Using Surveillance Monitoring as a Catalyst for Change: Decreasing Over-Utilization of Telemetry Monitoring

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Background

Over-utilization of telemetry is well documented in literature. This overuse can increase hospital costs, delay flow of patients, and increase nursing time with various telemetry tasks.

• Patient Safety Net (PSN) was first introduced in 2012 at CHS-NorthEast
  • Patient Safety Net is a device that monitors $O_2$ saturation and heart rate surveillance
Background

Remote Telemetry provides monitoring of cardiac rhythms with a telemetry box (see below) that is worn by patients, and the cardiac rhythm data is transmitted to a central monitoring station.

Remote Telemetry Box
- Used for medical & cardiac telemetry patients

Arrhythmia Center Monitoring Station
Preliminary Data

125 charts reviewed on medical telemetry patients from June-July 2017

<table>
<thead>
<tr>
<th>Medical Units:</th>
<th>Internal Pulmonary</th>
<th>Internal Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Beds</td>
<td>28</td>
<td>44</td>
</tr>
<tr>
<td>% of patients on Telemetry</td>
<td>39.28%</td>
<td>18.07%</td>
</tr>
<tr>
<td>Of patients on telemetry % of patients on PSN &amp; Telemetry</td>
<td>84.78%</td>
<td>77.11%</td>
</tr>
<tr>
<td>% over-utilization of Telemetry</td>
<td>48.33%</td>
<td>46.03%</td>
</tr>
</tbody>
</table>

*Data over 16 day period on two inpatient units at CHS NorthEast

Summary:
- Greater than 77% of patients were monitored by both Remote Telemetry & PSN
- Greater than 40% of patients on telemetry did not meet evidence-based recommendations for monitoring.
New Device-Radius 7

*New Device
- Patient wears device on arm
- Wireless
- RNs can admit to PSN from bedside
- MDs will be able to look back at $O_2$ saturation and heart rate trends
IRB approved Pilot Study on 44 bed Internal Medicine Unit

**Goal:** To decrease inappropriate telemetry utilization over 6 month period through substitution of surveillance monitoring with Patient Safety Net and Implementation of a Nurse-Driven Intervention based on AHA electrocardiographic (ECG) monitoring criteria.

### Primary Aims of Project
- Improve utilization of Patient Safety Net
- Decrease Telemetry Utilization among low risk medical patients
- Maintain or improve recognition of patient deterioration

### Measures
- PSN Utilization
- All individuals on Telemetry Monitoring to ensure they meet AHA criteria
- Total Rapid Response Calls for 6 months
Pilot Study

Phase I - June 2018

- Installation of new equipment
- Education for nursing staff
- Once unit reaches 90% PSN utilization moved into Phase II

Phase II - September 2018

- Inpatient Hospitalists educated on AHA guidelines
- All patients admitted to pilot unit were placed on PSN unless met exclusion criteria
- If order for telemetry did not meet AHA criteria, the telemetry was discontinued by RN
- Patients were only placed on telemetry if they met AHA criteria
AHA-Nurse Driven Telemetry Removal Form

Telemetry Assessment Form

AHA Nurse Driven Telemetry Removal Pilot – Phase 2
Telemetry Assessment Form – 4GHJ

Telemetry Assessments:
1. RN to review “AHA Telemedicine Monitoring Guidelines” (on back)
2. If patient does not meet AHA criteria, RN will remove telemetry. All patients will be on PPN.
   a. Complete the telemetry assessment form
3. If patient does meet AHA criteria, RN will leave patient on telemetry
   a. Complete Telemedicine Assessment Form (Complete S 6.2)
   b. RN will need to continue to utilize the nurse driven tele removal protocol when the patient reaches 68 hours on tele
4. When patient’s telemetry is removed part 3 of the form is utilized

1. Backround
Primary Diagnosis: ____________________________ Date/Time of Admission: ____________
Initial Reason for Telemy: ____________________________ Date/Time Tele Started: ____________

2. Admission Assessment of Cardiac Monitoring:
Date/Time: _________ RN Signature: _________
☐ Continue telemetry monitoring Reason: _________
☐ Order Telemy: *If patient meets criteria for disconnection (see back) go to section 3.

If patient remains on telemetry, assess again after 48 hours to see if patient can be taken off telemetry per protocol.

3. Did patient meet criteria for discontinuing telemetry during this hospital stay?
☐ Yes Please list date/time & criteria for discontinuing
☐ Order Telemy based on nursing protocol after 48 hours
☐ Order Telemy because patient did not meet AHA criteria (on back)

☐ No Please list why patient did not meet criteria
*Complete if patient is still on telemetry at discharge

Please use criteria below on admission and after 48 hours to review if patient meets criteria for telemetry monitoring.

<table>
<thead>
<tr>
<th>Patient Population</th>
<th>Arrhythmia Monitoring Recommendations</th>
</tr>
</thead>
</table>
| Chest Pain         | Early phase of Acute Coronary Syndrome Should be initiated immediately, continuing uninterrupted >24-48 hours or until ruled out (Negative troponins)
|                    | *If patient is low-risk and noncardiac chest pain - If normal EKG and negative biomarkers - Telemetry is not indicated. |
| Stroke             | Monitor 24-48 hours |
| Moderate to Severe imbalance of potassium or magnesium | K+: Moderate (2.5-2.9 mEq/L or 5.5-8.9 mmol/L)  
K+: Severe (<2.5 mEq/L or >8.9 mmol/L)  
Mg: Moderate (<1.3 mmol/L or 2.9-5.5 mmol/L)  
Mg: Severe ( <5.5 mmol/L) |
| Drug Overdose      | Monitor until free of the influence of drugs and clinically stable |
| Syncope of suspected cardiac origin | Monitor 24 hours until cause and treatment identified |
| Infective endocarditis | Free of the influence of the drugs and clinically stable |
| Acute discompensated heart failure | Until precipitating event (ex: volume overload, ischemia, anemia, respiratory or renal failure, hypertension, exacerbation of comorbidities, new-onset AF, or infection) is successfully treated |

Arrhythmias

New or recurrent A.fib
Telemetry should be placed on patient

Chronic A.fib
* If admitted for reason other than arrhythmia or rate and patient is hemodynamically stable (rate controlled) - Telemetry is not indicated

Sinus Bradycardia
Symptomatic - Telemetry Indicated
*Asymptomatic, hemodynamically stable, baseline, admitted for other indication - Telemetry not indicated

Sinus Tachycardia
Heart Rate >120 – Telemetry indicated
*Heart Rate <120 – Telemetry not indicated per CHS NorthEast Guidelines for Telemetry Monitoring

Atrium Health

IT STARTS WITH YOU.
Results

Average days on telemetry was greatly reduced from 4.46 to 2.12 days.
Results

Telemetry Avoidance: Patients not put on telemetry, or removed by nursing protocol

- September 2018 (9/24-9/30): 7
- Oct-18: 15
- Nov-18: 7
- Dec-18: 6

- Black: Never put on Telemetry
- Green: Shortened Telemetry duration: Nurse Protocol
Results

Provider Orders for Telemetry by Month

- Total Telemetry Orders on 4th floor
- Telemetry ordered on patients not meeting AHA criteria
- % not meeting AHA Criteria
Clinical Impact

Rapid Response Calls on Pilot Unit

- Total Cardiac/Respiratory Related, 68
- Respiratory on PSN, 31
- Other (Sepsis, Neuro, chest pain), 90
- Good Catches on PSN, 49
- Cardiac, Good Catch by PSN, not on Telemetry, 18

- Other (Sepsis, Neuro, chest pain)
- Total Cardiac/Respiratory Related
- Respiratory on PSN
- Cardiac, Good Catch by PSN, not on Telemetry
**Cost Savings**

- Estimated savings for the final phase of the project is $2,372, including those patients never placed on telemetry (cost savings $55.18 per patient) and those with telemetry removed early (duration less than 24 hours, savings of $15.82 per patient)

<table>
<thead>
<tr>
<th>Telemetry Costs</th>
<th>Item</th>
<th>Qty</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>5 electrode telemetry leads in a pack</td>
<td>3</td>
<td>0.46</td>
<td>1.38</td>
</tr>
<tr>
<td></td>
<td>4 pack of AA batteries (3 per telemetry box)</td>
<td>5.25 packs</td>
<td>0.60/pack</td>
<td>3.15</td>
</tr>
<tr>
<td></td>
<td>Disposable lead Wires</td>
<td>1</td>
<td>14.00</td>
<td>14.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Cost (3.6 days):</strong></td>
<td></td>
<td></td>
<td>18.53</td>
</tr>
<tr>
<td>Other</td>
<td>Arrhythmia center FTE Cost</td>
<td>3.6</td>
<td>14.22</td>
<td>51.19</td>
</tr>
<tr>
<td></td>
<td><strong>Total Telemetry Cost</strong></td>
<td></td>
<td></td>
<td>69.72</td>
</tr>
<tr>
<td><strong>Masimo Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td>Sensor Cost</td>
<td>1</td>
<td>9.00</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td>Replacement Tape</td>
<td>3</td>
<td>0.38</td>
<td>1.14</td>
</tr>
<tr>
<td></td>
<td>Wearable band for device</td>
<td>1</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Masimo Costs</strong></td>
<td></td>
<td></td>
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**Cost Savings**

$55.58 per patient stay if never placed on telemetry
Conclusion

• PSN wireless surveillance technology has proven to be an acceptable alternative to telemetry monitoring in medical patients.

• No adverse events were noted during the study.

• PSN can be utilized to decrease costs and nursing time while maintaining patient safety and providing surveillance for clinical deterioration.

• As a result of this study, 4 units were upgraded with the wireless PSN device and funding has been approved to upgrade remaining med-surg units.

• Continued work to determine PSN impact on hospital flow and patient throughput, which are often negatively impacted by lack of remote telemetry monitor availability.

• Going forward, looking to get Med Exec approval to spread substitution of PSN for medical telemetry on all med-surg units.
References


Questions?