Significantly Reducing Over-sedation by Changing Simple Practice Guidelines

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Purpose

• Conscious sedation in interventional radiology (IR) provides essential analgesia and anxiolysis.
• Although providing moderate sedation in IR is a routine practice, instances of over-sedation lead to significant morbidity and mortality.
Materials and Methods

- Analysis was performed from 2012-2017 at two urban tertiary care hospitals within a single academic institution.
- Data collected on the number of over-sedation events pre-intervention and post-intervention.
Materials and Methods

- Data collected from a control hospital was performed between 2016-2017.
- Intervention consisted of the following: modification of sedation algorithms, nursing staff in-services, initiation of a morning "huddle" with physicians and supportive staff, a standardized multiphase timeout, and decreased use of intra-procedural poly-pharmacy.
- Analyses of pre- and post-intervention at the intervention hospital, and between the post-intervention hospital and the control hospital were performed.
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Schematic diagram shows implemented interventions to reduce procedural over-sedation events.
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Results

- A total of 94 oversedation events were evaluated from 2012-2017.
- At the intervention hospital, 70 oversedation events occurred pre-intervention (2012-2015) and 3 oversedation events occurred post-intervention (2016-2017).
- Pre-intervention incidence of 5.37 events per 1000 cases (5.37/1000) and post-intervention incidence of 1.03/1000.
- 21 oversedation events occurred at the control hospital (2016-2017), representing an incidence of 3.48/1000.
Results

- Post-intervention relative risk reduction of 70% and absolute risk reduction of 0.2%.
- Pre-intervention diphenhydramine administration occurred in 23 of 70 cases, in 0 cases post-intervention, and in 2 of 21 cases at the control hospital.
- Average fentanyl and midazolam usage pre-intervention, postintervention, and control: 126.8 mcg (SD +/- 118.3) and 1.8 mg (SD +/- 1.7), 50 mcg (SD = 0) and 2.4 mg (SD +/- 0.3), 145 mcg (SD +/- 88.7) and 2.4 mg (SD +/- 1.44), respectively.
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<table>
<thead>
<tr>
<th>Intra-Operative Medication Use</th>
<th>Fentanyl</th>
<th>Versed</th>
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<tbody>
<tr>
<td>Pre-Intervention</td>
<td>126.8 mcg (Std Dev +/- 118.3)</td>
<td>1.8 mg (Std Dev +/- 1.7)</td>
</tr>
<tr>
<td>Post-Intervention</td>
<td>50 mcg (Std Dev = 0)</td>
<td>2.4 mg (Std Dev +/- 0.3)</td>
</tr>
<tr>
<td>Control</td>
<td>145 mcg (Std Dev +/- 88.7)</td>
<td>2.4 mg (Std Dev +/- 1.44)</td>
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Table demonstrates intra-operative medication use based upon pre-intervention, post-intervention, and control.
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Table demonstrates pre-intervention and post-intervention incidence of over-sedation events
Conclusion

- Sedation complications can lead to devastating and costly morbidity and mortality.
- Incidence of over-sedation complications can be significantly reduced through simple, but multifactorial interventions including a review of current moderate sedation best practices, educational in-services, and inclusion of both physician and supportive staff in the procedural process.