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Radiation Risks and Safety

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RADIATION RISKS AND SAFETY

NEWTOWN PRIMARY CARE; NEWTOWN, CT

Hyunsoo Joshua No

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Family Medicine Clerkship

Dr. Anureet Gill

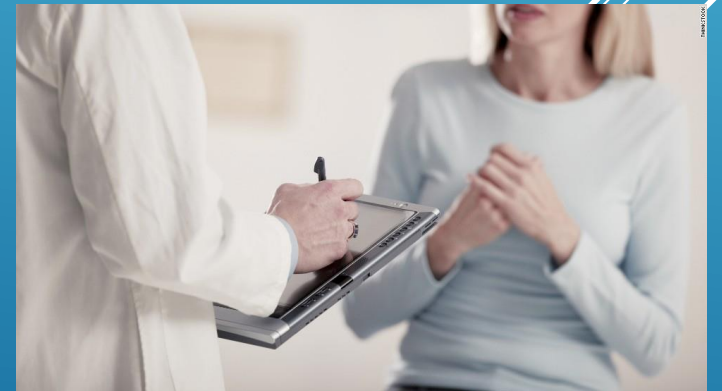
2A. PROBLEM IDENTIFICATION AND NEED

- Patient and physician requests for the use of X-Rays, CTs, and other radiation-producing medical imaging are increasing in the US. It is estimated that more than **62 million CT scans, alone**, per year are currently obtained in the United States, **including at least 4 million for children.**¹
- Public awareness of radiation knowledge is limited. In an exploratory analysis of public awareness and perception of ionizing radiation in Vermont, only **eight percent of respondents** from the general public in four Vermont counties **expressed having confidence in their knowledge of ionizing radiation**, indicating a great need for additional public education.²



2B. PROBLEM IDENTIFICATION AND NEED

- Studies have suggested that the general public is not concerned about exposure to ionizing radiation from medical procedures because of a **widespread notion that healthcare professionals have received extensive training in principles of radiation** and are competent in minimizing risk.^{3,4} However, **physician awareness of radiation knowledge is limited as well.** Despite evidence of some improvement, doctors of all grades still have a very poor knowledge of radiation exposure even with the most common investigations.⁵ Studies show that the resident doctors', interns', and radiographers' knowledge of radiation exposure from radiological investigations and the associated risks was poor.⁶ **Further supporting the need for education regarding radiation.**



3. PUBLIC HEALTH COSTS

- The American Board of Radiology Foundation identified several factors that influence the overutilization of imaging, including **self-referral and the practice of defensive medicine.**⁷
- Reimbursement for imaging procedures is high relative to that for many other health care services. This disparity encourages non-radiologists to add imaging to the services they provide to patients. There has been little action at the legislative or regulatory level of government to control inappropriate, financially motivated self-referral practices. In an article by Levin and Rao, self-referral is estimated **to cost \$16 billion a year** for unnecessary imaging procedures in the United States.⁸
- Defensive medicine, defined as diagnostic or therapeutic measures taken primarily to safeguard against possible accusations of malpractice rather than patient benefit, is unfortunately a common practice in the US. In a study in Massachusetts, it was found 25% of high-tech imaging studies were ordered principally for defensive purposes, **at a cost of \$1.4 billion per year.**⁷



4. COMMUNITY PERSPECTIVE

With great appreciation for the members of Greater Danbury community, including the office of Newtown Primary Care, the following comments were selected from interviews with community members:

- Amy Ricketts of Sandy Hook, CT comments:
 - “I associate X-rays with my dentist. I see the lead gowns and think "what are they doing to my body?" It's just an x-ray for my tooth! When I had my bone scan done, they set me all up and then they all left the room! It makes me wonder, **is this dangerous? I'm curious about the negative effects.** ”
- Erica Maillet, MA of Woodbury, CT comments:
 - “I really know nothing about [radiation]. **It'll be good to know more especially being in the medical field.**”



5. INTERVENTION AND METHODOLOGY

- Informational pamphlet, available for both providers and patients



- Providing simplified information regarding:
 - The principles of radiation
 - Potential exposure to radiation in a medical setting
 - Radiation exposure in our daily lives
 - Allowable annual radiation exposure dose
 - Outcomes of excessive radiation exposure, including signs and symptoms.

6. RESULTS/RESPONSE

- Amy Ricketts of Sandy Hook, CT comments:
 - **“I think this would surely make me feel more comfortable”**
 - Ms. Ricketts rated her comfort/knowledge with radiation a 5/10 on a subjective 10 point scale. After being provided the pamphlet, she reports an **8.5/10**.
- Erica Maillet, MA of Woodbury, CT comments:
 - **“Oh, there's lots of good info on here, this would definitely help.”**
 - Ms. Maillet rated her comfort/knowledge of radiation a 1/10 on a subjective 10 point scale. After being provided the pamphlet, she reports a **5/10**.



7. EVALUATION OF EFFECTIVENESS AND LIMITATIONS

- Objective effectiveness of our intervention is difficult to assess as our primary outcome focuses on patient education.
- Quick survey responses of 2 community members suggest a **37.5% improvement in comfort regarding radiation knowledge** after being provided the informational pamphlet. They also report better understanding where to find further information regarding radiation exposure and exposure outcomes. However, **sample size is incredibly limited** and responses are non-objective.



8. RECOMMENDATIONS FOR FUTURE INTERVENTIONS/PROJECTS

- Pre- and post-intervention surveys, with a larger sample size, can be helpful to assess the efficacy of a pamphlet intervention in providing information regarding radiation and radiation exposure.
- Inclusion of suggestions from survey respondents, on how to better improve the delivery of information, may be helpful.
- Including a lecture or lecture series, open to the public, could provide a more efficacious intervention, whether stand-alone or supplementary to the pamphlet.



9. REFERENCES

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