Health Literacy and Patient Safety Events

INTRODUCTION

Helping patients understand healthcare information and instructions is pivotal to engaging patients to improve their own health and safety. The challenge in communicating complicated and sometimes evolving healthcare information is in the presenter’s ability to deliver the information in a clear yet concise manner. Learning to read and speak healthcare terminology is akin to learning a foreign language. Acronyms, abbreviations, and Latin-based words are often used to represent complex concepts. Individuals unfamiliar with medical terms frequently struggle to understand and make decisions based on information presented to them. Analysts from the Pennsylvania Patient Safety Authority identified event reports in which the patient’s misunderstanding of healthcare instructions or information adversely impacted the patient’s care.

Communication gaps are not new to healthcare and can contribute to Serious Events, including permanent loss of function and even death. Health literacy, the ability to comprehend healthcare information, goes beyond reading and writing, and includes listening, speaking, and numeracy (i.e., use of math skills and reasoning for decision-making in everyday situations) in order to make informed healthcare choices.

In 2010, the Health Care Improvement Foundation and Thomas Jefferson University Hospitals started a health literacy initiative funded by the Pennsylvania Department of Health. This program, Southeastern Pennsylvania Regional Enhancements Addressing Disconnects in Cardiovascular Health Communication (SEPA-READS), began as a regional effort in Southeastern Pennsylvania and initially focused on older adults, age 50 or older, with cardiovascular disease. The SEPA-READS program has since expanded across the Commonwealth and helped spur the formation of the Pennsylvania Health Literacy Coalition. In December 2015, Authority staff attended a train-the-trainer program, “Communicating to Connect: Strategies to Improve Health Literacy.” This program taught Authority staff about health literacy principles and provided methods to disseminate this information among Pennsylvania healthcare facilities to improve patient comprehension of healthcare information. To better understand the impact of health literacy on patient care in Pennsylvania, Authority analysts searched the Pennsylvania Patient Safety Reporting System (PA-PSRS) database to identify potential health literacy–related event reports.

METHODS

Analysts queried the PA-PSRS database, searching the event narratives and recommendation data fields using the following keywords and phrases: “misunderstood,” “misunderstand,” “comprehend,” “did not understand,” and “did not follow directions;” the query was for the 10-year time period of January 2005 through December 2014. Analysts read event report narratives to identify potential health literacy–related event reports (i.e., situations in which patients either misunderstood or did not comprehend healthcare instructions or information provided to them by healthcare clinicians). Situations in which healthcare workers misunderstood instructions or orders were excluded.

Potential health literacy–related event reports were analyzed according to patient age and harm score.*

Event report narratives and PA-PSRS data fields labeled “contributing factors” (e.g., patient not understanding) and “remedy factors” (i.e., what was done to remedy the

situations) were further analyzed to identify patient outcomes, event explanations (e.g., preoperative instructions not followed), contributing factors, and remedies.

Event reports describing patients with cognitive impairment were also found and analyzed separately to identify outcomes specific to this subgroup.

RESULTS

Patient-Related Event Reports

Analysts identified 265 potential health literacy-related event reports in which patients misunderstood or failed to understand instructions or information provided by healthcare clinicians.

Patient age. The largest number of event reports (16.6%, n = 44 of 265) involved patients 51 to 60 years old. See Figure 1 for the age distribution from newborns to 94 years.

Harm score. Ten (3.8%) events were reported as Serious Events; harm scores were E and F. There were no event reports with the harm scores G, H, or I. The majority of events (48.3%, n = 128 of 265) were reported as a harm score C followed by the next harm score category D (27.9%, n = 74).

Outcomes, explanations, contributing factors, and remedies. Seven outcomes, five explanations, four patient-related contributing factors, and one patient-related remedy were identified (Table 1). Outcomes were identified in all but one report. The most frequently reported outcome was a delayed or cancelled procedure/surgery/treatment/test or the patient leaving without being seen (33.7%, n = 89 of 265), followed by patient falls (30.7%, n = 81). Fewer than half of the event reports identified an explanation (35.8%, n = 95 of 265), contributing factor (29.0%, n = 77), or remedy (26.8%, n = 71).* Patients not following preoperative instructions (54.6%, n = 53 of 97) was the most frequently reported explanation for a misunderstanding. The most frequently reported contributing factor was patient not understanding (80.5%, n = 62 of 77); lack of patient compliance, the second most frequently reported contributing factor, often results from lack of patient understanding.† Talking to the patient/family was the only patient-related remedy identified (n = 71).

Cognitive impairment. A subgroup of 75 event reports (28.3%) was identified that described patients who were confused, had cognitive disorders (e.g., Alzheimer’s disease, dementia), psychiatric disorders, or an inability to comprehend instructions (e.g., traumatic brain injuries). Patients in this subgroup experienced the outcomes shown in Table 2.

Examples of Patient Misunderstandings

The following are de-identified PA-PSRS event narratives.†

Delayed or Cancelled Procedure/Surgery/Treatment/Test

Even though the patient had pre-op instructions explained to her yesterday, she obviously did not understand. The nurse explained the instructions several times and the patient’s husband said he could stay and would be able to take a taxi home with his wife, the patient. This [action] did not transpire and the patient’s procedure had to be cancelled on the day of surgery.

Patient was to have an outpatient MRI with sedation. The patient had concerns about sedation. Investigation with involved staff revealed that detailed explanations were given to the patient. The patient was extremely anxious about the
*Falls*

The patient had been to the bathroom without assistance. The patient at times did not understand what was being said. Just prior to being admitted to the floor, and after family had left, the patient staggered out of the room and fell in the hallway. No injury noted. The patient was immediately raised up to his feet and assisted back into his room.

Patient stated several times that she wanted to get into bed. She was told that her physician ordered her to sit in a chair. The patient did not understand what was told to her. Patient was found by staff in the bathroom.

Patient has right hemiparesis. Patient was instructed not to get up without assist. Patient dropped her glasses on the floor, and in an attempt to get them, she fell.

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### Table 1. Potential Health Literacy-Related Event Outcomes, Explanations, Contributing Factors, and Remedies, as Reported through Pennsylvania Patient Safety Reporting System, January 2005 through December 2014 (N = 265)

<table>
<thead>
<tr>
<th>OUTCOMES</th>
<th>NO. OF EVENT REPORTS</th>
<th>% OF EVENT REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed or cancelled procedure/surgery/treatment/test or patient left before being seen</td>
<td>89</td>
<td>33.7</td>
</tr>
<tr>
<td>Fall</td>
<td>81</td>
<td>30.7</td>
</tr>
<tr>
<td>Medication error</td>
<td>31</td>
<td>11.7</td>
</tr>
<tr>
<td>Premature removal of pulmonary, gastric, or peripheral central catheters</td>
<td>19</td>
<td>7.2</td>
</tr>
<tr>
<td>Aggression by patient or family</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td>Wrong procedure/site</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>Miscellaneous (e.g., skin tears, patients leaving unit, removed dressing)</td>
<td>29</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>264</strong></td>
<td><strong>100</strong></td>
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</tbody>
</table>

**EXPLANATIONS**

<table>
<thead>
<tr>
<th><strong>EXPLANATIONS</strong></th>
<th>NO. OF EVENT REPORTS</th>
<th>% OF EVENT REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative instructions not followed</td>
<td>53</td>
<td>55.8</td>
</tr>
<tr>
<td>Language barrier</td>
<td>15</td>
<td>15.8</td>
</tr>
<tr>
<td>Discharge instructions not followed</td>
<td>13</td>
<td>13.7</td>
</tr>
<tr>
<td>Consent issue</td>
<td>9</td>
<td>9.5</td>
</tr>
<tr>
<td>Change in mental/medical status</td>
<td>8</td>
<td>8.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>95</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**CONTRIBUTING FACTORS**

<table>
<thead>
<tr>
<th><strong>CONTRIBUTING FACTORS</strong></th>
<th>NO. OF EVENT REPORTS</th>
<th>% OF EVENT REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of patient understanding</td>
<td>62</td>
<td>80.5</td>
</tr>
<tr>
<td>Lack of patient compliance†</td>
<td>37</td>
<td>48.1</td>
</tr>
<tr>
<td>Lack of family cooperation</td>
<td>7</td>
<td>9.1</td>
</tr>
<tr>
<td>Language barrier</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>77</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**REMEDIES**

<table>
<thead>
<tr>
<th><strong>REMEDIES</strong></th>
<th>NO. OF EVENT REPORTS</th>
<th>% OF EVENT REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information or explanation provided to patient or family</td>
<td>71</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>71</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

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* One event report did not identify an outcome.
† Explanations and contributing factors not reported on all reports.
‡ Lack of patient compliance is often a result of lack of patient understanding.
§ More than one explanation or contributing factor was described in some reports.
Table 2. Cognitive Impairment-Related Outcomes, as reported through the Pennsylvania Patient Safety Reporting System, January 2005 through December 2014 (n = 264*)

<table>
<thead>
<tr>
<th>OUTCOMES</th>
<th>EVENT REPORTS SPECIFYING COGNITIVE IMPAIRMENT (NO. OF EVENT REPORTS/TOTAL NO. OF EVENTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggression-related incidents by patients or family</td>
<td>81.8% (9 of 11)</td>
</tr>
<tr>
<td>Unplanned removal of tracheostomy, nasogastric, and gastric tubes</td>
<td>73.7% (14 of 19)</td>
</tr>
<tr>
<td>Falls</td>
<td>44.4% (36 of 81)</td>
</tr>
<tr>
<td>Miscellaneous issues (e.g., pressure ulcers)</td>
<td>20.7% (6 of 29)</td>
</tr>
<tr>
<td>Delays or cancellations in procedures, surgery, treatments, or tests</td>
<td>9.0% (8 of 89)</td>
</tr>
<tr>
<td>Medication errors</td>
<td>6.5% (2 of 31)</td>
</tr>
<tr>
<td>Wrong procedure or site</td>
<td>0% (0 of 4)</td>
</tr>
</tbody>
</table>

* One event report did not identify an outcome.

**Preoperative Instructions Not Followed**

The patient told the doctor that he had taken his [medication] for the past 3 days. The prescription was written for postoperative use. The patient misunderstood. The doctor explained to the patient the risk of continuing with the surgery due to the fact that he had been taking the [medication]. The patient and surgeon agreed to cancel the surgery and surgery will be rescheduled. The patient was re-educated not to take any medication prior to surgery.

The patient arrived for endoscopy. The patient misunderstood instructions and ate a sandwich two hours prior to arriving for the procedure.

The patient had a snack at 5:45 am. The parent misunderstood the NPO [nothing by mouth] instruction to stop solid food at midnight. The surgery was delayed.

**Consent Issues**

Consent form for trigger finger release was blank on front page. [Staff] filled in trigger finger release for patient to read but was unable to obtain permission. Patient not sure of procedure to be done, did not understand physician explanations... will have to wait until tomorrow.

**Extubations**

Patient found pulling her [nasogastric] tube out. Patient repositioned and order received to replace tube. Patient unable to comprehend the need to leave the tubes alone.

Patient was sitting up in the chair. When family entered the room, they noted the [patient’s] Foley catheter was completely removed. The patient was in no distress... Patient in wrist restraints due to mentally...unable to comprehend reason for tubes.

**DISCUSSION**

In the PA-PSRS events, oral communication issues, such as misunderstanding oral instructions for preventing falls or preoperative instructions, and written communication issues, such as obtaining a consent for procedures or surgery, are challenges faced by patients and healthcare staff. A person’s level of health literacy is based on word recognition, reading comprehension, and numeracy. Some aspects of health literacy are not easily measured, such as oral and written communication skills, reading ability, and familiarity with language, as well as background knowledge, such as biology, and different cultural approaches to health care.

Almost one third (28.3%, n = 75 of 265) of reported events in Pennsylvania involved patients with a cognitive impairment, and more than half (55.3%, n = 146 of 264) were patients age 51 or older. Many factors influence a person’s ability to process and understand health care information. Individual factors may include culture, language, emotion, age, medications, previous exposure to the health care system, cognitive impairment, and general literacy, as well as acute stresses such as fatigue and illness. Healthcare system factors include the complex and often-contradictory nature of health care information, complicated technology, diverse manners of presentation (e.g., signs, directions,) and time constraints. Although certain groups of patients (e.g., older adults, non-native English speaking people) are at greater risk of having a lower level of health literacy, it is difficult to determine a person’s level of health literacy by observation of how they look or speak.
The 2003 National Assessment of Adult Literacy (NAAL) categorized health literacy into four levels based on standardized test scores. The NAAL health literacy results showed that 12% of adults had proficient health literacy, 53% of adults had an intermediate health literacy level, 22% of adults had a basic health literacy level, and 14% had a below basic health literacy level.8 See “Health Literacy Level Descriptions” for further information. The NAAL has been replaced by the Program for the International Assessment of Adult Competencies (PIAAC). The PIAAC was last administered in 2012 and yielded results similar to the NAAL, indicating that health literacy is relatively static at the population level.10

The NAAL assessed patient age, gender, race and ethnicity, language spoken before starting school, highest level of education, and poverty level. The results showed that, in general, women have a slightly higher level of health literacy than men; more adults age 65 or older had lower levels of health literacy than adults in any of the younger age groups; Hispanic adults had lower average health literacy than adults in any other race or ethnic group; adults who did not speak English before starting school had the lowest average health literacy level; and adults below the poverty level had lower average health literacy than adults living above the poverty threshold.9

**Effects of Low Levels of Health Literacy**

Inadequate health literacy has been associated with poorer health outcomes.11-14 Implementing plain language descriptions (e.g., replacing medical or technical terms with words that people use in everyday conversations) during clinical encounters and in healthcare documents can help patients understand the complex language used in healthcare.8,15,16 A plain language agenda has been developed by the Centers for Disease Control and Prevention and the federal government; however, application of plain language into everyday documents, such as consent forms, and educational programs requires time to develop, test, and implement.16-18 Obtaining informed consent involves more than obtaining a patient’s signature on a written consent form. It is an interactive process between a patient and physician that has two major elements: a patient’s awareness and understanding of a healthcare situation and treatment options, and their voluntary choice to act upon this information.19 A patient’s signature on a consent form does not necessarily confirm that the patient understands the type of treatment he or she has authorized. Studies have shown that up to half of patients did not correctly recall the risks of surgery and one third did not correctly recall the alternatives to the procedures after providing informed consent.20-23

**Determining Health Literacy**

Before implementing any health literacy strategies with patients, the first step is to ensure that the universal health literacy precautions are in place.24 Then staff can proceed to identify whether a patient has a medical or mental health condition that will impinge on the patient’s ability to understand instructions. Next, determine whether patients with limited decision-making capacity are incapable of making their own decisions (e.g., giving informed consent) or whether there are periods when they are lucid and able to actively participate in their care.25,26 A patient’s overall decision-making capacity will drive the type of risk-reduction strategies selected by healthcare staff. The following risk-reduction strategies are useful to institute in patients who are unable to comprehend instructions due to medical or mental health conditions.7,25-31

**Risk Reduction Strategies for Patients with Impaired Decision-Making Capabilities**

The following strategies can be used with patients who have impaired decision-making capability:

- Screen patients for cognitive impairment
- Engage family members or surrogate decision-makers in the patient’s care
- Incorporate shared decision-making with other healthcare professionals who have cared for the patient

**HEALTH LITERACY LEVEL DESCRIPTIONS**

Below Basic—indicates no more than the most simple and concrete literacy skills, such as not being literate in English or not locating easily identifiable information in simple documents (e.g., charts or forms).

Basic—indicates skills necessary to perform simple and everyday literacy activities, such as reading and understanding information in simple documents.

Intermediate—indicates skills necessary to perform moderately challenging literacy activities, such as locating information in dense, complex documents and making simple inferences about the information.

Proficient—indicates skills necessary to perform more complex and challenging literacy activities such as integrating, synthesizing, and analyzing multiple pieces of information located in complex documents.

Recognizing Low Levels of Health Literacy

Testing patients to determine their level of health literacy can lead to shame and alienation. The literature suggests close observation and asking certain types of questions that can help identify individuals with limited reading and comprehension skills. Patients with low health literacy may exhibit the following behaviors:

- Make excuses when asked to read or fill out forms, such as “I don’t have my glasses” or “I’ll read this when I get home.”
- Lift text close to their eyes, point to the text with a finger while reading, or visually wander over the page without finding a central focus.
- Provide incomplete medical history or check items as “no” to avoid follow-up questions.
- Listen carefully and take instructions literally to avoid mistakes.
- Identify medications based on color, size, and shape.
- Fail to comply with medication regimens.
- Frequently miss appointments.
- Show signs of nervousness, confusion, frustration, and even indifference.
- Avoid situations or withdraw when complex learning is required.
- Give incorrect answers when questioned about what they have read.

Keep in mind that if patients do not exhibit any of these behaviors, it is not confirmation that they are health literate.

Addressing Health Literacy

The majority of PA-PSRS events involved patients with the capacity to make healthcare decisions. Yet these patients were faced with challenges in understanding oral and written communication instructions and are the focus of the risk-reduction strategies. Oral communication methods and programs such as the “teach back” method and the National Patient Safety Foundation (NPSF) Ask Me 3® program can provide feedback to healthcare clinicians about the patient’s level of understanding. Written communication strategies are divided according to common themes used to create the forms or instructions intended to inform patients.

Risk Reduction Strategies

Oral Communication

The following risk reduction strategies can be implemented when communicating verbally with a patient:

Verbal Communication Techniques

- Use teach back (or show me) method, which allows providers to confirm understanding by asking the patient to demonstrate or explain, in their own words, what they need to do.
- Provide incomplete medical history or check items as “no” to avoid follow-up questions.
- List carefully and take instructions literally to avoid mistakes.
- Identify medications based on color, size, and shape.
- Fail to comply with medication regimens.
- Frequently miss appointments.
- Show signs of nervousness, confusion, frustration, and even indifference.
- Avoid situations or withdraw when complex learning is required.
- Give incorrect answers when questioned about what they have read.

Verbal Communication Skills

- Talk slowly, use plain language.
- Avoid medical jargon.
- Use a trained medical interpreter for patients who have limited English proficiency.
- Use videos, interactive computer programs, or pictures to accommodate different learning styles.
- Keep number of points to three or less to focus on what the person needs to know and needs to do (i.e., action oriented).
- Communicate as if talking to a friend to show genuine interest.

Non-Verbal Communication Skills

- Face the patient when talking with him or her, make direct eye contact, and use relaxed body language.

Written Communication

Written communication approaches can focus on principles that simplify written instructions and forms that include:

Document Suitability

- Use assessment tools to evaluate the overall suitability of materials, such as the Plain Language Grade level, Relevance, Interest, and Design (Plain Language GRID), Suitability of Assessment Materials (SAM), Patient Education Materials Assessment Tool (PEMAT), and the Clear Communication Index (CCI).
- Explain the purpose of documents and keep the description simple (e.g., one to two key objectives).
- Provide clear messages; give the most important information first, describe what actions to take, and explain their importance.
- Emphasize desired behaviors.
- Highlight the positive message.
- Pretest materials for the intended audience.

Document Content

- Write at a grade 4 to 6 level; use readability calculators such as the Simple Measure of Gobbledygook (SMOG), Fry Graph Readability Formula, and Flesch-Kincaid readability tests (which is available in Microsoft Word).
- Write in short, brief sentences (no more than 10 to 15 words).
- Limit paragraphs to three to five sentences.
— Use the word “must” to indicate requirements.8,10
— Use active voice.8,16,18,24,40
— Use plain language and words with one or two syllables.8,15,18,35,36,39
— Avoid medical jargon, technical, or scientific language, and unnecessary abbreviations and acronyms; if a complex term cannot be avoided, clearly define what it means.6,8,13,16,18,35,39
— Use audience-appropriate images and diagrams to highlight key messages.18,35

**Document Format**

— Keep design simple, with sharp contrast between text color and background paper color.46
— Include ample white space, use appropriate space between lines of text (e.g., 1.2 to 1.5 spacing, and leave at least ½ inch to 1 inch of white space around the margins and between columns).9,16,40,46
— Leave right margin ragged so readers can easily track their location within the text.16,35,40,46
— Create short lists (i.e., three to seven items) with bullets, not commas.16
— Use no smaller than 12 point font, ideally 14 point font; avoid italics.8,15,35,40
— Use a simple, clear font style; a sans serif font is generally recommended for viewing on screens and devices.16,40

**LIMITATIONS**

This retrospective review of reported events is limited by the information reported through PA-PSRS, including the event descriptions and explanations. PA-PSRS does not have structured data fields that identify health literacy events; and the search terms used may not have encompassed all of the relevant descriptions used in reported events. It is also possible that limited health literacy may have contributed to events in ways that were not recognized by staff.

**CONCLUSION**

Limited healthcare literacy can contribute to delays or errors in treatment that can lead to poor healthcare outcomes. The complexity of healthcare information that healthcare clinicians use every day can be overwhelming for patients to comprehend and assimilate. Clear communication of healthcare information between healthcare clinicians and patients can improve patient understanding of the benefits and risks and improve adherence with medical interventions, thereby increasing the chance of better healthcare outcomes. Achieving effective patient communication requires implementation of universal precautions in a manner that meets the health literacy needs of all patients. The written and verbal strategies identified in this article provide some initial steps that can help bridge communication gaps between clinicians and patients and lead to better informed patients.

**NOTES**


The Pennsylvania Patient Safety Authority is an independent state agency created by Act 13 of 2002, the Medical Care Availability and Reduction of Error (Mcare) Act. Consistent with Act 13, ECRI Institute, as contractor for the Authority, is issuing this publication to advise medical facilities of immediate changes that can be instituted to reduce Serious Events and Incidents.

For more information about the Pennsylvania Patient Safety Authority, see the Authority’s website at http://www.patientsafetyauthority.org.

ECRI Institute, a nonprofit organization, dedicates itself to bringing the discipline of applied scientific research in healthcare to uncover the best approaches to improving patient care. As pioneers in this science for nearly 50 years, ECRI Institute marries experience and independence with the objectivity of evidence-based research. More than 5,000 healthcare organizations worldwide rely on ECRI Institute’s expertise in patient safety improvement, risk and quality management, and healthcare processes, devices, procedures and drug technology.

The Institute for Safe Medication Practices (ISMP) is an independent, nonprofit organization dedicated solely to medication error prevention and safe medication use. ISMP provides recommendations for the safe use of medications to the healthcare community including healthcare professionals, government agencies, accrediting organizations, and consumers. ISMP’s efforts are built on a nonpunitive approach and systems-based solutions.