University of Vermont ScholarWorks @ UVM

Public Health Projects, 2008-present

Public Health Projects, University of Vermont College of Medicine

1-18-2017

Public Awareness of Medical Imaging as a Source of Ionizing Radiation Exposure

Tim Fields
University of Vermont

Michael J. Hall The University of Vermont, Larner College of Medicine

Arjun Janardhan

Lawrence J. Leung *University of Vermont*

Samantha Magier Larner College of Medicine at The University of Vermont

 $See\ next\ page\ for\ additional\ authors$

Follow this and additional works at: https://scholarworks.uvm.edu/comphp_gallery

Part of the Community Health and Preventive Medicine Commons, and the Health Services
Research Commons

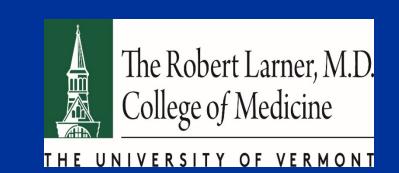
Recommended Citation

Fields, Tim; Hall, Michael J.; Janardhan, Arjun; Leung, Lawrence J.; Magier, Samantha; Robbins, Allison B.; Warther, Katie C.; Hoffman-Contois, Razelle; Irwin, William; and Carney, Jan, "Public Awareness of Medical Imaging as a Source of Ionizing Radiation Exposure" (2017). *Public Health Projects*, 2008-present. 243.

https://scholarworks.uvm.edu/comphp_gallery/243

This Book is brought to you for free and open access by the Public Health Projects, University of Vermont College of Medicine at ScholarWorks @ UVM. It has been accepted for inclusion in Public Health Projects, 2008-present by an authorized administrator of ScholarWorks @ UVM. For more information, please contact donna.omalley@uvm.edu.

Authors Tim Fields, Michael J. Hall, Arjun Janardhan, Lawrence J. Leung, Samantha Magier, Allison B. Robbins, Katie C. Warther, Razelle Hoffman-Contois, William Irwin, and Jan Carney



Public Awareness of Medical Imaging as a Source of Ionizing Radiation Exposure

Timothy Fields¹, Michael Hall¹, Arjun Janardhan¹, Lawrence Leung¹, Samantha Magier¹, Allison Robbins¹, Katie Warther¹, Razelle Hoffman-Contois, MS², William Irwin ScD², Jan Carney MD¹

¹The Larner, M.D. College of Medicine at the University of Vermont, ²Vermont Department of Health



Background

- Ionizing radiation is known to have numerous malefic effects¹
- In the US, 2006 data demonstrated that approximately half of all exposure to ionizing radiation came from medical imaging²
- Patients, physicians, and other caregivers frequently lack a proficient understanding of the risks associated with ionizing radiation^{3,4,5,6,7}
- Objectives:
 - Assess the extent to which productive, informed conversations regarding ionizing radiation are occurring between patients and providers
 - Characterize the public's awareness of medical imaging procedures as sources of ionizing radiation exposure
 - Investigate best practices in patient-provider communications

Methods

- Conducted a literature review
- Developed and administered a 17-question survey to 303 adults at 5 locations across Chittenden County, Vermont, over a 6-week period in fall 2016
- Data entered into Microsoft Excel. Quality control was randomly performed on 25% completed surveys.
- Descriptive and statistical analyses (ANOVA and Chisquared) were conducted using SPSS

1. WHO | Ionizing radiation, health effects and protective measures. WHO. 2016.

qualitative study. BMJ Qual Saf. 2014;23(11):893-901. doi:10.1136/bmjqs-2013-002773.

7. Lee CI, Haims AH, Monico EP, Brink JA, Forman HP. Diagnostic CT Scans: Assessment of Patient, Physician, and Radiologist Awareness of Radiation Dose and Possible Risks. Radiology. 2004;231(2):393-398. doi:10.1148/radiol.2312030767.

Results

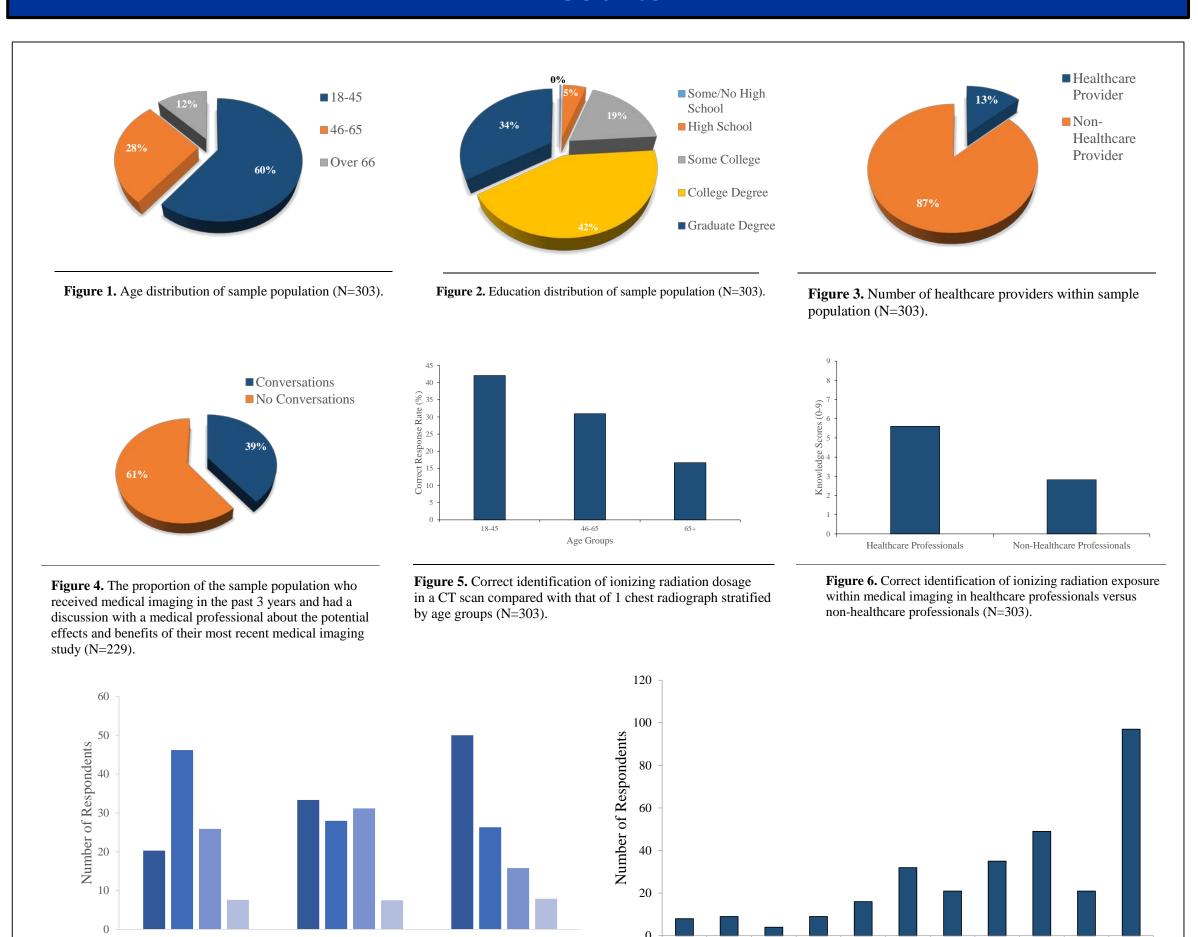


Figure 7. Preferred way to receive information regarding ionizing radiation exposure medical imaging stratified by age groups (N=303).

■ Written description ■ Oral Presentation ■ Written Charts ■ Pictographic Rep

Figure 8. Importance of tracking ionizing radiation measured on a 10 point scale (0= not important; 10= important).

Importance of Tracking Ionizing Radiation

- There is no statistically significant relationship between age (both of the participant and the members of their household) and the frequency of conversations taking place regarding ionizing radiation in medical imaging.
- The three age groups of respondents had different levels of knowledge about ionizing radiation (p<0.05), with the over 65 group showing the lowest level of knowledge (Figure 5.)

Discussion

- Participants who received imaging that imparted ionizing radiation within the last three years were more likely to have had a conversation with a healthcare provider regarding their exposure to ionizing radiation (p<0.05) (Figure 4); however, 61% getting imaging are not having conversations.
- The following factors did not impact participants' level of knowledge regarding ionizing radiation: level of education, frequency of healthcare visits, ages of people in the household, types of imaging received and frequency of conversations concerning ionizing radiation exposure.
- Healthcare providers know significantly more about ionizing radiation in medical imaging than the general public (p<0.001), despite the high education level of survey respondents (Figure 6.).
- Younger respondents (18-45) preferred verbal and older respondents (66+) preferred written materials (Figure 7).
- Most respondents stated that they think tracking ionizing radiation exposure is important and would prefer a designated tab in the electronic medical records for both patients and healthcare providers to access (Figure 8).

Recommendations

- A standard oral presentation for pre-imaging patientprovider communication should be developed, accompanied by a written handout.
- A section of the electronic medical record that contains ionizing radiation exposure should be created for patients and physicians to track individuals' information; this should be accessible through the patient portal.

NCRP Report 160 | NCRP | Bethesda, MD. http://ncrponline.org/publications/reports/ncrp-report-160/. Accessed December 14, 2016.
 Steele JR, Jones AK, Clarke RK, Giordano SH, Shoemaker S. Oncology Patient Perceptions of the Use of Ionizing Radiation in Diagnostic Imaging. J Am Coll Radiol. 2016;13(7):768-774 e2. doi:10.1016/j.incr.2016.02.019

^{4.} Repplinger MD, Li AJ, Svenson JE, et al. Emergency Department Patients' Perceptions of Radiation From Medical Imaging. WMJ. 2016;115(1):22-28.

http://www.ncbi.nlm.nih.gov/pubmed/27057576. Accessed October 3, 2016.
5. Baumann BM, Chen EH, Mills AM, et al. Patient Perceptions of Computed Tomographic Imaging and Their Understanding of Radiation Risk and Exposure. Ann Emerg Med.

^{2011;58(1):1-7.}e2. doi:10.1016/j.annemergmed.2010.10.018.

6. Kruger JF, Chen AH, Rybkin A, Leeds K, Frosch DL, Goldman LE. Clinician perspectives on considering radiation exposure to patients when ordering imaging tests: a