



Using Point-of-Care Visible Light Imaging to Quantify Misidentification Errors in Portable Radiography

Srini Tridandapani, MD, PhD, MSCR, Chair of Radiology, Radiology, University of Alabama at Birmingham
Carson Wick, PhD; Nabile Safdar, MPH, MD, FSIIM

Introduction

Misidentification errors continue to be an insidious problem in radiology. These errors are often undetected or addressed without adequate reporting, presenting a challenge to downstream users faced with incomplete information.

Hypothesis

Point-of-care (POC) patient visible light (VL) images can be used to detect and quantify misidentification errors in portable radiography.

Methods

Misidentification errors were detected by retrospectively querying PACS using logs from an existing deployment of an automated POC patient VL imaging system (Figure 1). Studies for which VL images were acquired but contained radiographs no longer in PACS were manually reviewed. For each of these studies, VL images were compared to VL images from other studies with the same patient identification number. If the patient in the VL images did not match, a misidentification error was noted (Figure 2).

Results

Over a one-year period, 19,997 portable radiography studies with POC patient VL images were acquired. Of these, 257 (1.3%) had at least one radiograph missing during follow-up PACS querying, and 97 (0.5%) had all radiographs missing. For the 160 studies with one, but not all, radiographs missing, an error with an individual radiograph was likely. For the 97 studies with all radiographs missing, an error with the study, e.g., a misidentification error, was likely. From these 97 studies, 18 misidentification errors were found after manual review (1 in 1111 portable radiography studies).

Conclusion

A scalable method was used to quantify misidentification errors in portable radiography by reviewing discrepancies in studies in PACS over time. This method provides a vastly reduced set of radiography studies for manual review to quantify these errors. Analyses using this method based on POC patient VL imaging will be expanded to investigate both trends and the causes of these errors with the ultimate goal of providing guidance regarding which areas in radiography to direct improvement efforts.

Figure(s)

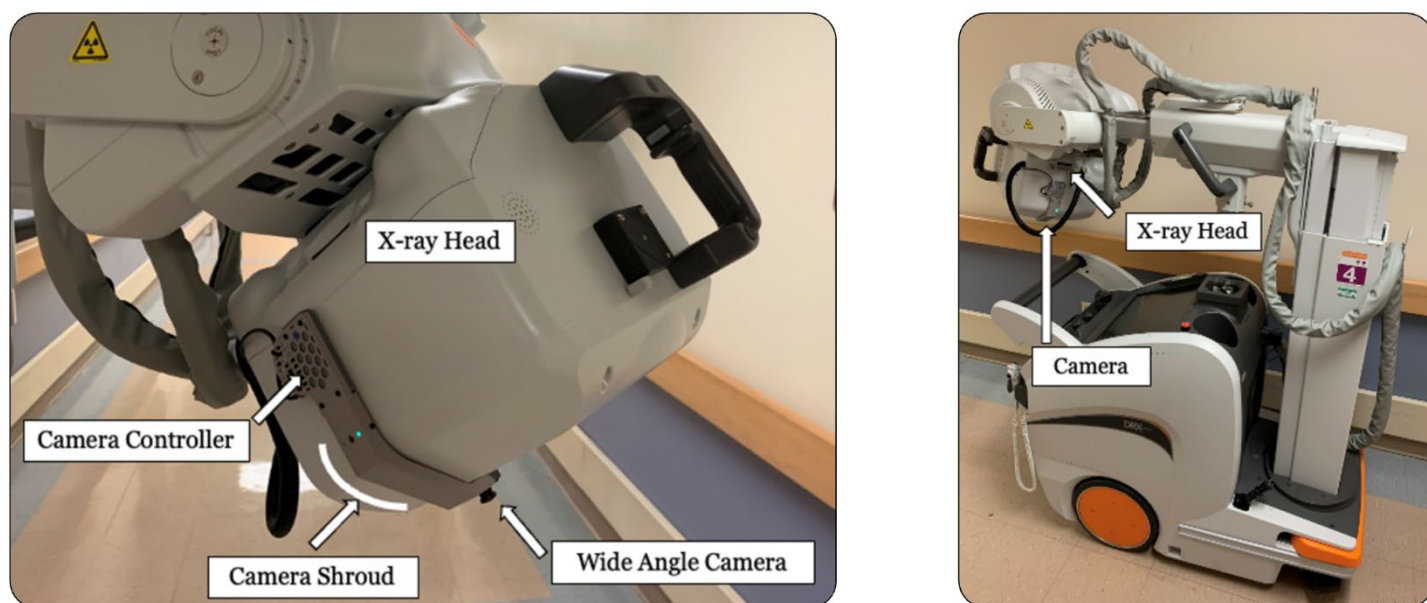


Figure 1A. Detailed view of the point-of-care visible light imaging device attached to the portable radiography machine head. B Overview of the point-of-care visible light imaging device installed on a portable radiography machine.

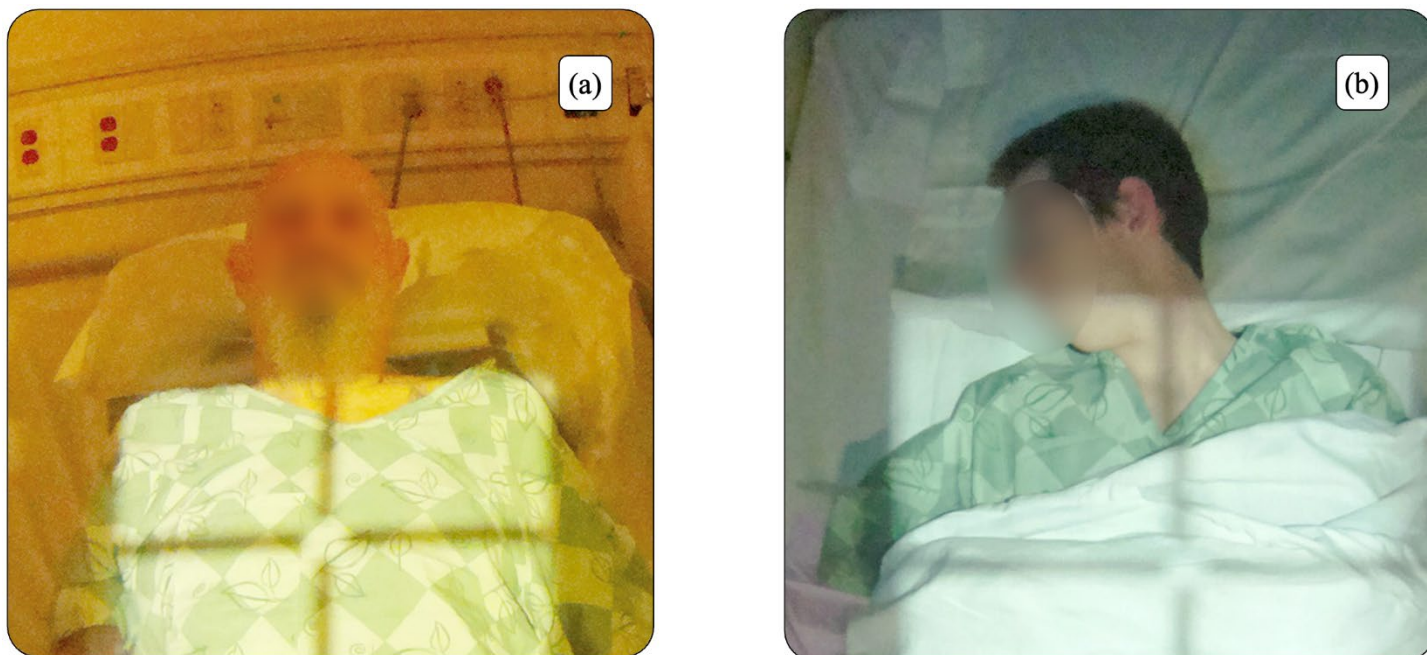


Figure 2A. Visible light image from a portable radiography study that was no longer in PACS. B Visible light image from a portable radiography study in PACS with the same patient identification number as A, indicating a misidentification error.

Keywords

Artificial Intelligence/Machine Learning; Clinical Workflow & Productivity; Communication Data Management; Emerging Technologies; Imaging Research; Standards & Interoperability