Development of an Integrated Patient Centered Tele-Medical Home in Liver Transplantation

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Quality

- Types of organs
- Improved graft survival
- Waitlist mortality
- Readmissions
- Cost
- Length of stay
- Living Donor
- Volume
Pay for Performance

• Do you know how good you are?
  – The answer determines your pay
  – Payers, government rank physicians based on outcomes
  – Tie your performance to reimbursement
  – What outcomes are they using?

• Suggestion to be good and cheap
  – Surgeons vs payers definition of good
  – Cost may not be in your hands

• Bundling
  – Transplant already operates with this
  – Readmissions bundled? Will they be paid?
What’s important to patients?

• Improving function
• Quality of life
• Independence
• Better transition from hospital->home
• “Care between visits”
HOSPITAL UTILIZATION AND CONSEQUENCES OF READMISSION AFTER LIVER TRANSPLANTATION
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PURPOSE
Preventable readmissions have become a focal point for controlling cost and improved quality in medicine. The frequency and causes of readmissions after liver transplantation (OLT) at 30 days and 1 year have not been described. We aimed to determine the risk factors, rate and outcomes of readmissions within the first year after OLT and its potential impact on patient and graft survival.

METHODS
Medical records of 239 consecutive patients who underwent OLT from 2007 to 2012 at University of Cincinnati Medical Center were reviewed. Fifteen patients were excluded due to death (n=11) or re-OLT (n=4) within the same hospital stay. Transplant and non-transplant related factors were collected during the index admissions and potential readmissions. This database was then linked to the Scientific Registry of Transplant Recipients (SRTR) and University Health Consortium (UHC) databases to link transplant and hospital related data respectively.

RESULTS
224 patients
- UC Liver Transplants 2007-2012
- 15 patients excluded (death, retransplant)

30 day readmission
- 118 readmissions in 92 patients
- 41% readmission rate

1 year readmission
- 413 readmissions in 154 patients
- 69% readmission rate
## Reasons for Readmission

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<th>Reason</th>
<th>30 Days (n=118)</th>
<th>2-12 Months (n=295)</th>
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<tr>
<td>Infections</td>
<td>23 (19.5%)</td>
<td>73 (24.8%)</td>
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<td>Renal failure</td>
<td>11 (9.3%)</td>
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<td>GI (vomiting, diarrhea)</td>
<td>10 (8.5%)</td>
<td>19 (6.4%)</td>
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<tr>
<td>Pulmonary (edema, effusion)</td>
<td>9 (7.6%)</td>
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<td>Biliary complications</td>
<td>8 (6.8%)</td>
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<td>Mental status changes</td>
<td>8 (6.8%)</td>
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<td>Medication-related</td>
<td>7 (5.9%)</td>
<td>9 (3%)</td>
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<td>Hepatic artery complications</td>
<td>4 (3.4%)</td>
<td>6 (2%)</td>
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<tr>
<td>Malnutrition</td>
<td>4 (3.4%)</td>
<td>9 (3.0%)</td>
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<tr>
<td>Acute Cellular Rejection</td>
<td>3 (2.5%)</td>
<td>25 (8.5%)</td>
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<tr>
<td>Other</td>
<td>31 (26.3%)</td>
<td>93 (31.5%)</td>
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</tbody>
</table>
Hospital Readmissions after Liver Transplantation

30-Day Readmission Rate = 37.9%
Hospital Readmissions after Liver Transplantation

30-Day Readmission Rate = 37.9%

51.7% of Readmissions occur within 7 days of D/C
Hospital Readmissions after Liver Transplantation

90-Day Readmission Rate = 47.6%
Hospital Readmissions after Liver Transplantation

90-Day Readmission Rate = 47.6%

3,750 patients readmitted

6,459 readmissions

44.5% of readmitted patients had multiple readmissions
Most of ‘Health Care’ occurs ‘Between Visits’

- Engage Patients in Healthful Behavior

Visit

- Between Visits

Pre-Visit

Post-Visit

Between Visits
e-Health Literacy

Methods

• Study questions adapted from the validated Heartview NAR (NING) Aftercare Technology Survey
  – Upon presentation to clinic (pre- and post-transplant), patients were asked to complete the survey by the medical assistant who also collected them

159 surveys returned.
81% own or have access to a computer.
Internet and Email

1. Have used the Internet?
   - 81% said **YES** vs 19% said **NO**

2. Have used email?
   - 74% said **YES** vs 26% said **NO**

3. Have used an iPhone or iPAD?
   - 46% said **YES** vs 54% said **NO**

4. Have used video conferencing?
   - 20% said **YES** vs 80% said **NO**
Internet and Email Frequency

5. Frequency of internet use of those who answered the question:
   – 6.5% yearly
   – 10% monthly
   – 17% weekly
   – 66.5% daily

6. Frequency of email use of those who answered the question:
   – 2% yearly
   – 6% monthly
   – 12% weekly
   – 48% daily
iPhone/iPad and Conferencing Frequency

7. Have used an iPhone or iPad*
   - 5% weekly
   - 36% daily

8. Have used video conferencing
   - 7% yearly
   - 4% monthly
   - 4% weekly
   - 2% daily
Paradigms of Care

1st Paradigm: Hospital
- Acute Care
- High Complexity
- High Cost
- Least Patient Participation

2nd Paradigm: Clinic
- Preventive Proactive Care
- Least Complexity
- Least Costly
- Most Patient Participation

3rd Paradigm: ‘Between Visit’

4th Paradigm: Community of Care
- home
- work
- play

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Parameters of When to Call

Monday-Friday 8am-4:30pm: Sarah Diersing RN 513-584-8478

After hours on weekends and holidays call 513-584-9999 and follow the prompts to have the Liver transplant coordinator on call paged.

1. Call if patient gains more than 5 pounds in 2-3 days.

2. Call if blood pressure, top number is greater than 150

3. Call if Pulse is less than 60 or greater than 110

4. Call if fever greater than or equal to 101 degrees Fahrenheit

5. Call if fever equal to 100 degrees Fahrenheit for more than 24 hours

6. Call if increased redness, swelling, pain, foul-smelling drainage, bleeding from surgical incision.

7. Call with symptoms of nausea, vomiting, diarrhea or constipation.

8. Call 911 and your coordinator if having symptoms of chest pain or shortness of breath.

9. Call with any other concerns
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<th>AM PULSE</th>
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Use of IT and Tele-Health technology

Capture, Connect and Collaborate

- Pulse Oximeter
- Glucose Meters
- Blood Pressure Monitors
- Scales
- Support of Family and Friends
- Care Team
- Self Monitoring Care Plans
- Personalized Learning
- Desk & Laptops
- Smart phones
- IPad, Playbook
CONNECT RCM

Connect RCM is an innovative, cloud-based application that can significantly reduce the complexity and cost of deploying a clinically driven remote care management program.

The Connect RCM application facilitates the collection and transmission of daily biometric data measurements and provides access to clinician-directed health sessions, videoconferencing, and interactive education.

With its cloud-based connectivity, the Connect RCM client application provides individuals with greater freedom and flexibility to participate in their own care from wherever they are connected online.
Post-transplant home monitoring

Transplant Center

Phone line
Internet
3G wireless

Home

Transplant Physician
Transplant Coordinator

Patient information/
education
Hypothesis
Integrated Patient Centered Medical Home in Liver Transplantation

• Through the use of a patient centered health technology platform, we aim to improve the care of patients after LT by increasing patient centered care, decreasing hospital utilization with readmissions and improved outpatient care and lowering costs.
Pilot study
20 consecutive patients once home

OLT Performed POD#0

Tablet ordered, delivered and registered – POD#1

When on floor, teaching performed (Pam Kimmel RN, Jen Garrett PA) POD#4-6

Patient discharged POD#7

Medical home visit by Pam Kimmel to ensure device working and setup complete POD#8-9

Supported by the University of Cincinnati Comparative Effectiveness and Patient Centered Outcomes Research Grant
What did we learn?

• Increased monitoring
  – Increased appreciation among high risk group
• Sometimes too much work –
• Questions not answered around 40-50% of the time
  – As patients got better – need was less
• Vitals done well
  – Human input vs. plug in
• Overall – value added
Taking the leap
Increased Patient Engagement

VITALS

EDUCATION VIDEOS and INFORMATION

DIALOGUE

GAMES DESIGNED FOR KNOWLEDGE AND INFORMATION

CAMERA – LOOK INSIDE THEIR ENVIRONMENT

TEXT MESSAGING AND COMMUNICATION DAILY
Summary

• Use of telehealth may be best suited for acute critical illnesses
  – Readmissions
  – Complications
  – Cost
• Learning curve
  – Providers > patients
• Must adopt future technologies – and make it patient centered.