Assessment of Understandability of Online Neurosurgical Patient Education Materials

Christian Lopez Ramos, MPH¹, Jon Williams, BS², Yanik J. Bababekov, MD, MPH³,⁴, David C. Chang, PhD, MPH, MBA³,⁴, Bob S. Carter, MD, MPH⁵

1. University of California San Diego School of Medicine
2. Tufts University School of Medicine
3. Department of Surgery, Massachusetts General Hospital
4. Codman Center for Surgery and Outcomes Research, Massachusetts General Hospital
5. Department of Neurosurgery, Massachusetts General Hospital, Boston, MA

Poster ID 41672
Disclosures

Nothing to disclose.
Introduction

Health literacy (HL)

- Skills necessary to access, process, and understand health information to make informed health decisions
- Only 12% of English-speaking adults in the U.S. are proficient in HL
- Inadequate HL associated with poor outcomes and higher healthcare costs
- Vast majority of Americans consult the internet to address their health concerns

Objective

- Assess the understandability of online neurosurgical patient education materials (PEMs) provided by the American Association of Neurological Surgeons (AANS) and MedlinePlus
Methods

• Inclusion criteria: articles on neurosurgical conditions and treatments listed on both the AANS site and MedlinePlus
  • Categorized articles on neurosurgical subspecialty: cerebrovascular, functional, neurotrauma, pain, pediatrics, spine and tumor

• Two independent reviewers scored articles using the Centers for Disease Control and Prevention’s Clear Communication Index (CCI)
  • Validated tool of 20 scored items to assess the understandability of print health information materials → score ≥90% indicates information is easy to read

• Data Analysis
  • Inter-rater reliability assessed with Cohen’s kappa test (k = 0.87)
  • Wilcoxon rank sum test
Results

- Total number of Articles, n=138
  - AANS, n= 61
  - Medline, n= 77

<table>
<thead>
<tr>
<th>Category</th>
<th>AANS (n=61)</th>
<th>Medline (n=77)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrovascular</td>
<td>(n=6)</td>
<td>(n=12)</td>
</tr>
<tr>
<td>Functional</td>
<td>(n=7)</td>
<td>(n=6)</td>
</tr>
<tr>
<td>Neurotrauma</td>
<td>(n=6)</td>
<td>(n=9)</td>
</tr>
<tr>
<td>Pain</td>
<td>(n=8)</td>
<td>(n=12)</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>(n=9)</td>
<td>(n=10)</td>
</tr>
<tr>
<td>Spine</td>
<td>(n=14)</td>
<td>(n=15)</td>
</tr>
<tr>
<td>Tumor</td>
<td>(n=11)</td>
<td>(n=13)</td>
</tr>
</tbody>
</table>
## Results

**Table**: Total CCI scores by PEM source and stratified by condition

<table>
<thead>
<tr>
<th>Patient Education Material (PEM) Source</th>
<th>MedlinePlus (n=77) median [IQR]</th>
<th>AANS (n=61) median [IQR]</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CCI Score</td>
<td>68.9 [62.5-81.3]</td>
<td>56.3 [46.7-73.7]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Stratified by Condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular</td>
<td>70.0 [62.5-81.3]</td>
<td>57.5 [45.0-70.0]</td>
<td>0.32</td>
</tr>
<tr>
<td>Functional</td>
<td>81.3 [62.5-81.3]</td>
<td>56.2 [43.8-68.8]</td>
<td>0.08</td>
</tr>
<tr>
<td>Neurotrauma</td>
<td>81.3 [62.5-81.3]</td>
<td>63.2 [57.9-68.4]</td>
<td>0.23</td>
</tr>
<tr>
<td>Pain</td>
<td>62.3 [62.5-84.4]</td>
<td>59.1 [47.7-63.2]</td>
<td>0.036</td>
</tr>
<tr>
<td>Pediatric</td>
<td>62.5 [62.5-81.3]</td>
<td>65.0 [56.3-70.0]</td>
<td>0.25</td>
</tr>
<tr>
<td>Spine</td>
<td>62.5 [62.5-81.3]</td>
<td>50.0 [46.7-60.0]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Tumor</td>
<td>68.8 [56.3-81.3]</td>
<td>50.0 [43.8-53.3]</td>
<td>0.015</td>
</tr>
</tbody>
</table>

*Scores out of 100, ≥90% is considered “easy-to-read”*
Results

CCI score of all AANS and Medline articles

• Only one of 138 articles had a CCI score ≥90% (threshold to be considered “easy to read”)
Results

• 21.3% of AANS PEMs stated a "main message" relative to 49.4% of Medline education handouts

• Both the AANS and Medline performed poorly on providing a summary (14.8% vs 13%) and using supporting visual aids for a main message (1.64% vs 3.90%)

• Neither PEM source used visual cues to emphasize their main message based on the CCI criteria
Discussion

• **AANS** and **Medline** patient education materials may be difficult to understand, scored poorly on the following elements:
  • Main Message
  • Visual cues and Visual aids to convey main message
  • Informative headers
  • Summary of main points

• Need for more effective communication materials → improve patient experience and satisfaction, and promote meaningful health decision making
  • Empower and engage patients in the medical decision process
Summary Points

• Neurosurgical patient education materials may be difficult to understand and may act as barriers for patients’ engagement with health systems

• There is a need to deliver patient-centered health information that effectively informs patients, aiding in meaningful health-decision making

• Health Literacy is a **national and public health priority**
  • institutions and health systems should aim to create and deliver patient education materials that are *clear, understandable, and actionable*