Improving sedation outcomes as part of a process improvement project. [Type a quote from the
document or the summary of an interesting point. You can position the text box anywhere in the
document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]

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Introduction: Respiratory events are commonly recognized as being the most frequent adverse
occurrences during moderate sedation, and data collected at our institution between 1996 and 2004 is
consistent with this finding (Green et al.). We evaluated the factors contributing to respiratory adverse
events during moderate procedural sedation to identify potential strategies for decreasing these
adverse events.

Methods: This project was conducted as part of a quality improvement project and a Six Sigma Green
Belt certification project. Retrospective chart review of sedation records for Q2-Q4, 2014 revealed 1011
sedation events during this period. We identified through automated reporting from the EMR types of
adverse events which occurred during these 1011 sedations, including desaturation, airway obstruction
and apnea. We analyzed potentially controllable factors that could be targeted for modification in
sedation processes. Binary logistic regression (BLR) was run to help determine which of our
controllable factors were correlated with a hypoxic event during sedation.

Results: Binary logistic regression showed opioids and/or benzodiazepines, given as part of a pre-
procedural/pre-sedation pain management regimen, were positively correlated with the occurrence of a
respiratory event (desaturation, with or without apnea) necessitating an intervention (i.e. bag-valve
mask ventilation, positive pressure ventilation, administration of supplemental oxygen) (p=0.019, r2:
0.605). The time interval between pain medication administration and sedation medication
administration, of our sample group (n=68) ranged from 1-255 minutes, Mean: 86.68 min, Median:
62.82 min.

Data Comparison:

<table>
<thead>
<tr>
<th></th>
<th>1996-2003</th>
<th>2014</th>
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<tbody>
<tr>
<td>Number of Sedations</td>
<td>2500</td>
<td>1011</td>
</tr>
<tr>
<td>Number of “events” (%)</td>
<td>458 (18.32 %)</td>
<td>173 (17.11 %)</td>
</tr>
<tr>
<td>Number of respiratory events</td>
<td>215 (46.94 %)</td>
<td>68 (39.31 %)</td>
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Discussion: We found that administration of opioids and/or benzodiazepines correlated with the
occurrence of respiratory events when given as part of a pain management plan and before a sedating
medication, for moderate procedural sedation. This is a potentially avoidable contributor to respiratory
adverse events during moderate procedural sedation. Further studies are needed to determine if
modifications such as increasing the time between the last pain medication and the first sedating
medication administration, or decreasing the first dose of sedating medication if within a specified
timeframe after the last opioid/benzodiazepine administration might influence the rate of adverse
respiratory events.
References:
