Type Test Results of the New Instadose Dosimeter

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Introduction to Instadose

- Legacy Personal Passive Dosimetry platforms ultimately require a return to a centralized processor for analysis

- One of the main advantages of instadose is that it can be read on-site via a PC/Mac utilizing a web-based software package
Instadose Detector

- Instadose utilizes the DIS (Direct Ion Storage) detector
- DIS Dosimeter:
  - Non Volatile Analog Memory Cell surrounded by a Gas Filled Ion Chamber
  - For photon radiation, initial interactions take place in the wall material and secondary electrons ionize the gas of the chamber
Instadose Energy Response
NVLAP Proficiency Blind Test, ANSI N13.11-2009
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## Low Dose Testing

<table>
<thead>
<tr>
<th>Irradiated Dose (mSv)</th>
<th>0.01</th>
<th>0.03</th>
<th>0.05</th>
<th>0.1</th>
<th>0.2</th>
<th>0.25</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Dose</strong></td>
<td>0.009</td>
<td>0.026</td>
<td>0.053</td>
<td>0.096</td>
<td>0.197</td>
<td>0.251</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>0.008</td>
<td>0.002</td>
<td>0.001</td>
<td>0.001</td>
<td>0.003</td>
<td>0.0003</td>
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<tr>
<td><strong>Max</strong></td>
<td>0.025</td>
<td>0.036</td>
<td>0.064</td>
<td>0.11</td>
<td>0.207</td>
<td>0.264</td>
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<tr>
<td><strong>Min</strong></td>
<td>0.001</td>
<td>0.009</td>
<td>0.044</td>
<td>0.062</td>
<td>0.189</td>
<td>0.236</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>0.009</td>
<td>0.026</td>
<td>0.053</td>
<td>0.1</td>
<td>0.196</td>
<td>0.251</td>
</tr>
</tbody>
</table>

\[ n=10 \]
Dodose Dose Rate Independent

- Dose Rate Independent

\[
\text{Response} = \frac{Dose_{\text{sem}}}{Dose_{\text{CTV}}} \times \left( \text{dose rate}_t \right) \text{ is normalized to response at 30 mSv h}^{-1}
\]
- 1.1 µSv/hr to 100 µSv/hr (courtesy of ARS)
- Two tests
- Test 1 - 3 Groups (reference, +40C, -20C) were irradiated to 3.0 mSv
- Test 2 – 2 Groups (0.35 mSv and 0.05 mSv) at +40C
Drop Test

- Instadose were irradiated to 2.0 mSv
- Read
- Dropped at 1 m
- Re-read
- Re-irradiated to 2.0 mSv
PC USB Power

- Power from a PC’s USB may vary
- Test to determine if varies, will dose still be good.
- 6 devices irradiated to 3.0 mSv and read at various voltages

### PC USB Voltage Test

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<th>4.8</th>
<th>5</th>
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Summary

- The instadose dosimeter performed very well in the testing performed.
- The instadose dosimeter created a paradigm shift to standard personal passive dosimetry.