

Brief Report

Impact of Adding a Pictorial Display to Enhance Recall of Cancer Patient Histories: A Randomized Trial



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Abstract

Context. Current health care delivery models have increased the need for safe and concise patient handover. Handover interventions in the literature have focused on the use of structured tools but have not evaluated their ability to facilitate retention of patient information.

Objectives. In this study, mock pictorial displays were generated in an attempt to create a snapshot of each patient's medical and social circumstances. These pictorial displays contained the patient's photograph and other disease- and treatment-related images. The objective of this randomized trial was to assess the ability of these snapshots to enhance delayed information recall by care providers.

Methods. Participating physicians were given four advanced cancer patient histories to review, two at a time over two weeks. Pictorial image displays, referred to as the Electronic Whiteboard (EWB) were added, in a randomized manner to half of the textual histories. The impact of the EWB on information recall was tested in immediate and delayed time frames.

Results. Overall, patient information recall declined significantly over time, with or without the EWB. Still, this trial demonstrates significantly higher test scores after 24 hours with the addition of pictures to textual patient information, compared with textual information alone ($P = 0.0002$). A more modest improvement was seen with the addition of the EWB for questionnaires administered immediately after history review ($P = 0.008$). Most participants agreed that the EWB was a useful enhancement and that seeing a patient's photograph improved their ability to retain information.

Conclusion. Most studies examining the institution of handover protocols in the health care setting have failed to harness the power of pictures and other representative images. This study demonstrates the ability of pictorial displays to improve both immediate and delayed recall of patient histories without increasing review time. These types of displays may be amenable to generation by software programs and have the potential to enhance information transfer in various settings. *J Pain Symptom Manage* 2017;53:109–115. © 2016 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Patient handover, information recall, picture superiority effect, electronic whiteboard, pictorial display

Introduction

As the complexity of our health care system expands, patient care becomes increasingly fragmented with more frequent patient handover. This fragmentation

stems, in part, from shorter trainee shifts, medical staff rotation, and patient transfers. Each handover risks further miscommunication, with the process likened to a game of “broken telephone.”¹ The joint commission on Healthcare Organizations in the United States has

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Accepted for publication: August 2, 2016.

identified communication failure as a major contributor to transfer-related adverse events (defined as events leading to death or permanent loss of function)² and the Canadian Medical Association has sought the development of a standardized process for clinical handovers.³ Thus, tools to facilitate succinct communication of a patient's condition to the receiving physician are essential.

Handover intervention in the literature has focused on checklists, structured templates, electronic documentation, and mnemonics.^{4–9} Although standardized, these tools may not facilitate retention and assimilation of information by the incoming provider, necessitating repeated review of a patient's chart.

A previous trial by Walker et al.¹⁰ demonstrated improved recall of histories for patients with advanced cancer utilizing an anatomic diagram to illustrate disease location and treatment. The authors concluded by suggesting the possible utilization of software to enhance the creation of this type of tool in the future. In this study, we build on this previous work and investigate the benefit of utilizing a simulated computer display, containing pictures (patient photograph and disease related images) to enhance the handover process. This approach is based on the concept of the picture superiority effect,^{11–14} which describes how pictures are remembered better than words. The reasoning behind this improved recall is controversial, but proposed theories include: the dual representation in memory of information in verbal and image form (dual coding theory),¹¹ the distinctive features of pictures that are encoded more uniquely,¹² and the fact that pictures undergo more cognitive processing to assess their meaning.¹³

We, thus, created a paper-based simulation of a computer display containing patient variables amenable to pictorial representation. We refer to this display as the Electronic Whiteboard (EWB) acknowledging our eventual goal to use this tool as an electronic upgrade to the traditional dry-erase board. It is not the intention of the EWB to replace chart review or physician-to-physician handover, rather to enhance information retention. We hypothesized that the addition of the EWB display would improve delayed recall of patient information. We anticipated a lesser effect on immediate recall as the benefit of picture superiority effect is seen more with longer term information storage.

Methods

Paper-based simulations of computer displays were created containing images intended to represent a snapshot summary of a cancer patient's history. To decide which items to include in the display, we undertook an iterative process in which a wide-screen computer monitor was installed in the palliative care conference room at the University of Alberta Hospital.

When practical, cognitively intact patients were asked for their consent to have a portrait photograph taken by the hospital photographer. These patient photographs were displayed during our daily palliative care team patient rounds. Informal feedback from the team was taken into account to produce the final layout of the simulated pictorial display used in this study (Fig. 1). The final display included a simulated patient photograph, representative images of the cancer primary, metastatic sites, lines/devices, and a family tree. A table outlining the patient's anticancer treatment was also included with pictorial headings (Fig. 1). Images were purchased from stock photography Web sites.^{15–24}

Study participants included a convenience sample of 20 University of Alberta-affiliated medical residents, palliative care fellows, and staff physicians. Over the course of two weeks, each participant reviewed four patient histories (Table 1). Both the EWB display and the text-only packages contained patient name, age, cancer primary, metastatic disease, irradiated areas, anti-cancer surgery, chemotherapy, family tree, lines/devices, and discharge plan. Each week participants were given two of the four patient histories to review, one accompanied by an EWB pictorial display and the other with textual information alone. The order in which the EWB and text only cases were reviewed was determined by computer-generated randomization in which subjects were randomized into four groups at the outset (Fig. 2). Randomization resulted in half of the participants ($n = 10$) reviewing cases in the same EWB/text order over the two weeks and the others in opposite order (Fig. 3). Subanalysis was undertaken to compare these two groups.

Twenty participants reviewed each of the four cases and completed all elements of the study. Following each set of two cases, participants were given two short answer questionnaires to test basic details of the patient's history. After 24 hours, a second questionnaire with distinct questions (delayed questions) was sent to the subject via e-mail to test longer term information retention on the two histories (Fig. 3). Questionnaires were marked by a rater blinded to the EWB/textual allocation, the nature of the participants, and the general purpose of the study.

The fictionalized patient data were intended to replicate information commonly contained in a palliative care history (400 to 600 words). No specific instructions were given to participants with respect to the most salient data to memorize; rather, they were asked to review it in their usual fashion. Information was studied in a private quiet room without interruption. The privacy and confidentiality of the participant was ensured. Participants reviewed the histories until they felt comfortable with the content and review time was recorded without their knowledge.

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