Real-Time Telehealth for COPD Self-Management Using Skype™
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January 24, 2014
Funded By: Breathe California of Los Angeles County & NIH/NINR P20 MR015671-03

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AIMS

1. Explore feasibility of real-time telehealth to teach pursed-lips breathing (PLB) to people with COPD
2. Compare outcomes of intervention to control group
   - Dyspnea
   - Social Support

Framework

Telehealth

- Remote delivery of Internet-supported health delivery activities
  - Synchronous or asynchronous
- Promotes positive health outcomes
  - Symptoms reduced
  - Subjective well-being improved
Software: Skype™

- Real-time interactive audio/visual communication
  - readily available
  - free
  - easily downloaded

Chronic Obstructive Pulmonary Disease

- 3rd leading cause of death in US (CDC ‘12)
- 6.3% of US with 15 M diagnosed/ M more undiagnosed
- $42.6 billion U.S. health expenses 2007
- Dyspnea on exertion

COPD: Chronic airflow limitation – dx spirometry
COPD Objective Signs

INCREASED RESIDUAL VOLUME
LUNG STATIC HYPERINFLATION

Dyspnea due to DYNAMIC hyperinflation

Breathing Pattern Time
Pursed-lips Breathing (PLB) Slows Exhalation & Reduces Dyspnea

Instruments

- Dyspnea
  - Intensity & Distress: Visual Analogue Scale
  - UCSD Shortness of Breath Questionnaire
  - Modified Borg Scale after 6-min walk distance

- Social Support
  - Medical Outcomes Study (MOS) Social Support Survey

Methodology

- Randomized control trial – IRB approval
- Measurement
  - Baseline
  - 4 wks
  - 12 wks
- Recruitment
  - Outpatient pulmonary clinic, West LA VA Healthcare Center
**Inclusion Criteria**

- FEV1/FVC % < 70, FEV1 % pred < 80, no reversibility after inhaled bronchodilator
- “3” or greater on Medical Research Council Breathlessness Scale
  
  *Do you have to walk slower than most people on the level? Do you have to stop after a mile or so (or after 30 minutes) on the level at your own pace?*

- No computer or computer experience required

**Intervention**

**Technology**

Computer set-up in home: Laptop with webcam, headset,

Internet service with 768K upload speed needed for quality video

Computer modification required for ease of delivery
Computer
- Preconfigured laptop with Skype starting at activation
- Color-coding for 4 keyboard functions, volume, computer activation, and shut-off
- Same computer for health educator and client for ease of problem solving

Protocol for PLB practice
- ALL: 10 min PLB educational session (in-person)
- ALL: Short, frequent daily practice times max 10 min/day to 25 min/day by 4th week, logbook
- Intervention only: 1 weekly 15-30" telehealth session for 4 wks
- Same computer for health educator and client for ease of problem solving

Call Initiation Procedure
Health Educator:
- Calls on land-line phone at app’t time
- Makes sure participant laptop is open and powered
- Establishes Skype™ call

Participant:
- Opens laptop
- Confirms image looks like Skype™ image on handout
- Hangs up phone
- Puts on headset
Statistical Analysis

- Examine patterns over time for each outcome variable
- Intent to treat analysis
- Mixed-effects model

Sample N = 22

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<th>Control</th>
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Results

- No significant clinical and demographic differences between groups at baseline
- COPD severity based on FEV1 %pred
  - 15 moderate
  - 6 severe
- Use of log books to record practice times
  - Intervention: all
  - Control: 64%
MOS Total Social Support Score

- Baseline
- 4 Weeks
- 12 Weeks

Control vs. Intervention

MOS Social Support Emotional Score

- Baseline
- 4 Weeks
- 12 Weeks

Control vs. Intervention

VAS INTENSITY

"During the past 24 hrs, how easy or how hard was it to get your breath?"

- Baseline
- 4 Weeks
- 12 Weeks

Control vs. Intervention
Results: Participants

“...a good way to teach and learn”.
“This pgm really opened my eyes to COPD”
“...a time saver & just like seeing the doctor in person”

Summary

• PLB training with real-time interactive audio/video communication is feasible
• All participants reported improved dyspnea management
• Intervention group pattern
  – Increased perceived social support
  – Decreased dyspnea intensity

Clinical Implication

Synchronous telehealth using Skype™ may be a useful strategy for learning self-management skills for home-bound clients
Current Technology

• Skype videoconferencing phone is simple and self-contained, requires little space and is under $300.

• Mobile phones with 4G have the capacity to do video conferencing and do not require internet installation.