mHealth Technology and Clinical Integration of Patient-Generated Health Data (PGHD) for Improving Patient Engagement

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Patient Generated Health Data – Diabetes

Sensor Data from Patient:

- Physical Activity: Steps, distance, active minutes, calories burned,....
- Sleep Analysis: Duration of sleep
- Nutrition: Total calorie intake, resting and active calories burnt, carbohydrates, protein, fat, sugar, fiber....
Sensor Selection & Testing
## Sensor Selection

<table>
<thead>
<tr>
<th>Order</th>
<th>Per Synopsis Report in EMR</th>
<th>Apple Health Kit Display Name</th>
<th>App Source for EMR</th>
<th>Jawbone UP - Collects/Healthkit ($75)</th>
<th>Basis Peak - Collects/Healthkit ($199)</th>
<th>Garmin VivoFit ($115)</th>
<th>Polar ($140)</th>
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<tr>
<td>1</td>
<td>Weight</td>
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Sensor and App Selection

- Intel
- Basis Peak
- Under Armour
- MyFitnessPal
- Apple
- HealthKit
- Epic
- MyChart
Patient Generated Health Data - Integration

Patient Generated Health Data (PGHD)

UCDHS Patient

Visualization - Patient Dashboard

UCDHS Portal

3rd party

Managed authentication

Raw responses stored for analysis

Enables research and other analytical capabilities

UCDHS Provider

Visualization - Care Team Dashboard

Epic Hyperspace

Epic Chronicles

“Actionable” summary information within Epic

Epic Clarity

MyChart

UCDHS Patient Portal

MyChart

UCDHS Provider
Provider Components in Electronic Health Record

- Current goals- Overall goal and short-term goals
- Nurse coach summary (updated and populated from each coaching encounter)
- Summary of progress toward goals through sensor data (quick visual)
- Ability to see multiple clinical metrics (ex, HgbA1c or weight values tracked over time)
Patient Goals

**Step Goals:** Achieve [PGHD Step Goals: 7000001] [UCD PGHD STEP GOAL DAYS PER WEEK GOALS: 700000012]

**Total Calories Burned:** Achieve [PGHD TOTAL CALORIES BURNED: 700000032] [PGHD TOTAL CALORIES BURNED DAYS PER WEEK: 700000033]

**Workout Goals:** Complete the following activities: [UCD PGHD Workout Goals: 70000004]

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**Patient Generated Health Data Goals as of 3/29/16 %**

**Nutrition:**

- Consume less than 2000 calories per day, 7 days per week.
- Achieve calorie 100 calories deficit 7 days per week.
- Reduce processed food consumption

**Sleep Goals:** Achieve 7 hours per night 7 days per week.

**Step Goals:** Achieve 10,000 steps 3 days per week.

**Total Calories Burned:** Achieve 2000 3 days per week.

**Workout Goals:** Complete the following activities: Cycling 3 days per week 30 minutes.
Visualization of Sensor Data
PGHD Nurse Coaching SUBSEQUENT ENCOUNTER

Date: 03/29/2016  
Encounter Start: 2:22 PM  
Encounter End: 2:53 PM

Previous SMART Goal:

Previous SMART Goals

Goal Success (patient self-rated):
- PRIMARY GOAL: Physical Activity Scale: Rarely (10-30%)
- SECONDARY GOAL: Nutrition Scale: Sometimes (31-60%)

Frequency of Engagement with Technology Device:
- Wearing Device: 40% time
- Utilizing Applications: 4 days per week

Patient Identified Barriers:
- Lack of time and Decreased motivation

Facilitators Identified:
- Internal motivation and Re-arranging schedule

Assessment of Goals from ‘Patient Generated Health Data’ (clinician rated)
- PRIMARY GOAL: Physical Activity Scale: Rarely (10-30%)
- SECONDARY GOAL: Medication Scale: Never
Patient Component - My Chart

- Provide dashboard view of goals (patient generated through my chart or mobile app)
- Progress toward goal as measured by sensors (visual dials or temperature marker, some quick visual)
- Ability to determine which dials are displayed to graph and measure progress and success
- Tailored intervention (messaging, education, encouragement) based on readiness and tied to personal data
Thank you!