

# Writing and Designing Readable Patient Education Materials

Michael D. Aldridge

**M**uch 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 function-

---

**Michael D. Aldridge, MSN, RN, CCRN**, is a Nurse Educator in the pediatric intensive care unit at the Children's Hospital of Austin in Austin, Texas. He also serves as the Home Dialysis Coordinator for the Children's Dialysis Clinic of Central Texas in Austin, TX.

---

*Functional illiteracy is a problem often overlooked by nurses. Although the average adult in the United States cannot read above the eighth-grade level, most patient education materials are written on a high-school or college reading level. If patients cannot read educational materials, then there is little hope of them using or understanding the information. Strategies for improving the readability of education materials specific to the needs of nephrology patients are discussed in this article.*

---

ally 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

**Table 1**  
**Using the SMOG Formula**

1. Pick 10 sentences in a row at the beginning, middle, and end of the document (a total of 30 sentences).
2. Count every word in the sentences that has three or more syllables. Read words aloud to determine the number of syllables. Words that repeat count each time they appear. Proper nouns and hyphenated words of more than three syllables count also. Abbreviations are counted as the whole word they represent.
3. Figure the square root of the total number of words with three or more syllables.
4. Add three to the square root. This is the grade-level of the document.  
*Example:* Your 30 sentences have 55 words with three or more syllables.  
The square root of 55 is 7.4.  
Add 3 to 7.4 to get 10.4, which is the grade-level of the document.

**Note:** Adapted from McLaughlin, G.H. (1969). SMOG grading – A new readability formula. *Journal of Reading*, 12, 639-646.

**Table 2**  
**Using Computers to Determine Readability**

- If your document is in Microsoft Word (Microsoft Corporation, 2002), do the following:
1. Click on “tools” “options” “spelling and grammar”
  2. Select the “show readability statistics” box
  3. Click “ok”
  4. When you are finished with your document, select “spelling and grammar.” Word will complete its spelling and grammar checks, and then present the readability statistics for your document.

Nearly all word-processing programs will produce readability statistics. If you use another word processing program, instructions can usually be found by searching for “readability” in the Help menu.

**Note:** Instructions adapted from *Microsoft Word for Windows 2002* [Computer software]. (2002). Redmond, WA: Microsoft Corporation.

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

**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.
- Use headings and subheadings to divide the text.
- 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).

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 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 4**  
**Improving Readability: Simplifying Complex Words**

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

**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 long.
  - ❑ 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).

mation might encourage patients to actively use the brochure.

Finally, remember to do a pilot test on patient education material before printing hundreds of copies. Ask other nurses and physicians to read it for content and accuracy. Most importantly, ask for feedback from patients who will be using the material (Brownson, 1998). Find out whether they understand what you are trying to communicate, and ask them if they would use the brochure. Patients often have good insight into the very problems we are trying to address, and the changes you make from a pilot test can make your future educational efforts much more effective.

### Limitations of Printed Materials

The strategies described will help improve the readability of written patient education materials. However, we should not be under the illusion that making materials more readable will address all of the patient education challenges. As mentioned before, readability does not equal comprehension, and we cannot rely on written materials alone to educate patients.

Brownson (1998) argues that many patients simply disregard educational handouts. This is probably more common in patients who are functionally illiterate, as the utility of the handout is less in this group. In fact, many of these patients rely on television, family members, and friends as a resource for health information (Brownson, 1998). Educational efforts could be enhanced by targeting these sources of information as well.

Educational materials should also be mindful of the cultural needs of particular groups. Clinics with large populations of Hispanic or Asian patients, for example, should examine their educational handouts. Do the materials need to be translated into another language? Are there cultural references that should be included or excluded?

Horner, Surratt, and Juliusson (2000) describe the process of revising teaching materials for children with asthma. The patients and families

**Table 6**  
**Example of Patient Education Materials for Hyperphosphatemia**

**Difficult (12th-grade reading level):**

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.

**Easier (Fifth-grade reading level):**

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.

spoke 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 (Graber, Roller, & Kaeble, 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 useable. 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.

**References**

Brownson, K. (1998). Educational handouts: Are we wasting our time? *Journal for Nurses in Staff Development*, 14, 176-182.

D'Alessandro, D.M., Kingsley, P., & Johnson-West, J. (2001). The readability of pediatric patient education materials on the World Wide Web. *Archives of Pediatric Adolescent Medicine*, 155, 807-812.

Doak, C.C., Doak, L.G., & Root, J.H. (1996). *Teaching patients with low literacy skills*. Philadelphia: Lippincott Publishers.

Eyles, P., Skelly, J., & Schmuck, M.L. (2003). Evaluating patient choice of

typeface style and font size for written health information in an outpatient setting. *Clinical Effectiveness in Nursing*, 7, 94-98.

Graber, M.A., Roller, C.M., & Kaeble, B. (1999). Readability levels of patient education materials on the World Wide Web. *Journal of Family Practice*, 48, 58-61.

Hochhauser, M. (2003). *Readability of HIPAA privacy notices*. Retrieved March 6, 2004, from <http://www.benefitslink.com/articles/hipaareadability.pdf>

Hochhauser, M. (2002). Patient education and the Web: What you see on the computer screen isn't always what you get in print. *Patient Care Management*, 17(11), 10-12.

Horner, S.D., Surratt, D., & Juliusson, S. (2000). Improving readability of patient education materials. *Journal of Community Health Nursing*, 17, 15-23.

Institute of Medicine. (2004). *IOM report calls for national effort to improve health literacy*. Retrieved April 16, 2004 from <http://www4.nationalacademies.org/news>

Institute of Medicine. (2003). *Officials should target 20 key areas to transform health care system*. Retrieved March 18, 2004 from <http://www4.nationalacademies.org>

Kahn, A., & Pannbacker, M. (2000). Readability of educational materials for clients with cleft lip/palate and their families. *American Journal of Speech-Language Pathology*, 9, 3-9.

McLaughlin, G.H. (1969). SMOG grading - a new readability formula. *Journal of Reading*, 12, 639-646.

Microsoft Word for Windows 2002 [Computer software]. (2002). Redmond, WA: Microsoft Corporation.

Monsivais, D., & Reynolds, A. (2003). Developing and evaluating patient education materials. *The Journal of Continuing Education in Nursing*, 34, 172-176.

Quirk, P.A. (2000). Screening for literacy and readability: Implications for the advanced practice nurse. *Clinical Nurse Specialist*, 14, 26-32.

Smith, L.S. (2003). Help! My patient's illiterate. *Nursing* 2003, 33(11), 32hn6-32hn8.

U.S. Congress, Office of Technology Assessment. (1993). *Adult literacy and new technologies: Tools for a lifetime (OTA-SET-550)*. Washington, DC: U.S. Government Printing Office.

Winslow, E.H. (2001). Patient education materials. *American Journal of Nursing*, 101(10), 33-37.