

# How well do patient education materials for *Clostridium difficile* infection score? A systematic evaluation

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## Abstract

Patient education and engagement is fundamental in the prevention of *Clostridium difficile* infection (CDI). The usefulness of accessible patient education materials on CDI prevention is uncertain. We undertook a systematic assessment of available materials for patient education on CDI using a validated evaluation tool, the Patient Education Materials Assessment Tool (PEMAT). We found that available materials received low marks on the PEMAT.

**Keywords:** Cross infection; Patient education as topic; *Clostridium* infections and prevention and control; Patient education handout.

## Introduction

*Clostridium difficile* infection (CDI) is an increasingly prevalent and severe nosocomial infection, with significant impact on morbidity and mortality as well as length of hospital stay and costs.<sup>1,2</sup> *C. difficile* is an anaerobic, gram-positive bacillus that causes diarrhea, colitis, and septicemia, and in many cases, ultimately, death.<sup>3</sup> According to the CDC, over 107,000 cases of CDI occurred in hospitals in 2011.<sup>4</sup> Prevention measures include dedicated patient care items and equipment, isolation precautions, environmental decontamination

and patient engagement in measures to prevent CDI through education materials. Although a multitude of patient education materials are available for CDI prevention the utility of these educational tools for patients is ambiguous. Furthermore, the understandability and actionability of these materials is unclear. More importantly, the extent to which these materials are of value for the patient is unknown. We performed a systematic assessment of materials for patient education on CDI using a validated evaluation tool, the Patient Education Materials Assessment Tool (PEMAT).

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## Methods

Increasingly, patients utilize online resources to seek information on health care.<sup>5</sup> We completed an environmental scan for patient education materials on CDI online. Prominent field-relevant search engines such as the Agency for Healthcare Research & Quality, the Society for Healthcare Epidemiology of America, and Bing, amongst others, were used. Keywords and phrases searched include: *C. diff* patient education materials, *C. diff* prevention materials, CDC patient education materials about *C. diff*, *C. diff* Prevention, *C. diff*, *Clostridium difficile* prevention, and What Patients can Do to Prevent *Clostridium difficile*. This uniform scan of common keywords was employed in order to make the scope of the investigation as great as possible. The search was performed on April 23rd, 2014. Materials were included if: they were easily accessible materials seeking to inform patients about the prevention of CDI from public or private healthcare institutions or agencies. In order to determine the understandability and actionability of these education materials, we utilized the PEMAT tool. The PEMAT allows a systematic evaluation of patient education materials by utilizing two series of statements. Seventeen statements are used to determine the understandability, while seven are used to determine the actionability.<sup>6</sup> Understandability statements evaluate the content of the material, such as the clarity, organization, and use of visual aids. The material is graded on its ability to make the reader familiar with medical terminology as well as its use of quantitative information. Following the United States Department of Health and Human Services guidelines, materials were considered easy to read if they were at a maximum fifth grade reading level.<sup>7</sup> The materials were also evaluated on the overall organization. Sections over fifty words were considered too long and were given a lower rating for the relevant statement than the more concise alternative. Inclusion of visual aids was rewarded and received superior ratings in the pertinent statement than materials lacking such components. The actionability statements determined the capacity of a material to provide the patient with clear actions to take, use of tangible tools (i.e. checklist), and directly addressing the user when describing the action. Each statement response was rated as either 0 (fail to meet the statement), 1 (satisfied the statement) or n/a (not applicable to the material). N/a was only an option for

statements that the PEMAT identified as appropriate to select such a response. Three independent reviews were performed to corroborate PEMAT findings. Descriptive statistics were performed using Excel. Inter-evaluator agreement was calculated using the kappa statistics. Disagreement was resolved via consensus.

## Results

We found a total of 19 patient education materials that satisfied our inclusion criteria. The understandability of available patient education materials averaged at 73.4, with a range of scores between 62.7 and 82.9. In contrast, the overall actionability average score was 50.5 with grades ranging from 13 to 73.3. The majority of materials found did not contain visual aids or any form of a tangible tool (i.e. checklist). A review of the actionability and understandability scores for each of the patient education materials for *C. difficile* infection is located in Table 1. The Kappa statistic was 0.8 indicating good agreement between the 3 reviewers.

## Discussion

The poor actionability ratings reflect a general lack of utility of these education materials for the patient. None of the patient education materials evaluated in the scope of this study utilized visual aids, despite patient feedback indicating that patients prefer them over text.<sup>8</sup> Additionally, visual aids can also serve as a means to enhance the patient-provider dialogue.<sup>9</sup> Although the understandability ratings are higher on average than the actionability scores the education materials received, there is still significant room for improvement, most commonly in the defining of complex medical terminology.

To improve patient engagement on CDI prevention, several changes can be made to available materials for patient education, including using visual aids, a more specific focus on the preventative measures that engage the patient rather than the healthcare institution.<sup>10</sup>

Our study has limitations. Each review was conducted autonomously, and each evaluator graded the materials based on their own experiences and opinions. For example, the PEMAT requires the evaluator to determine whether or not a material has presented the information in a logical sequence. The potential exists for inter-reviewer disagreement as to whether

**Table I. Rates of Understandability and Actionability of patient education materials for *C. difficile* infection**

	Site Search/URL	Associated Institution	PEMAT Actionability Rating	PEMAT Understandability Rating
1	cdc.gov	Centers for Disease Control	66.7	79.2
2	picnet.ca	Provincial Infection Control Network of British Columbia	73.3	72.7
3	online.xplain.com	The Patient Education Institute	60	66.97
4	thechristhospital.org	The Christ Hospital Network	60	73.6
5	vdh.virginia.gov	Virginia Department of Health	33	62.7
6	choa.org	Children's Healthcare of Atlanta	66.7	80.6
7	chkd.org	Children's Hospital of the King's Daughters	66.7	76.2
8	mayoclinic.org	The Mayo Clinic	33	74.3
9	icpsne.org	Infection Control Professionals of Southern New England	66.7	79.2
10	upmc.org	University of Pittsburgh Medical Center	53.3	70.2
11	mskcc.org	Memorial Sloan Kettering Cancer Center	60	77.56
12	patientsafetyauthority.org	Pennsylvania Patient Safety Authority	13	68.4
13	patientsafetyauthority.org	Pennsylvania Patient Safety Authority	33	70.63
14	virginia.edu	University of Virginia Health System	60	72.6
15	effectivehealthcare.ahrq.gov	Agency for Healthcare Research and Quality	60	63.3
16	cdph.ca.gov	California Department of Global Health	40	80.3
17	danburyhospital.org	Danbury Hospital	46.7	82.97
18	lahey.org	Lahey Hospital and Medical Center	46.7	77.6
19	vdh.virginia.gov	Virginia Department of Health	20	66.3

(Author's note: If there is an error with the link please contact study authors.)

the relative importance of the actions the patient or the hospital can take to prevent the spread of CDI are more important, and subsequently should be presented first.

Despite these limitations, the conclusions from our study can be utilized to guide the development of complete, concise, and applicable materials that facilitate the engagement of the patient in their own recovery and care of CDI.

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