Media workshop

Introduction to organ donation and transplantation

Axel Rahmel

Brussels, 07.10.2013
What makes organ transplantation special?

Medical

- High-tech medicine
- Multidisciplinary cooperation
- Taking calculated risks
  ...

Ethical/Social

- Definition of death
- Allocation of scarce resources
- Culture differences
  ...

Legislation/Organization

- Access to transplantation
- International cooperation
- Organ trade/Transplant tourism
  ...
Distribution of tasks in organ transplantation

Organ Procurement Organization

EUROTRANSPLANT
International Foundation

Transplant-center
Each day, 10 European citizens die whilst waiting for a suitable organ transplant, that’s almost 4,000 people on a yearly basis*

*3820 deaths on the waiting list in 2009, Council of Europe data 2010
Tip of the iceberg...
Patients newly registered on the waiting list for organ transplantation (per million population)

Transplant Newsletter - Council of Europe/ONT 2007
How serious is end-stage kidney disease with dialysis treatment?

Quality of life
Prognosis of patients on hemodialysis
ERSA-EDTA-Registry – Annual report 2008

Survival probability (%)

- Diabetes
- Hypertension / renal vascular disease
- Glomerulonephritis
- Other cause
- All

years
Liver cirrhosis – Clinical situation

Stages of liver damage

Healthy

Cirrhosis

LiverSupport.co.uk
MELD score vs. waiting list mortality

Expected 3-months mortality and MELD score

![Graph showing the relationship between MELD score and 3-months mortality on the waiting list. The graph illustrates a curve where mortality increases as MELD score increases.]
Patients with end-stage heart failure
Assist device as destination therapy in inotrope-dependent heart failure

INTrEPID-Trial – Novacor-LVAD

Rogers et al, JACC 2007; 50:741-7
Prognosis with Cardiac Assist Device

Jun 23, 2006 – Mar 30, 2007, n=156

% Survival vs. Months after Device Implant

- **LVAD n=117, deaths=18**
- **Bi-VAD n=30, deaths=9**
- **TAH n=6, deaths=2**
- **RVAD n=3, deaths=3**

Event: Death

p < .0001
Patients on the waiting list for lung transplantation
Prognosis of mechanical ventilated patients awaiting lung transplantation
MHH, Germany, 2005 - 2008

No LTx (n=31)
Organ donation
“Brain death”

- Death declared on the basis of neurologic criteria
- Irreversible loss of all functions of the entire brain, including the brain stem
Brain death – No cerebral perfusion
Declaration of death

“Brain death”
- Death declared on the basis of neurologic criteria
- Irreversible loss of all functions of the entire brain, including the brain stem

“Circulatory death”
- Death declared on the basis of cardiopulmonary criteria
- Permanent cessation of circulatory and respiratory function
Donation after cardiac/circulatory death (non heartbeating donation) in Europe
The critical donation pathway
Donation after brain death

Severe brain damage

- Identify potential donor

Diagnose brain death

- Donor detection

Refer potential donor

- Donor referral

Approach to family

- Family care & communication

Maintain viability of organs

- Donor maintenance

Retrieve organs

- Organ retrieval

Provide feedback
ACTUAL DECEASED ORGAN DONORS – both DBD and DCD included – Annual Rate p.m.p 2012
The probability to receive an organ transplant is about three times higher than the probability to become an organ donor.
Transplantation
Organ procurement, transport and transplantation
Survival benefit after kidney transplantation
ERA-EDTA-Registry – Annual report 2008

Transplantation
Survival benefit
Survival benefit after lung transplantation in mechanically ventilated patients
MHH, Germany 2005-2008

Survival (%)

days since ventilation on HU status

LTx (n=53)

No LTx (n=31)

survival – benefit
N = 60 %
Quality of life after heart transplantation
Organ allocation
Guiding Principle 9

Where donation rates do not meet clinical demand, *allocation criteria should be defined* at national or subregional level by a committee that includes experts in the relevant medical specialties, bioethics and public health...
Heart Waiting List and Transplants
Eurotransplant 1995 – 2012

Active waiting list
Heart transplants

<table>
<thead>
<tr>
<th>Year</th>
<th>Active Waiting List</th>
<th>Heart Transplants</th>
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<tbody>
<tr>
<td>1995</td>
<td>732</td>
<td>0</td>
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<tr>
<td>1996</td>
<td>759</td>
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<td>2012</td>
<td>588</td>
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Guiding Principle 9

The allocation of organs, cells and tissues should be guided by clinical criteria and ethical norms, not financial or other considerations. Allocation rules, defined by appropriately constituted committees, should be equitable, externally justified, and transparent.
Balancing urgency and outcome "Transplant window"-concept

Mortality

"too early"

"Transplantation window"

"too late"

benefit

-> Increasing organ failure  ->
Basic principles of an organ allocation system

**Objectivity**
- Allocation is independent of subjective factors (procurement and allocation organization, transplant center)

**Reliability**
- With same donor information and same waiting list information an identical matchlist is generated

**Transparency and accountability**
- Every step in the allocation process is documented and can be explained

**Validity of allocation criteria**
- Ethically acceptable, medically based
Balancing urgency and outcome
## Examples of the consequences of allocation trade-offs

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<th>20 years without Diabetes</th>
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<td>Lifespan without transplant*</td>
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<td>16 years</td>
<td>9 years</td>
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*Median survival for this specific patient group (US data)*
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Allocation to the most urgent patient (maximize waiting list survival)
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**Allocation to the patient with best outcome (maximize post transplant survival)**
Examples of the consequences of allocation trade-offs

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*Median survival for this specific patient group (US data)

Allocation to the patient largest benefit (maximize incremental survival)
Organ Allocation Principles

Queuing

• Waiting time is easy to understand
• "first come first served" is considered to be a fair way to do things
Determination of the Matchlist Selection and Ranking

Waiting list
Day 1

Donor A
65 yrs, 50kg

Matchlist 1
Pat. „C“ is number 2 on the matchlist
Determination of the Matchlist Selection and Ranking

Waiting list
Day 2
Determination of the Matchlist Selection and Ranking

Waiting list

Donor B
40 yrs, 75kg

Matchlist 2
Pat. „C“ is number 5 on the matchlist
Manipulation of waiting list data in Germany

Manipulation of lab values
- Wrongly labeled blood samples
- Manipulation of blood samples
  - Adding urine to increase creatinine
  - Adding citrate to increase INR

Incorrect information entered into ENIS
- „Patient on dialysis“ although there was no renal replacement therapy
TRUST
Is a fragile thing. Easy to break, easy to lose, and very hard to get back.
Death on the waiting list and delisting due to deterioration
Liver-Tx Germany 2010-2012

Cumulative number of patients

+14%
Summary

- Organ transplantation gives huge benefit to the patients both with regard to survival and quality of life.
- Main limit to organ transplantation is donor shortage.
- Organ donation can be improved by a well-organized and structured approach, learning from best practices is important.
- Transparent organ allocation based on sound medical and ethical allocation principles is necessary to address the needs of patients on the waiting list and make best use of the available donor organs.