed respondents to, “please check all of the organs and tissues you believe can be donated following death.” Some respondents wrote in comments by hand on the survey in regard to whether the question was addressing donation after cardiac death, brain death, natural death, or donation for research purposes, which may have contributed to some confusion among those respondents.

Significant numbers of respondents were unaware that the pancreas and intestine are, in fact, transplantable organs. Responses pertaining to the other organs and tissues were inconsistent and indicated that additional education is needed among this group of health care providers. The organs and tissues that are not transplantable after death include: brain, reproductive organs, and bone marrow. Transplantable organs include: heart, lungs, liver, pancreas, kidneys, and intestine. Transplantable tissues include: cornea and sclera, heart valves, skin, tendons, fascia, blood, arteries and veins, cartilage, and rotator cuff elements. It is important to note that bone marrow is transplantable, but only from living donors and that donation of reproductive organs and brains would only occur in association with whole body donation for education and research, not for organ donation and transplantation.

Few other studies have evaluated the awareness of specific transplantable organs and tissues. However, one study by Sander and Kopp Miller also found the pancreas and intestine to be the organs that the public were least aware were transplantable at 54.6% and 36.6% awareness respectively. They also concluded that among the public there was greater awareness of specific transplantable organs than transplantable tissues (Sander & Kopp Miller, 2005).

Attitude Toward Organ and Tissue Donation

The results of the current study are relatively consistent with the results of other survey studies in relation to overall attitudes toward and support for organ donation. The current study found that nearly all respondents (97.9%) agreed or strongly agreed that they support organ and tissue donation for transplantation and overall favorable attitudes toward organ donation were found. The Gallup survey from 2007, which was a nationwide survey of the public, found that 95% of respondents supported or strongly supported organ donation. A survey of 500 medical students in Ohio revealed that they were overwhelmingly supportive of organ donation (Essman, 2006). A 1988 survey by Prottas and Batten revealed the following group percentages for those who “personally strongly approve[d] of organ donation”: 91% of hospital administrators, 93% of directors of nursing, 93% of intensive care unit nurses, 91% of neurosurgeons, and 90% of the public. A survey of 545 physicians, nurses, hospital administrators, and staff from 176 transplant centers revealed that attitudes toward organ donation were overwhelmingly positive (Ettner et al., 1988). Attitudes and overall support for organ donation have repeatedly been found to be favorable and in support of donation.

Sharing Donor Preferences with Family or Next-of-Kin

The current study revealed that most respondents agreed that it is important for their family to know their decision about organ and tissue donation (98.7%), but significantly fewer

respondents indicated that they had shared those preferences with their family (83.9%). An older study of the public revealed that 51% of the surveyed sample were unaware that next-of-kin has the ultimate responsibility for authorizing donation (Saub et al., 1998).

Other studies of medical students, physicians, the public, and other health care professionals have revealed wider discrepancies for designated donors who have not discussed their preferences with family or next-of-kin. A survey of 500 medical students in Ohio revealed that virtually all of them were supportive of organ donation (99%, N=499) but that only 60% (N=299) had talked with their family about their decision (Essman, 2006). A survey of health professionals revealed that virtually all professionals support organ donation, would donate their own organs and would consider giving permission for procurement of a relative's organs, but that nurses were more likely to have discussed donation with their families than the general public or neurosurgeons. Ninety-one percent of neurosurgeons from that study personally strongly approved of organ donation, but only 52% had discussed those feelings about organ donation with a family member (Prottas & Batten, 1988). Eighty-four percent of respondents in the current study had shared their preferences about organ and tissue donation with their family, while only 69% indicated that a family member had shared their preferences with them. Similarly, the Gallup survey of the public revealed that only 71% of Americans had shared their preferences with a family member and even fewer, 53%, revealed that a family member had shared the same information with them (Gallup Organization, 2005). In comparison to the public and these other previous studies, the current study reveals that physician assistants in Ohio have a higher proportion of family discussions regarding organ and tissue donation preferences.

Promotion of family discussions about organ and tissue donation is an important strategy to increase the number of designated donors and consent from family members. This has been

suggested several times in the literature (Bidigare & Ellis, 2000; Coolican & Swanson, 1998; Hostetter & Weber, 1991). The Bidigare and Ellis study showed that a relatively simple intervention by family physicians can increase the commitment to organ donation. The Coolican and Swanson study also suggested that primary physicians are an important resource for encouraging patients and families to discuss donation and that through collaboration with organ procurement agencies the number of available organs and tissues for transplant can be positively impacted. A review of the literature by Hostetter and Weber reported that, “an informed public who have discussed organ donation with family members will be more likely to respond positively when approached about organ donation.” The importance of promoting physician-patient and patient-family discussion about organ donation has already been established. Perhaps specific interventions by the organ procurement organizations in collaboration with primary care physicians may increase the number of designated donors, the number of available organs and tissues for transplant, and the rate of consent for donation by family.

Comments on the Impact of Knowledge and Attitude Results

It is of notable importance to acknowledge that high knowledge and attitude assessments do not necessarily correlate with increased organ donations or actual behaviors. Research has shown that increased discussion of organ donation between health care providers, patients, and their families and that simple physician interventions can result in increased commitment to donate (Bidigare & Ellis, 2000). Accurate knowledge of organ donation has also been shown to have positive influences on the number of designated donors (Saub et al., 1998). The current study did reveal high knowledge levels and favorable attitudes; however, 67.1% of respondents agreed or strongly agreed with the statement, “I do not believe I have adequate knowledge of organ and tissue donation to provide education to patients regarding their decision to become an

organ donor.” This data provides evidence that additional education and training is urgently needed among physician assistants in order to provide them with the resources necessary to confidently discuss these issues with patients.

Moreover, it is ultimately the implementation of policies, campaigns, educational and training programs by organ procurement organizations and practitioners that increase the number of designated donors and not merely favorable attitudes or high knowledge levels. These findings strongly indicated that there is a greater need for cooperation among organ procurement agencies and health care providers.

Designated Donors

More than two-thirds of respondents (69.7%) had designated their wish to be an organ and tissue donor by joining the Ohio Donor Registry. Two-thirds of public respondents in northwest Ohio indicated they were designated organ donors in Sander and Kopp Miller’s 2004 study. It is interesting to note that the public results for northwest Ohio are similar to that of the physician assistant population in the state. The Gallup survey of the public revealed that 53.2% of Americans have granted permission to become organ and tissue donors via designation on their driver’s license, by signing a donor card, and/or by joining an organ donor registry (Gallup Organization, 2005), indicating that far more physician assistants in Ohio are registered organ donors than are members of the general public.

Relationship Between Attitude, Knowledge, and Designated Donor Status

Individuals with greater awareness and knowledge of organ donation tend to be more likely and willing to be designated organ donors (Saub et al., 1998). This study revealed that designated donors were found to be more knowledgeable about organ and tissue donation. More positive attitudes were also found among designated donors than among those were not

designated donors. These results are consistent with the findings of previous studies of the public (Sander & Kopp Miller, 2005; Saub et al., 1998).

Implications for Practice

Many physician assistants may never set foot in an operating room during transplantation or procurement or work with a transplant team; however, most of them will probably interact with a patient or family impacted by organ donation or transplantation. This interaction may be through a patient who has received an organ or tissue transplant, a family that has lost a loved one who became an organ donor, or perhaps a patient on kidney dialysis who is in need of a kidney transplant. Nevertheless, as health care providers, physician assistants have a professional responsibility to be informed of the medical and ethical issues associated with organ donation and to address those issues when they arise with their patients. Physician assistants, among other health care providers, should be given education to rectify misinformation about organ and tissue donation. Practitioners who work in outpatient clinics, especially those in primary care, should have pamphlets or access to other information to answer patient questions when they arise.

The decision about organ and tissue donation should also be incorporated into the discussion of advanced directives and living wills. The majority of respondents do not routinely inquire about organ and tissue donation preferences when discussing end-of-life issues. However, more than 90% of respondents agreed that “the topic of organ and tissue donation should be routinely addressed when helping patients to prepare advanced directives.” Therefore, intervention is needed. First, organ donation information should be included in informational pamphlets about advanced directives so that patients understand it is an important issue associated with end-of-life discussions. Second, providing a standardized form for advanced

care directives with a place to indicate organ donation preferences would ensure that the topic would not easily be overlooked. Third, perhaps recommending that practitioners inquire about and update advanced care directives every 5 years as part of the medical history would be a reasonable strategy to ensure these questions are asked of patients.

Whether physician assistant education should incorporate instruction about organ donation and transplantation is worth evaluating in the future. This study reveals that there are gaps in knowledge on this topic and that there is a real need for increased education among physician assistants. Educational programs could begin at the physician assistant program level or could be in the form of continuing medical education (CME).

Public education efforts are also needed to help correct misinformation and to foster favorable attitudes toward organ and tissue donation. Previous studies have suggested that patients would like to discuss these issues with their health care providers, while others have suggested just the opposite. Sander and Kopp Miller (2004) found that although health care providers were infrequently reported as sources for organ donation information, 60% of respondents would like to discuss donation with a practitioner. Two-thirds (66%) of respondents in the 1998 Saub et al study indicated that they did not want to discuss organ donation with their health care provider, although having spoken with a physician about organ donation (5% of respondents) and wanting to discuss organ donation with a physician (34% of respondents) were positive factors associated with the likelihood to donate (Saub et al., 1998). The study by Bidigare and Ellis (2000) revealed that a simple educational tool such as a brochure with or without a brief discussion about organ donation can significantly increase the number of individuals committed to organ donation. Physician assistants and other providers can increase

public education by simply having educational materials such as brochures available in their offices.

Limitations of the Current Study

Several limitations apply to the current study including those limitations associated with most survey and mail questionnaire research. As with all survey research, participants may be inclined to respond with socially desirable answers. However, this survey attempted to maximize participant confidence to provide honest answers by ensuring the anonymity of respondents.

It is important to realize that this study reflects primarily white physician assistant attitudes and knowledge due to the small sample sizes of other ethnic groups and, therefore, we were unable to draw significant conclusions about differences in attitudes and knowledge among ethnic groups of physician assistants in Ohio.

Although the questionnaire used in this study was adapted from two previously used questionnaires, it is impossible to make direct comparisons among dissimilar questions and assessments of overall attitudes and knowledge when the questions are not identical.

It is important to realize that the knowledge section was only made up of sixteen questions that may or may not adequately reflect true knowledge levels. Important topics including knowledge of brain death criteria, donation after cardiac death, and living donation were not addressed here.

The response rate of the study was 35.09% and must also be taken into consideration. The results may not be generalizable to the entire state of Ohio and for that matter cannot be considered generalizable at the national level.

Recommendations for Future Research

The results of this study are useful and can and should be repeated in other geographical regions and perhaps even among physician assistants nationwide. Future research efforts should focus on developing and evaluating effective interventions for incorporating the decision about organ donation into advanced directives. It would be beneficial to survey hospital-based physician assistants, especially in critical care specialties, regarding the specifics of brain and cardiac death and their ability to identify potential organ donors.

Conclusion

The current study revealed that the majority of physician assistants throughout Ohio are knowledgeable about and possess favorable attitudes toward organ and tissue donation and transplantation. However, several gaps in knowledge were discovered which should be addressed in future educational endeavors for physician assistant students and practicing professionals.

Health care providers, including physician assistants, have the potential to be effective participants in the effort to increase knowledge and awareness of organ donation among the patient population through simple interventions. Physician assistants in Ohio agree that organ donation decisions should be routinely addressed when discussing and preparing advanced directives; however, the majority of respondents did not feel adequately prepared to have such discussions with patients. Therefore, future research and educational efforts should focus on providing these practitioners with the resources necessary to address these issues jointly and effectively.

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Tables

Table 1

Demographic Characteristics of Respondents

Item		Results	Responses (N)
Gender	Female	67.8%	354
	Male	32.2%	168
Mean Age (years)		39.6 (<i>SD</i> =10.53)	518
Ethnicity	White	98.7%	497
	African American	1.3%	7
	Asian	1.1%	6
	Hispanic	0.8%	4
	Other	1.0%	5
	Missing	0.6%	3
Religious Preference	Christian	83.5%	436
	No preference	11.3%	59
	Other	3.4%	18
	Jewish	1.0%	5
	Muslim	0.2%	1
	Missing	0.6%	3
Highest Educational Degree	Master's	58.8%	307
	Bachelor's	26.2%	137
	Associates	12.5%	65
	Doctoral	1.7%	9
	Other	0.8%	4
Received Formal Training	Family Grief Counseling	12.8%	67
	Explaining Brain Death	12.3%	64
	Requesting Organ Donation	10.3%	54
Mean Number of Times Involved in Organ Donation/Transplantation		3.52 (<i>SD</i> =20.3)	500
Mean Years as Practicing Physician Assistant		9.94 (<i>SD</i> =8.29)	520

Table 2

Knowledge Questions and Results

Question	Correct Answer (True or False)	Overall % Correct (N = 518)
1. There are currently more than 98,000 individuals on the waiting list to receive an organ in the United States.	True	95.0%
2. Approximately 70 percent of individuals on the transplant waiting list are waiting to receive a kidney.	True	81.0% **
3. There is a strict age limit for eligibility to donate organs.	False	82.8%
4. Organ and tissue donation disfigures the body and prevents an open casket funeral.	False	98.3% *
5. People can specify which organs and/or tissues they want to be donated.	True	94.4%
6. The family members of an organ and tissue donor end up paying extra medical bills.	False	97.1% *
7. A person can recover from brain death.	False	94.4%
8. Most organ donations result from cardiac death.	False	82.0%
9. A person declared dead by cardiac death criteria cannot donate vital organs but can donate tissues such as bone, skin, heart valves and corneas.	True	70.9% **
10. Rich and famous people on the transplant waiting list get organs and tissues before other people.	False	84.9%
11. Joining the Ohio Donor Registry would <u>not</u> change the quality of medical care a patient receives.	True	92.1%
12. Joining the Ohio Donor Registry guarantees that my wishes to be an organ donor would be honored.	False	48.7% **
13. Once a person joins the Ohio Donor Registry it cannot be changed.	False	97.9% *
14. If a patient is declared brain dead, his or her family will be asked to consent to donation even if the patient has already joined the Ohio Donor Registry.	True	86.0%
15. Most major religions oppose organ and tissue donation.	False	91.6%
16. The organ distribution system does not discriminate by race or financial status.	True	96.4%
Mean Percentage Correct (14.04 out of 16)		87.8%

* Top three questions most often answered correctly (5, 6, and 13).

** Top three questions most often answered incorrectly (2, 9, and 12).

Table 3

Knowledge of Individual Organs and Tissues and Results

Organs and Tissues	Participant Responses (N=522)	
	Yes (%)	No (%)
Heart (yes)	95.6	4.4
Small Intestine	33.9	66.1
Cornea (yes)	99.0	1.0
Skin (yes)	91.8	8.2
Bone Marrow	65.1	34.9
Blood	32.8	67.2
Tendons (yes)	78.2	21.8
Veins	48.3	51.7
Lungs (yes)	89.5	10.5
Reproductive Organs	14.6	85.4
Pancreas (yes)	60.9	39.1
Cartilage (yes)	66.9	33.1
Bone (yes)	86.4	13.6
Brain	15.1	84.7
Kidneys (yes)	96.0	4.0
Heart Valves (yes)	82.8	17.2
Liver (yes)	90.4	9.6
Fascia (yes)	48.9	51.1

Table 4

Attitude Questions and Results

Attitude Question	S. A. (%)	A. (%)	N.O. (%)	D. (%)	S.D. (%)	Mean score +/- SD
18. I support the donation of organs and tissues for transplantation. (N=521)	78.9	19.0	1.5	0.2	0.2	4.77 +/- .50
19. I am willing to donate my organs and tissues after my death. (N=519)	71.5	20.3	5.0	2.1	0.6	4.61 +/- .73
20. I would consider consenting to donating my family member's organs and tissues. (N=516)	58.6	32.0	5.6	2.3	0.4	4.48 +/- .74
21. Organ and tissue donation helps families cope with grief. (N=521)	33.9	46.4	15.9	3.6	0.0	4.11 +/- .80
22. Organ and tissue donation allows something positive to come from a person's death. (N=521)	56.5	38.9	4.0	0.4	0.0	4.52 +/- .59
23. I do not believe I have adequate knowledge of organ and tissue donation to provide education to patients regarding their decision to become an organ donor. (N=518)**	14.8	52.3	8.2	20.5	3.4	2.45 +/- 1.08
24. Training is important in determining who should make the request for organ and tissue donation. (N=519)	35.6	55.6	5.6	2.5	0.2	4.25 +/- .69
25. It is important to for my family members to know my decision about organ donation. (N=521)	68.0	30.7	0.4	0.8	0.0	4.66 +/- .53
26. I am aware of my facility's protocol for organ and tissue donation. (N=516)	7.7	22.0	21.8	41.8	5.6	2.84 +/- 1.08
27. I am comfortable discussing organ donation with family members of potential organ donors. (N=519)	10.7	32.8	13.8	37.9	4.2	3.08 +/- 1.14
28. I am comfortable with how my facility handles organ and tissue donation. (N=509)	8.8	19.3	61.3	6.3	1.7	3.28 +/- .79
29. My facility has strict guidelines for declaring brain death. (N=509)	16.3	20.1	59.2	1.7	0.2	3.52 +/- .80
30. The option of organ and tissue donation should ideally be discussed along with end-of-life decisions in the primary care setting prior to the event of a crisis. (N=520)	47.7	45.2	5.2	1.3	0.2	4.39 +/- .67

Table 4

Attitude Questions and Results (continued)

Attitude Question	S. A. (%)	A. (%)	N.O. (%)	D. (%)	S.D. (%)	Mean score +/- SD
31. The topic of organ and tissue donation should be routinely addressed when helping patients to prepare advanced directives (durable power of attorney for health care and living will). (N=519)	54.0	42.3	2.7	0.4	0.0	4.51 +/- .57
32. I routinely inquire about organ donation preferences when discussing advanced directives and other end-of-life care decisions with my patients. (N=507)	2.7	11.7	51.0	26.6	5.2	2.80 +/- .82

S.A. = Strongly Agree (Score = 5), A. = Agree (Score = 4), N.O. = No Opinion (Score = 3), D. = Disagree (Score = 2), S.D. = Strongly Disagree (Score = 1), SD = Standard Deviation

**This question was reverse scored (Strongly Agree = 1 point and Strongly Disagree = 5 points).

Table 5

Questions Regarding Designated Donor Status, Sharing Preferences and Discussion with Family, Possession of Living Will and/or DPOA, and Awareness of How to Become a Designated Donor

Question	Yes	No
33. I have designated that I want to be an organ and tissue donor by joining the Ohio Donor Registry. (N=512)	69.7%	28.4%
34. I have shared my preferences about organ and tissue donation with my family. (N=520)	83.9%	15.7%
35. A member of my family has told me about their preferences to donate or not to donate their organs and tissues after death. (N=522)	69.2%	30.8%
36. I have discussed with my family some of the arrangements that I would like to take place at the time of my death such as funeral arrangements or specifics of my will. (N=521)	54.4%	45.4%
37. I have a living will and/or a durable power of attorney for health care. (N=519)	37.7%	61.7%
40. Are you aware of how to become a designated organ donor? (N=510)	74.5%	23.2%

Table 6

Questions Regarding Willingness to Donate a Family Member's Organs

Question	Very Likely	Somewhat Likely	Not Very Likely	Not at All Likely
38. If you had <u>not discussed</u> organ donation with family members, how likely would you be to give consent to donate their organs upon death? (N=456)	37.0%	38.5%	10.7%	1.1%
39. If family members <u>had requested</u> that their organs be donated upon death, how likely would you be to give consent for donation upon death? (N=510)	89.3%	8.0%	0.4%	0.0%

For questions 1-16, please clearly write “True” for statements you believe to be True and “False” for statements you believe to be False.

1. _____ There are currently more than 98,000 individuals on the waiting list to receive an organ in the United States.
2. _____ Approximately 70 percent of individuals on the transplant waiting list are waiting to receive a kidney.
3. _____ There is a strict age limit for eligibility to donate organs.
4. _____ Organ and tissue donation disfigures the body and prevents an open casket funeral.
5. _____ People can specify which organs and/or tissues they want to be donated.
6. _____ The family members of an organ and tissue donor end up paying extra medical bills.
7. _____ A person can recover from brain death.
8. _____ Most organ donations result from cardiac death.
9. _____ A person declared dead by cardiac death criteria cannot donate vital organs but can donate tissues such as bone, skin, heart valves and corneas.
10. _____ Rich and famous people on the transplant waiting list get organs and tissues before other people.
11. _____ Joining the Ohio Donor Registry would not change the quality of medical care a patient receives.
12. _____ Joining the Ohio Donor Registry guarantees that my wishes to be an organ donor would be honored.
13. _____ Once a person joins the Ohio Donor Registry it cannot be changed.
14. _____ If a patient is declared brain dead, his or her family will be asked to consent to donation even if the patient has already joined the Ohio Donor Registry.
15. _____ Most major religions oppose organ and tissue donation.
16. _____ The organ distribution system does not discriminate by race or financial status.

For question 17, please check all of the organs and tissues you believe can be donated following death.

17.

- | | |
|--|--|
| <input type="checkbox"/> Heart
<input type="checkbox"/> Small Intestine
<input type="checkbox"/> Cornea
<input type="checkbox"/> Skin
<input type="checkbox"/> Bone Marrow
<input type="checkbox"/> Blood
<input type="checkbox"/> Tendons
<input type="checkbox"/> Veins
<input type="checkbox"/> Lungs | <input type="checkbox"/> Reproductive Organs
<input type="checkbox"/> Pancreas
<input type="checkbox"/> Cartilage
<input type="checkbox"/> Bone
<input type="checkbox"/> Brain
<input type="checkbox"/> Kidneys
<input type="checkbox"/> Heart Valves
<input type="checkbox"/> Liver
<input type="checkbox"/> Fascia |
|--|--|

For questions 18-32, please circle your response.

18. I support the donation of organs and tissues for transplantation.
Strongly agree Agree No opinion Disagree Strongly disagree
19. I am willing to donate my organs and tissues after my death.
Strongly agree Agree No opinion Disagree Strongly disagree
20. I would consider consenting to donating my family member's organs and tissues.
Strongly agree Agree No opinion Disagree Strongly disagree
21. Organ and tissue donation helps families cope with grief.
Strongly agree Agree No opinion Disagree Strongly disagree
22. Organ and tissue donation allows something positive to come from a person's death.
Strongly agree Agree No opinion Disagree Strongly disagree
23. I do not believe I have adequate knowledge of organ and tissue donation to provide education to patients regarding their decision to become an organ donor.
Strongly agree Agree No opinion Disagree Strongly disagree
24. Training is important in determining who should make the request for organ and tissue donation.
Strongly agree Agree No opinion Disagree Strongly disagree

35. A member of my family has told me about their preferences to donate or not to donate their organs and tissues after death.

Yes

No

36. I have discussed with my family some of the arrangements that I would like to take place at the time of my death such as funeral arrangements or specifics of my will.

Yes

No

37. I have a living will and/or a durable power of attorney for health care.

Yes

No

For questions 38-40, please circle your response.
--

38. If you had not discussed organ donation with family members, how likely would you be to give consent to donate their organs upon death?

Very likely

Somewhat likely

Not very likely

Not at all likely

39. If family members had requested that their organs be donated upon death, how likely would you be to give consent for donation upon death?

Very likely

Somewhat likely

Not very likely

Not at all likely

40. Are you aware of how to become a designated organ donor?

Yes

No

Please add any additional comments which may be helpful to this study.

Thank you for your participation. We hope to gain valuable information from your responses.

Please return your completed survey in the self-addressed and postage-paid envelope provided with your survey.

Appendix B

IRB Number _____

Dear Participant,

As a student of the University of Toledo – Health Science Campus Physician Assistant Program, I am conducting research to explore knowledge and attitudes toward organ and tissue donation among physician assistants in Ohio. You were selected for participation based on your status with the State Medical Board of Ohio.

The enclosed questionnaire should take less than 30 minutes of your time to complete. Your contribution will provide valuable information which can be used to design effective educational programs regarding organ and tissue donation. I would greatly appreciate it if you would take a few minutes of your valuable time to complete it.

Your participation in this study is voluntary and anonymous. Your reply will be held in the strictest confidence, so please do not place your name or any other identifying information on the questionnaire. Participation is acknowledged by your return of the enclosed questionnaire and implies your consent. Instructions are included on the survey form. If you prefer not to answer certain questions, please leave the answer space blank.

Please return the completed questionnaire by March 15th, 2008 in the self-addressed, postage-paid envelope provided. If you have any questions or concerns about the survey or its contents, please contact Jena Smith at jena.smith@utoledo.edu or Barbara Kopp Miller at (419) 383-4289.

Thank you for your time and assistance.

Sincerely,

Barbara Kopp Miller, Ph.D.
Principal Investigator and Research Advisor

Jena Smith, PA-S
Co-investigator

Appendix C

Dear Participant,

Approximately one month ago you received a questionnaire inquiring about knowledge and attitudes toward organ donation. Your response is very important. We are investigating knowledge and attitudes of organ donation among physician assistants in Ohio. The information you provide will be important in the development of effective educational programs for health care professionals.

If you have already returned the questionnaire, I extend a heartfelt thanks to you for participating in this study. If you have not completed and returned the survey, I would appreciate it if you could take a few minutes of your time to do so. If you have misplaced or discarded the questionnaire and would like a replacement, please email me at jena.smith@utoledo.edu and I will send you a new one.

Thank you again for taking the time to contribute to this research study.

Sincerely,

Jena Smith, PA-S
Co-investigator
Barbara Kopp Miller, Ph. D
Principal Investigator and Research Advisor

Abstract

An Assessment of the Knowledge and Attitudes of Ohio Physician Assistants Regarding Organ Donation and Transplantation

Objective: Ohio physician assistants were surveyed regarding their knowledge and attitudes toward organ and tissue donation. **Method:** A questionnaire was mailed to 1570 physician assistants licensed to practice in Ohio. The questionnaire included 54 questions assessing demographics, knowledge, attitudes, and behaviors. Data obtained was statistically analyzed to establish relationships among the variables. **Results:** A total of 552 valid surveys were obtained. The mean knowledge score for respondents was 87.7%, indicating high knowledge levels. Overall favorable attitudes toward organ donation were found. Participants with higher knowledge levels were more likely to have more favorable attitudes and to be designated organ donors. Still, 67% of respondents did not feel adequately knowledgeable to educate and counsel patients regarding organ donation decisions. **Conclusion:** In spite of high knowledge levels and favorable attitudes found among Ohio physician assistants, evidence indicates there is a great need for increased organ donation education and training.