Simulated Learning in Emergency Training for HDR

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Introduction

• Epworth Radiation Oncology (ERO) commenced its HDR service in July 2013
• microSelectron® Digital afterloader
• Currently treat HDR vaginal vault patients
• Vaginal CT/MR Multi Channel (VCMC) applicator
• Standard CT/MR applicator set
Background

• Likelihood of the source not retracting or source detachment is very low

• AAPM Radiation Therapy Committee Task Group No. 59 (Kubo et al. 1998)

• All HDR Brachytherapy services have Emergency Procedures and protocols in place
Background – Simulated Learning

• Epworth Clinical Simulated Learning Team

• Applied in other high-hazard professions
  – Aviation,
  – Nuclear power
  – Military (Ziv et al. 2003)

• Rapidly developing discipline that provides safe
  and effective learning environments

• Advantage is the ability to create an environment
  that facilitates deliberate practice (Weller et al. 2012)
Purpose

• To create a simulation-based medical education tool
• To test Epworth’s HDR emergency procedures
• To meet AAPM TG 59 recommendation of containment in 1-2 minutes
• To provide training, feedback and credentialing of brachytherapy staff
Methods

- HDR Emergency Procedures
- High fidelity simulation to accurately represent the clinical environment
- Hybrid simulation approach
- Used a Laerdal SimMan Essential Patient Simulator™ female pelvis mould
- HDR emergency was simulated
Methods

- Simulation was recorded on 5 cameras
Results

• Simulation 1

• Videos\Onc Scenario 1.m4v

• Simulation 4

• Videos\Onc Scenario 4.m4v
## Results

<table>
<thead>
<tr>
<th>Simulation</th>
<th>Role</th>
<th>Individual Time (sec)</th>
<th>Time Source Contained (sec)</th>
<th>Total Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation 1</td>
<td>Physicist</td>
<td>21</td>
<td>44</td>
<td>126</td>
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<tr>
<td></td>
<td>RO</td>
<td>87</td>
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<td>63</td>
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<td></td>
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<td>Simulation 2</td>
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<td>Nurse</td>
<td>51</td>
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</table>
Discussion

• Debriefed after each simulation

• Identified gaps and processes were put in place to improve emergency procedures

• Staff movement throughout the emergency situation needed improvement

• Highlighted the importance of staff-patient and staff-staff communication
Conclusion

• Successfully tested and reviewed Epworth’s emergency procedures

• Simulation based training has given Epworth Radiation Oncology a valuable training tool

• Source was removed and contained in less than 45 seconds in each simulation

• Total emergency response time was improved by 18%
Acknowledgements

• Epworth Radiation Oncology
• Epworth Simulation and Clinical Training team – Tom Hallahan, Daniel Knoche & Tess Vawser
References


• Ziv, A, Wolpe, P. R, Small, S. D & Glick, S 2003, ‘Simulation-Based Medical Education: An Ethical Imperative’, Academic Medicine, vol. 78, no. 8, pp. 783-788