The Road to Target: Stroke Honor Roll Elite Plus

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INTRODUCTION

One minute of brain ischemia kills 2 million neurons and 14 billion synapses. Longer treatment times decrease the likelihood of good functional recovery. The American Stroke Association implemented the Target: Stroke Elite Plus campaign to reduce treatment delays and improve outcomes. For a center to win this Elite Plus Award, patients must receive IV t-PA within 60 minutes of hospital arrival 75% of the time, and treated within 45 minutes 50% of the time.

PURPOSE

Early in fiscal year 2015, the Door-To-Needle (D2N) and Door-To-Reperfusion (D2R) times at our comprehensive center rose to 78 min and 154 min, respectively. The rate of IV t-PA administration in 60 min decreased to 17%. Therefore, the stroke team used lean methodology (Teams Refocus Imagine Measure; TRIM) to reduce DTN and DTR, improve outcomes, and achieve Elite Plus status.

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Target</th>
<th>FY14</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to Needle (D2N) time</td>
<td>60 Min</td>
<td>57 min</td>
<td>66 min</td>
<td>53 min</td>
<td>68 min</td>
<td>76 min</td>
</tr>
<tr>
<td>Percent of patients w/t-PA ≤ 60 min</td>
<td>&gt;75%</td>
<td>76%</td>
<td>60%</td>
<td>80%</td>
<td>56%</td>
<td>17%</td>
</tr>
<tr>
<td>Door to Groin</td>
<td>&lt;105 min</td>
<td>109 min</td>
<td>119 min</td>
<td>124 min</td>
<td>108 min</td>
<td></td>
</tr>
<tr>
<td>Door to Reperfusion (1st Pass)</td>
<td>&lt;120 min</td>
<td>146 min</td>
<td>156 min</td>
<td>165 min</td>
<td>134 min</td>
<td>133 min</td>
</tr>
<tr>
<td>Door to Full Reperfusion</td>
<td>N/A</td>
<td>175 min</td>
<td>197 min</td>
<td>172 min</td>
<td>154 min</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Average Door to Needle, Door to Intervention Times

METHODS

TRIM and Plan-Do-Check-Act methods, value stream mapping, A3 problem solving and real-time observations were used to identify barriers, duplications and wasted time. The following major changes were made over the last 2 years:

- All strokes to Trauma Room 49
- Quick registration
- EDP educate on t-PA
- Glucose and EKG accepted from EMS
- Do not insert Foley
- “One page” alert system
- Quick anesthesia approach
- No written consent for treatment
- D2N goal from 60 to 45 min
- t-PA in CT Scan
- Security escort to gallery

RESULTS

Table 2. Average Times before and after the TRIM process

90-day mRS

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Target</th>
<th>Before TRIM</th>
<th>After TRIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to Needle (D2N) time</td>
<td>45 Min</td>
<td>59 ± 18 min</td>
<td>42 ± 18 min</td>
</tr>
<tr>
<td>Percent of patients treated w/t-PA ≤ 45 min</td>
<td>&gt;50%</td>
<td>27%</td>
<td>73%</td>
</tr>
<tr>
<td>Door to Groin</td>
<td>≤90 min</td>
<td>112 ± 36 min</td>
<td>93 ± 45 min</td>
</tr>
<tr>
<td>Door to Reperfusion (1st Pass)</td>
<td>≤120 min</td>
<td>143 ± 42 min</td>
<td>120 ± 46 min</td>
</tr>
<tr>
<td>Door to Full Reperfusion</td>
<td>N/A</td>
<td>173 ± 39 min</td>
<td>138 ± 51 min</td>
</tr>
</tbody>
</table>

Figure 1. Average ± SD for D2N (top panels) and percent compliance with D2N ≤ 60 min (middle panels) or D2N ≤ 45 min (bottom panels). Results before TRIM process was initiated (left panels) and after TRIM (right panels).

Figure 2. Average ± SD for D2G (top panels) and percent compliance with D2G ≤ 90 min (bottom panels). Results before TRIM process was initiated (left panels) and after TRIM (right panels).

Figure 3. 90-d modified Rankin Scale scores before and after TRIM. A score of 0-2 (blue) is considered good clinical outcome. Median initial NIHSS was similar at both time points (Before: 12, After: 13).

CONCLUSIONS

Through an organized multidisciplinary team approach using standardized process improvement methods, identified best practices, stroke treatment was faster, we achieved Elite Plus status for 2017, and we improved patient outcomes.

ACKNOWLEDGMENTS

Thank you to the Baptist Hospital Stroke TRIM Committee for their tremendous hard work and persistent pursuit of excellence.