Nitrous Oxide Exposure in a Pediatric Dental Clinic

UNIVERSITY OF WASHINGTON
Field Research and Consultation Group
Health Effects

» Spontaneous abortion - increased rate
» Fetal abnormalities - suspicion
» Central nervous system - decreased performance of complex tasks basis for TLV level
» Liver and kidney - increased disease rate
Methods

- Badge monitoring
  full shift and procedure length
- Minute-by-minute recording of:
  distance from patient, N2O+O2 flow rate,
  N2O%, scavenging flow rate, & adjacent N2O
- Ventilation measurements
- Leak testing
- Change of mask
Matrix mask with scavenging cone
## Full Shift N2O Levels

<table>
<thead>
<tr>
<th>Study Part</th>
<th>$TWA_{\text{shift}}$ Mean (ppm)</th>
<th>No. Sampled</th>
<th>&gt;PEL of 50 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>32</td>
<td>12</td>
<td>29%</td>
</tr>
<tr>
<td>Intervention</td>
<td>36</td>
<td>12</td>
<td>42%</td>
</tr>
</tbody>
</table>
## Procedure N2O Levels

<table>
<thead>
<tr>
<th>Phase</th>
<th>TWA_{proc} Mean (ppm)</th>
<th>Stnd. Dev. (ppm)</th>
<th>Nbr. Sampled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>177</td>
<td>218</td>
<td>18-assist. 8-dent.</td>
</tr>
<tr>
<td>Intervention</td>
<td>217</td>
<td>310</td>
<td>12-assist. 9-dent.</td>
</tr>
</tbody>
</table>
Conclusions

- Still a problem
- Dilution ventilation not enough
- Requires complete management system: leak-testing, training, scavenging/mask system and dilution ventilation