Empowering Chronically Ill Patients and Their Caregivers: Using an Interactive Tele-Monitoring Program

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Conflicts of Interest Disclosure

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HealthCare Partners Medical Group

Part of DaVita, physician-owned, serving multiple states at global capitation, full risk.

Southern California:

Facilities
- 69 Staff Model Facilities (Primary Care, Urgent Walk-In, Ambulatory Surgery, Pharmacy)
- 753 Independent Physician Offices (IPA)

Physicians
- 235 Employed
- 975 Independent Physician Associates
- Serving 554,000 lives:
  - 417,000 commercial,
  - 109,000 senior patients,
  - 28,000 MediCal patients
Disease Management

- Disease Registries to identify Patient Populations (CHF, COPD, Diabetes, CKD)

- Target patients based utilization data; post discharge; clinical markers; and/or referral

- Physician Champions coordinate and support nurse staff

- Technology supports consistent program delivery; EMR and Chronic Care Management Information System (CCMIS).

- Outcomes reporting updated daily to monitor effectiveness

- Education/training – Disease education modules for nurse staff; Motivational interviewing
Program Structure

ESRD

HomeCare

High Risk Clinics

CCM – Complex CM

• DM – COPD
• DM – CHF
• DM – Diabetes
• DM – CAD

• DM – CKD
• DM - Asthma

High Risk Programs

CCM Programs

CM & Disease Management Programs
COPD Burden: 3\textsuperscript{rd} Leading Cause of Death

- Disease Registry of COPD Patients
  - 2009: 16,642
  - 2011: 20,357
  - 2012: 25,695

- Economic burden of COPD is significant
  - Greater than $2,000 nationally per member, per month
  - Inpatient hospitalization accounts for \textasciitilde50\% of all costs

- HCP consistently one of the top 10 ranked for inpatient admissions and readmissions.
  - 30 day readmission rate-15\%
Program Aims & Objectives

To implement a disease management program at HCP focused on COPD patients

- Improve patient outcomes & QOL
- Decrease hospitalization: goal 20% reduction
- Decrease ER visits: goal 20% reduction
- Reduce cost of care: goal 10% reduction in the pmpm of study population

Ultimately

- Optimizing healthcare for the individual
- Improving outcomes for the population
- Reducing unnecessary cost and waste
Identify “Intervention Group”

Determine baseline utilization characteristics, cost PMPM & utilization/1000

Concurrent utilization measurement (cost PMPM & utilization/1000) for each group

Program Cost & Interventions

Frequency and timing of concurrent program measurement

Frequency: monthly

Stage 1

Stage 2
Phone call to direct to COPD CM/RN (day) or Telehealth RN (night), if not done already

Patient identified during interview to have active symptoms or exacerbations

Evaluate symptoms of Self Management Plan: Breathing, Sputum, Thinking, and Energy

Patient calls with worsening symptoms or concerns

Contact MD (PCP, Hospitalist) Refer to ED/UC

Red

Zone of Symptom

Yellow

Start Emergency Prescription. PCP/Specialists F/U in same day on 1st call

Green

Reassure F/U PCP 2-3 days Feedback to PCP Possible Home Health

Call back next day
# COPD Action Plan
## Managing Your COPD

<table>
<thead>
<tr>
<th>GREEN ZONE</th>
<th>YELLOW ZONE</th>
<th>RED ZONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>You feel well.</td>
<td>You feel worse.</td>
<td>You feel much worse or in danger!</td>
</tr>
</tbody>
</table>

### GREEN ZONE
- You are able to breathe without difficulty while doing your usual activities.
- There is no change in your cough, sputum, ability to think/remember, or energy.

### Action Plan
- **Continue** your usual activities.
- **Take** your medicine as directed by your doctor.

### YELLOW ZONE
- You have more shortness of breath, wheezing, or coughing than usual.
- Your sputum is thicker, or has turned green or brown.
- You have a fever of 100°F or more.
- You may feel forgetful or confused, and may have difficulty concentrating or sleeping.
- You feel more tired, and cannot finish your usual activities without resting.

### Action Plan
- **Increase** the use of your “Rescue Inhaler” or Nebulizer (Albuterol or Xopenex).
- **Use** Pursed Lip Breathing and/or other energy-saving techniques.
- **Continue** to use any oral steroids (Prednisone) and/or antibiotics your doctor has prescribed.
- **Call** your doctor or care manager, or go an affiliated Urgent Care / Walk-In Center.

### RED ZONE
- You are having trouble breathing.
- You have difficulty coughing up sputum.
- You have blood in your sputum.
- You feel drowsy or have difficulty waking up.
- You are not able to do any of your usual activities.

### Action Plan
- **Follow** the Action Plan in the yellow zone column.
- **Call** your doctor or care manager immediately.
- **Go** to the nearest Urgent Care / Walk-In Center or Hospital Emergency Room or **call 911** if necessary.
COPD Program Results

<table>
<thead>
<tr>
<th>Date: 8/1/08-7/31/09</th>
<th>Control</th>
<th>Intervention</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total admits</td>
<td>57</td>
<td>40</td>
<td>30% reduction</td>
</tr>
<tr>
<td>Total beddays</td>
<td>190</td>
<td>115</td>
<td>39% reduction</td>
</tr>
<tr>
<td>Total ED visits</td>
<td>92</td>
<td>71</td>
<td>23% reduction</td>
</tr>
<tr>
<td>Cost of care (all paid-pmpm)</td>
<td>$7,070</td>
<td>$4,661</td>
<td>34% reduction</td>
</tr>
<tr>
<td>PCP visit</td>
<td>683</td>
<td>887</td>
<td>30% increase</td>
</tr>
<tr>
<td>Drug cost est.</td>
<td>$402,553</td>
<td>$415,154</td>
<td>3% increase</td>
</tr>
</tbody>
</table>
BODE Stratification and Correlation to Patient Outcomes

Percentage of Patients in Each Quartile with at least 1 Admission

BODE Quartile
COPD Best Practices

- Initial face-to-face visit for assessment and education; BODE Assessment; COPD Staging.
- Expedited access to clinical staff; including 24-hour triage
- Immediate intervention, including emergency prescriptions and intervention based on “zones of symptoms.”
- “Pathways” tracking process of patient self-management
- Interactive voice response technology (IVR) to monitor patient’s symptoms and symptom changes.
- IVR does NOT replace clinical staff visits/interaction.
Expanding Clinical Capacity

IVR Technology

- Expand the clinical capacity of our nurses; expected Case Loads ~200 patients; 5% triggering follow up.
- Supports the administration of emergency prescriptions; patients recognize worsening symptoms and are taking action

Clinicians’ Reports

- Reports are easy to read/actionable; Nurses: “We know which symptoms the patient is experiencing.”
- Frees-up time and allows clinicians to focus on patients who are more at-risk.
Optimizing Telehealth Operations

Detecting Exacerbations Sooner

- Not intrusive: brief calls that engage patients.
- Avoided timely and complicated set up: patient uses their own phone; majority were Senior patients; majority use landline phones, but increasing cell phone use.
- Convenient: calls occur either at noon with a back-up call early evening
- Provides critical and actionable information for clinicians
- Survey captures yellow zone or red zone symptoms and reinforces recognition on a regular basis
PATIENT MONITORING PROCESS

Telehealth survey call to patient’s home phone on Mondays and Thursdays. First call at noon, if that call is missed, second call at 7:00 pm

Patients respond to the survey by pressing 1, 2 or 3 on their telephone keypad based on current symptoms.

Vendor collects data after patients complete survey. Returned to HCP which releases trending reports of the survey results are e-mailed to the care team.

“Answered 3 for Any Question” indicates patient is in the red zone with possible “flare-up” or exacerbation. Nurse will contact these patients as priority.

“Change Greater Than 2” indicates the patient has an increase in their survey score since last report. Nurse will follow-up with these patients for possible COPD “flare-up.”
Longitudinal IVR Report

Patient Trending Chart

Chart from 03/02/2013 to 4/1/2013

- Patient ID:
- Full Name:
- Address:
- Phone:
- Doctor:
- Region:
- Calls Per Week: 2 - Mon, Thu
- Status: ACTIVE
  - Begin Date: 03/27/2011
  - End Date: NA

Chart from 03/02/2013 to 4/1/2013

Legend:
- Red > 10
- Black = 9 or 10
- Blue < 9

Total Answer

Date Of Call

Page 1 of 1
## ROI Calculated

### Program Costs – IVR Monitoring

<table>
<thead>
<tr>
<th>Total Pilot Patient Enrollment</th>
<th>90</th>
</tr>
</thead>
</table>

**Technology and Other Operating Costs ($USD)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Operating Costs</td>
<td>31,594</td>
</tr>
<tr>
<td>Per patient</td>
<td>351</td>
</tr>
</tbody>
</table>

**Personnel Costs ($USD)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered nurses allocated time/costs</td>
<td>98,000</td>
</tr>
<tr>
<td>Care Coordinator</td>
<td>37,000</td>
</tr>
<tr>
<td>Management resources/costs</td>
<td>4,900</td>
</tr>
<tr>
<td>Total Personnel costs per patient</td>
<td>1,559</td>
</tr>
</tbody>
</table>

**Total Program Costs ($USD)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Operating costs</td>
<td>171,914</td>
</tr>
<tr>
<td>Total Operating costs per patient</td>
<td>1,910</td>
</tr>
</tbody>
</table>
**IVR ROI Analysis**

<table>
<thead>
<tr>
<th>Analysis Pilot: 90 Enrolled Patients in IVR</th>
<th>Disease Management program only</th>
<th>Disease management program + IVR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital admissions</td>
<td>48</td>
<td>22</td>
</tr>
<tr>
<td>Hospital admission rate per thousand</td>
<td>69</td>
<td>31</td>
</tr>
<tr>
<td>Hospital Costs ($USD)</td>
<td>8,529</td>
<td>3,909</td>
</tr>
<tr>
<td>Outpatient Clinic Visits</td>
<td>446</td>
<td>581</td>
</tr>
<tr>
<td>Outpatient Clinic Costs ($USD)</td>
<td>765</td>
<td>996</td>
</tr>
<tr>
<td>Return on Investment ($USD)</td>
<td></td>
<td>4,388</td>
</tr>
</tbody>
</table>
Enhancing Activation and Quality of Life

- Does not substitute a nurse call or face-to-face meetings with patients and educational training; it supplements these Program activities
  - “Calls were easy”
  - “Did not take too much time”
  - “Helped me become more involved in my healthcare”

- Encourages patients to monitor their own symptoms; reinforces patient’s monitoring of their zones of symptoms

- Prior to IVR, patients hated to “bother” their nurse or doctor; not “sick enough” to call until it was too late.
“Right Care at the Right Time.”

- Patients/family need to know how to monitor and treat symptom exacerbation. Telemonitoring is implemented once the patients is confident that they understand their Action Plan.

- Reinforces the need for patients to self-manage their own condition with appropriate support

- Objective is to support patients to remain at their chosen residence

- Strategy also supports HCP goals for cost-effectiveness; expanding clinical capacity of the staff
Future Plans and Diffusion

- Expansion has included CHF and Spanish IVR for both CHF and COPD (2012); Currently 315 patient enrolled and expanding

- Further analysis development

- Launching in other geographical areas (Florida, Nevada)

- White papers, intervention surveys, operational streamlining (“what’s working”, “what’s not working”, “sharing best practices”)
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Team:
- Patients and their informal caregivers
- Chronic disease management nurses
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