Writing and Designing Readable Patient Education Materials

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Much of the communication between dialysis patients and their health care providers occurs verbally, but we often rely on written materials to augment or reinforce our verbal instructions. Dialysis patients may refer to written materials that provide instructions about medication dosages, dietary regimens, fluid management, and treatment schedules. Patients must be able to both read and understand these written materials if there is any hope of them adhering to treatment plans.

The average adult in the United States is unable to read above the eighth-grade level (Doak, Doak, & Root, 1996). A large percentage of dialysis patients are older than 65 years of age and are particularly at risk, as 40% of people over 65 read below the fifth-grade level (Doak et al., 1996). People reading below the fifth-grade are considered functionally illiterate.

While the literacy levels of dialysis patients have not been described in existing literature, there are trends in the overall population that provide us with the larger picture. People with low socioeconomic status, immigrants, high school dropouts, and the unemployed have higher rates of functional illiteracy than the average adult (Quirk, 2000). According to a 1993 government report, the states of Louisiana, Mississippi, and Texas have the highest rates of functional illiteracy in the entire country (U.S. Congress, Office of Technology Assessment, 1993).

Due to shame and embarrassment, patients rarely admit they are functionally illiterate (Winslow, 2001). Rather, they make attempts to hide their reading problems. They might have a friend or family member read documents for them, state that they forgot their glasses, or tell you they will read the document when they get home (Smith, 2003). However, these cues are often missed by health care providers, and these patients are usually skillful at hiding their deficiencies.

To acknowledge this nationwide problem of functional illiteracy, numerous authors have recommended that patient education materials be written on a fifth to sixth-grade reading level (Doak et al., 1996; Monsivais & Reynolds, 2003; Winslow, 2001). However, the majority of patient education materials are written on high-school or college reading levels (Brownson, 1998; Winslow, 2001). Doak et al. (1996) note that understanding the instructions that come with over-the-counter medications requires a tenth-grade reading level, and reading the instructions on a frozen TV dinner requires an eighth-grade reading level. A recent analysis of 31 HIPAA privacy notices found that they were written on a second or third-year college reading level (Hochhauser, 2003). There is clearly a gap between the average person’s reading ability and the reading level of many instructions and documents in our society.

The Institute of Medicine (IOM) has included health literacy, which is defined as the ability of a person to obtain, process, and understand health information, as one of the 20 key priority areas to transform the U.S. health care system (IOM, 2003). Like the other priority areas (such as diabetes, hypertension, and nosocomial infections), health literacy was selected due to the prevalence of illiteracy, as well as the potential positive effects improvement would have throughout the health care industry. In addition, the IOM released a specific report about health literacy in 2004. The report states that 90 million Americans have difficulty understanding and acting upon health information and includes specific recommendations that health care systems and providers can take to promote a health-literate society (IOM, 2004). Clearly, creating readable patient education materials is an important step in improving health literacy.

Determining Readability

Based on the high incidence of functional illiteracy in the U.S., it is likely that dialysis clinics have a significant number of patients who are functionally illiterate. It is also likely that the average dialysis clinic’s patient education materials are written on a level that is not readable by many of its patients. Brownson (1998) argues that it is a waste of valuable nursing time to develop patient education materials that cannot be used by all patients. Thus, it is critical to determine the
readability of patient education materials. Ideally, this analysis will occur during the development of new education materials; however, it can also be done retrospectively for existing materials. If the grade level is found to be too high, then steps can be taken to simplify the material.

The concept of readability is not new, and can be described as the “characteristics of written material that make that material ‘easy’ or ‘difficult’ to read” (Kahn & Pannbacker, 2000, p. 3). Readability can be determined by a number of different formulas, most of which use sentence length and word length as primary factors.

Readability should not be confused with comprehension or understanding. The latter terms imply that the reader has internalized the material, and are measured by testing or application exercises (Kahn & Pannbacker, 2000).

There are over 40 different formulas used to determine readability (Winslow, 2001). One of the most common and easiest to use is the SMOG formula. This formula was developed by McLaughlin (1969), and has been used for more than 30 years.

The process for using the SMOG formula is described in Table 1.

Determining the readability of a document that is stored electronically is even simpler. Most word processing programs have a built-in feature that will automatically calculate the readability for you (see Table 2).

### Strategies for Simplifying Reading Levels

The goal is to have patient education materials on a fifth or sixth-grade reading level. Patients with good reading skills are unlikely to be insulted when presented with a brochure that is easy to read. In fact, adults generally prefer material that is easy to read over material that is challenging to read (Doak et al., 1996).

There are two aspects to consider when simplifying any document: *design* and *writing*. *Design* refers to the visual elements of the brochure. The goal is to create something that is visually appealing, uncluttered, and easy to follow. Well-designed documents have:

- Important elements and key points highlighted with visual cues such as italics, bold face, and boxes;
- A limited number of fonts;
- All type in at least 14-point font size;
- Lists that are bulleted so they are easy to follow;
- Critical information placed prominently and repeated more than once;
- Graphics and pictures to augment the text and help to explain difficult concepts; and
- A lot of white space on the page.

Table 3 highlights strategies to use in the design of patient education materials.

*Writing* refers to the words that make up the text, as well as the sentence structure and the style in which the text is written. Generally, words that are more than three syllables long increase the difficulty of the word to be read and understood. Many medical, nursing, and dialysis-specific words contain more than three syllables, which contributes to these materials being difficult to read. Table 4 presents words that are commonly used in dialysis patient education materials and offers simpler words that can be substituted instead.

In addition to decreasing the number of words that contain more than
three syllables, the length of sentences should be no more than 10 to 15 words long. The longer a sentence is, the more difficult it is to comprehend. Commas and semicolons can easily be replaced with periods to divide one long sentence into several short sentences. Finally, writing in the active voice is easier to read and mimics conversational English. Table 5 summarizes strategies to improve readability by altering writing.

**Using the strategies.** Several strategies have been reviewed for improving the readability of patient education materials. The following example will demonstrate how these strategies can be applied to improve the readability. Table 6 shows a paragraph with an example of two complex sentences from a brochure on hyperphosphatemia. By applying the strategies discussed, the paragraph is simplified into four sentences that are easier to read.

The difficult paragraph is written on a 12th-grade reading level. To improve readability, several words that had more than three syllables were replaced with shorter words. The long sentences were divided into several shorter sentences, and everything was written in the active voice. Phosphorus was consistently referred to as “phosphate” throughout the paragraph. These simple maneuvers produced a paragraph written on the fifth-grade reading level.

Although this reading level is appropriate for most patients, it is important to remember that even if patients can read the material they may not be able to understand the concept. In this example, a picture illustrating the action of phosphate-binders would help patients understand this concept more than words alone.

### Writing and Designing New Materials

The same strategies that can be used to simplify existing documents can also be used when creating new patient education materials from scratch. Designing new patient education materials provides the opportunity to create something truly meaningful for patients. In addition, the education can be tailored to the specifics of individual dialysis clinics or transplant units. For example, if a certain medication used in treating hyperphosphatemia is not routinely prescribed in a clinic, then it should not be included in that clinic’s brochure. A guiding rule is to try to tell patients what they need to know, not what is nice to know (Brownson, 1998).

Patient education materials—unlike verbal instructions—serve as a permanent record of the instructions given to a patient. Therefore, they should be accurate and include only treatments that are accepted in common practice. For example, suppose a dialysis clinic surveyed its home peritoneal dialysis patients and found that none of its patients actually washed their hands or wore masks when performing exchanges. Because they have not experienced unusually high rates of peritonitis, the clinic concludes that handwashing and wearing masks is optional and then states this in their new home training manual. Later, a patient who follows these written instructions gets peritonitis, transitions to hemodialysis, and dies of complications. It would be difficult to legally justify telling home patients they did not need to wash their hands or wear masks during exchanges, and the written training manual would serve as strong evidence in court. Although this scenario is fictional, it serves as a reminder about the potential liability of written materials. To address this, some clinics require a disclaimer to be added to all educational materials given to patients. You can consult the risk management department if you need some clinics require a disclaimer to be added to all educational materials given to patients. You can consult the risk management department if you are unaware of your clinic’s policy.

When designing patient education materials, it is advisable to leave blank spaces for patients to personalize the material with information like their individual lab values, medication dosages, blood pressure readings, dry weights, etc. In the hyperphosphatemia brochure example, a space could be added to write in the patient’s current dose of phosphate-binding medications. A chart could also be constructed with the dates and phosphorus levels to help patients track their progress. Personalizing the infor-

### Table 3

**Improving Readability: Design Strategies**

- Use **bold** or **italics** to emphasize key points
- Use black letters on white paper for clarity
- Use at least 12-point font size.
  - One study found that patients prefer 14-point Arial type
- Avoid using many fonts, as it is distracting to the reader.
- Use picture or drawings to illustrate concepts or procedures
  - Keep them simple. Pictures from textbooks or journals are too complex.
  - Do not use pictures that demonstrate the wrong behavior.
- Do not use all caps—IT IS DIFFICULT TO READ.
- Justify the text to the left margin and leave the right side ragged.
- Leave a lot of white space on the page.
  - The goal is for the handout to look uncluttered.
- Use interactive elements to encourage patients to use the material.
  - Examples include charts for lab values, blood pressure monitoring, dry weights, medication dosages, and so on.
  - Have patients fill in the blanks as you discuss the material with them.
    - Example: An alternative to eating ice cream is to eat ______________.
  - Bullets (like in this table) help the reader follow the information.

**Note:** This table is summarized from the following references: Brownson (1998); D’Alessandro et al. (2001); Eyles, Skelly, & Schmuck (2003); Horner et al. (2000); Winslow (2001).
Table 4  
**Improving Readability: Simplifying Complex Words**

<table>
<thead>
<tr>
<th>Replace this word</th>
<th>With this word or phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer</td>
<td>Give</td>
</tr>
<tr>
<td>Anemia</td>
<td>Low blood count</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>Receive blood</td>
</tr>
<tr>
<td>Catheter</td>
<td>Tube</td>
</tr>
<tr>
<td>Contaminated</td>
<td>Dirty</td>
</tr>
<tr>
<td>Determine</td>
<td>Find out</td>
</tr>
<tr>
<td>Diabetes</td>
<td>High blood sugar</td>
</tr>
<tr>
<td>Dialyze, dialysis</td>
<td>Remove fluid and waste</td>
</tr>
<tr>
<td>Discontinue, terminate</td>
<td>Stop</td>
</tr>
<tr>
<td>Difficulties</td>
<td>Problems</td>
</tr>
<tr>
<td>Document</td>
<td>Record, write down</td>
</tr>
<tr>
<td>Edema</td>
<td>Swelling</td>
</tr>
<tr>
<td>Effluent</td>
<td>Drain fluid</td>
</tr>
<tr>
<td>Erythropoietin</td>
<td>Epo</td>
</tr>
<tr>
<td>Experience</td>
<td>Have</td>
</tr>
<tr>
<td>Hypertension</td>
<td>High blood pressure</td>
</tr>
<tr>
<td>Indicate</td>
<td>Show</td>
</tr>
<tr>
<td>Injection</td>
<td>Shot</td>
</tr>
<tr>
<td>Intravenous</td>
<td>In a vein</td>
</tr>
<tr>
<td>Notify</td>
<td>Call</td>
</tr>
<tr>
<td>Obtain</td>
<td>Collect</td>
</tr>
<tr>
<td>Ointment</td>
<td>Cream</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Phosphate</td>
</tr>
<tr>
<td>Physician</td>
<td>Doctor</td>
</tr>
<tr>
<td>Procedure</td>
<td>Task, skill</td>
</tr>
<tr>
<td>Sodium</td>
<td>Salt</td>
</tr>
<tr>
<td>Subcutaneous</td>
<td>Under your skin</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>Problem solving</td>
</tr>
<tr>
<td>Ultrafiltrate</td>
<td>Remove fluid</td>
</tr>
<tr>
<td>Utilize</td>
<td>Use</td>
</tr>
<tr>
<td>Venipuncture</td>
<td>Draw blood</td>
</tr>
</tbody>
</table>

**Note:** Table is summarized from the following references: D’Alessandro et al. (2001); Horner et al. (2000); Winslow (2001).

Table 5  
**Improving Readability: Writing Clearly**

- Be consistent in the words you choose.
  - Example: Don’t refer to “medicines,” then “medications,” then “pills.” Pick a word and use it throughout the material.
- Replace words with more than three syllables with shorter words (see Table 4).
- Sentences should be 10 to 15 words longs.
  - Divide long sentences at commas and semicolons.
- Turn the passive voice into the active voice:
  - Passive voice: Your exchanges should be done every night.
  - Active voice: Do your treatment every night.
- Define words that your patients might not understand.
  - A glossary might be helpful at the end of your document.
- Do not include technical words, statistics, or abbreviations.
- Use the second-person (“you”) instead of the first-person (“I”) or the third-person (“the patient”). It is more personal.
- Use numerals (1, 2) instead of numbers spelled out (one, two).

**Note:** This table is summarized from the following references: Brownson (1998); D’Alessandro et al. (2001); Horner et al. (2000); Winslow (2001).
spoken both Spanish and English, so the new teaching materials were translated into Spanish and lined up side by side with the English version. This allowed readers, many of whom spoke English as a second language, to move back and forth between the English and Spanish text. This maneuver improves readability in this population, because medical words used in the patient’s disease process may be more readily understood in their English form rather than their Spanish form.

The continuing emergence of the World Wide Web has had vast effects on patient education. It is now common practice for patients to search the Internet for medical information. However, this practice may present challenges as well. Hochhauser (2002) states that consumers tend to scan documents on the web, rather than read them word-by-word. This could lead to patients misunderstanding the intended information. In addition, there is evidence that web-based patient education materials are written on higher-than-average reading levels. One study (Grabner, Roller, & Kaebel, 1999) found a sampling of patient education material from the Internet to be written on a 10th-grade reading level. Another study (D’Alessandro, Kingsley, & Johnson-West, 2001) looked specifically at pediatric patient education materials on the Internet, and found those materials to be written on a 12th-grade reading level. Therefore, similar challenges exist in designing and writing patient education materials that will be Web-based.

Finally, we must remember that changing any behavior, such as increasing adherence to taking phosphate-binding medications, is multifactorial. Patients may simply lack the motivation or support to change their behavior, and a handout alone is unlikely to change that fact.

**Conclusion**

Well-designed and appropriately written patient education materials can augment other educational efforts and ultimately improve patient care. Improving readability does not guarantee that patients will understand or use education materials; however, these simple strategies increase the likelihood that the materials will be usable. It is important for nephrology nurses to understand how to create such materials in order to provide patients with chronic kidney disease increased opportunities for understanding their disease process and how they can best adapt to it.

**Table 6**

**Example of Patient Education Materials for Hyperphosphatemia**

<table>
<thead>
<tr>
<th>Difficult (12th-grade reading level):</th>
<th>Easier (Fifth-grade reading level):</th>
</tr>
</thead>
<tbody>
<tr>
<td>The patient should be taking phosphorus-binding medications with every meal or snack, as these drugs prevent absorption of phosphorus from the gastrointestinal tract into the bloodstream. The excess phosphate eventually leaches calcium from the bones, resulting in weakening of the bone structure.</td>
<td>You should take some medicines every time you eat a meal or snack. We call these medicines phosphate binders. The medicines keep the phosphate in your intestine. This helps calcium stay in your bones and keeps your bones strong and healthy.</td>
</tr>
</tbody>
</table>

References


