Radiation exposure, reduction techniques, and standardization of swallow study evaluations

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Radiation Exposure, Reduction Techniques, and Standardization of Swallow Study Evaluations

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Q1. What did you hope to accomplish?

- Retrospectively establish a fluoroscopic radiation exposure baseline
  > Analyze past swallow study procedures performed by a single resident as proxy measure for interprofessional team exposure rates

- Interventions
  > Provide proper radiation safety equipment for all team members
  > Implement a standardized swallow study evaluation flowchart to promote efficiency and organization

- Monitor prospective radiation exposure reduction techniques
  > Analysis of swallow study procedures performed by that same resident after implementations
  > Compare retrospective and prospective data in order to assess relative success of implementations
Q2. What were you able to accomplish?

- **Baseline:** Obtained and analyzed retrospective radiation exposure data
  - Calculations for patient radiation exposure (time, dosage, # of imaging runs)
  - Resident radiation exposure data over a 4-week rotation extrapolated (time, dosage)

- **Interventions:** Proper equipment provided to all team members
  - Shared radiation safety glove for speech pathology
  - Shared radiation safety goggles with cleaning supplies for fluoroscopic techs

- **Findings:**
  - Protective equipment unused by interprofessional team members
  - Identified safety issues with badge-dosimetry monitoring
    - Deficient collection/reporting by the physics department
    - Inconsistent usage
    - Incorrect monthly badge updates/turn-ins
### Swallow Study Flowchart and Results

#### Swallow Study Flowchart

- **Legend**
  - No Aspiration
  - Aspiration

#### Prior to Implementations

<table>
<thead>
<tr>
<th></th>
<th>Time (minutes)</th>
<th>Radiation (mGy)</th>
<th>Runs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation Exposure</td>
<td>Average</td>
<td>1.9</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>1.8</td>
<td>7.2</td>
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<tr>
<td></td>
<td>Range</td>
<td>0.3 - 4.3</td>
<td>1.5 - 24.3</td>
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<tr>
<td><strong>Resident</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation Exposure</td>
<td>Extrapolated Exposure per 4-week Rotation</td>
<td>183.7</td>
<td>21.2</td>
</tr>
</tbody>
</table>

#### After Implementations

<table>
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<th>Time (minutes)</th>
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<th>Runs</th>
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<tbody>
<tr>
<td><strong>Patient</strong></td>
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<td></td>
</tr>
<tr>
<td>Radiation Exposure</td>
<td>Average</td>
<td>1.8 †</td>
<td>8.3 †</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>1.9 †</td>
<td>7.8 †</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>0.4 - 3.3 †</td>
<td>1.9 - 21.8 †</td>
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<tr>
<td><strong>Resident</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation Exposure</td>
<td>Extrapolated Exposure per 4-week Rotation</td>
<td>174 †</td>
<td>22.3 †</td>
</tr>
</tbody>
</table>
Q3. Knowing what you know now, what might you do differently?

- **Interventions:**
  > Educate team re: repeated radiation exposure effects on their long term health *(just because do not immediately experience it...)*
  > Periodic reinforcement essential

- **Metrics**
  > Obtain proper badge-dosimetry data – it’s standardized radiation exposure reporting system
  > Compare baseline results with badge-dosimetry data
Q4. What surprised you and why?

- Assumed providing radiation safety goggles to fluoroscopic technologists and gloves for speech pathologists would result in their use
- Team members rarely if ever chose to wear them - “inconvenient”
Q5. Cohort Five – Sustainability and next steps

- What does your CEO need to know to help keep your work sustainable?
  > Need to improve badge-dosimetry reporting/documentation
  > Proper use of radiation safety equipment needs to be hospital priority