

## A Review of Organ/Tissue Donation in Out of Hospital Cardiac Arrest Patients at an Academic Community Hospital

Jordan Williams, Amanda Broderick, Alexandra Maryashina, James Wu, MD  
Department of Surgery, Division of Cardiothoracic Surgery

### Abstract

*Objective* This study sought to review organ/tissue donation statistics in out of hospital cardiac arrest patients.

*Background* While OHCA patients who are not revived in the emergency department are generally disqualified from donating organs, these patients are sometimes still able to donate tissue. However the fact remains that there is an organ shortage in the United States healthcare system as the need exceeds the donation rate, and thus other avenues to increase the donation rate need to be explored.

*Methods* A retrospective chart review was performed on 378 patient records with OHCA from January 2011 to May 2015. From these records, the eligibility of the patients to donate, reasons behind their ineligibility, number of patients who donated, reasons for eligible patients who didn't donate, and a comparison of number of arrests and number of donations by age were extracted.

*Results* It was found that while 72% of patients were eligible to donate, only 41% of these patients went on to donate tissue and/or organs. For those patients that were ineligible the most common reason was being medically unsuitable, and for the eligible patients who didn't donate the most common reason was their family withholding consent. In the age comparison of number of arrest and number of organ/tissue donations it was found that the rates by which these groups changed did not match, especially in patients over the age of 50.

*Conclusion* While no formal conclusion can necessarily be drawn from this data, it does offer some suggestions and ideas for further research. One possible area of study could be increasing education about organ donation in the community surrounding the hospital. Another area of study could be in ways of lengthening organ viability time in OCHA patients that proceed to donate.

### Keywords

Out of Hospital Cardiac Arrest, Organ Donation, ECMO, "Education in Organ Donation"

### Introduction

The national survival to discharge rate in out of hospital cardiac arrest (OHCA) remains low, currently 9.5% as of 2013 according to the American Heart Association (American Heart Association, 2012). One potential solution to this problem might be extracorporeal membrane oxygenation (ECMO) for these patients assuming they match certain criteria such as age, comorbidities, presenting rhythm, time to advanced care, etc. However, another aspect of ECMO could be to prolong organ viability in potential organ donors (Magliocca, et al., 2005) (Munjal, et al., 2012).

According to the US Organ Procurement and Transplantation Network, the percent of national eligible deaths that resulted in donation of at least one organ was 71.3% in 2013 (U.S. Department of Health and Human Services, 2015). However, the amount of organs available for transplant currently does not meet the demand. For example, at the end of 2013 there were 60,189 candidates on the waiting list for a kidney transplant, while there were only 17,654 transplants performed that year. Similar trends were noted for liver, heart, and lung donations (U.S. Department of Health and Human Services, 2015).

Current US organ donation policy on deceased donors states that organ donation can only be considered when the potential donor has died from

neurological death or controlled circulatory death (Wall, Plunkett, & Caplan, 2015). OHCA patients that are not successfully revived in the emergency department are considered to have died from an uncontrolled form of death, and thus many of these patients are only eligible to donate tissue (instead of organs). However, an OHCA patient could go on to become a donor if they are revived in the field, or in the emergency department, and are subsequently taken off life continuing measures such as ventilators, ECMO, etc., as this would now be considered a controlled form of circulatory death or neurological death if applicable. Even in a case where a patient has died from a controlled form of death, and is eligible to donate organs and/or tissue, a donation might not occur due to the family of the patient withholding consent. Legislation, such as the revised Uniformed Anatomical Gift Act of 2006, has been introduced which would eliminate the need to gain consent from the family, if the patient in question was listed in their state's donation registry. However it has not been enacted in Pennsylvania, along with Delaware, Florida and New York (Uniform Law Commission, 2015). This study stands to serve as a review of organ/tissue donation information at an academic community hospital in order to generate interest for further research investigating ways to increase organ donation rates.

## Methods

A retrospective chart review was utilized for patients with OHCA over the time period from January 2011 to May 2015. Patients were then sorted by age at time of admission, and were excluded if they were over the age of 70 or under 18, yielding 434 records. An arrest was classified as out of hospital if it occurred before arrival in the emergency department, or occurred in the emergency department. A database was created which encompassed many aspects of OHCA patients; however this study focused primarily on organ donation information. Specifically, the patients' eligibility for organ/tissue donation was recorded, as well as the reason for their ineligibility, if applicable. The reasons for ineligibility were gained from the Gift of Life (our hospital's organ procurement organization) form in the patient's chart. Other data included were if the patient actually donated,

reason(s) for not donating, and the specific tissue and/or organs donated. Based off of this information, patients were then excluded from the study if they did not have both eligibility data, and donation data. From this cohort of 378 patients, descriptive statistics were utilized to depict aspects of patient eligibility and donation information.

## Results

Out of the 378 patients studied, 72% (272/378) were eligible to donate (see figure 1). For the other 28% (106/378), 33 patients survived to discharge, leaving 73 patients who were ineligible due to some other reason. The most common reason for their ineligibility was being medically unsuitable, with 48 out of the 73 falling into this category (figure 2). The next most common reason was that the medical examiner/coroner determined that they were ineligible (10/73). Finally being ineligible due to previous drug use (8/73), and being marked as ineligible without any reasoning (7/73) were the least common reasons.

The next point viewed was the percent of eligible patients that actually went on to donate organs/tissue. Out of the 272 eligible patients, only 41% (112 patients) actually went on to donate, leaving 59% (160 patients), who, while eligible, didn't donate (figure 3). The reason behind the lack of donation was then examined. The most frequent reason was family declining to give consent, with 91 of the 160 patients who were eligible but didn't donate falling into this category (figure 4). For 65 of the 160 patients, the reasons for not donating were undocumented, 3 out of the 160 didn't donate due to the hospital staff not gaining consent from the family within the organ viability timeframe, and 1 patient who was previously deemed eligible, was later deemed ineligible to donate.

For those patients that were eligible and donated (112/378), the most common tissue donated was corneas, with 82 patients donating these, and the most common organ was the kidney, with 4 patients donating at least one of these (figure 5). An interesting trend to note is how the number of arrests for a given age group differs from the amount of organ donations in that category (figure 6). The number of arrests peak in the 59-62 years age range,

while the number of donations peak in the 51-54 range. This would suggest that the rate at which organ/tissue donations are occurring differs from the rate that OHCA's are occurring.

## Discussion

Due to the fact that this study was done at one academic community hospital, formal conclusions cannot be drawn from this study. However, from this review of 378 OHCA patients, it can still be seen that the number of organ/tissue donations does not match the number of arrests. It can also be seen that the most common reason for eligible patients not donating is that their family did not give consent. While there is a law currently being introduced to the Pennsylvania state government that would remove the need to gain consent from the family if the patient was a known donor, other solutions should be pursued. It has been suggested that education on organ donation may serve to play an important role in increasing organ donation rates (Martinez, et al., 2001). Perhaps the families in this

study might have benefited from more education on organ donation, before the sudden event of an OHCA in a loved one. This way they would be able to discuss with their loved one what their wishes were beforehand, to prevent the stressful decision from having to be made suddenly in the hospital setting. Considering that many of the patients in this study would not have been eligible to donate organs simply due to their death being classified as an uncontrolled form of death, further research in this hospital could be pursued in expanding organ donor criteria to include more OHCA patients. Along this line, research could be pursued in using ECMO or other organ preservation measures in OHCA patients in order to increase the rates of organ/tissue donation.

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Appendix

Figure 1

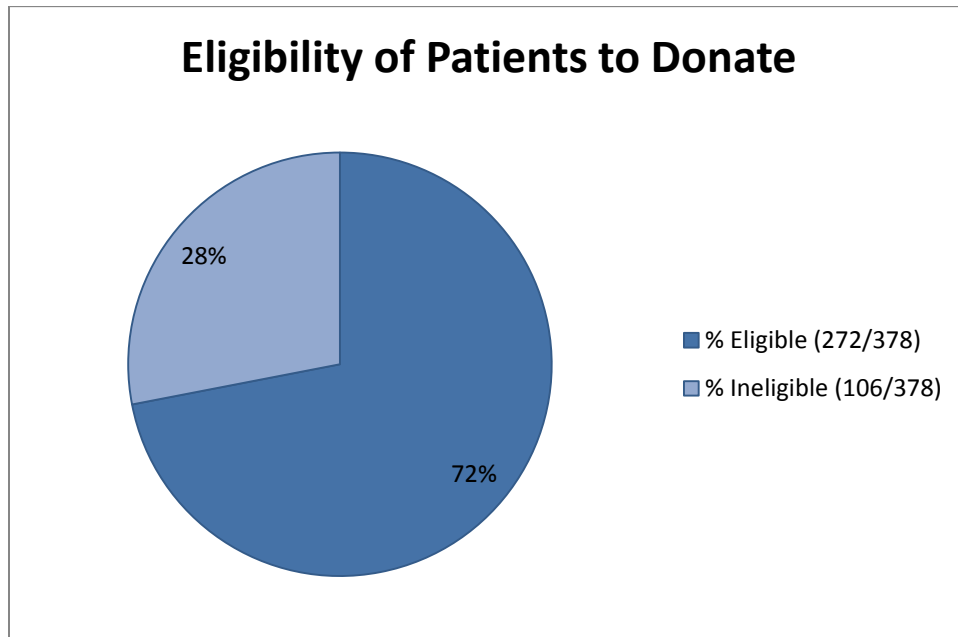


Figure 2

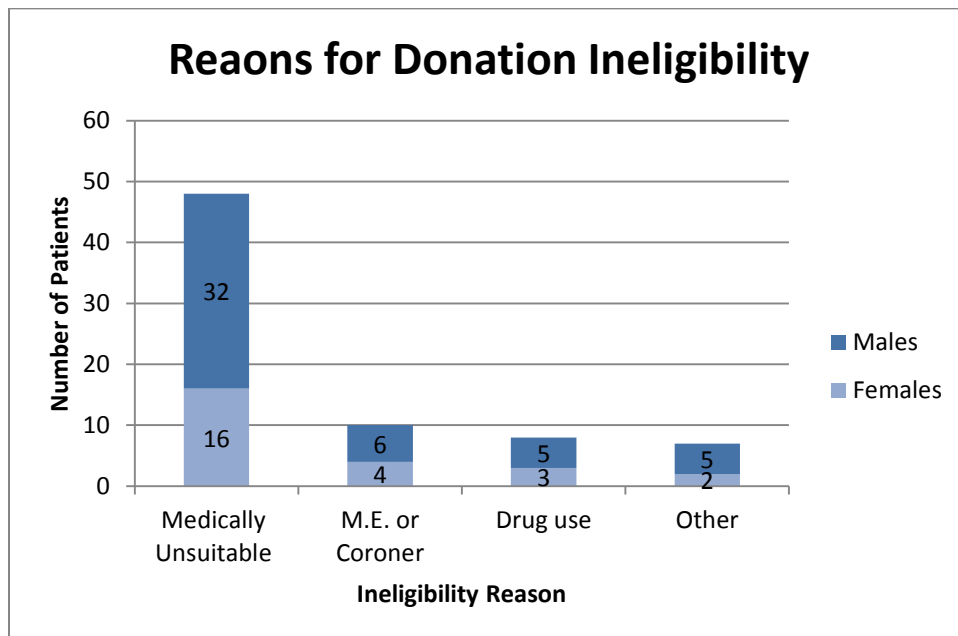


Figure 3

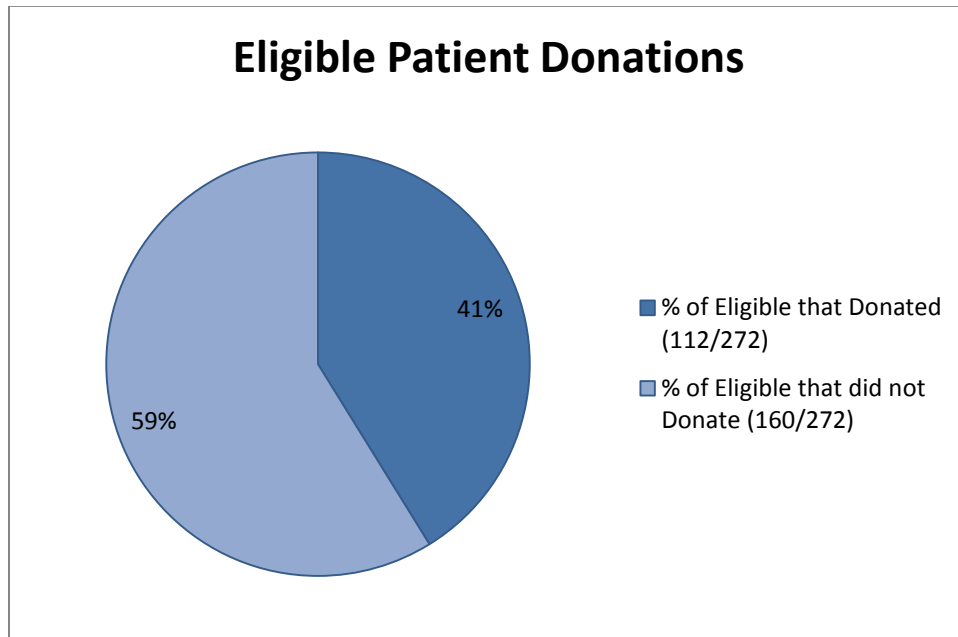


Figure 4

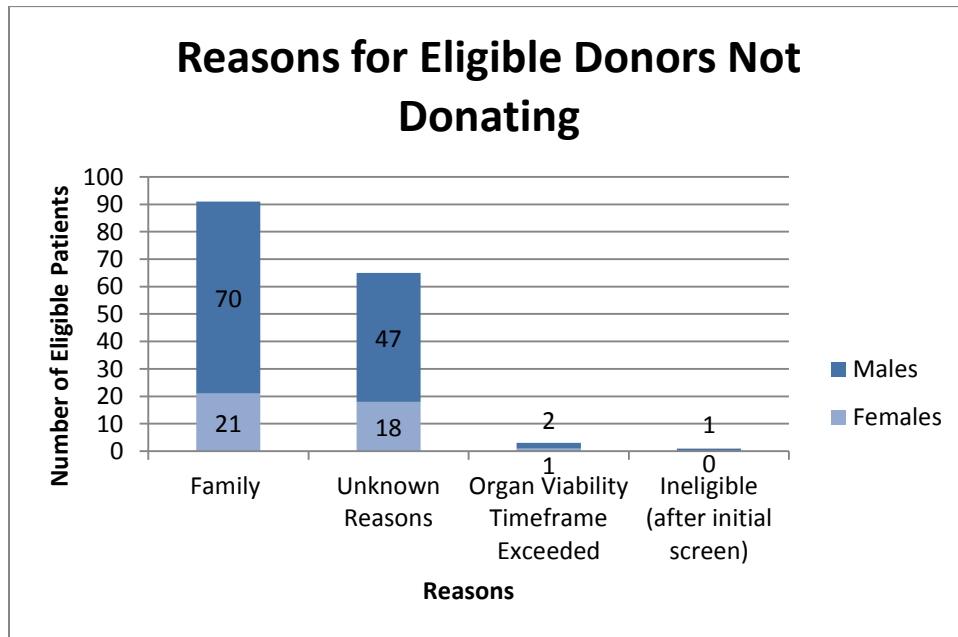


Figure 5

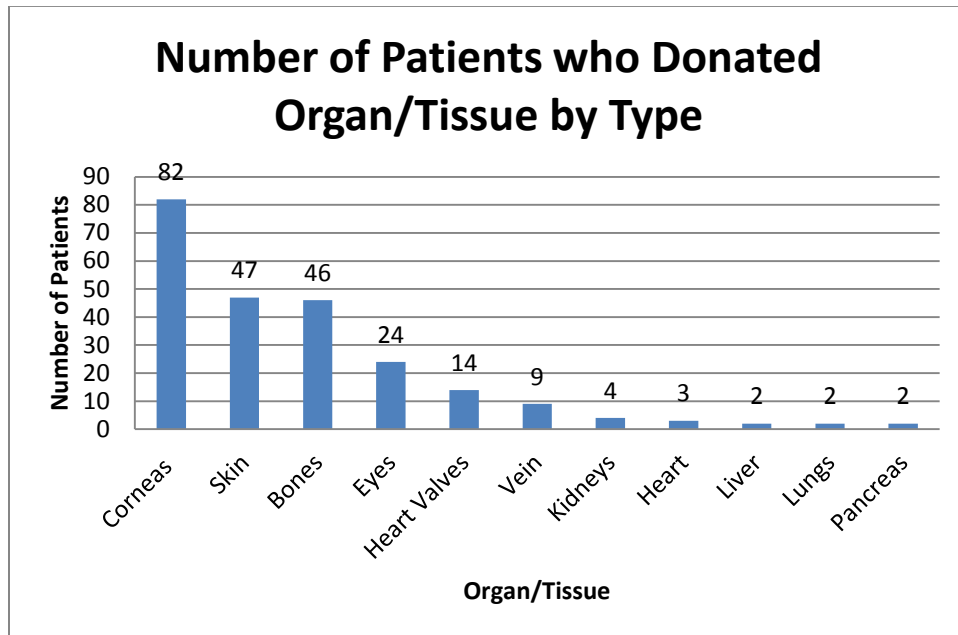


Figure 6

