Remote Patient Monitoring Case Study

Presented by:

Robert Abel, RN, Chief Nursing Officer and Palliative Care Director
I have no financial relationship with a commercial entity producing healthcare-related products and/or services relevant to the content I am presenting.
Tools of Telehealth Technology

- 4G tablet with pre-loaded software to include video education, health assessments, video visit capacity
- Patients use tablet to comply with treatment plan & remain engaged in self-care activities
- Patients can access tablet to immediately access caregiver, clinician or tech support
- Data input to track activity, diet, vital signs, weight & medication available for clinician & caregiver review
- Caregivers & clinicians receive alerts to intervene if patient is at increased risk for urgent care or hospital readmission
The Peripherals

- Wireless Watch Pedometer
- Wireless Scale
- Wireless Blood Pressure Monitor
- Wireless Glucose Monitor
- Wireless Pulse Oximeter
- Wireless Thermometer
HOME DIURETIC PROTOCOL FOR HEART FAILURE

NOTE: Protocol is for heart failure patients receiving home health telemonitoring services.
To be used in conjunction with MaineHealth Home Diuretic Standing Order.

INTAKE ASSESSMENT
Vital signs, weight, osmolarity
Review of fluid, sodium restrictions
Medication Reconciliation (No NSAIDs)
Patient education using TeachBack Methodology and MH Tools
Draw baseline BMP if not available.

DAY 1
1. EVIDENCE OF VOLUME OVERLOAD
   - New dyspnea, orthopnea, tachycardia
   - Decreased oxygen saturation
   - New or increased rates
   - New or increased peripheral edema
   - Early satiety, abdominal bloating

2. UNSTABLE VITAL SIGNS
   RR>30 or respiratory distress,
   SBP<80 or >180,
   Resting HR <50 or >100,
   Significant change from patient’s baseline.

3. ONGOING MONITORING
   - Vital signs, weight, osmolarity, telemonitoring,
   - Patient & family education,
   - Care coordination

DAILY WEIGHT MEASUREMENT
Weight gain of 2 lbs in 24 hours or 4 lbs from target weight.

Assess for
- Evidence of volume overload OR
- Evidence of volume overload but stable vital signs, no chest pain,
  no new dysrhythmia or concerning illness

Evidence of volume overload OR
- Evidence of volume overload 
  but stable vital signs, no chest pain,
  new dysrhythmia or concerning illness

Assess for treatable causes:
- Dietary indiscretion, overexertion,
  medication non-compliance or changes,
  Patient education as needed.

Immediate provider consult or hospital referral.

Increase dose of diuretic per medication chart
Recheck vital signs at 6 and 24 hours
Fluid restriction 1500 ml, 2 gram Na+ diet
Notify provider
(If BID then increase BID, not just one dose)

Check Lab Results
- Back to baseline weight
- Symptoms resolved
- Draw labs: BMP, Mg++
- Resume previous medication dosages
- Ongoing monitoring § Notify provider.

DAY 2
Weight not back to baseline or weight increased but symptoms unchanged
Stable Vital Signs & exam

Progressive symptoms or unstable vital signs OR
or worsening exam regardless of weight change

Immediate provider consult or hospital referral.

Repeat increased dose of diuretic
No new dysrhythmia (Zerodine) 2.5 mg
with each dose
Draw lab: BMP, Mg++
Recheck vital signs at 6 and 24 hrs

DAY 3
Weight not back to baseline or weight increased but symptoms unchanged, stable Vital Signs & exam

Progressive symptoms or unstable vital signs OR
or worsening exam regardless of weight change

Immediate provider consult or hospital referral.

Monitor patient 30 minutes after IV administration

Administer diuretic IV per medication chart
HOLD oral dose of diuretic if not yet taken
Draw labs: BMP, Mg++
Recheck vital signs at 6 hrs & 24 hrs
(If usual oral dose is BID then administer IV dose BID)

DAY 4
Notify provider if labs abnormal

If K+ less than 3.5 give 40 meq potassium.
If patient on daily potassium, max dose=60 meq.

Immediate provider consult or hospital referral.

Notify Provider
Our Results: March 2015 – August 2015

- Served 275 Patients (CHF, COPD, Diabetes)
- Patient Adherence: 74.5% - 77%
- Improved Clinical Outcomes
- Increased Patient Satisfaction Average (top 4)
  - 3.91% - would recommend tablet to family/friends
  - 3.81% - tablet is easy to use and positive experience
  - 3.67% - tablet increases satisfaction with healthcare provider
- Reduced Hospital Readmission
  - 30-day 11.3%
  - 60-day 4.72%
MaineHealth Home Diuretic Protocol

**Enrollment and Activation**

- pts enrolled: 101
- pts who activated: 49
- # pts who activated multiple times: 30
- total activations: 153
HDP Experience

Measures

- Doubled po diuretic (day 1): 136
- Dbl'd po diuretic+metolazone (day 2): 74
- IV diuretic (day 3): 24
- 30 day readmit (all cause): 18
HDP (n=101) and Comparison Group (n=100)

Patient Age at First Episode

Average Age: Protocol patients - 73, Control group - 74
Median Age: Protocol patients - 77, Control group - 75

Creatinine Levels

Protocol
- Normal Creatinine: 65
- Above Normal Creatinine: 36
Control
- Normal Creatinine: 78
- Above Normal Creatinine: 19
HDP: Value

All Cause Readmission

- Protocol: 18
- Control: 19

Protocol

Control
Further Analysis: Value

Apples and apples or apples and oranges?

- Are the protocol patients sicker?
  - Average length of episode of comparison group vs protocol group
  - Mortality between groups
  - EF?
- Other?

How to qualify/quantify #readmits/activations, not just #readmits/patient?

How to qualify/quantify value to Home Health and/or providers
Home Diuretic Protocol: Safety

Creatinine Levels
Home Diuretic Protocol

- Status worsens (not clinically signif): 21%
- Status worsens (clinically signif >.3 change): 3%
- Status improves: 13%
- No follow up: 12%
- No creatinine labs: 6%
- Normal creatinine: 42%

N=153
# Home Diuretic Protocol: Cost

## HDP

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<th>Baseline</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
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## Comparison Group

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## ER for HF Jan-Mar 2015

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<tr>
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<th>all (1025)</th>
<th>discharged (728)</th>
<th>admitted (279)</th>
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<td>Avg ED charges</td>
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<td>$1,644.00</td>
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THANK YOU

Questions?