

# **Donation after Cardiac Death: One Surgeon's Perspective**

Nicole Turgeon, MD  
Emory Healthcare  
Department of Surgery  
The Emory Transplant Center



# The Numbers

**> 90,000 people on the transplant waiting list**



**Georgia Dome Capacity 71,250**



# The Numbers

- **National Waiting List**

■ All	96,942
■ Kidney	72,190
■ Pancreas	1,682
■ Kidney/Pancreas	2,327
■ Liver	16,882
■ Intestine	230
■ Heart	2,689
■ Lung	2,747
■ Heart/Lung	119

- **Transplants in 2005**

■ Total	28,106
■ Deceased donor	21,213
■ Living donor	6,893

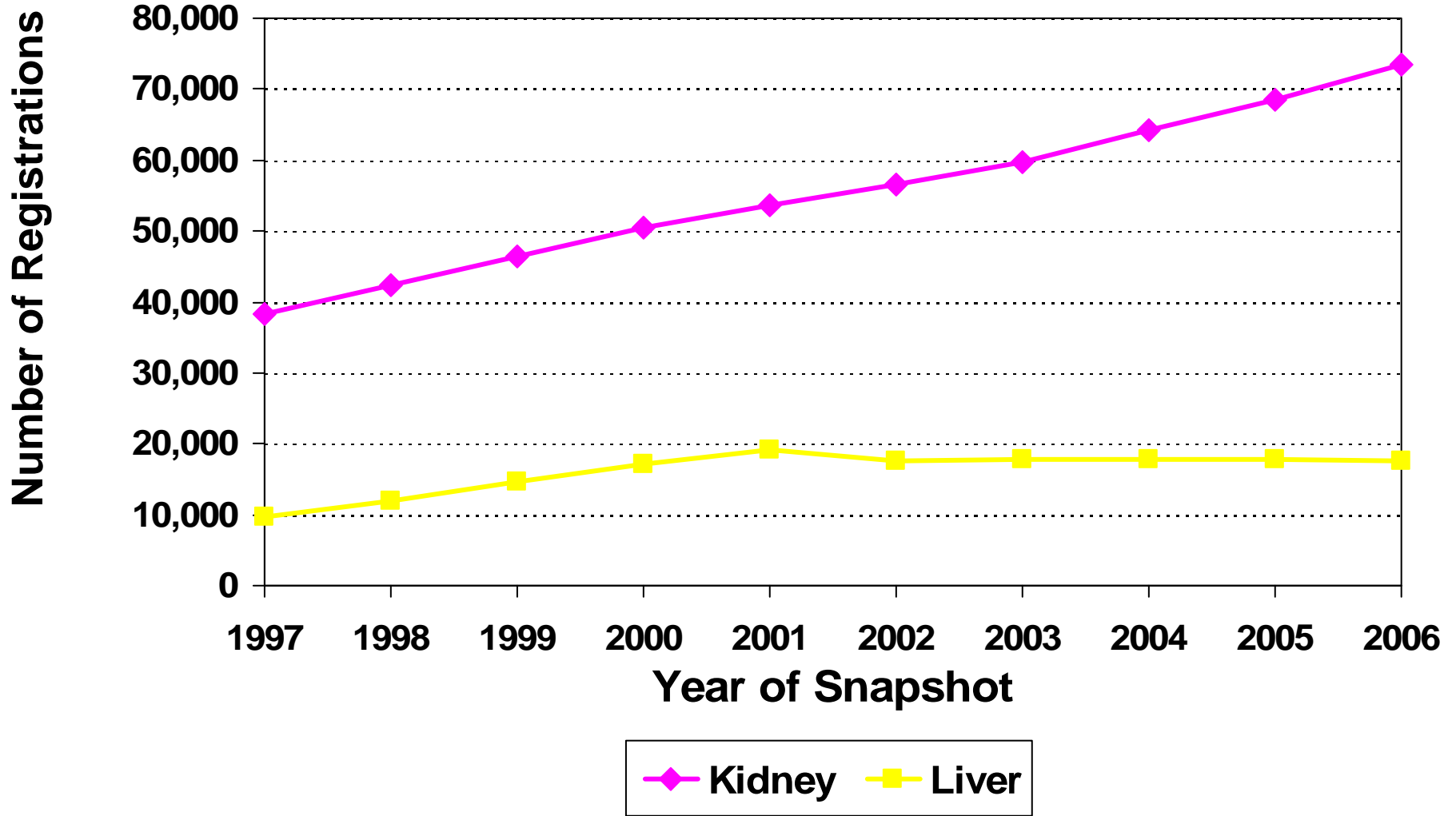
- **Donors Recovered 2005**

■ Total	14,490
■ Deceased donor	7,594
■ Living donor	6,896

\*As of 8/14/07

# Waiting List Registrations 1997-2006

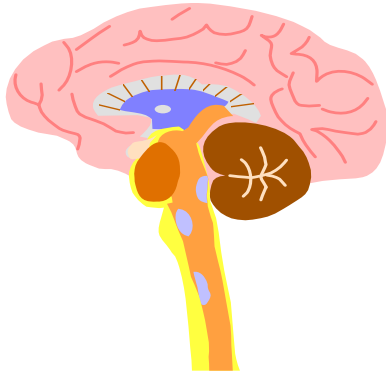
## U.S.



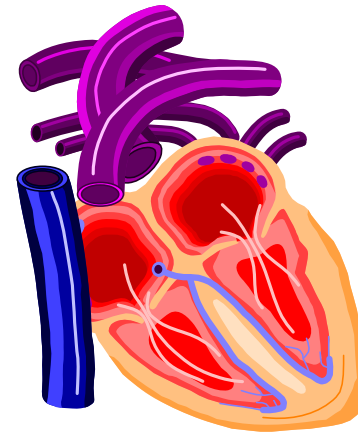
# Deceased Organ Donation

## Two Categories

- **Donation After Brain Death (DBD)**



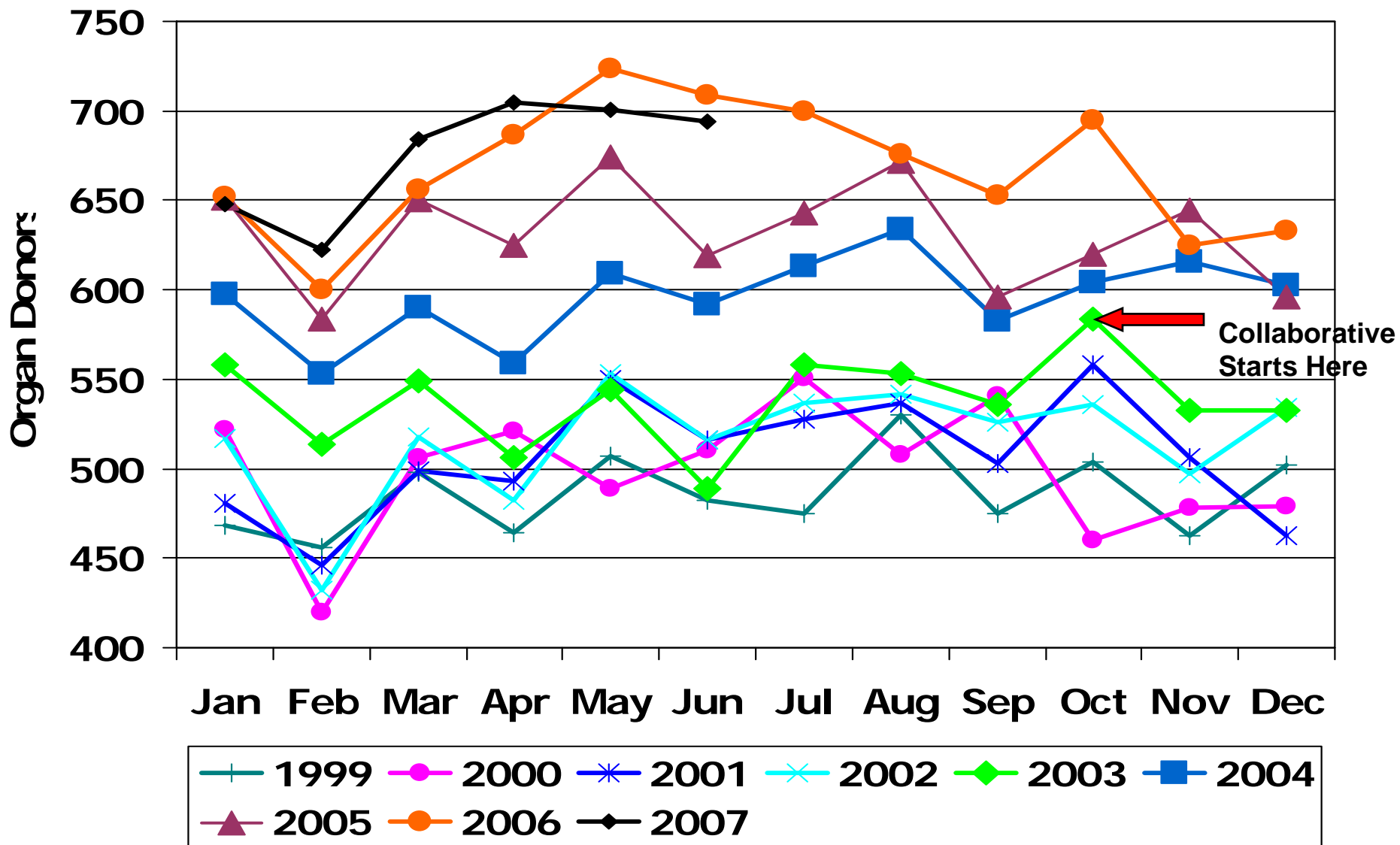
- **Donation After Cardiac Death (DCD)**



# Options for Increasing the “Donor Pool”

- **Increase Donation from Brain Death (DBD)**
- **Increase Expanded Criteria Donation (ECD)**
- **Increase Living Donation**
- **Increase Donation After Cardiac Death (DCD)**

# Month-by-Month Increases in Number of Organ Donors



# History of Organ Donation

- **Initially all organs for transplant were recovered from “non-heart-beating donors”.**

**Kidney 1962**

**Liver 1963**

**Heart 1967**

- **1960's-1970's**
  - **Increased understanding of neurosciences**
  - **Advances in life support**
  - **Guidelines defining brain death accepted by the legal, scientific and medical communities**



# History of Organ Donation

**1968** Harvard Medical School *ad hoc* committee defined irreversible coma

**1981** President's Commission on Study of Ethical Problems in Medicine and Biomedicine and Behavioral Research

**Death**: Cessation and irreversibility of cardiopulmonary or brain function

**1999** Hastings Center Report

**Dead Donor Rule**: Retrieval of organs for transplantation should not cause death of the donor

# Diagnosis of Brain Death

- **Absence of blood flow to the brain**
  - **Nuclear Medicine Flow Scan**
  - **Cerebral Angiogram**
  - **EEG**
- **Unresponsive to all stimuli**

# Diagnosis of Brain Death

- **No spontaneous respiratory activity**
  - **Failed Apnea Test**
- **Absence of ALL Brain Stem Reflexes:**
  - **Pupillary response to light**
  - **Corneal Reflexes**
  - **Oculo-vestibular reflex (caloric response)**
  - **Oculocephalic reflex (doll's eye phenomenon)**
  - **Gag reflex**

# **Diagnosis of Cardiopulmonary Death**

## **Cessation**

- 1. Electrocardiogram changes consistent with absent heart function by electronic monitoring.**
- 2. Zero pulse pressure as determined by monitoring in an arterial catheter.**
- 3. At least 2 minutes of observation is required and more than 5 minutes is not recommended.**

# **Diagnosis of Cardiopulmonary Death**

## **Irreversibility**

- 1. Persistent cessation of function during an appropriate period of observation.**
- 2. Respiration and circulation cease and will not resume spontaneously.**

# **Auto-Resuscitation**

- **Spontaneous circulation will return and the patient is not actually “dead”.**
- **Cessation of circulation not cessation of electrical activity.**
- **When life sustaining therapy is withdrawn, spontaneous circulation does not return after 2 minutes of cessation of circulation.**

# Who are the Candidates for DCD?

- **Patients with severe neurological injury**
  - **Intracranial hemorrhage, stroke, anoxia, trauma**
- **Patients without neurological injury**
  - **Degenerative neuromuscular diseases**
  - **End-stage cardiopulmonary diseases**
  - **High spinal cord injury**

# **Who are the Candidates for DCD?**

- **Do not meet the criteria for brain death**
- **No chance for survival off the ventilator**
- **Family and physician elect to withdraw support**



# Categories of “Non-Heart-Beating Donors”

## European Maastricht Classification

<b>Category 1</b>	<b>Dead on arrival</b>
<b>Category 2</b>	<b>Unsuccessful resuscitation</b>
<b>Category 3</b>	<b>Terminal prognosis awaiting cardiac arrest</b>
<b>Category 4</b>	<b>Unexpected cardiac arrest while brain-dead</b>
<b>Category 5</b>	<b>Inpatients with documented cardiac arrest</b>

# **Barriers to Widespread Acceptance of DCD**

- **Difficulty in predicting who is eligible**
- **Process of making requests**
- **Lack of financial, educational and human resources**
- **Lack of expertise and commitment**
- **Ethical issues surrounding end of life care**
- **Donation process**

# **Barriers to Widespread Acceptance of DCD**

- **Religious beliefs**
- **Conflict of interest**
- **Variability in the process**
- **Feelings that procurement is the “reason for withdrawal”**

# **Barriers to Widespread Acceptance of DCD**

- **Outcomes are bad**
- **Inability to “opt out”**
- **Concern about the public perception**
- **Violation of the dead donor rule**
- **Result in a decrease in brain dead donors**

# Organ Donation Process

**Vent-Dependent with a Non-Recoverable Neurological Injury/Illness  
Care Team Determines Grave Prognosis**

## **Donation After Brain Death**

**Neuro  
Exam**

## **Donation After Cardiac Death**

- Exam c/w brain death
- Death pronounced on neuro criteria

- Approach family about donation (OPO And Care Team)

- Support family through decision making
- Maintain hemodynamic support

- Patient transferred to OR
- Surgical recovery

- Exam Not c/w brain death / no neuro injury
- Care Team / Family discussion re: grave prognosis and withdrawal of care

- Approach family about donation (OPO And Care Team)

- Support family through decision making
- Maintain hemodynamic support

- Withdrawal of care performed in OR or ICU
- Death pronounced on cardio-pulm criteria
- Surgical recovery

# Approaching Families For Consent

- Discussion of donation and the informed consent process takes place *only after the decision to withdraw* treatment has been established by the family.
- Decision to withdraw cannot be so as to facilitate organ donation.

# **Pre-recovery Administration of Medications**

- **Transplant related medications may be administered.**
- **Medications require specific informed consent**
  - **Discussion of any added risk of hastening death**
  - **Discussion of the potential benefit of improving the opportunity for successful transplantation.**

Institute of Medicine, National Academy of Sciences. Non-heart beating organ transplantation: Medical and ethical issues in procurement. Washington, DC: National Academy Press, 1997, 2000, 2005

Report of a National Conference on Donation after Cardiac Death, *AJT* 2006

# **Pre-recovery Administration of Medications**

- **Best practice of pre-recovery administration of agents:**
  - **Heparin**
    - **Current standard of care-given according to local protocols**
    - **Evidence that does not hasten death of donor**
    - **Long term survival of organs may be at risk if thrombi impede circulation to the organs after reperfusion**
  - **Variable utilization of other agents**
    - **Vasodilators: phentolamine (Regitine)**
    - **Anti-oxidants: steroids, vitamin E, N-acetylcysteine**



# Who Will Declare Death?

- **Physicians**
  - **Primary physician**
  - **Intensivist**
  - **On-call physician, Hospitalist**
  - **(Resident)**

# **Conflict of Interest**

## **Transplant surgeon charged with trying to hasten patient's death**

**The physician faces felony counts alleging he tried to hasten a man's demise to make use of his organs.**

**By Charles Ornstein and Tracy Weber, Times Staff Writers  
July 31, 2007 Los Angeles Times**

## **Records show concerns over transplant**

**In San Luis Obispo, behavior of a visiting team harvesting the organs of a disabled man was questioned. Charges have since been filed.**

**By Charles Ornstein and Tracy Weber, Times Staff Writers  
August 7, 2007 Los Angeles Times**

# **What Happens if the Patient Does Not Expire?**

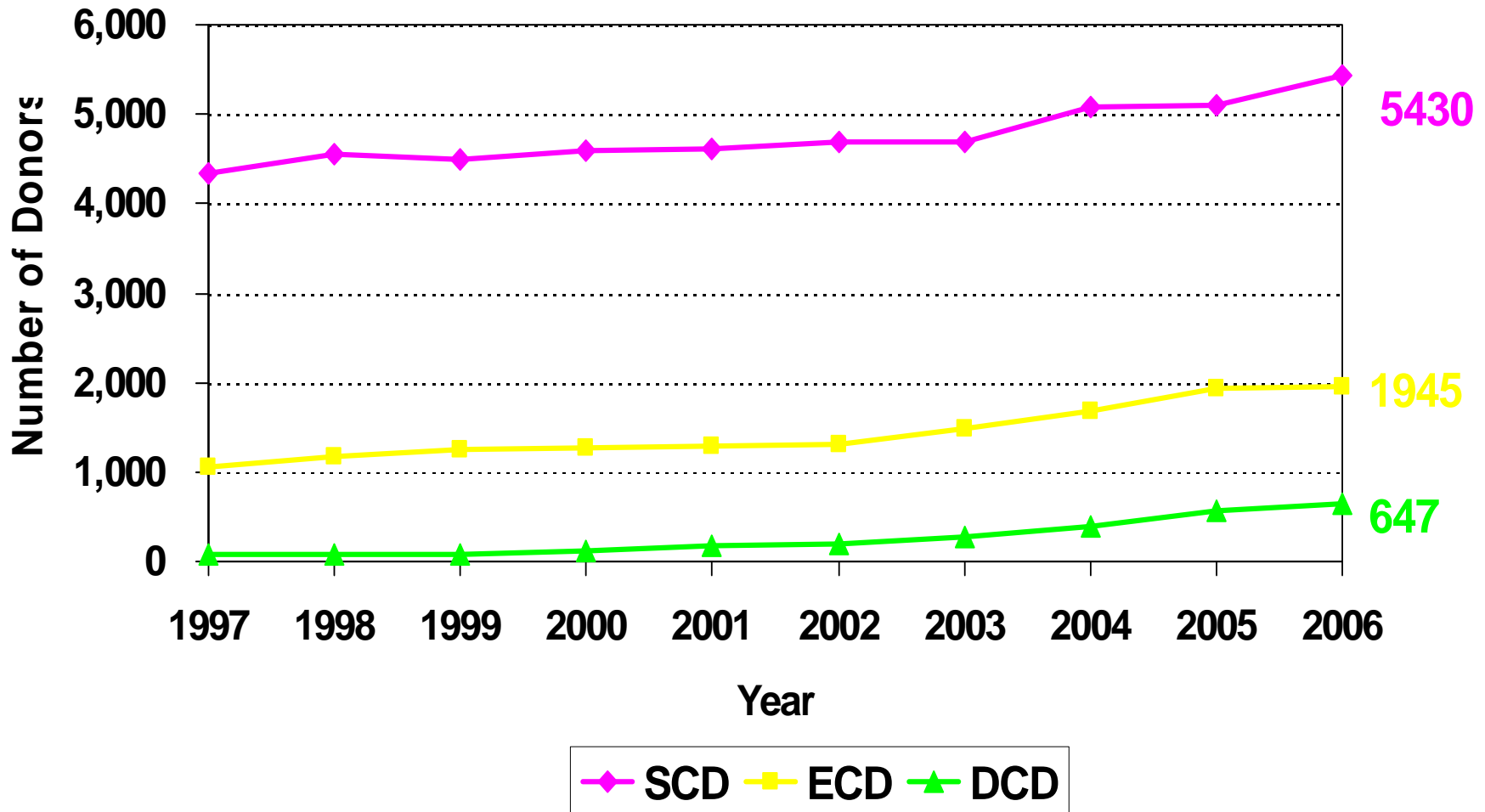
- **Occurs in approximately 5-10% of cases.**
- **Pre-donation discussion with family, physicians and nurses.**
- **Patient transferred to pre-determined unit.**
- **Treating team or a pre-determined team is responsible for patient care.**

# **Impact of DCD upon DBD**

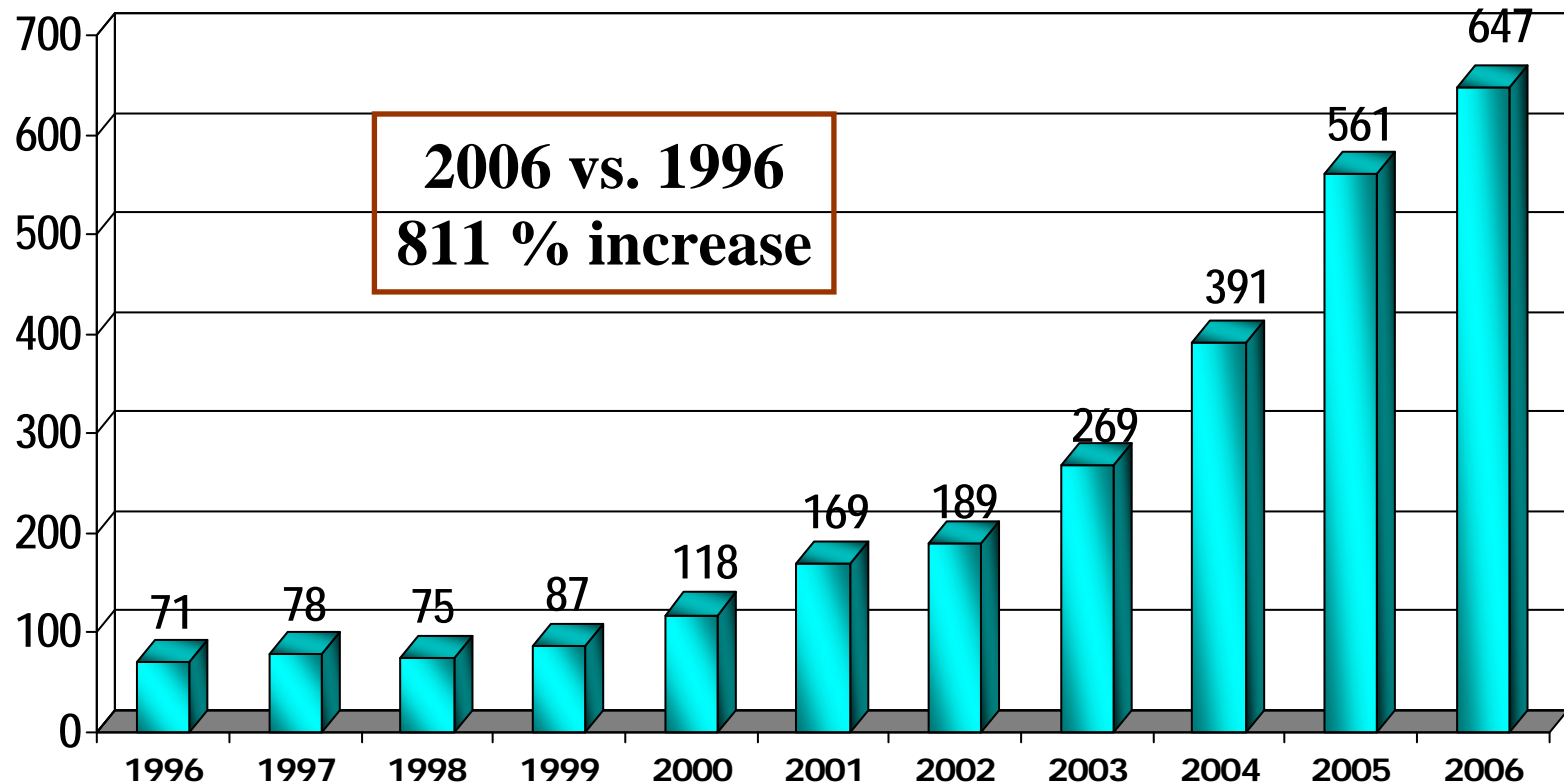
- **16 DSAs accounting for 80% of DCD donation in 2004 increased DCD, SCD, and ECD donor recovery**
- **from 2003 to 2004:**
  - **49.3% increase for DCD**
  - **9.4% increase for SCD**
  - **3.8% increase for ECD**
  - **Donation rate increased from 50% to 53.9%**
- **In 2004, non-DCD recovery positively associated with DCD recovery among the 59 DSAs.**



# Deceased Donors by Type 1997 - 2006



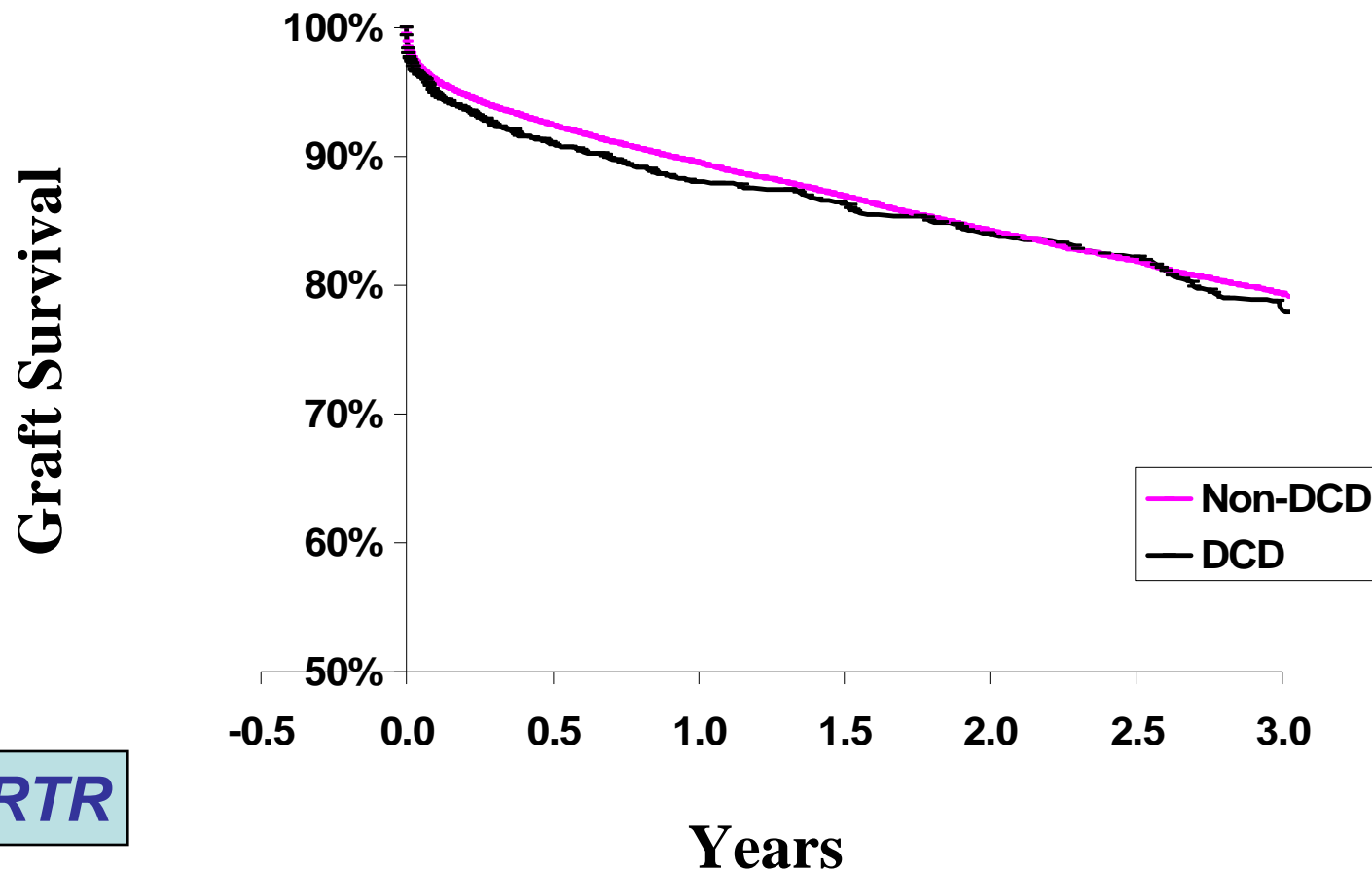
# Nationwide Growth in Donation after Cardiac Death 1996-2006



**In 2006, DCD donors provided 1,366 life-saving organ transplants**

# **Donation after Cardiac Death and Renal Transplantation**

# Adjusted\* Graft Survival for DCD vs. non-DCD Kidney Transplants, 2000-2004



SRTR

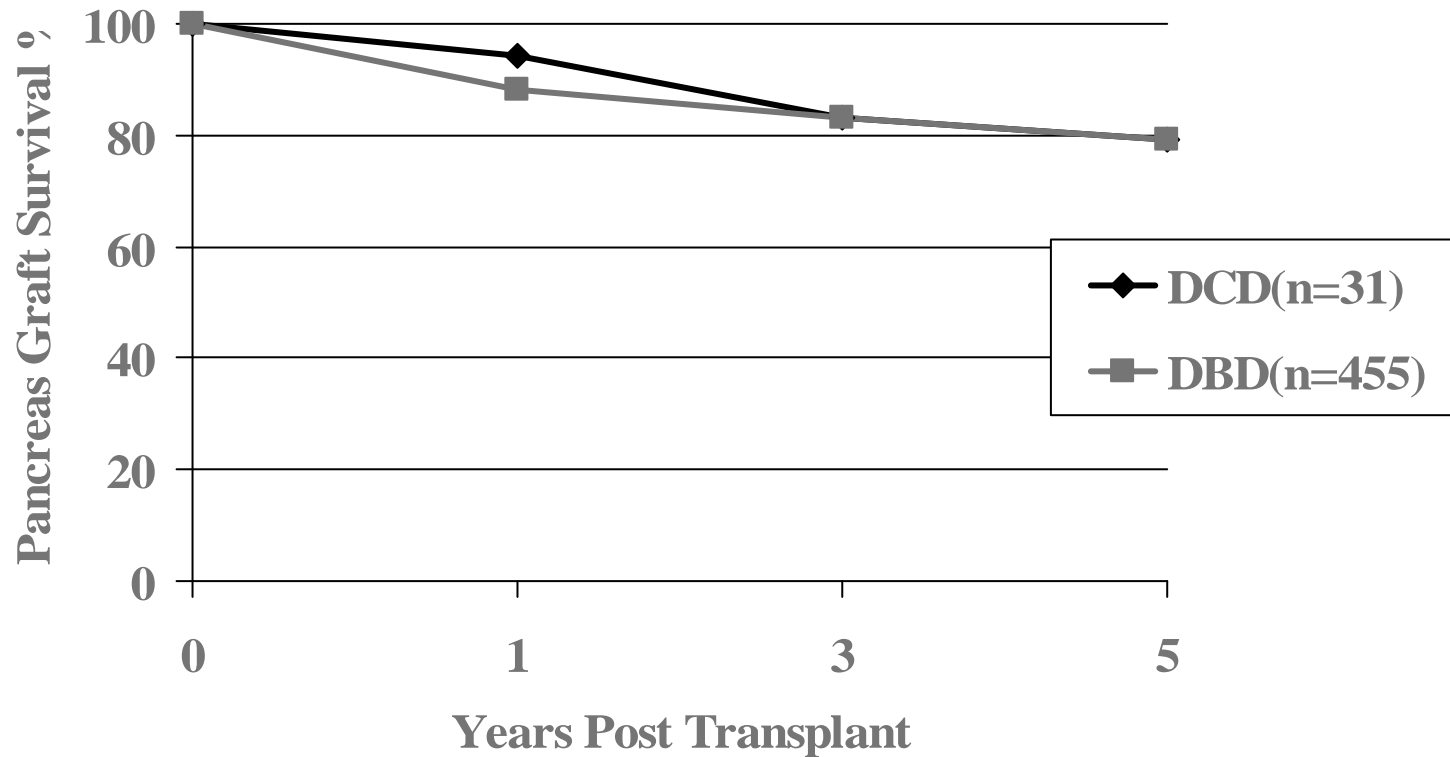
\*Adjusted for recipient age, sex, race, PRA, ESRD cause, years of ESRD, HLA mismatch, year of transplant, previous transplant, transfusions and donor age, sex, race, hypertension, diabetes, cause of death, creatinine, cold ischemia time



# **Donation after Cardiac Death and Simultaneous Pancreas -Kidney Transplantation**

# SPK DCD Transplantation

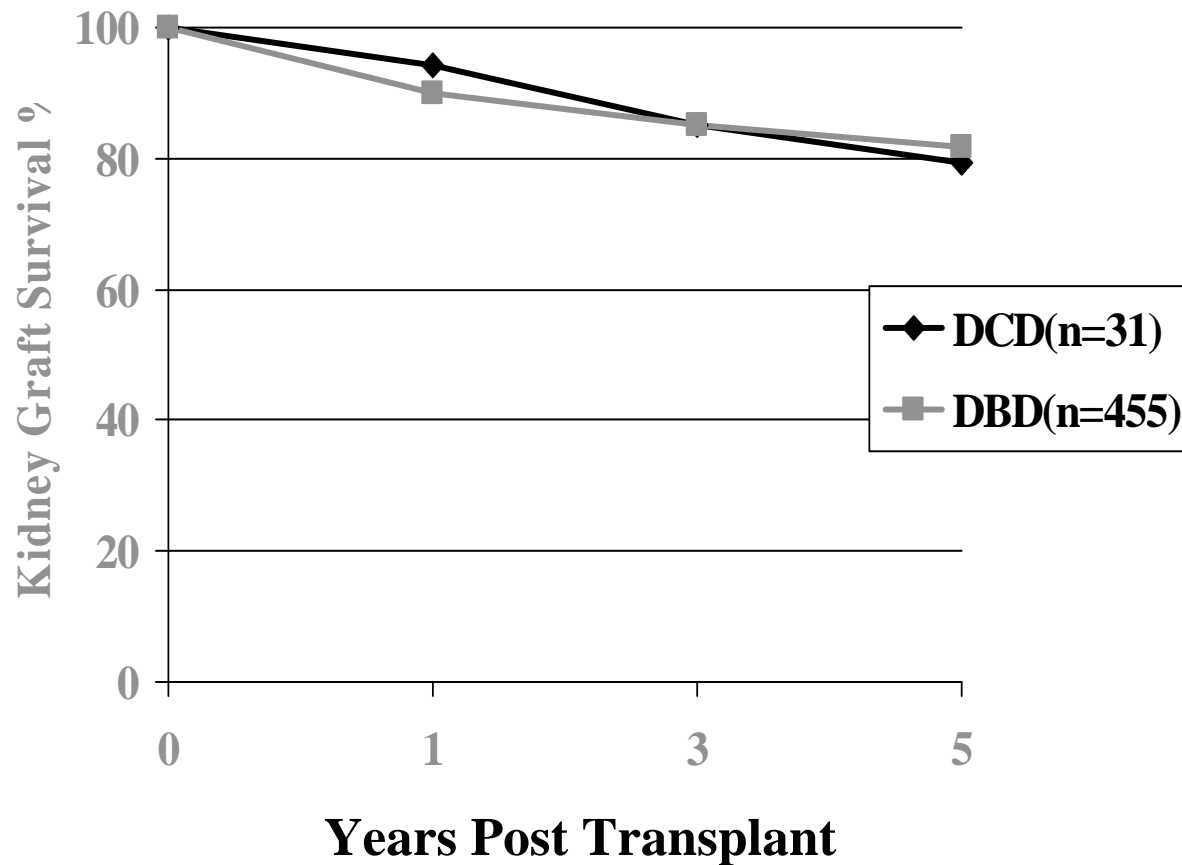
## Pancreas Graft Survival



*P* = .5648

# SPK DCD Transplantation

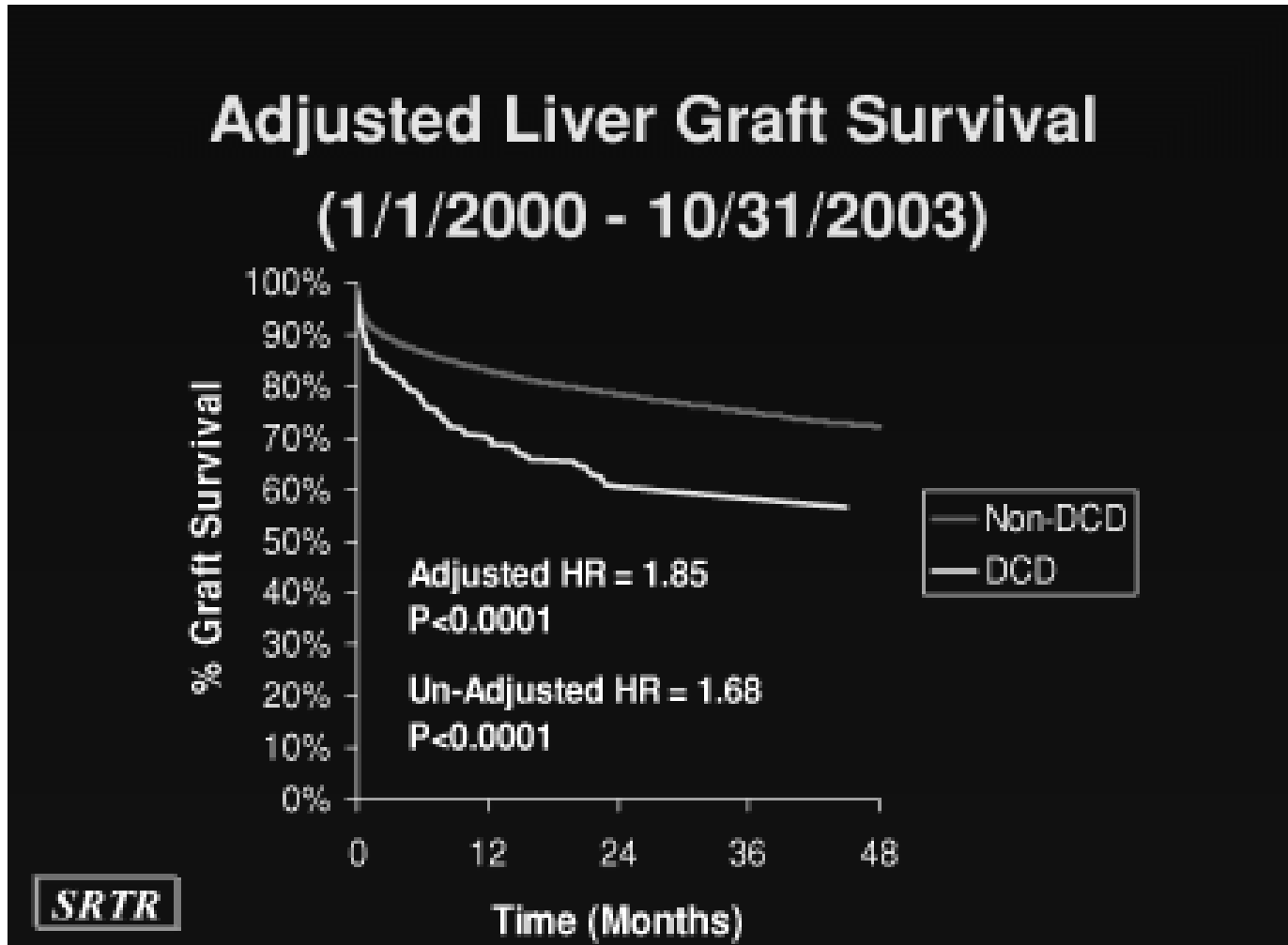
## Kidney Graft Survival








*P*=.6549

# **Donation after Cardiac Death and Liver Transplantation**

# Graft Survival







# Barriers to Widespread Acceptance of DCD

<b>Barriers and Myths</b>	<b>Reality</b>	<b>Myth</b>
<b>Difficulty in predicting who is eligible</b>		
<b>Process of making requests</b>		
<b>Lack of financial, educational and human resources</b>		
<b>Lack of expertise and commitment</b>		
<b>Ethical issues surrounding end of life care</b>		

# Barriers to Widespread Acceptance of DCD

<b>Barriers and Myths</b>	<b>Reality</b>	<b>Myth</b>
<b>Religious Beliefs</b>		<input checked="" type="checkbox"/>
<b>Conflict of Interest</b>	<input checked="" type="checkbox"/>	
<b>Too much variability in the process</b>		<input checked="" type="checkbox"/>
<b>Result in a decrease in brain death donation</b>		<input checked="" type="checkbox"/>

# Barriers to Widespread Acceptance of DCD

<b>Barriers and Myths</b>	<b>Reality</b>	<b>Myth</b>
<b>Inability to “opt out”</b>		
<b>Concern about public perception</b>		
<b>Violation of the Dead Donor Rule</b>		
<b>Outcomes are “bad”</b>		



**Thank You**



# Emory DCD Policy

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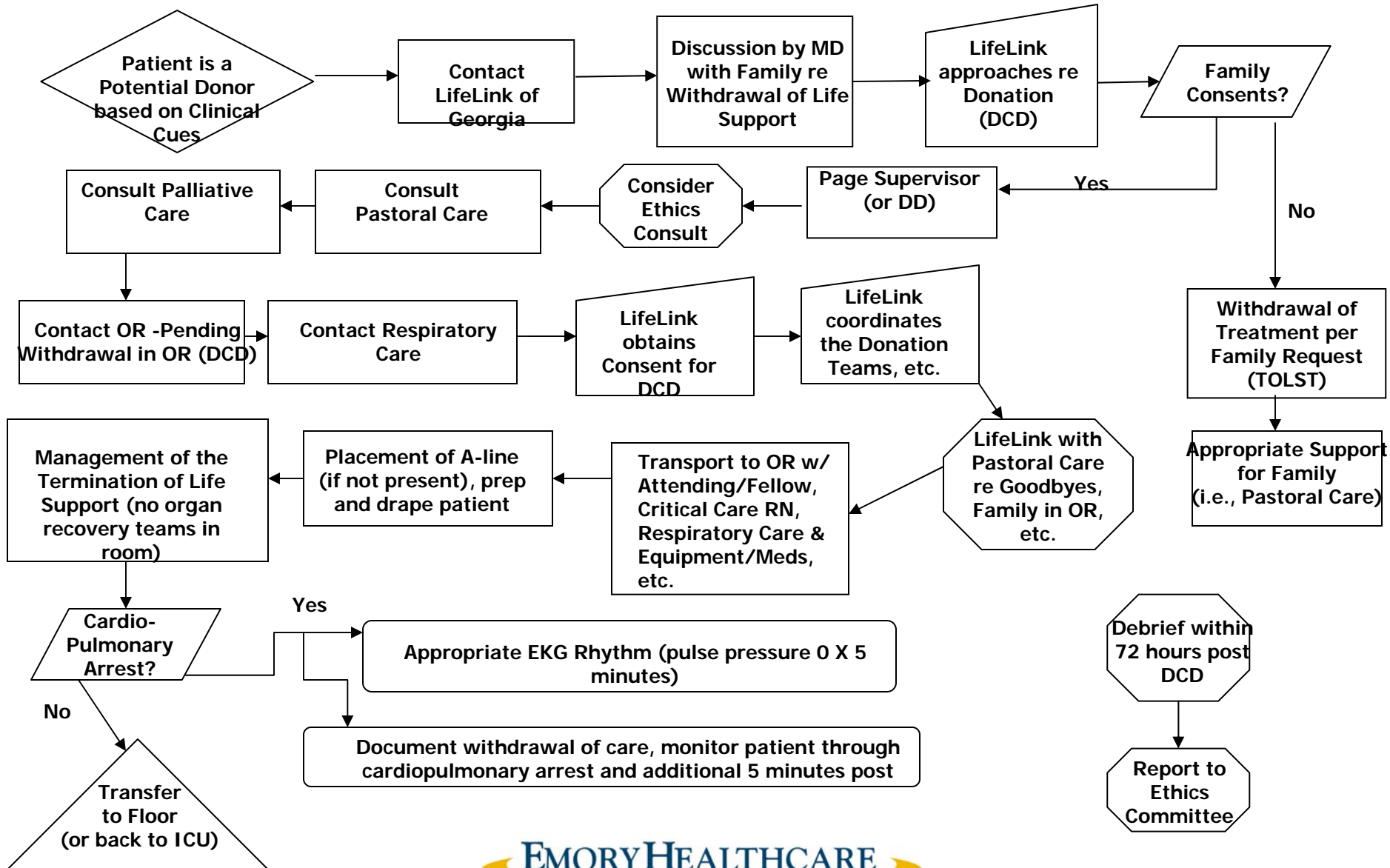
- **Emory Healthcare respects the rights of patients to have life support removed and donate organs if so desired.**
- **Emory Healthcare believes it is ethically appropriate to consider organ recovery from patients who are declared dead by cardiac or respiratory criteria in accordance with established medical standards**
- **Emory healthcare professionals have a right to “opt out” of DCD procedures if participation is against personal, ethical or religious beliefs**

# Elements of the Policy

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- **Twelve page document includes definitions of controlled and uncontrolled DCD. (Policy – controlled; uncontrolled, case-by-case).**
- **Criteria**
- **Assumptions and guiding principles for managing terminally ill donor**
- **Roles and responsibilities of**
  - **Critical care physician**
  - **Critical care nursing staff**
  - **OR staff**
  - **Anesthesiologists**
  - **Pastoral care**
  - **LifeLink staff**
- **Elements of the DCD process**
  - **Consent**
  - **Medical management and evaluation**
  - **Withdrawal of support and pronouncement**
  - **Care of the donor family**
  - **Surgical recovery**

# Donation after Cardiac Death (DCD) Process Flow



# Policy Summary

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- **Respect for patient and family's wishes - autonomy**
- **Humane care of patient and family**
- **Respect of staff**
- **Removal of any potential conflict of interest**
- **Societal value of organ donation**
- **Foundations – ethical principles, established medical standards, and national organ allocation regulations**