

# An Assessment of the Quality of CT Radiation Dose Information on the Internet

*Siobhán O'Neill, PhD, David Glynn, RCSI, Kevin P. Murphy, RCSI, Karl James, RCSI, Maria Twomey, RCSI, Richard Kavanagh, FFR RCSI, Owen J. O'Connor, MD, Michael M. Maher, MD*

## Abstract

**Objectives:** Our goal was to ascertain the quality of health information related to CT radiation exposure using a simulated Internet search and from incident information that may be available during day-to-day Internet usage.

**Methods:** We entered 14 terms relating to information on CT dose into the most commonly used Internet search engine and analyzed the first 100 web page results for each. A Rich Search Site (RSS) feed search was also used to evaluate incidental information over a 12-week period in 2014. Each web page was classified as being “completely accurate,” “somewhat accurate,” or “inaccurate.”

**Results:** Of 1,400 web pages, 290 were relevant and accessible. We deemed 12.8% of these pages as inaccurate and 67.2% of pages as completely accurate. The highest proportion of web pages was from media sources, which, along with discussion forums, commercial websites, and blogs, were found to have proportionally the largest amount of inaccurate information. Of 1,943 posts, 136 (7.0%) identified by the RSS were relevant, 9.6% were deemed inaccurate, and only 29.9% were deemed completely accurate. The results of our simulated query highlight the importance of public education regarding Internet usage when researching topics relating to radiation exposure associated with CT.

**Key Words:** Internet, tomography, x-ray computed, radiation dosage, consumer health information, communication

*J Am Coll Radiol 2017;■:■-■. Copyright © 2017 American College of Radiology*

## INTRODUCTION

The Internet has become a source of medical information for patients and health care professionals alike [1]. Up to 60% of people use the Internet for health-related queries [2], and most admit to information obtained in such a manner impacting their health behaviors. Unfortunately, information on the Internet is largely unregulated and immense in volume, meaning high-quality information may be difficult to obtain.

Radiation dose from CT is topical, with medical imaging now the greatest single source of ionizing radiation to the US public [3]. Pearce's landmark paper suggested a real but small risk of malignancy induction from CT imaging, attracting much media attention with this advance in knowledge [4]. Patients often resort to the Internet to investigate their

concerns, and despite the existence of reputable health information portals, the typical adult seeking health information on the Internet will begin by using a search engine [5], rarely going beyond the first page of returned results [6].

The aim of this study was to assess the quantity, content, accuracy, and source of online information related to CT radiation dose and determine the quality of information available to patients. We aimed to determine the accuracy of the information retrieved regarding CT radiation dose in a simulated patient Internet search using the Google search engine (Google Inc, Mountain View, California, USA) and also to assess the incident information that patients are passively exposed to in their day-to-day Internet usage.

## MATERIALS AND METHODS

Ethical approval was granted by the institutional review board before commencement of this prospective observational study. We performed a two-pronged search strategy to evaluate the CT radiation dose information available online.

Cork University Hospital, Bishopstown Road, Wilton, Cork, Ireland.

Corresponding author and reprints: Dr Karl James, Cork University Hospital, Radiology Department, Bishopstown Road, Wilton, Cork, T12 DC4A, Ireland; e-mail: [drkarlames@gmail.com](mailto:drkarlames@gmail.com).

The authors have no conflicts of interest related to the material discussed in this article.

First, we assessed the written prevalent information retrievable by a market-leading internet search engine, Google, after searches using 14 key phrases related to CT radiation dose (Table 1). These 14 key phrases were chosen to reflect a broad range of search terms that might be used by a patient to obtain information regarding the risk of radiation exposure during a CT scan. The search was performed on “All” content in the Google search engine. Results were limited to the English language and were not limited by any other search criteria.

Second, we used a Rich Site Summary (RSS) feed search strategy to evaluate the written incident information over a 12-week period (March 10, 2014, to June 2, 2014) as a surrogate for postings on social media and news media. We entered the same 14 key phrases into Google Alerts and enabled the “Similar terms” setting to increase the sensitivity of the search. Google Alerts continuously searched for new, relevant online content, and we followed up the hyperlinks for all new posts and analyzed their content.

We analyzed the web pages identified by each search strategy in an identical manner. First, we categorized each post as relevant, nonrelevant (posts failing to provide information relevant to CT radiation dose), duplicate (if the same web page appeared more than once in the results), or inaccessible (if the hyperlink led to a post that required a user login or had since expired or been removed).

All relevant posts were further assessed. The source website was assigned a subtype based on the “About Us” section or equivalent. We noted the geographic origin of each website and the perceived target audience for the

post. The presence or absence of an identifiable author and references to the peer-reviewed literature was also recorded; however, these references were not further assessed. We assessed each website for the presence of HON code (Health on the Net Foundation Code of Conduct) certification. This is an ethical conduct certification, based on satisfaction of eight key ethical criteria (authorship, complementary, privacy, attribution and references, justifiability, transparency, financial disclosure, and honesty in advertising policy) that aims to guide users of the Internet toward health information that is reliable, understandable, accessible, and credible [7].

We then assessed the accuracy of the information in each relevant post. In the absence of standardized guidelines outlining the information that should be provided to patients, the guidance contained on the websites included in the ACR Patient and Family Radiation Safety Resource List on [www.acr.org](http://www.acr.org) [8] (Table 2), and the European Congress of Radiologists (ECR) EuroSafe Imaging website ([www.eurosafeimaging.org](http://www.eurosafeimaging.org)) was used as a standard. We classified the information in each post on a 3-point ordinal scale as “completely accurate” (the contained information was consistent with the ACR and ECR approved information), “somewhat accurate” (the basic information within the post was accurate, but the information was presented in a misleading manner), or “inaccurate” (the information was factually incorrect). The assessment of post accuracy was carried out by two of the senior authors (M.M.M., O.J.O.), who have extensive experience in the field of CT radiation dose. The assessment was done in tandem, and the final decision was arrived at by consensus between the two assessors after subjective assessment of post content relative to ACR- and ECR-approved information.

Data compilation and statistical analyses were performed using Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA) and GraphPad Prism version 6.0 (GraphPad Software Incorporated, San

**Table 1.** Internet search terms

Search Term
CT cancer
CT scan cancer
CT and cancer
CT radiation dose
Radiation dose in CT
CT radiation exposure
Radiation exposure in CT
CT radiation
CAT scan radiation
CT dangers
CT scan dangers
CT benefit
CT scan benefit
CT scan

**Table 2.** ACR Patient and Family Radiation Safety Resources\*

Resources
RadiologyInfo—Patient Safety
Image Gently—The Alliance for Radiation Safety in Pediatric Imaging
Image Wisely—Radiation Safety in Adult Medical Imaging
American Cancer Society—Radiation Exposure and Cancer
NRC—Fact Sheet on Biological Effects of Radiation
EPA—Radiation Information for the General Public

\*From [www.acr.org](http://www.acr.org) [8].

Download English Version:

<https://daneshyari.com/en/article/8823317>

Download Persian Version:

<https://daneshyari.com/article/8823317>

[Daneshyari.com](https://daneshyari.com)