Lung Transplant Digital Care

Detecting graft dysfunction in lung transplant recipients using home spirometry during the COVID-19 Pandemic

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Detecting graft dysfunction in lung transplant recipients

- Early Detection of both Acute Allograft Dysfunction and Chronic Lung Allograft Dysfunction is important as delays in detection / treatment may lead to worse outcomes.
- Spirometry remains the principal method for detecting graft dysfunction in outpatient lung transplant recipients.
COVID-19 Impact on Spirometry

- Aerosol Generating Procedures pose a significant risk of COVID-19 transmission
- Nationwide most PFT labs either closed or significantly reduced volumes
- Barriers to In-Lab Spirometry:
  - COVID-19
  - Requires travel
  - Variability between labs
  - Frequency of measurement limited
  - Getting outside spiro data intercalated with our data
  - Review of outside spiro is challenging/requires fax/personnel
Detecting graft dysfunction in lung transplant recipients using home spirometry

- **Home Spirometry: potential benefits**
  - Less risk - Keeps AGPs at home
  - Less Travel
  - Increased Frequency
  - Portable Data
  - Home management

- **Barriers**
  - Compare to Lab Measure?
  - How to interpret?
  - How to trouble shoot?
  - Education / Coaching?
Adherence to home spirometry generally decreases over time due to multiple factors - Lack of understanding - Lack of feedback - Lack of engagement

Non-adherence to home spirometry is related to a decreased freedom from BOS
Goals of home spirometry

- Obtain spirometry on a weekly basis for the first year and monthly basis after one year to detect graft dysfunction
- Obtain spirometry in real time to assess remote symptoms
- Identify changes in lung function earlier
  - Diagnose acute graft dysfunction
  - Diagnose CLAD earlier
- Provide education to patients
- Collect feedback
- Iterate based on experience and feedback
Engagement Platform

Before we get started, please accept our Terms of Use and Privacy Policy.

Hello, and welcome to your UCSF Lung Transplant Care Chat.

Your UCSF care team has developed this automated chat program to stay connected after your lung transplant.

We’ll be using these chats to monitor your lung function using your new spirometry device.

In particular, you’ll enter your FEV1 values here.

This information is securely sent back to your UCSF care team, which helps keep us updated on how you’re doing.

Which device did you receive?

Or a SmartOne®

Do you feel comfortable using your spirometry device?

Excellent

The most important number from your spirometry is the FEV1.

This means "Forced Expiratory Volume in 1 second." In other words, it’s the total volume of air you can blow out in the first second of blowing.

Your device will report several numbers, but the FEV1 is only the number we’ll be asking for in these chats.

Would you like to enter a FEV1 value now?

Yes

No
Create Spiro Data

Engage, Collect, Feedback

Data Deposit, Assimilation

Feedback, Disposition
## Physician Dashboard

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Date of Birth</th>
<th>Values Reported</th>
<th>Median (IQR)</th>
<th>Baseline</th>
<th>Most Recent</th>
<th>FEV1 Trend</th>
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<td>128</td>
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<td>1.89 (1.85 - 1.92)</td>
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<td>1.88 (1.8 - 2)</td>
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<td>45</td>
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<td>45</td>
<td>2.19 (2.08 - 2.24)</td>
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</tbody>
</table>
Home spirometry highly correlates with Lab spirometry

\[ R^2 = 0.938 \]
Enrollment and Engagement

Number of Patients Enrolled Over Time

Module Completion Rates

Module Status
- Completed
- Not Completed

Module Completion Percentage:
- Intro
- Welcome Back
- Intake and assessment
- Goodbye
- FEV1 Assessment
- Unscheduled Session
- PEC
**Next steps**

- **April:** Development and First patient beta testers
- **May:** Marketing release to patients that received first 200 spirometers
  - Patients self enrolling
  - Total enrollment at 220
- **May-July:** Print materials sent to latest cohort with next shipment of 200 spirometers
  - Newsletter for existing patients August 6th
  - Information re: bulk enrollment of remaining 200 patients August 10th
- **August:** Email Marketing and bulk enrollment
  - Transfer FEV1 data into EMR
  - Allows for easier dispo planning
- **February:** Integration of alerts into EMR
- **Next:** Disposition (Telehealth)
  - Goal state allows for engagement platform to prompt patient to self schedule urgent follow up
We rapidly developed a home spirometry program to help manage lung transplant recipients during COVID-19. The program provides for engagement, data collection and feedback. The data generated has a high degree of fidelity. We continue to iterate to improve user experience and engagement. The future state will allow for more rapid clinical assessments utilizing both Telehealth self scheduling and onsite evaluations.