GLOBAL LEADERSHIP SYMPOSIUM

A GLOBAL PERSPECTIVE ON THE LAW ADDRESSING ORGAN DONATION:
LESSONS FROM AROUND THE WORLD

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Vice President, Administration & General Counsel
Gift of Life Donor Program
Why We Do What We Do (a/k/a a heart, mind, feet & hands)
Gift of Life Donor Program
Philadelphia, Pennsylvania USA

- Non-Profit OPO/Tissue Recovery/Eye Bank
- Established in 1974
- Largest OPO in the United States
- Federally designated OPO (by Medicare) for eastern PA, Southern NJ & Delaware
  - 131 Acute Care Hospitals
  - 15 Transplant Centers, 42 Programs
  - 11 Million Population

- 483 organ donors in 2015, resulting in 1,291 transplants; highest volume in the U.S. – 44 donors/MM; 1,202 bone recoveries; 2,265 cornea recoveries and 2,546 tissue recoveries

- Over 40,000 organs for transplantation and over 550,000 tissue allografts

- Accredited by: Association of Organ Procurement Organizations (AOPO); American Assoc. of Tissue Banks (AATB) & Eye Bank Assoc. of America (EBAA); UNOS/OPTN member OPO
An International Public Health Crisis
It is estimated that more than 250,000 people are awaiting a life-saving transplant ... in those countries that maintain a list

Consequences of the International Organ Shortage: Death

More than 6,000 people in the United States die each year awaiting a life-saving organ transplant... Tens of thousands die waiting Worldwide annually
CONSEQUENCES
Of the International Organ Shortage

20 April 2016, Baghdad, Iraq – BBC News
Om Hussein (right) attempted to sell a kidney in order to help support her family. Gangs in Iraq will pay up to $10,000 USD (£7,000) for a kidney.

18 Nov 2009, Rawalpindi, Pakistan – Getty
A father and his two sons display their scars from selling a kidney. They were paid approximately $1,200 USD each.

11 July 2012, Brooklyn, NY – NY Times
Levy-Izhak Rosenbaum pleaded guilty to illegally brokering the sale of kidneys from Israeli donors to American patients.
Our Task:

• Increase the Number of Deceased Organ Donors

• Increase the Number of Living Donors

HOW?
The Process:

• Survey the Laws of Various Countries Regarding Anatomical Donation and Review the Guiding Ethical Principles

• Survey the Donation and Transplantation Rates in those Countries

• Imagine

• Prepare Recommendations
Ongoing Development of International Standards for Anatomical Donation

Establish a Legislative Framework to Address the Worldwide Organ Shortage
“All countries need a legal and professional framework to govern organ donation and transplantation activities...that ensures..the enforcement of standards and prohibitions on unethical practices.”
WHO GUIDING PRINCIPLES
ON HUMAN CELL, TISSUE AND ORGAN TRANSPLANTATION

PREAMBLE

1. As the Director-General’s report to the Executive Board at its Seventy-ninth session pointed out, human organ transplantation began with a series of experimental studies at the beginning of the twentieth century. The report drew attention to some of the major clinical and scientific advances in the field since Alexis Carrel was awarded the Nobel Prize in 1912 for his pioneering work. Surgical transplantation of human organs from deceased, as well as living, donors to sick and dying patients began after the Second World War. Over the past 50 years, the transplantation of human organs, tissues and cells has become a worldwide practice which has extended, and greatly enhanced the quality of, hundreds of thousands of lives. Continuous improvements in medical technology, particularly in relation to organ and tissue rejection, have led to an increase in the demand for organs and tissues, which has always exceeded supply despite substantial expansion in deceased organ donation as well as greater reliance on donation from living persons in recent years.

2. The shortage of available organs has not only prompted many countries to develop procedures and systems to increase supply but has also stimulated commercial traffic in human organs, particularly from living donors who are unrelated to recipients. The evidence of such commerce, along with the related traffic in human beings, has become clearer in recent decades. Moreover, the growing ease of international communication and travel has led many patients to travel abroad to medical centres that advertise their ability to perform transplants and to supply donor organs for a single, inclusive charge.

3. Resolutions WHA40.13 and WHA42.5 first expressed the Health Assembly’s concern over commercial trade in organs and the need for global standards for transplantation. Based on a process of consultation undertaken by the Secretariat, the Health Assembly then endorsed the WHO Guiding Principles on Human Organ Transplantation in resolution WHA44.25. Over the past 17 years the Guiding Principles have greatly influenced professional codes and practices as well as legislation around the world. In the light of changes in practices and attitudes regarding organ and tissue transplantation, the Fifty-seventh World Health Assembly in resolution WHA57.18 requested the Director-General, inter alia, “to continue examining and collecting global data on the practices, safety, quality, efficacy and epidemiology of allogeneic transplantation and on ethical issues, including living donation, to enable review of the Guiding Principles on Human Organ Transplantation.”
Setting the Stage: Gift Model

- WHO Guiding Principle 1: Organs may be removed from the bodies of deceased persons for transplant if any consent required by law is obtained and there is no reason to believe the decedent objected to the donation.

- WHO: Guiding Principle 5: “Organs should only be donated freely, without any monetary payment or other regard or monetary value.”
Setting the Stage: Gift Model

• **Gift defined:**
  • A voluntary and legally binding uncompensated transfer

• **Elements of a gift:**
  • Donative intent
  • Delivery
  • Acceptance
LEGAL BASIS OF DECEASED DONATION: The Gift Model

• Principles of Donative Intent
  – Voluntary
    • Without coercion
  – Binding
    • Without expectation of return
  – Altruistic
    • Without compensation
Approaches to Donative Intent in deceased donation

- Express or “Opt-in”
- Presumed or “Opt-out”

Which is Preferable?
SETTING THE STAGE:
What is an Opt-In System?

Australia

USA

UK
U.S. System

• Federal Statute, Regulations and Policy establish a framework for donation and transplantation – both organ and tissue (including establishment of organ procurement organizations)

• State law governs the “gift” or consent process and the determination of death
US Law - Uniform Anatomical Gift Act (UAGA)

• Model State Law developed in 1968; revised in 1987 and 2006

• Addresses only anatomical donation after death

• Without authorization no anatomical donation can occur

• A person 18 years of age or older may make an anatomical “Gift” to be effective upon their death (e.g. inclusion in a registry, driver’s license, advance directive, donor card)

• Accommodates gifts from minors with parental authorization
Uniform Anatomical Gift Act

• Provides for “Autonomy of Patient” – also referred to as “First–person” authorization or consent
  • **Next-of-kin cannot legally override**

• Recognizes surrogate decision-maker -- establishes a hierarchy of who makes donation decision at time of death in absence of decision by decedent

• Authorization/Consent ≠ “Informed” Consent
Uniform Anatomical Gift Act

• Scope of the gift- transplant, therapy or research
• Persons who may become donees (where does the organ or tissue go):
  – named individual (directed donation)
  – appropriate procurement agency
  – hospital, accredited medical or dental school, other (research)
• Separation of transplant/OPO team and declaration of death
• “Good faith” immunity clause
• Reciprocity between states
• Confidentiality
Registries

- UAGA established registries in every state with ACTIONABE DONOR DESIGNATIONS
Registries

An actionable designation can also be made through Donate Life America at www.DonateLife.Net
Registries

• Critical issue is how the registry is operationalized
• US model affords multiple (every trip to DMV; Website) opportunities to designate
• As of 9/15/2015, 51.7% of people over 18 years of age designated

128,289,638

Designated
Discussion Break

UAGA does not permit next-of-kin to override a person’s decision to donate.

1. What do you do when there is first-person consent in a registry, but the family objects?
2. What are the consequences of acting against the family’s wishes?
Discussion Break

Potential outcomes:
• Proceed against family wishes
• Don't proceed
• Go to Court

• Considerations:
  – Autonomy
  – Media
  – Hospital Team
  – Risk Management/legal
  – Other

- Public Trust
- Compatible Recipients
- OPO Staff
- Family Support
Working Together to Achieve the Best Possible Outcome for Everyone Involved in End-of-life Decisions.

Collaboration

Advocacy for Patient Autonomy

Respect for Family

Advocacy for Recipients

Transplant Center

OPO

Hospital
LifeLine vs. OhioHealth (2013)

• 21-year-old declared brain dead after hit-and-run while bicycling
• Parents objected to allowing organ donation to proceed – argued son didn’t understand what he was doing when registered to be an organ donor
• Court ruled that organ donation could proceed – 1st person consent sufficient
Considerations in Family Opposition to First Person Consent

- Autonomy
- DMV donor designation
- Public trust
- Legislation
- Medically suitable donor
- Compatible recipients identified
- Fiancé’s knowledge & support of decision
- Hospital staff and administration support
- OPO administration & legal counsel support
- Mother (legal NOK) unwilling to support decedent’s wishes
Setting the Stage: Gift Model

• WHO: Guiding Principle 5: “..Organs should only be donated freely, without any monetary payment or other regard or monetary value. Purchasing, or offering to purchase... for transplantation, or their sale by living persons or by the next of kin for deceased persons, should be banned. ... does not preclude reimbursing reasonable and verifiable expenses..”
Setting the Stage: Gift Model

- **Gift defined:**
  - A voluntary and legally binding uncompensated transfer

- **Elements of a gift:**
  - Donative intent
  - Delivery
  - Acceptance
National Organ Transplant Act

• Passed in 1984
• Prohibited the buying and selling of organs from both living & deceased donors
• 42 U.S. Code § 274e
  • It shall be unlawful for any person to knowingly acquire, receive, or otherwise transfer any human organ for valuable consideration for use in human transplantation if the transfer affects interstate commerce.
60 Lives, 30 Kidneys, All Linked

FROM START TO FINISH A donation by a Good Samaritan, Rick Ruzzamenti, upper left, set in motion a 60-person chain of transplants that ended with a kidney for Donald C. Terry Jr., bottom right.

By KEVIN SACK
Published: February 18, 2012
National Organ Transplant Act

Valuable consideration does not include:

- Reasonable payments associated with removal, transportation, implantation, processing, preservation, quality control, storage, or expenses of travel, housing and lost wages incurred by an organ donor in connection with the donation.

Valuable consideration does not include:

- Human organ paired donation

Are there other “incentives” that should be/excluded from Valuable Consideration?
Where are we now?
Overall Support for Organ Donation

US Dept. of Health & Human Services; Gallup
Q: If you indicate you intend to be a donor, doctors will be less likely to try to save your life.

Beliefs About Organ Donation

US Dept. of Health & Human Services; Gallup
Beliefs About Organ Donation

Q: Is it possible for a brain dead person to recover from his or her injuries?

US Dept. of Health & Human Services; Gallup
Waiting list consists of patient registrations. Transplants occurred in the GLDP area. Wait list data based upon OPTN data.
Hard Facts of an Opt-In Nation

- Over 120,000 people are awaiting a lifesaving organ transplant nationwide

- Over 6,100 people are dying each year awaiting a transplant – on average 21 people each day

- A new name added to the transplant waiting list every 10 minutes

Is this working?
SETTING THE STAGE:
What is an Opt-Out System?
An Opt-Out System
Presumed Consent

• Adopted in Many European Countries

• Assumes Donation Unless the Deceased has “Opted-Out” By Affirmatively Refusing Organ Donation

• Pure or Soft = Variations on the Presumed Consent Standard (Strict or Relaxed)
Austria – Pure

- Austrian citizens may only OPT OUT via written statement
- Relatives of the decedent may NOT overrule the decision
- Doctors have no affirmative duty to search for documents indicating rejection or to inform family of the donation
- Err on the side of donation- If there is doubt as to whether the decedent opted out, removal is permitted
- If a citizen registers his objection and later needs a transplant, he is placed at the “bottom” of the list

RESULTS: Austria’s deceased donation rate has increased from 4.6 donors per million in 1986 to more than 25.5 donors per million in 2014
Low donation rates caused Chile to adopt an opt-out system in 2010.

High opt-out rates necessitated new legislation in 2013 to require a notarized document in order to opt-out.

2013 legislation also gave priority access to transplants to those who do not opt-out.

RESULTS: Deceased donation increased by about 20% in 2014 to 6.9 donors per million.
France – Soft Pure

• Caillavet Law “An organ to be used for therapeutic or scientific purposes may be removed from the cadaver of a person who has not during his lifetime made known his refusal of such procedure. If, however, the cadaver is that of a minor or a mentally defective person, organ removal for transplantation must be authorized by his legal representative.”

• Has a computerized non-donor registry

• Allows hospitals to know instantly whether a patient has opted out of donation

• In the absence of opting out, the principle of presumed consent will hold. HOWEVER, in practice, doctors still inform families of the option to refuse.

RESULTS: France has seen a deceased donor rate of 25.3 donors per million in 2014
Belgium – Soft

• Like France, Belgium has a computerized non-donor registry

• Has nationwide informational campaigns to educate individuals about advances in transplant technology

• Doctors are encouraged to approach all families and inform them of their option to refuse donation on behalf of a decedent who had not “opted out”; Familial consent not required for donation

• Fewer than 10% of families refuse donation

• Belgium often used as an example of the benefits of presumed consent. Antwerp/Leuven

RESULTS: Belgium has seen a deceased donor rate of 26.8 donors per million in 2012
Singapore – Hybrid
(Presumed Consent & Altruistic)

- One of the more advanced systems in the world
- Presumed consent only applies to kidneys of victims of fatal accidents.
- Must be 21-60 years old
- Must be mentally competent
- Coroner must determine if the accident caused the fatality
- Two (2) senior physicians (who cannot be related to the transplant team or recipient) must determine if patient is brain dead through a series of tests
Singapore – Hybrid
(Presumed Consent & Altruistic)

• Just before 21st birthday citizen receives a letter outlining their options. Rejections posted on a confidential computer registry accessible to the 5 major hospitals.
• System provides for “OPT-IN” donation of all other organs
• Individuals who have not opted out get priority on the waiting list
• If “rejection” is removed after need arises patient is given priority after 2 yrs.
• Immediate family members of a donor receive 50% subsidy for medical expenses for 5 yrs following donation

RESULTS: Singapore had a deceased donor rate of 5 donors per million
Hard Facts of an Opt-Out Nation

- There is significant variation in the implementation of various Opt-Out Models
- Factors impacting donation may not be dependent upon Opt Out but upon national healthcare system
- History of governmental/monarchy role regarding disposition of body
- Overall death toll in Europe – 3,650 people die each year awaiting transplant
RESULTS: Deceased Donation Rates Per Million Population (2013)

Source: IRODaT
## Comparison of Legal Models

<table>
<thead>
<tr>
<th>System</th>
<th>Presumed Consent Opt-Out</th>
<th>Express Consent Opt-In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicit Consent</td>
<td>Donation may proceed</td>
<td>Donation may proceed</td>
</tr>
<tr>
<td>Explicit Refusal</td>
<td>Donation prohibited</td>
<td>Donation prohibited</td>
</tr>
<tr>
<td>No Decision</td>
<td>Donation may proceed (strict )</td>
<td>Must obtain authorization from next-of-kin</td>
</tr>
<tr>
<td>Next-of-Kin</td>
<td>No role if explicit consent or refusal exists</td>
<td>No role if explicit consent or refusal exists</td>
</tr>
<tr>
<td></td>
<td>May override presumption in “soft” opt-out countries</td>
<td>May authorize or refuse if no decision made</td>
</tr>
</tbody>
</table>
**OPT-IN or OPT-OUT?**

- Which results in higher donation rates?
  - It depends

- If an Opt-Out Model, then Pure or Soft?
  - It depends

- Too many other factors weigh on results
  - Switching to Opt-Out has proved harmful in some countries
OPT-IN or OPT-OUT?

• Even the most successful examples of each approach cannot meet the needs of those waiting. The model must be aligned w/ cultural, legal and ethical principles.

• What other approaches can increase donation, independent of authorization model?
  • Living Donation?
  • Incentives?
  • Changes in Allocation?
Discussion Break

Soft presumed consent laws permit families to override the presumption and prevent donation. Strict presumed consent laws do not.

1. Which model is preferable?
2. What are the consequences of acting against the family’s wishes?
Break
Table Discussions
Issue 1 – Brain Death

• A system of deceased organ donation can only exist where the concept of death is adequately addressed

• What happens when the concept of death is called into question?
Brain Death – Harvard Criteria

• 1968 Harvard Medical School ad hoc committee on irreversible coma
  – Unreceptivity and unresponsiveness
  – No movement or breathing
  – No reflexes
  – Flat electroencephalogram (confirmatory)

• In addition, the following must be present
  – Body temperature $\geq 32^\circ$ C
  – Absence of CNS depressants
Tucker’s Admin. vs. Lower (1972)

- Unidentified man suffered brain injury in a fall and was pronounced brain dead
- State Medical Examiner authorized organ donation – heart and kidneys recovered
- Administrator of estate sued Medical Examiner and surgeons who participated in recovery for killing the decedent (wrongful death action) in the course of the organ recovery procedure
- For the first time in the US, the court instructed the jury to consider brain death in determining time of death
Jeffrey Strachan shot himself in the head in a suicide attempt, he was declared brain dead.

The next morning, the family instructed that he be removed from artificial support.

More than two days later, and after requiring the family to sign a consent and release of liability, the hospital removed support.

Court found hospital negligent in failing to promptly release body to family.
Uniform Determination of Death Act

• Model state law developed in 1978, revised in 1980
• Modeled after UAGA, enacted in 38 states

§1. Determination of Death. An individual who has sustained either (1) irreversible cessation of circulatory and respiratory functions, or (2) irreversible cessation of all functions of the entire brain, including the brain stem, is dead. A determination of death must be made in accordance with accepted medical standards.
Death not declared in violation of individual's religious beliefs.

“The death of an individual shall not be declared upon the basis of neurological criteria …when the licensed physician authorized to declare death, has reason to believe, …that such a declaration would violate the personal religious beliefs of the individual.” NJSA 26:6A-5
Q: Is it possible for a brain dead person to recover from his or her injuries?
The Tragic Case of Jahi McMath

- 13-year-old girl underwent surgery at Children’s Hospital Oakland (CA) in 2013 to address sleep apnea
- Bleed caused massive blood loss, cardiac arrest, and progressed to brain death
- Family rejected determination of death, sued hospital to keep Jahi on ventilator
Jahi McMath Case

• Court ruled Jahi dead, hospital released body to coroner (while still on ventilator)
• Coroner issued a death certificate, but also released body to family who arranged transfer to a facility in New Jersey (allows religious objection to death determination)
• Remains at an undisclosed location with family periodically posting pictures on social media
OTHER ETHICAL CONCERNS:
California caps damages in a malpractice lawsuit for the death of a child at $250,000.

Potential damages if Jahi is considered alive could exceed $10 million.

Numerous cases since Jahi of families seeking to prevent determination of death.
Should parents or other family members be permitted to object to a determination of death?

If so, under what circumstances?
As existing systems fall short of meeting the need for organs for transplant, is there an ethical way to incentivize donation?

Would incentives help or hurt?
Non-Monetary Incentives

- Priority for those who authorize donation or who do NOT opt-out (Singapore, Israel, Chile)
- Priority to family members of donors
- Free access to national parks
Monetary Incentives

- **Direct Compensation (Iran)**
  - Since 1988 have allowed compensation for living unrelated kidney donors
  - Average payment $2,000 - $4,000
- **Reimbursement for living donor expenses, tax credits**
- **Subsidized medical costs for donor family**
- **Funeral / memorial benefit**
- **Discounted driver’s license fees**
Transplant Economics

• Cost of Dialysis-- $71,000 per year

• Cost of Transplant—
  – Medical Services Supporting Transplant: $100,000
  – Annual Costs thereafter-- Anti-rejection drugs $17,000 year

• Transplant becomes more cost efficient after only 1.5 years
Discussion Topic #2

What types of non-monetary incentives could be appropriate for living donors?

For families of deceased donors?
In the age of Facebook, there is the potential to reach an incredibly large audience for minimal cost.

What happens when people on the waiting list use social media to solicit living or directed deceased donors?
WHO Guiding Principles

• WHO Guiding Principle 6: Promotion of altruistic donation by means of advertisement or public appeal is permitted in accordance with applicable regulation... payment should be prohibited.
Low-Tech
Search for a kidney donor for Brad Weeman Community

Timeline  About  Photos

Search for posts on this Page  Status

Young Female Needs Kidney

Date: 2011-07-14, 1:22PM EDT
Reply to: see below link in message

I am a 28 year old African American female.
I live in Palm Beach Gardens, Florida.
I was born with health problems since the beginning of birth.
I was born with Spina Bifida, causing me to be crippled and wear leg braces.
Now I am on peritoneal dialysis which I do every night for 9 hours.

FREE KIDNEY (ANY WHERE)

Date: 2009-07-13, 10:09AM PDT

I HAVE AN EXTREMELY HEALTHY KIDNEY TO GIVE AWAY!!! NO NOT A JOKE!!
BUT, I HAVE NO FAMILY.. (DONOR TEAM DOESN'T LIKE THAT!) AND I HAVE NO
HEALTH INSURANCE (THEY DON'T LIKE THAT EITHER)
I AM WILLING TO SIGN A MEDICAL RELEASE, AND I WANT NOTHING IN
RETURN!!! YOU HAVE TO WORK OUT THE DETAILS AND I WILL GIVE YOU A
KIDNEY!!
‘Noncompliance’ bars 15-year-old Atlanta boy from heart transplant list

Anthony Stokes has an enlarged heart and has been given six months to live, but Children's Healthcare of Atlanta won't put him on a heart transplant list, stating failures to take medication in the past and suggesting he would not complete follow-ups if given a new heart. His family and civil rights groups have called the hospital's decision a 'death sentence' for the teen.

BY Trudi Bird
NEW YORK DAILY NEWS
Tuesday, August 13, 2013, 10:36 AM

August 14, 2013 Sick Teen Finally Put On Heart Transplant Waiting List After Initially Being Denied

Doctors had refused to put Fifteen-year-old Anthony Stokes on the transplant because of his "history of non-compliance."

August 27, 2013 Anthony Stokes Receives Heart Transplant
A teen initially denied access to a donor list for...curious reasons undergoes the potentially life-saving surgery
Donate a lung to Sarah Murnaghan

Donate a lung to Sarah Murnaghan
Community

Timeline About Photos Likes Videos

PEOPLE

1,737 likes

ABOUT

Sarah Murnaghan has weeks to live and needs a lung transplant, but an organ transplant policy is preventing her from receiving it.

“If you want to directly...

READ MORE

http://www.cnn.com/2013/06/02/health/pennsylvania...

PHOTOS

Judge orders girl added to adult lung transplant list

A federal judge on Wednesday ordered the U.S. Health and Human Services Secretary to suspend existing organ allocation rules to give a 10-year-old Pennsylvania girl a better chance at a life-saving lung transplant. U.S. District...
URGENT! Someone PLEASE help & call me at 314-392-9140! I'm looking for someone age 20 to 40, at least 5'3", who is COMMITTED & healthy with O blood type in Chicago or willing to go to Chicago for LESS than a week to save a life by donating a kidney! My insurance covers ALL costs! I've been abandoned MULTIPLE times so I'm looking for HONEST & TRUSTWORTHY people only! This has gotten so out of hand I've been to the hospital 24th times! 24th TIMES!!!

Some mentally ill PSYCHOS on ... See More

Christy Coats, Tiara Gucciourtumtup Mckinnie, Victoria Harris and 82 others like this.

30 shares

Stephanie Nathalie Lopez: You've been needing a kidney for years now but you keep saying you have less then a month to live sorry but you just sound untruthful I hope you're not a scam & that I'm wrong.

Kidney For Neal: WRONG! I only started targeted promotion last summer and STILL haven't found a HEALTHY & COMMITTED donor who is O blood type! January last year a lady made this Facebook page but she had NO idea to promote it! Anyone who wants to be tested to donate a kidney can call the hospital after we speak and they will CONFIRM I need a kidney!
Is it appropriate to recruit living unrelated donors using advertisements and social media?

Should transplant centers encourage or permit these types of donations / transplants?
Lessons Learned

• After you work to create the law, have the law work for you!
• Use it or lose it!
• Be careful what you ask for – remember how difficult it was to change the law- leave room for flexibility (be nimble)
Thank You
United States Patient Waiting List

April 2016

120,980 Patients Waiting

- 100,187 Kidney
- 14,771 Liver
- 4,143 Heart
- 1,463 Lung
- 1,916 Kidney/Pancreas
- 1,002 Pancreas
- 43 Heart/Lung
- 268 Intestine

Based on OPTN data as of 4/29/2016
How long is the wait?
National Median Time (In Days) to Transplant

<table>
<thead>
<tr>
<th>Organ</th>
<th>Median Time (In Days)</th>
<th>Median Time (In Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney</td>
<td>1,968</td>
<td>5.4</td>
</tr>
<tr>
<td>Heart</td>
<td>167</td>
<td>0.50</td>
</tr>
<tr>
<td>Liver</td>
<td>356</td>
<td>0.97</td>
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<tr>
<td>Heart-Lung</td>
<td>372</td>
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<tr>
<td>Lung</td>
<td>428</td>
<td>1.17</td>
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<tr>
<td>Kidney Pancreas</td>
<td>591</td>
<td>1.6</td>
</tr>
<tr>
<td>Pancreas</td>
<td>738</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: Based on OPTN data as of March 8, 2013. Based on OPTN registrations listed in 1999-2004.
National Deaths Waiting for a Transplant (2015)

Source: Based on OPTN data through December 31, 2015.

- Kidney: 4,252
- Liver: 1,415
- Pancreas: 28
- Kidney/Pancreas: 123
- Heart: 402
- Lung: 205
- Heart/Lung: 12
- Intestine: 13
- Total: 6,110