Introduction

Stoke codes require the immediate cessation of the normal work routine and are considered disruptive. Neurology residents are frequently the first responder to stroke codes. Prior literature has examined burnout among physicians. Research examining the direct effects of stroke codes on residents is lacking. The objective was to evaluate the effects of stroke codes on neurology residents at a Comprehensive Stroke Center with the goal of describing code stroke fatigue (CSF). At comprehensive stroke centers, it is typical for neurology residents to respond to stroke codes. However, stroke codes are disruptive, requiring the cessation of a normal work routine. Neurology residents are frequently the first responders to stroke codes. We hypothesize by recognizing CSF as a distinct entity, we would be able to target and reduce contributing factors to mitigate resident burnout.

Problem

Burnout may be associated with decreased productivity and decreased job satisfaction. The rates of depression, suicidal ideation, plans, and attempts were noted to be high in burnout states and tended to decline with recovery from it. We conducted a study of the neurology residency program on the impact of stroke codes at our Joint Commission-Accredited Comprehensive Stroke Center. We found that Code Stroke Fatigue (CSF) is a distinct entity that impacts patient care. This is due to the added stress to the neurology residents daily routine. Neurology residents (n=18) completed an anonymous 27-item online survey regarding stroke code fatigue. The survey was adapted from the Maslach Burnout Inventory (MBI). The questions were modified to identify symptoms of burnout specifically in association with stroke code experiences. Measures evaluated: emotional exhaustion (measures feelings of being emotionally overextended and exhausted by one’s work), depersonalization (measures an unfeeling and impersonal response toward recipients of one’s service, care treatment, or instruction), and personal-accomplishment (measures feelings of accomplishment and successful achievement in one’s work). Measured responses were stratified as low, moderate, or high.

Descriptive Statistics

Table 1. Comparing stroke code burnout between neurology residents (n=18)

<table>
<thead>
<tr>
<th>Clinical Variable</th>
<th>Low Burnout (n=7)</th>
<th>Moderate Burnout (n=6)</th>
<th>High Burnout (n=5)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to Code time</td>
<td>Arrived prior to the call (minutes)</td>
<td>5.9 (5.0)</td>
<td>5.2 (4.0)</td>
<td>5.0 (4.0)</td>
</tr>
<tr>
<td>Likert Scale Score (mean)</td>
<td>Post MD arrival to Code time</td>
<td>7.5 (7.0)</td>
<td>7.3 (6.5)</td>
<td>7.0 (6.0)</td>
</tr>
<tr>
<td></td>
<td>Number of residents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rarely</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Stoke code fatigue appears to be a distinct entity that has a significant impact on residents, leading to event associated burnout. Stroke codes add stress to the resident’s training to the point where they wish that a stroke code is not paged during their shift.

Regression Results

Of the 18 residents, six moderately (33.3%) and 12 highly (66.7%) experienced burnout. More female PGY II and PGY IV residents exhibited burnout than their male counterparts. Residents who experienced high burnout reported high emotional-exhaustion, high depersonalization, and low personal-accomplishment. Of the 838 stroke codes, 19.7% (n=153) were considered legitimate stroke codes. The average door-to-code time was shorter for residents who received prior EMS notifications (9.7 minutes) relative to residents who did not (14.1 minutes). The average resident-arrival time was shorter for residents who received prior notification of a potential code stroke (arrived 6.3 minutes prior to code stroke called) compared to residents who did not arrive 10.5 minutes after code stroke called. The regression results found PGY III (OR:9.76, p<0.000), PGY IV (OR:6.04, p<0.000) residents were associated with higher odds of burnout relative to PGY II residents. For every additional NIH stroke scale unit of severity (OR:1.60, p<0.000) results in higher odds of burnout. On the other hand, for every additional minute of prep-time for potential stroke codes (OR:0.70, p=0.002), and resident-arrival-time (OR:0.95, p<0.000) results in lower odds of burnout. Whereas, for every additional delayed minute of prep-time for potential stroke codes (OR:1.01, p<0.001), and resident-arrival-time (OR:1.16, p<0.001) results in higher odds of burnout.

Conclusion: Next Steps

The results indicates that age, gender, and level of training does not appear to be a factor for burnout criteria, but rather the key factor that influences code stroke fatigue is the amount of prep and notification time given to the resident and time. The additional minutes given to prep or arrive to the patient, the less burned out the residents are. The study aims to increase education awareness, develop interventions and coin the term stroke code fatigue within the field of neurology, in efforts to improve the wellness of neurology residents. Burnout is a well-known phenomenon that must be addressed by leadership in academic medicine. Hospitals need to develop an active awareness of burnout and ought to consider incorporating relevant instruction and interventions during the process of training resident physicians. In efforts to avoid the negative impact of burnout on patient care: risk of medical errors, patient safety risks, and potentially compromising of quality of care.

References

IHI National Forum – IHI. IHI.org
IHI National Summit – IHI. IHI.org