Medtronic CareLink Express Device Usage in Midsize Emergency Department

**INTRODUCTION**

Cardiovascular Implantable Electronic Device (CIED) interrogation in the emergency department (ED) has traditionally been performed by RNs or manufacturer representative, who have to be called in to perform the interrogation. This increases the length of stay in the ED and adds to patient care cost. CareLink express (CLE) technology allows an automatic interrogation in the ED that will be interpreted instantly electronically. The time and cost using CLE is evaluated in a midsize ED and no. of patients needed to make this cost effective.

**METHODS**

- Between January to November 2015, there were 125 patients with Medtronic devices that presented to the ED that needed the CIED interrogation.
- It is a midsize ED department, where an average of 192 patients are seen a day.
- The Devices include Loop recorders, Defibrillators, Pacemakers.
- From January to June, 79 patients visited ED and were interrogated manually without CLE usage. (Control Group)
- From July to November, 46 patients visited ED and the CLE were implemented. (Study Group)
- P values associated with a chi square test of association and Fisher Exact test for categorical variables and two sample test for continuous variables.
- End points were length of stay (LOS) in minutes at ED and Estimated Cost of Stay in ED (65 / min. According to National Database of Hospitals 2010).
- The average expense in our ED after excluding lab, pharmacy and physician costs is $.20 /min.

**RESULTS**

The demographics and comorbidities of the two groups were similar (Table 1).

<table>
<thead>
<tr>
<th>Baseline Characteristics</th>
<th>Overalln=125</th>
<th>Study n=46</th>
<th>Control n=79</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>65.5±1.47</td>
<td>67.5±2.48</td>
<td>70.3±1.83</td>
<td>0.4301</td>
</tr>
<tr>
<td>Gender (Female)</td>
<td>70.63%</td>
<td>31/67 (46%)</td>
<td>45/79 (57%)</td>
<td>0.2841</td>
</tr>
<tr>
<td>BMI</td>
<td>25.0±3.0</td>
<td>25.0±3.0</td>
<td>25.0±3.0</td>
<td>0.2841</td>
</tr>
<tr>
<td>CAD</td>
<td>50.4%</td>
<td>23/46 (50%)</td>
<td>27/79 (35%)</td>
<td>0.0953</td>
</tr>
<tr>
<td>CKD Stage ≥3</td>
<td>45.0%</td>
<td>21/46 (46%)</td>
<td>24/79 (30%)</td>
<td>0.2296</td>
</tr>
<tr>
<td>DM</td>
<td>30.0%</td>
<td>14/46 (30%)</td>
<td>15/79 (19%)</td>
<td>0.3226</td>
</tr>
<tr>
<td>HTN</td>
<td>17.6%</td>
<td>8/46 (18%)</td>
<td>9/79 (11%)</td>
<td>0.0747</td>
</tr>
<tr>
<td>CABG</td>
<td>25.3%</td>
<td>12/46 (26%)</td>
<td>13/79 (16%)</td>
<td>0.3094</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>46.7%</td>
<td>22/46 (47%)</td>
<td>25/79 (32%)</td>
<td>0.1923</td>
</tr>
</tbody>
</table>

The primary outcome showed statistically significant shorter length of stay in the CLE group (182.2 ± 9.69 min. vs. 229.8 ± 9.19 min.) (P = 0.001).

Subsequently, the cost of stay also was less in the CLE group ($1093.4 ± 58.14) vs. the control group ($1378.7 ± 55.16) (P = 0.001).

There was no difference in the interrogation findings (76.1% vs. 64.6% normal) (P = 0.254) and defibrillator shocks (10.9% vs. 8.9%). The inpatient admission decision was the same in both groups (43.5% vs. 53.2%) (P = 0.296). As expected, there was a trend of fewer patients in the CLE group that had reprogramming of the device (2.2% vs. 13.9%) (P = 0.055).

**COST EFFECTIVENESS OF CLE**

- Length of stay (LOS) by four patients visit in control group equals to five patients stay in CLE group.
- Room rent at St Luke excluding labs/drugs/physician charges etc. is 20 cent/min.
- Cost to pt. for each min stay in ED $6/min acc. to US national database 2010.
- Loss to hospital by lesser stay of patients in CLE group than control group in terms of room rent equals duration stayed less by each patient into room rent.
- The profit earned by an extra patient visit in CLE group equal average stay of CLE patient in mins into Cost to pt. for each min stay minus loss to the hospital in CLE group by decreased stay in room rent comes out to be $1055.
- Device cost to hospital per year is $5000/min.
- No. of patients needed to balance this cost is (5000/10554) is 18/year.
- For hospitals running pacemaker, each visit of pacemaker nurse costs $79 to hospital.
- At St. Luke’s, there are 20 patients who required a pacemaker nurse visit in the control group during 10 months. So, money saved by CLE is $1896 every year.
- Hence, no. of patients required to run CLE in facilities with pacemaker is (5000/1896)/10554 is 12 per year.

**CONCLUSION**

CareLink Express facilitates a shorter length of stay in the ED. The number of patients needed to make CareLink Express usage cost effective in the ED is at least 19 patients per year in facilities without an on-call pacemaker nurse, and 12 patients per year in facilities with an on-call pacemaker nurse.