Introducing DCD into Clinical Practice

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DCD across Europe

- Austria, Belgium, Czech Republic, France, Italy, Latvia, Netherlands, Spain, Switzerland, UK
- Cyprus, Estonia, Luxembourg, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Sweden
- Bosnia-Herzegovina, Finland, Germany, Greece, Hungary, Lithuania, Turkey

Dominguez-Gil et al. Transplant International 2011
DCD in the UK, 2010-11

Data from Potential Donor Audit

- Was treatment withdrawn?
  - No: 576
  - Yes: 6,616

- Were there any absolute or relative medical contraindications to solid organ donation?
  - No: 2,875
  - Yes: 3,741

- Were the family formally approached for consent/authorisation for solid organ donation?
  - No: 1,516
  - Yes: 1,359

- Was consent/authorisation for solid organ donation given by the family?
  - No: 668
  - Yes: 691

- Did solid organ donation occur?
  - No: 346
  - Yes: 345

Actual DCD donors pmp

Map showing the distribution of DCD donors across different regions in the UK.
Maastricht Classification of DCD

Maastricht Categories

I. Dead on arrival
II. Unsuccessful resuscitation
III. Anticipated cardiac arrest
IV. Cardiac arrest an DBD
V. Unexpected arrest in ICU patient

Potential depends on frequency of WLST
Framework for DCD
DCD donation in UK
2000 - 2013

Key features of DCD in UK

- Largely Maastricht III / IV
- 10 fold increase in DCD over last decade
- Accounts for 40% of all deceased donors

Addressing the legal, ethical and professional issues associated with DCD is essential
DCD donation in UK
2000 - 2012

Key features of DCD in UK

- Largely Maastricht III / IV
- 10 fold increase in DCD over last decade
- Accounts for 40% deceased donors
- 25% of all transplanted organs

Addressing the legal, ethical and professional issues associated with DCD is essential
Introducing DCD into UK

Initial efforts

- Started in Neuro ICUs with an audited potential for DCD
  - Kidney only retrieval and local allocation
- Conservative approach in challenging areas
  - Organ specific interventions before death
  - Diagnosis of death
- Absence of professional / legal framework
- Concerted effort to minimise delays for donor family

Importance of Lead Centres in driving regional performance centres
Referrals to TC from Frenchay

- HBD referrals
- NHBD referrals

- Graph showing referrals from 2002 to 2008.
Regional Impact

- Programme started July 2002 – Frenchay ICU
- 2004 - Expansion of programme to Bath, Southmead, Weston General Hospital
- 2005- Family initiated referrals from Barnstaple., Yeovil, BCH
- 2007 Implemented across region
Actual deceased donors-
South West team

1 April 2004 to 31 April 2014, data as at 9 April 2014

Hospitals are allocated to teams using the current team allocations, not the allocation at the time of donation.
How to implement a DCD 3 scheme on your ICU
Implementing a DCD 3 Scheme

- Decide which patients will be potential DCDs
- Audit potential numbers
- Discuss practical, ethical / moral issues with all involved parties
- Design protocol for local implementation
- Review cases within team regularly
Category III Patients

- Patients with non-survivable Injury / condition
- Planned WLST
- Asystole likely within 2 – 4 hours of extubation
- Normal or ‘recoverable’ renal function
- No contra-indications to organ donation

The decision to withdraw treatment is separate from any consideration of organ donation
Most, but not all, DCD donors have a neurological cause of death.
Implementing a DCD 3 scheme

- Decide which patients to target
- Audit potential numbers
- Discuss practical, ethical / moral issues with all involved parties
- Design protocol for local implementation
- Review cases within team regularly
Audit of all Neurosurgical deaths on ICU / A&E 1999-2000

- All potentially BSD patients identified
- All relatives approached regarding organ donation
- Maximum no. of relatives agree

Group consisting of Intensivist, Renal physician, ICU sister, transplant coordinator, auditor to undertake / interpret the audit.
Neurosurgical Deaths

1999
- 37 in ITU
- 5 in A&E
M/F 21/21
Age 4-92yrs

2000
- 29 in ITU
- 2 in A&E
M/F 19/12
Age 2-74yrs
BSD Tests performed

1999
• 13 of 42 patients
• 7 of 13 became donors
• Relatives refused – 4
• Pt unsuitable – 1
• Coroner refusal - 1

2000
• 9 of 31 patients
• 3 of 9 became donors
• Relatives refused – 2
• Failed tests (breathe) – 2
• Coroner refused – 1
• BSD test not completed
# BSD Tests Not Performed

## 1999

<table>
<thead>
<tr>
<th>Event</th>
<th>Patients</th>
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</thead>
<tbody>
<tr>
<td>Patient breathing</td>
<td>16</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>4</td>
</tr>
<tr>
<td>Pt refused treatment</td>
<td>1</td>
</tr>
<tr>
<td>Respirat. not neuro death</td>
<td>1</td>
</tr>
<tr>
<td>Treatment withdrawn</td>
<td>2</td>
</tr>
<tr>
<td>IPPV stopped in A&amp;E</td>
<td>1</td>
</tr>
<tr>
<td>Unsurvivable HI in A&amp;E</td>
<td>1</td>
</tr>
<tr>
<td>DOA at A&amp;E</td>
<td>1</td>
</tr>
</tbody>
</table>

## 2000

<table>
<thead>
<tr>
<th>Event</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient breathing</td>
<td>10</td>
</tr>
<tr>
<td>Cardiac Arrest</td>
<td>1</td>
</tr>
<tr>
<td>Respirat. not neuro death</td>
<td>2</td>
</tr>
<tr>
<td>Treatment withdrawn</td>
<td>1</td>
</tr>
<tr>
<td>Thiopentone</td>
<td>3</td>
</tr>
</tbody>
</table>

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Time from Extubation to death

• Ventilation withdrawn electively in 26 patients
• 0 –60 minutes                  9 patients
• 1-2 hours                     4 patients
• > 2 hours or unknown           13 patients
550 ICU admissions pa

110 ICU deaths pa

66 deaths follow treatment withdrawal

6 DCD pa
Implementing a DCD 3 scheme

- Decide which patients to target
- Audit potential numbers
- Discuss practical, ethical / moral issues with all involved parties
- Design protocol for local implementation
- Review cases within team regularly
Discuss issues with all involved

- Before implementation!
- All ICU / ED staff
- Theatre staff
- Specialties likely to be involved (neurosciences, ED, medicine, surgery)
- Transplant centre
Implementing a DCD 3 Scheme

• Decide which patients to target
• Audit potential numbers
• Discuss practical, ethical / moral issues with all involved parties
• **Design protocol for local implementation**
• Review cases within team regularly
Aspects of protocol

• Use national guidelines when withdrawing treatment
• Do not deviate in context of DCD
• Approach made by ICU team + TC
• Discuss procedure involved with family
• Agree time of WLST with relatives
• Withdraw in ICU if possible
• Have a plan if DCD does not proceed
• Usual practice – opioids, sedatives
• No CPR, CPB after death confirmed
## Method of Treatment withdrawal and DCD Potential

<table>
<thead>
<tr>
<th>Treatment withdrawal type</th>
<th>Potential to actual DCD %</th>
<th>Consented to actual DCD %</th>
<th>% of total DCDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing current level of intervention with no further escalation</td>
<td>0.78</td>
<td>20.00</td>
<td>0.5%</td>
</tr>
<tr>
<td>Reduction / withdrawing of ventilation, but not extubated</td>
<td>4.02</td>
<td>47.75</td>
<td>13.4%</td>
</tr>
<tr>
<td>Extubation</td>
<td>15.21</td>
<td>52.94</td>
<td>86.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10.38</strong></td>
<td><strong>51.76</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Controlled DCD is possible even if extubation is not part of WLST
What happens after the WLST


- 3904 admissions from 1994 – 2000
- WLST in 318 (8.1%)
- 41% of all ICU deaths follow WLST
- 60% die in ICU
- 33% die later on an general ward
- 7% discharged alive from hospital
- Median survival 1.4 months
- 4 patients (1.26%) alive 5 years later

Most patients, but not all, die after the WLST
What happens after the WLST

ICNARC Database 2011

122,891 Admissions in 2011
Treatment withdrawn in 9%
45% of ICU deaths after WLST
8% alive for > 24 hours
0.7% discharged alive from hospital
ICU Variation 0 -10%

Most patients, but not all, die after the WLST

These data derive from the Case Mix Programme Database. The CMPD is the national, comparative audit of patient outcomes from adult critical care coordinated by ICNARC. These analyses are based on data for 128,480 admissions to 204 adult, general critical care units based in NHS hospitals geographically spread across England, Wales and Northern Ireland. For more information on the representativeness and quality of these data, please contact ICNARC.
Despite the identification of risk factors for early death and the additional value of the clinical judgment by the intensivist, it is not possible to reliably identify potential donation after cardiac death donors who will die within 1 or 2 hrs after life-sustaining treatment has been withdrawn. Consequently, a donation procedure should be initiated in every potential donor. Wind et al Crit Care med 2012; 40: 766-9

Reduced stand down = Avoids family distress; Improve retrieval services efficiency Reduces burden on ICU staff
Implementing a DCD 3 scheme

- Decide which patients to target
- Audit potential numbers
- Discuss practical, ethical / moral issues with all involved parties
- Design protocol for local implementation
- Review cases within team regularly
Lessons learnt

- Learning curve minimal with preparation
- Withdraw treatment in ICU not theatre if possible
- Unpredictable time of patients death
  - Prediction Tools of limited value
- Theatre access – Book 2 hr laparotomy
- Staff attitudes
- Have a plan if DCD does not proceed
Number of patients transplanted from UK deceased donors
1 April 2011 – 31 March 2012

<table>
<thead>
<tr>
<th></th>
<th>DBD</th>
<th>DCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donors</td>
<td>652</td>
<td>436</td>
</tr>
<tr>
<td>Total transplanted patients</td>
<td>3960</td>
<td></td>
</tr>
<tr>
<td>Transplanted patients per donor</td>
<td>4.0</td>
<td>2.6</td>
</tr>
</tbody>
</table>

25% of DD transplants in the UK come from DCD donors
Donation after circulatory death

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3 Flinders Medical Centre, Adelaide, South Australia

Editor’s key points
- Donation after circulatory death (DCD) has been reintroduced and has facilitated donation in many countries.
- DCD is increasing in response to a lack of organs available for transplant.
- DCD differs in many aspects from donation after brain death and poses specific challenges.
- Where DCD is prioritized widely, organ donation is often considered a routine part of end-of-life care.

Summary. Donation after circulatory death (DCD) describes the retrieval of organs for the purposes of transplantation that follows death confirmed using circulatory criteria. The persistent shortfall in the availability of organs for transplantation has prompted many countries to re-introduce DCD schemes not only for kidney retrieval but increasingly for other organs with a lower tolerance for warm ischaemia such as the liver, pancreas, and lungs. DCD contrasts in many important respects to the current standard model for deceased donation, namely donation after brain death. The challenge in the practice of DCD includes how to identify patients as suitable potential DCD donors, how to support and maintain the trust of bereaved families, and how to manage the consequences of warm ischaemia in a fashion that is professionally, ethically, and legally acceptable. Many of the concerns about the practice of both controlled and uncontrolled DCD are being addressed by increasing professional consensus on the ethical and legal justification for many of the interventions necessary to facilitate DCD. In some countries (e.g. DCD after the withdrawal of active treatment) accounts for a substantial proportion of deceased organ donors overall. Where this occurs, there is an increased acceptance that organ and tissue donation should be considered a routine part of end-of-life care in both intensive care unit and emergency department.

Keywords: brain death; death; directed organ donation; donation after circulatory death; end-of-life care; ethics; organ donation; organ transplantation.