BLAZING TRAILS IN TRANSPLANTATION
BETTER TODAY THAN YESTERDAY...

BETTER TOMORROW THAN TODAY.

Jim Harbaugh, via Twitter (and others)
Transplant's Legacy

The Herrick Twins

Joseph Murray

The art of the solvable problem

the wonderful generosity of human nature

NPR, NYT, and Boston Globe
I never heard anyone who was there describe this as ... the first human liver transplantation.

If they mentioned it at all, it was always just about Bennie.
Transplant’s Legacy

Transplant Professionals:
Nursing, pharmacy, nephrology,
Social work, nutrition, etc...

Cyclosporine

Laparoscopic Donor Nephrectomy

Kidney Pumps

SRTR
Transplanters are born into a legacy of innovation.
We bear the same burden of responsibility for our patients.
We have the same opportunity to change the world.
Wearables
## Wearable Artificial Kidney

- Effective electrolyte mgmt
- Stable hemodynamics
- Improved QOL

### Issues:
- Study stopped early for CO2 bubbles in the device
- Tube kinking

Has fast-track FDA status

---

**Table 3. Subject ratings of treatment satisfaction comparing conventional hemodialysis with the WAK**

<table>
<thead>
<tr>
<th>RTSQ item</th>
<th>Item content</th>
<th>Conventional hemodialysis&lt;sup&gt;a&lt;/sup&gt;</th>
<th>WAK&lt;sup&gt;a&lt;/sup&gt;</th>
<th>P value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Satisfaction with treatment</td>
<td>4.1</td>
<td>5.1</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>Satisfaction with control over kidney disease</td>
<td>5.0</td>
<td>5.1</td>
<td>0.74</td>
</tr>
<tr>
<td>3</td>
<td>Satisfaction with treatment side effects</td>
<td>3.4</td>
<td>5.7</td>
<td>0.003</td>
</tr>
<tr>
<td>4</td>
<td>Satisfaction with treatment-related demands</td>
<td>3.9</td>
<td>4.7</td>
<td>0.22</td>
</tr>
<tr>
<td>5</td>
<td>Convenience of treatment</td>
<td>4.0</td>
<td>4.9</td>
<td>0.04</td>
</tr>
<tr>
<td>6</td>
<td>Flexibility of treatment</td>
<td>3.3</td>
<td>5.3</td>
<td>0.04</td>
</tr>
<tr>
<td>7</td>
<td>Satisfaction with freedom afforded by treatment</td>
<td>2.6</td>
<td>5.9</td>
<td>0.007</td>
</tr>
<tr>
<td>8</td>
<td>Satisfaction with understanding of treatment</td>
<td>5.1</td>
<td>5.7</td>
<td>0.23</td>
</tr>
<tr>
<td>9</td>
<td>Satisfaction with time taken by treatment</td>
<td>2.7</td>
<td>5.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>10</td>
<td>Discomfort or pain involved with treatment</td>
<td>3.9</td>
<td>5.0</td>
<td>0.04</td>
</tr>
<tr>
<td>11</td>
<td>How well treatment fits in with lifestyle</td>
<td>3.1</td>
<td>5.7</td>
<td>0.002</td>
</tr>
<tr>
<td>12</td>
<td>Would you recommend this treatment to others</td>
<td>3.9</td>
<td>5.9</td>
<td>0.06</td>
</tr>
<tr>
<td>13</td>
<td>Satisfaction to continue with present treatment</td>
<td>2.3</td>
<td>5.6</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Total treatment satisfaction score&lt;sup&gt;c&lt;/sup&gt;</strong></td>
<td><strong>46</strong></td>
<td><strong>70</strong></td>
<td><strong>&lt;0.001</strong></td>
</tr>
</tbody>
</table>

WAK, wearable artificial kidney; RTSQ, Renal Treatment Satisfaction Questionnaire. <sup>a</sup>Individual item scales are from 0 (lowest satisfaction) to 6 (highest satisfaction). <sup>b</sup>P value from paired t test. <sup>c</sup>Summary score calculated by summing individual item scores.

---

*JCI Insight. 2016 Jun 2; 1(8): e86397.*
Implantables
Implantables
The Kidney Project

HEMOFILTER:
- Silicon nanopore membrane
- Ultrafiltration driven by blood pressure

BIOREACTOR:
- Human renal tubule cells
- Resorption of Na and water
- Production of Vitamin D
- Regulation of blood pressure
The Kidney Project
Bioengineering a kidney

DECELLULARIZATION

RECCELLULARIZATION

Bioengineering a kidney

Bioengineering a kidney

Bioengineering a kidney

A perfect system would provide excellent renal function AND:

- Eliminate the risk of rejection
  - ↑ the expected lifespan of an organ
  - ↓ the organ shortage
  - ↓ need for treatment of rejection and its complications of treatment

- Eliminate barriers to transplantation for highly sensitized pts

- Eliminate the need for immunosuppression
  - ↓ Infectious risk
  - ↓ Toxicity of medications
  - ↓ Cost of medications and monitoring
  - ↓ Need for infectious prophylaxis

- ??? Artificial rather than cadaveric scaffold
While we are shooting for the moon...

What if we could prevent patients from ever needing a transplant?
Meanwhile

We have the same responsibility to our patients with renal disease as those investigators developing the next paradigm shift in transplantation...
MAKING TRANSPLANT BETTER NOW

- Improving Access
- Improving Outcomes
- Improving Patient Care
Kidney Allocation System

- ISSUES:
  - Discarded organs
  - Access to transplantation
  - Injustice in wait time calculation
  - Mismatch between recipient and organ longevity
    - Transplant kidneys that outlive the patient
    - Patients who long outlive their transplant

- Solvable problem?
Kidney Allocation System

- Estimated Post-Transplant Survival
- Kidney Donor Profile Index

Recipient Longevity

Organ Longevity
Kidney Allocation System

Estimated Post Transplant Survival

- Current diagnosis of diabetes
- Any prior solid organ transplant
- Duration on dialysis
- Candidate’s age

EPTS score range 0%-100%

OPTN

UNOS DONATE LIFE
Kidney Allocation System

KDPI vs. ECD/SCD

Potential Post-Transplant Organ Longevity

OPTN
Kidney Allocation System

EPTS & KDPI in the New System

- EPTS 0-20%
- Longevity Matching
- KDPI 0-20%

OPTN
Kidney Allocation System

- Patients traditionally disadvantaged receive greater priority:
  - PRA 98-100
  - Blood type B → access to A_2 and A_2B organs
  - Late referrals → wait time starts at RRT start

- Other priority groups
  - Prior living donors
  - Children
Kidney Allocation System: Results

**The Good**
- 7% ↑ in deceased donor transplants
- Bolus in transplants for previously under-prioritized patients
  - Highly sensitized
  - Long dialysis times

**The Bad**
- ↑ DGF, stabilizing
- ↑ kidney discard rate, 18.5% → 19.8%
- Slight ↓ in pediatric transplant rates, BUT kids transplanted with “better” kidneys
Living Donation

Living Donor Kidneys Last Longer
Well matched living donor kidneys last even longer

*Source: 2010 OPTN/SRTR Annual Data Report, Published in American Journal of Transplantation 2012;12 (Suppl 1)
Kidney Paired Donation

Mother
Donor #1

Son
Rec #1

Husband
Donor #2

Wife
Rec #2

National Kidney Registry
Kidney Paired Donation

- Non-Directed Donor
- Donor 1
  - Incompatible
  - Recipient 1
- Donor 2
  - Incompatible
  - Recipient 2
- Donor 3
  - Incompatible
  - Recipient 3
Kidney Paired Donation

- Involving compatible pairs to improve HLA match and access for non-compatible pairs

- Living Kidney Donor Profile Index: LK DPI

- Increasing participation nationally
Our mission is to reduce financial disincentives to living organ donation.

- 348 participating transplant programs
- 3,818 organ donations made possible
- 89% of applications have been approved
Nat’l Living Donor Assistance Center

- Funded by the federal government
- Administered under HHS and DoT

- Provides reimbursement for non-medical expenses related to donor evaluation and donation
  - Travel
  - Lodging
  - Meals

- Does not address the issue of lost wages
Living Donors: Single Day Evaluation

- Designed to:
  - Diminish the burden of the evaluation for the donor
  - Diminish time to transplantation for the recipient

- Full evaluation in a single day:
  - Transplant Nephrology
  - Transplant Surgery
  - Social Work
  - Other providers as needed
  - Labs and Imaging
Living Donors: Laparoscopic Nephrectomy

- 1995: First living donor nephrectomy performed laparoscopically by Dr. Lloyd Ratner
- POD 1 Discharge
- POD 14 Returned to work
- Multi-modal pain control:
  - Toradol
  - Long acting sub-fascial local anesthetic
  - Tylenol
  - Opioids as needed
Social Media in Kidney Transplantation

Confessions of a kidney donor: Allyssa Bates at TEDxBeaconStreet 2013

TEDx Talks

I need a new kidney. There are over 100,000 people waiting for a cadaver kidney in this country alone. With a live donor the wait will end for me and start a chain of partner transplants.... See More

Public Group
Anyone can see the group, its members and their posts.

View Group Info

View Pinned Post
Social Media in Kidney Transplantation

To share that you're an organ donor on your Timeline:

1. Click Life Event at the top of your Timeline
2. Select Health & Wellness
3. Select Organ Donor
4. Select your audience and click Save
Mobile Technology

Care After Kidney Transplant
National Kidney Foundation

iPhone

Introduction

The long term success of a kidney transplant depends on many things. You should:
- Be seen by your transplant team on a regular basis and follow their advice.
- Take your anti-rejection medications daily in the proper dose and at the right times, as directed by the transplant team, to keep your body from rejecting your new kidney.
- Follow the recommended schedule for lab tests and clinic visits to make sure that your kidney is working properly.
- Follow a healthy lifestyle including proper diet, exercise, and weight loss if needed.
- Select a category below to continue.

- Rejection and Transplant Medicine
- Infection
- Vaccines
- New-Onset Diabetes After Transplant
- Heart Disease

Rejection and Transplant Meds

What are anti-rejection medications?
Why do I need to take anti-rejection medication?
How should I take anti-rejection medications?
Do anti-rejection medications have side effects?

Anti-rejection (immunosuppressant) medications have a number of side-effects which are usually mild for most patients. Blood levels of rejection medications will be checked regularly to prevent rejection and side-effects. If side-effects do occur, your doctor may change the dose or medications.

Transplant Hero - Medication Reminder, Pill...
Transplant Hero LLC

iPhone

Add any medication you need

Get notifications when it's time to take your pill.
Recipient Care: Everyday

- Streamlined evaluation process
- Evidence-based recipient selection
- Expanding the potential recipient pool
- Improving recipient education... and re-education
- Communication and follow-up while waitlisted
- Preventing patients from developing contra-indications to transplantation while waitlisted
- Improving deceased donor organ selection and organ-recipient matching
Recipient Care: Everyday

- Clean, efficient operations
- Peri-operative monitoring and imaging
- Post-operative pain control
- Discharge planning and outpatient resources
- Immunosuppression protocols
- Rejection monitoring: protocol biopsies and urinary biomarkers
- Easy accessibility to patients throughout the process
- Kindness
BETTER TODAY THAN YESTERDAY…

BETTER TOMORROW THAN TODAY.

Jim Harbaugh, via Twitter (and others)
CONTACT US

University Transplant Center
Experts On Life.

University Health System | UT Health San Antonio

4502 Medical Dr. MS-18, San Antonio, TX 78229
UniversityTransplantCenter.com

Hospital to Hospital Transfer: 210.743-3100

Main: 210.567.5777