AANA Drug Shortage Survey Results

Disclaimer:
The information provided is for quality improvement purposes to better understand practice experiences and to evaluate the impact of possible recommendations. This survey is not intended to generalize practices associated with drug shortages.

The purpose of the AANA Drug Shortage Survey was to gauge how drug shortages have impacted CRNAs in the past year and provide additional information, as requested by the U.S. Food and Drug Administration (FDA), regarding CRNAs suggestions and comments related to drug shortages.

The survey was first conducted in September 2011. The February 2013 survey included 3 questions from the 2011 survey and additional questions to identify current practice experiences. The survey was disseminated to a sample of 10,000 AANA members who received a personalized email directing them to the survey. The results presented are based on an analysis of data combined from both surveys.

Response Rate
Of the 10,000 emails which were sent, 9,376 (94%) were successfully received (e.g., email addresses on file were current and active or member had not opted out of receiving AANA e-mail). Overall, 2500 members completed the emailed survey, for a response rate of 27%. There were a total of 2500 responders to the survey. Open ended questions were not mandatory; the thematic analysis was only based on the number of responders to each individual question.

Results

1. Are you currently experiencing anesthesia related drug shortages?

<table>
<thead>
<tr>
<th></th>
<th>March 2013</th>
<th>September 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>90.2%</td>
<td>94.7%</td>
</tr>
<tr>
<td>No</td>
<td>9.8%</td>
<td>5.3%</td>
</tr>
</tbody>
</table>

n=2,500 n=408

2. Have you experienced shortages of any of the following medications? Check all that apply.

Respondents were able to make multiple selections when answering this question.

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propofol</td>
<td>91.5</td>
<td>82</td>
</tr>
<tr>
<td>Succinylcholine</td>
<td>53.8</td>
<td>Neostigmine</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>49.8</td>
<td>Vecuronium</td>
</tr>
<tr>
<td>Neostigmine</td>
<td>48.6</td>
<td>Phenylepherine</td>
</tr>
<tr>
<td>Atropine</td>
<td>44.1</td>
<td>Succinylcholine</td>
</tr>
<tr>
<td>Etomidate</td>
<td>38.4</td>
<td>Dexamethasone</td>
</tr>
</tbody>
</table>

n=2229 n=408
“Other” 2013 comments included single and multiple responses. The following drug shortages are listed from highest to lowest frequency of occurrence.

<table>
<thead>
<tr>
<th>Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>etomidate</td>
</tr>
<tr>
<td>dexamethasone</td>
</tr>
<tr>
<td>midazolam</td>
</tr>
<tr>
<td>ondansetron</td>
</tr>
<tr>
<td>bupivacaine</td>
</tr>
<tr>
<td>epinephrine</td>
</tr>
<tr>
<td>calcium chloride</td>
</tr>
<tr>
<td>morphine</td>
</tr>
<tr>
<td>pancuronium</td>
</tr>
<tr>
<td>lidocaine</td>
</tr>
<tr>
<td>duramorph</td>
</tr>
<tr>
<td>nalbuphine</td>
</tr>
<tr>
<td>furosemide</td>
</tr>
<tr>
<td>glycopyrrolate</td>
</tr>
<tr>
<td>rocuronium</td>
</tr>
<tr>
<td>ropivacaine</td>
</tr>
<tr>
<td>midazolam</td>
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<tr>
<td>toradol</td>
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<tr>
<td>sodium bicarb</td>
</tr>
<tr>
<td>dexamethasone</td>
</tr>
<tr>
<td>sodium pentothal</td>
</tr>
<tr>
<td>phenylephrine</td>
</tr>
<tr>
<td>bupivacaine</td>
</tr>
<tr>
<td>epinephrine</td>
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<tr>
<td>calcium chloride</td>
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<tr>
<td>furosemide</td>
</tr>
<tr>
<td>glycopyrrolate</td>
</tr>
</tbody>
</table>

n=734

3. **State of primary practice setting.**

<table>
<thead>
<tr>
<th>State</th>
<th>2013 (%)</th>
<th>2011 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td>7.1%</td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>6.5%</td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>5.8%</td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>4.9%</td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>4.8%</td>
<td></td>
</tr>
<tr>
<td>Minnesota</td>
<td>3.9%</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>3.7%</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>3.7%</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>3.2%</td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>3.2%</td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>3.1%</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>69.4%</td>
<td></td>
</tr>
<tr>
<td>Ambulatory surgical center</td>
<td>19.7%</td>
<td></td>
</tr>
<tr>
<td>Critical access hospital</td>
<td>5.9%</td>
<td></td>
</tr>
<tr>
<td>Office-based</td>
<td>3.6%</td>
<td></td>
</tr>
<tr>
<td>Endoscopy Center</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>Pain management clinic</td>
<td>0.2%</td>
<td></td>
</tr>
</tbody>
</table>

n=2463

4. **Have drug shortages caused you to cancel cases?**

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7%</td>
<td></td>
<td>6.1%</td>
</tr>
</tbody>
</table>

n=2362 n=409

5. **What is your primary practice setting?**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Hospital Size (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>69.4%</td>
</tr>
<tr>
<td>Ambulatory surgical center</td>
<td>19.7%</td>
</tr>
<tr>
<td>Critical access hospital</td>
<td>5.9%</td>
</tr>
<tr>
<td>Office-based</td>
<td>3.6%</td>
</tr>
<tr>
<td>Endoscopy Center</td>
<td>1.2%</td>
</tr>
<tr>
<td>Pain management clinic</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

n=2463

6. **Indicate the size of your hospital.**

<table>
<thead>
<tr>
<th>Hospital Size</th>
<th>&lt;100 beds</th>
<th>100-199 beds</th>
<th>200-399 beds</th>
<th>400 + beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>374</td>
<td>352</td>
<td>566</td>
<td>416</td>
</tr>
</tbody>
</table>

n=1708
7. **Have you experienced any of the following due to drug shortages?**

Respondents were able to make multiple selections when answering this question.

<table>
<thead>
<tr>
<th>Conservation measures placed on drugs</th>
<th>74.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large, single-dose vials are the only size of drug available</td>
<td>73.2%</td>
</tr>
<tr>
<td>Modification in anesthesia technique or management of hemodynamic changes</td>
<td>68.2%</td>
</tr>
<tr>
<td>Pharmacy has prepared smaller, single-dose syringes</td>
<td>57.5%</td>
</tr>
<tr>
<td>I have prepared smaller, single-dose syringes</td>
<td>45.6%</td>
</tr>
<tr>
<td>Delayed emergence or recovery</td>
<td>21.7%</td>
</tr>
<tr>
<td>Increase in post-operative issues that required intervention</td>
<td>16.3%</td>
</tr>
<tr>
<td>Delay of case or procedure</td>
<td>12.0%</td>
</tr>
<tr>
<td>Cancellation of case or procedure</td>
<td>5.7%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>3.1%</td>
</tr>
<tr>
<td>None of the above</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

Representative “other” comments:

“Not in compliance with USP 797 regulations or AANA Infection Control Guidelines when we draw up many doses from a single vial.”

“To conserve Propofol we are doing general anesthesia instead of monitored anesthesia care. When an induction agent is not available or on short supply, we are using small doses of the intravenous induction agent and mask induction with the inhaled anesthesia agent.”

“To minimize waste, emergency drug calculations are done for each pediatric patient, but emergency drugs are not drawn up.”

“Increased near miss risk of significant drug error due to different sized vials, labels that look like another drug and/or varying concentrations available for one drug.”

“Older medications were not used in my education. It takes time to become proficient with the drug, changed technique and management of side effects.”

8. **What drug shortage information is valuable in your practice?**

Respondents were able to make multiple selections when answering this question.

<table>
<thead>
<tr>
<th>Advance notice of a drug shortage</th>
<th>77.7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated duration of a drug shortage</td>
<td>76.3%</td>
</tr>
<tr>
<td>Alternative drug choices and techniques</td>
<td>64.4%</td>
</tr>
<tr>
<td>Medication inventory availability</td>
<td>53.3%</td>
</tr>
<tr>
<td>Source of the drug shortage</td>
<td>46.6%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Representative “other” comments:

“All 5 of the answers would be helpful. Active communication and planning have allowed us to manage the many shortages as easily as is possible.”
9. **What drug shortage resources do you find valuable?**
Respondents were able to make multiple selections when answering this question.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal facility planning (e.g., work group, email alerts, memos, pharmacy updates)</td>
<td>66.3%</td>
</tr>
<tr>
<td>Facility/departmental meetings</td>
<td>41.4%</td>
</tr>
<tr>
<td>AANA website</td>
<td>29.0%</td>
</tr>
<tr>
<td>FDA drug shortage website</td>
<td>27.3%</td>
</tr>
<tr>
<td>AANA communications (e.g., AANA FaceBook, Twitter, Anesthesia E-ssential)</td>
<td>20.9%</td>
</tr>
<tr>
<td>Manufacturers</td>
<td>18.8%</td>
</tr>
<tr>
<td>Wholesalers</td>
<td>13.0%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>6.6%</td>
</tr>
<tr>
<td>Non-AANA Social Media tools</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

*Representative “other” comments:

“Our pharmacy has been on top of every pending drug shortage and has been able to provide us (through great effort on their part) with the needed drug in some useable form, or helped use link up with sources of alternate drug usage information. The anesthesia department has done a great deal of internet research for solutions and alternative product/technique.”

“Medscape, state association notices.”

“I did not know that this information was posted on the AANA website.”

“The ability to purchase drugs manufactured outside of the United States.”

“I would find any communication valuable. We find out after the fact when the nurse doing the pharmacy order finds out she cannot order something due to a back order. We are free standing and have no PHARMACY to tell us about info they receive from their sources... so we are truly the last to know. We order when we NEED to order and do not stockpile drugs. So, we are usually up a creek without a paddle when this happens as we do not stockpile... this has been a BIG problem each and every time we have had a shortage which I really do not understand why?? I have been in anesthesia for 35 years and this increased level of shortage for such an extended period of time has never happened before!!!”

10. **What has your facility done well to address drug shortage(s)?**
Respondents were able to make multiple selections when answering this question.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy Communication</td>
<td>62.4%</td>
</tr>
<tr>
<td>Modify Technique</td>
<td>25.2%</td>
</tr>
<tr>
<td>Cope</td>
<td>21.6%</td>
</tr>
<tr>
<td>Conservation</td>
<td>18.9%</td>
</tr>
<tr>
<td>Purchasing Multidose Vials</td>
<td>18.6%</td>
</tr>
<tr>
<td>Interprofessional Team</td>
<td>14.3%</td>
</tr>
<tr>
<td>Pharmacy Compounding Syringes</td>
<td>12.7%</td>
</tr>
<tr>
<td>Purchasing Compounded Syringes</td>
<td>12.5%</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>9.6%</td>
</tr>
<tr>
<td>Drugs secured that are in limited supply</td>
<td>8.2%</td>
</tr>
<tr>
<td>Large Purchasing Group</td>
<td>8.1%</td>
</tr>
</tbody>
</table>
11. Does your Pharmacy have the ability to compound drugs?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>33.4%</td>
</tr>
<tr>
<td>No</td>
<td>66.6%</td>
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</tbody>
</table>

n=2362

12. Are you aware of how to report a drug shortage directly to the Food and Drug Administration (FDA)?

<p>| | |</p>
<table>
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<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Yes</td>
<td>11.1%</td>
</tr>
<tr>
<td>No</td>
<td>88.9%</td>
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</tbody>
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n=2362