Gonadal & Fetal Shielding Update:

* A Technologist's View of Patient Shielding

Quentin T. Moore, PhD, R.T.(R)(T)(QM)
July 13th, 2022
Section Objective

• Learn about the role radiologic technologists have in implementing clinical changes their perspectives about patient shielding.

• Paradigm Shift
  • Dictionary.com: a fundamental change in approach or underlying assumptions.
Change: Transtheoretical Model (TTM)

- Change is difficult
- What fosters a behavioral change?

Example: Effective July 1, 2022, UI Health Care
Change: Socioecological Model (SEM)

- Change is difficult

Figure based on McLeroy Socioecological Model

Shielding Change Challenges (via SEM)

- **Policy:**
  - Navigating state and federal regulations

- **Community:**
  - *Imaging community: Change initiated here via AAPM (2019); NCRP (2021)*
  - Technologist community: Paradigm shift occurring within the technologist's scope of practice
  - Patient community: Patient-facing questions and concerns (radiophobia)
  - Medical community: Understanding the change

- **Institutional:**
  - Organizational/department policy
  - Navigating department culture: practices, expectations
  - Leadership actions drive practices

- **Interpersonal:**
  - Peer actions and applications

- **Intrapersonal:**
  - Awareness of the science – the “why”. TTM considerations
Primary R.T. Challenge

Change is appropriate, but change is complicated

• Utilization of patient shields is an engrained practice

• Educational practices
• Disciplinary actions
• Workflow changes
• Psychological safety
• Dose understanding
Need for Education

Who? What? When? Why?

• Who? R.T.s
• What? Comprehensive requirements
• When? Now
• Why? Practice change and workflow adoption take time, energy, and understanding
Strategy 1

Craft the Message

• Clear, consistent, trusted, and understood
• Primary patient-facing stakeholders
  • Technologists
  • Ordering providers
Strategy 2

Improve Communication

- Science lays the groundwork for data-driven discussions across imaging stakeholders
- Communicate routinely & purposefully
Strategy 3

Be intentional

• Commit to a culture of safety
• Provide education
• Identify your coaches and champions
• Engage in PQI
Strategy 4

Foster Interdisciplinary Collaboration

• Each member of the imaging community brings a unique vantage point
• All members must be at the table as practice change is contemplated, particularly those that have a direct and specific impact on the work of another group
  • Approach to safety, workflow, and patient engagement
• Form a one team mentality
  • Implementing another specialties practice change within the technologist’s scope of practice
  • Recognize power and “silos”
Collaborative Actions
Bring in R.T.s

- Institutional-level
- Community-level
  - Co-branded practice parameters and technical standards
  - ASRT?

Source: https://www.acr.org/Clinical-Resources/Practice-Parameters-and-Technical-Standards
Radiation Safety Culture Determinants and Outcomes

Radiologic Technologist’s Overall Perception of Radiation Safety (OPRS)

1. Personal Accountability
2. Teamwork in Imaging
3. Teamwork Across Imaging Stakeholders
4. Questioning Attitude
5. Feedback Loops
6. Organizational Learning
7. Leadership Actions
8. Nonpunitive Response
9. Error Reporting
10. Radiation Policy

Each correlate to OPRS


### OPRS and Determinant Correlation

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>p value</th>
<th>r</th>
<th>Correlation</th>
<th>r²</th>
<th>Effect size</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1: Personal accountability</strong></td>
<td>&lt;.001</td>
<td>.29</td>
<td>low-positive</td>
<td>0.08</td>
<td>n/a</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H2: Teamwork in imaging</strong></td>
<td>&lt;.001</td>
<td>.44</td>
<td>moderate-positive</td>
<td>0.19</td>
<td>Small</td>
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<tr>
<td><strong>H3: Teamwork across imaging stakeholders</strong></td>
<td>&lt;.001</td>
<td>.66</td>
<td>moderate-positive</td>
<td>0.43</td>
<td>Medium</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H4: Questioning attitude</strong></td>
<td>&lt;.001</td>
<td>.56</td>
<td>moderate-positive</td>
<td>0.31</td>
<td>Medium</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H5: Feedback loops</strong></td>
<td>&lt;.001</td>
<td>.57</td>
<td>moderate-positive</td>
<td>0.33</td>
<td>Medium</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H6: Organizational learning</strong></td>
<td>&lt;.001</td>
<td>.57</td>
<td>moderate-positive</td>
<td>0.33</td>
<td>Medium</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H7: Leadership actions</strong></td>
<td>&lt;.001</td>
<td>.71</td>
<td>high-positive</td>
<td>0.50</td>
<td>Large</td>
<td>Reject null</td>
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<tr>
<td><strong>H8: Nonpunitive response</strong></td>
<td>&lt;.001</td>
<td>.36</td>
<td>low-positive</td>
<td>0.13</td>
<td>Small</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H9: Error reporting</strong></td>
<td>&lt;.001</td>
<td>.39</td>
<td>low-positive</td>
<td>0.15</td>
<td>Small</td>
<td>Reject null</td>
</tr>
<tr>
<td><strong>H10: Radiation policy</strong></td>
<td>&lt;.001</td>
<td>.57</td>
<td>moderate-positive</td>
<td>0.33</td>
<td>Medium</td>
<td>Reject null</td>
</tr>
</tbody>
</table>

Multiple Regression: Leadership actions ($\beta = .402$, p < .001), teamwork across imaging stakeholders ($\beta = .304$, p = .011), organizational learning ($\beta = .121$, p = .007), and questioning attitude ($\beta = .110$, p = .001) significantly predicted the overall perception of radiation safety.
## Determinant Scores – Descending Mean

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal accountability</td>
<td>4.57</td>
<td>.42</td>
</tr>
<tr>
<td>Teamwork in imaging</td>
<td>4.22</td>
<td>.76</td>
</tr>
<tr>
<td>Leadership actions</td>
<td>3.97</td>
<td>.81</td>
</tr>
<tr>
<td>Questioning attitude</td>
<td>3.92</td>
<td>.79</td>
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<tr>
<td>Radiation policy</td>
<td>3.91</td>
<td>.76</td>
</tr>
<tr>
<td>Teamwork across imaging stakeholders</td>
<td>3.88</td>
<td>.80</td>
</tr>
<tr>
<td>Overall perception of radiation safety</td>
<td>3.85</td>
<td>.83</td>
</tr>
<tr>
<td>Organizational learning</td>
<td>3.68</td>
<td>.77</td>
</tr>
<tr>
<td>Feedback loops</td>
<td>3.67</td>
<td>1.08</td>
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<tr>
<td>Nonpunitive response</td>
<td>3.41</td>
<td>.87</td>
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<tr>
<td>Error reporting</td>
<td>3.29</td>
<td>1.04</td>
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</tbody>
</table>

# Teamwork across imaging stakeholders

## Descriptive Statistics

<table>
<thead>
<tr>
<th>Teamwork across imaging stakeholders</th>
<th>Item</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is good cooperation among Technologists, Radiologists, and Medical Physicists.</td>
<td>3.96</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>Technologists, Radiologists, and Medical Physicists work well together to provide the best radiation safety practices for patients.</td>
<td>3.92</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>It is often unpleasant to work with Radiologists and Medical Physicists on radiation safety improvement.</td>
<td>3.77*</td>
<td>0.94</td>
</tr>
</tbody>
</table>

So many variables...

Approaching Practice Change

Establishing a culture of safety requires:

- Committed leadership support
- Teamwork
  - Stakeholder engagement
  - Mutual respect
  - 3 roles come together under a single vision
- Dedicated organizational learning

Created by Nithinan Tata
Tuckman’s Team Theory

Teaming takes time

Tuckman’s Model of Five Stages

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

Work that Remains

• Education:
  • Training and curricula
  • Technologist understanding of change
  • Patient education (1 patient educated at a time is not an effective practice)
  • Provider education

• Utilization of clear terminology and directives—Yield vs Shed
  • Reduction of shielding vs. elimination of shielding

• One-team mentality
  • Siloed Work/Territorial
  • Mutual respect/mutual support

• Compliance vs. Improvement

• Impact on patient satisfaction

• ASRT advancing the initiative
  • Continued reinforcement (Education and Clinical) – shielding@asrt.org
Thank you!

Quentin T. Moore, PhD, R.T.(R)(T)(QM)
QuentinT.Moore@gmail.com