

# Plain Language in Healthcare: A Psycholinguistic Approach

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## Abstract

In healthcare, small misunderstandings can have serious consequences. A patient who leaves the hospital unsure how to follow discharge instructions may skip treatment, take medication incorrectly, or avoid activity out of fear. Many plain language initiatives try to solve this problem by shortening sentences or swapping out technical words, but these surface fixes only go so far. This paper looks at plain language through the lens of psycholinguistics, focusing on how readers process, remember, and act on information. By considering cognitive load, sentence structure, and working memory, health materials can be written in a way that patients are more likely to understand and use. Making communication clearer does more than prevent mistakes; it also helps ensure that people with limited literacy or English proficiency have a fair chance at safe and effective care.

## Introduction: Why language matters in healthcare

Imagine a patient being handed a hospital discharge sheet that says, "Resume activities as tolerated." He stares at the page, unsure if that means he can climb stairs, lift groceries, or drive his car. Without clarity, he risks either overexerting himself and getting injured or avoiding activity entirely and delaying recovery. Scenarios like this play out in hospitals and clinics every day, showing how unclear medical communication can lead to poor health outcomes.

Clear communication is crucial in healthcare, where even small misunderstandings can have life-threatening consequences. Consent forms, discharge instructions, and medication labels often contain technical language, complex syntax, or unexplained abbreviations that confuse patients. When people cannot fully understand their care instructions, they may skip treatments, misuse medication, or fail to recognize dangerous symptoms. Using plain language in healthcare is not just helpful; it is an ethical responsibility.

It is also essential that patients can remember

and use the information they receive. Even if someone reads and understands a complex medical text, the knowledge is useless if they cannot recall or apply it when needed. Studies show that plain language in instructions improves recall, suggesting that patients are more likely to follow medical recommendations and achieve better outcomes when information is clear (Kessels).

Over the past decade, the PLAIN movement, a global campaign for clear communication, has gained traction in healthcare. A growing body of evidence shows that “a well-executed plain language approach can improve consumer understanding of health and medical information, save time and money, and improve consumer satisfaction” (Stableford & Mettger 9). These improvements in communication benefit both clinicians and patients in many ways, but most current strategies still focus on surface-level tools such as readability formulas and shorter sentences. These strategies often fail to account for how people actually process language. A psycholinguistic approach, which considers how the brain understands, stores, and retrieves information, offers a deeper and more effective way to improve clarity. By addressing cognitive load and language structure, it can enhance patients’ comprehension of medical information and advance health equity, particularly for individuals with low literacy, learning differences, or limited language skills.

#### **What plain language looks like in healthcare**

#### **today**

Acknowledging its importance, medical fields are increasingly trying to adopt plain language in an effort to improve communication between clinicians and patients. The healthcare industry is fighting a constant battle with poor communication. According to several studies, the “reading levels...of the materials used in healthcare settings...exceed the reading abilities of the average adult” (Rudd et al, 7). The health sciences library of the University of North Carolina at Chapel Hill claims that a text is written in plain language if a reader can 1) find what they are looking for 2) understand what they find the first time they read or hear it 3) use what they find to meet their needs (“North Carolina Health Literacy: Creating Patient Education Materials”).

Currently, applications of plain language in healthcare settings mostly target patient handouts and educational materials. In this case, “using plain language” usually refers to translating complex jargon into more digestible terms and using the active voice. For instance, “smoking cessation” can be translated into “stop smoking,” and “tests may be needed to find out what’s wrong” can be translated into “you may need a test to find out what’s wrong.” The general idea is that using simpler terms and using the active voice communicates information in a clearer manner and better induces people to take action. The official plain language checklist offered by the Government of British Columbia, for example, puts an

emphasis on using simple terms and making the text as concise as possible ("Plain language checklist").

This approach is fairly intuitive. Replacing complex jargon with simpler alternatives allows the information to be understood by a wider range of audiences. The active voice is clearer and direct than the passive voice, which makes it a more appropriate choice for patient handouts and educational materials (Inzunza 2).

Readability formulas are valuable tools that can help healthcare professionals gauge whether a text is too complex or not. The Flesch-Kincaid Readability Tests are a set of readability formulas that examine the average sentence length and the average word length (i.e., syllables). The Flesch-Kincaid Readability Tests provide quantitative scores that can be used to identify areas where there are overly long sentences and complex vocabulary.

Another commonly used readability formula is the SMOG readability formula, which looks into the estimated number of years of education needed to understand a particular text. In contrast to the Flesch-Kincaid Readability Tests, the SMOG readability formula specifically examines the number of polysyllabic words (words with more than three syllables).

However, it should be noted that these readability formulas are not without their limitations. Looking out for long sentences and complex vocabulary is an oversimplification of

plain language. According to research by Geyer and Carey, artificially shortening long sentences and replacing complex words with less complex words does not improve the comprehensibility of the text in any regard (Campbell 3). Short sentences that are poorly written can be difficult to understand, and long sentences that are well written can be easy to understand. Simply judging a sentence by its length would be like judging a book by its cover. All in all, while readability formulas can be used as valuable guides, human review is always necessary to ensure that a text is truly clear and understandable.

Contrary to readability formulas that only focus on surface-level features such as sentence length, the psycholinguistics approach to plain language takes into account the cognitive processes that underlie reading. In other words, compared to readability formulas, psycholinguistics can better tell us whether readers can really comprehend and understand a text.

### **What psycholinguistics offers: A cognitive view on clarity**

Psycholinguistics studies how readers parse sentences, access word meaning, and integrate ideas in real time (Pinker 2014). It is often obvious to a skilled writer that some sentences are clearer than others. What is less clear is the why. Psycholinguistics helps answer this question, using cognitive and linguistic research on language processing. Psycholinguistics

approaches 'plain language' as a subject to be studied scientifically rather than an elusive mystery.

The main advantage of viewing plain language through the lens of psycholinguistics is the generalizability of findings. According to psycholinguistics, most readers share a common set of characteristics, meaning that psycholinguistics can help us create generalizable guidelines that work for most individuals. For instance, "knowing that an alphabetic reader's eyes can extract linguistic information up to 5-6 characters on the left and 10-12 characters on the right of the point of a single fixation" can enable us to understand how all readers process a written text, which can - in turn - provide insight into what makes a text clear and easy to understand (Rastelli 2).

In contrast to readability formulas that merely look at sentence length and word length, psycholinguistics examines the mechanics of sentence construction.

A sentence's syntactic structure can have a vast influence on its comprehensibility. For example, garden path sentences, while grammatically correct, lend themselves to incorrect interpretations due to their unusual syntax. The sentence "the horse raced past the barn fell" is difficult to understand because the word "raced" is initially interpreted as the main verb, even though it is being used as a past participle.

Garden path sentences are difficult to parse

because they play with readers' expectations. The sentence "time flies like an arrow; fruit flies like a banana" is difficult to parse because, after reading the first sentence, readers hastily presume that "fruit" is a noun, "flies" is a verb, and "like" is a preposition, which eventually leads them astray.

The findings from psycholinguistics recommend using complementizers such as "that" and "which" and using appropriate punctuation to clarify syntactic structure. Most importantly, writers should be mindful of readers' expectations, knowing that readers make assumptions while interpreting a sentence. For example, it is somewhat easy for a writer to realize that a sentence like "time flies like an arrow; fruit flies like a banana" can sow confusion in the reader's mind.

Another important factor to consider is the reader's working memory. Working memory is intricately tied to reading, since readers have to remember and integrate information in order to comprehend long passages. A key problem to note is that our working memory has limited capacity; according to research on cognitive science, our average working memory can only store three to five items (Cowan). Being aware of readers' limited working memory can help writers write in a clear, comprehensible manner.

For example, writers can benefit from knowing the difference between left-branching sentences and right-branching sentences. Left-branching sentences are sentences that include additional

information, such as modifiers or subordinate clauses, before the main subject and verb. Conversely, right-branching sentences are sentences that include additional information after the main subject and verb.

Right-branching sentences are easier to comprehend than left-branching sentences, since left-branching sentences require readers to retain information before encountering the main subject and verb. The sentence "Bob called a locksmith because he left his key in the car" is, for example, easier to understand than "Because he left his key in the car, Bob called a locksmith," since the latter sentence requires readers to hold information in their working memory before reading the main idea.

Additionally, readers of the English language typically expect to follow a subject-verb-object order and a logical flow of ideas (Hahn and Xu). It is often confusing for readers if writers violate these expectations by, say, separating the subject and the verb using lengthy modifiers. The simple subject-verb-object order - although not always 'correct' stylistically - enables readers to easily recognize "who did what to whom," which is especially helpful for readers of the English language, since English lacks clear case markings. Indeed, long sentences are typically difficult to comprehend, not because of their length but because of their complex syntax. This is perhaps what differentiates the psycholinguistics approach from traditional readability formulas. Traditional readability formulas are grounded in the idea that long

sentences make prose difficult to understand, but the psycholinguistics approach more flexibly acknowledges that long sentences can be acceptable if they follow a good structure.

Lastly, when writing longer passages, writers have to also consider the overall structure of the text. It does not matter that the individual sentences are well written if the passage as a whole is incomprehensible.

First, to help readers understand a large chunk of text, writers can utilize what is known as 'breaks'. Steven Pinker describes breaks as visual bookmarks that allow "the reader to pause, take a breather, assimilate what he has read, and then find his place again on the page." Breaks are useful because humans have short attention spans. Research estimates that an average human being has an attention span of 8.25 seconds ("Average Human Attention Span Statistics & Facts [2024]"). Accordingly, it is important that writers occasionally include breaks so that readers can rest their eyes and take a break.

Psycholinguistics research recommends introducing the topic at the beginning of the text. The Bransford & Johnson experiment, though seemingly relevant to writing, effectively illustrates why writers should reveal their point as soon as possible. The researchers told the participants to read and remember an obscure passage. There was a total of three conditions in the Bransford & Johnson experiment: a group that was only given the obscure passage, a group

that was given the topic before reading the obscure passage, and a group that was given the topic after reading the obscure passage. The researchers in the experiment found that the group that was given the topic before reading the obscure passage had almost double the level of recall.

The findings of this experiment demonstrate that knowing the topic before reading a text can help readers comprehend and remember the text (Bransford & Johnson, 7). If the readers know what the writer is talking about from the start, they can interpret the passage using a very clear mental framework. Though some writers may fear that revealing the topic too quickly can ruin suspense, writers who are aiming to write in plain language should strive to introduce their point in the very beginning.

Compared to traditional methods, the psycholinguistics approach offers a more effective way to improve communication. Health communicators should be mindful of the points discussed above to make their writing clearer and direct.

### **Why these matters: Health equity and real-world impact**

Plain language is not just about improving our safety - it is an essential step towards equity. Using plain language in the medical sector is important because it ensures that everyone can have access to essential information, regardless of their background or language proficiency.

In fact, not using plain language in the medical arena marginalizes certain segments of the population, such as "immigrants, seniors, individuals with limited literacy, [and] those with mental or physical disabilities" (Shohet & Renaud 2). These disadvantaged groups especially struggle to comprehend texts with complex syntax and uncommon words, making them the core victims of unclear writing.

In the United States, around 26 million people have limited English proficiency (Gonzalez-Barrera et al.). People with limited English proficiency typically report poorer health status than their counterparts, possibly because they struggle to gain access to the healthcare they need. According to one study, "more than a quarter of the patients who needed—but did not get—an interpreter reported they did not understand their medication instructions" (Yudelma). Furthermore, people with limited English proficiency are almost three times more likely to be uninsured than those who are proficient in English, showing how language barriers can exclude certain segments of the population from healthcare services. Indeed, research claims that low health literacy is often associated with "a lack of preventative care" and "an inability to receive timely" treatments (Kim et al.).

Additionally, unclear health instructions can lead to higher chances of rehospitalization, which means that they can be especially detrimental to economically disadvantaged groups who cannot afford to be readmitted to

hospitals.

Currently, in the United States, healthcare organizations are required to provide language assistance to those who are not proficient in English to ensure that they are not left out. In 2000, President Bill Clinton signed Executive Order 13166, which directed federal agencies and recipients of federal funds to improve language services for individuals with limited English proficiency. Plus, several strategies for improving language services have been suggested, including "increasing recruitment of students, residents, and physicians from diverse backgrounds and promoting high-quality medical language courses" (Ramirez et al.).

Studies suggest that language concordance between the provider and patient can lead to improved health outcomes for individuals who have limited English proficiency (Ramirez et al.). Furthermore, research indicates that providing language services to individuals with LEP is often associated with reduced readmission rates ("Reducing Barriers, Improving Outcomes").

A problem in the health industry is that it is difficult to identify those who have health literacy needs. According to research, patients who have health literacy needs can often pass screening questions and maintain undiscovered (Batterham et al.). Furthermore, patients might be reluctant to reveal that they have health literacy needs in the first place due to fears of being stigmatized.

Furthermore, there are also doubts that the language services provided by health institutions are of low quality. Indeed, research shows that one in five interpreters at a large health institution lacks the skills to fully fulfill their role (Moreno et al.). Additionally, in an interview, patients expressed concerns that "their messages were not communicated properly to the healthcare providers during translation" (Pandey et al.).

Some health providers who have language services at their disposal choose not to use professional language services because they undervalue the importance of clear communication or because they do not know how to use interpreters (Ramirez et al.).

Professionals working in the health industry should continue to adopt plain language practices to ensure that disadvantaged groups can also get access to the healthcare they deserve. As discussed above, improving plain language strategies is important because not doing so will result in inequity. While plain language alone does not provide enough support for individuals with Limited English Proficiency, it surely helps them to get access to the information that they need. When plain language is informed by psycholinguistic principles that account for how people process language, these practices become even more powerful tools for reducing health disparities.

### **Examples and early applications**

Several efforts have been made to implement

plain language in the medical and public sectors. The ensuing section will attempt to analyze the examples and early applications of plain language from a psycholinguistics perspective. Some examples come from the public sector rather than healthcare, but they are included because they illustrate techniques that can be applied to medical materials such as consent forms and discharge instructions.

The first example is from LanguageLoop, Australia's language services provider. LanguageLoop worked with the Early Learning Division of the Department of Education to convert a convoluted letter into plain language. The Senior Project Officer in the Early Learning Division of the Department of Education and Training provided positive comments about LanguageLoop's work, remarking that LanguageLoop made the letter much easier to understand ("A case study on writing clearly for translation"). Though this text is not related to the medical sector, it provides useful insight into how plain language can be applied in real life.

The original version of the letter is difficult to understand because it includes left-branching sentences. The sentence "To help keep your children and your family safe, your childcare or kindergarten service will continue these important health and safety activities" is difficult for readers to comprehend because it requires them to hold information in their working memory before encountering the main subject and verb. The edited version of the

sentence "Your child care or kindergarten will help keep your children and your family safe by" reduces the reader's cognitive load, since it immediately enables the reader to identify the main subject and verb.

The second example is from the European Union's publication *From Institutions to Community*. Though this text is not from the medical sector, it still provides us with valuable insight into how plain language can be applied in real life.

Most, if not all, sentences used in this guide are right-branching, introducing the main subject and verb in the beginning without using any confusing modifiers. This aligns with the notion that right-branching sentences are relatively easier to comprehend compared to left-branching sentences. It is also noteworthy that the subject and verb are placed close to each other, possibly to ensure that the syntax is easy to parse. The only parenthetical statement in the text ("including the guide") is short, meaning that it does not significantly confuse readers who are unconsciously searching for the S-V-O order.

The last example is from the Plain Language Action and Information Network (PLAIN). PLAIN aims to promote plain language in the public sector, believing that citizens deserve clear communication from the government. The example that I chose is from a section titled "Ambiguous Wording Rewritten" ("Ambiguous Wording Rewritten").



The original sentence "This rule proposes the Spring/Summer subsistence harvest regulations in Alaska for migratory birds that expire on August 31, 2003" is confusing because the syntax is difficult to parse. Specifically, this sentence is difficult to comprehend because it is not immediately clear to the reader that the phrase "that expire on August 31, 2003" modifies "regulations."

The new sentence "This rule proposes the Spring/Summer subsistence harvest regulations for migratory birds in Alaska. The regulations will expire on August 31, 2003" fixes this sentence by dividing the sentence into two separate sentences. This version is easier to comprehend compared to the previous version because it makes it clear that it is the "regulations" that "will expire on August 31, 2003."

In this section, I have analyzed several examples and early applications of plain language in the medical sector. The examples that I have selected are all from credible sources, meaning that they provide valuable insight into our discussion. I have observed that successful examples of plain language apply psycholinguistic principles, either deliberately or unintentionally. They also demonstrate how similar techniques, such as reducing cognitive load and clarifying syntax, can improve medical materials like consent forms and discharge instructions, ultimately supporting clearer communication in healthcare.

## **Challenges and opportunities for broader application**

A potential challenge for broader application is that health communicators typically do not receive training on communicating in plain language (Warde et al.). Without official training or education, health officials and clinicians can struggle to write in a clear, direct manner, even if they acknowledge the importance of plain language.

Furthermore, systematic change in general is difficult to achieve in the health sector due to organizational inertia. Research indicates that health professionals are typically resistant to change, which means that implementation of plain language will likely be a long and arduous process (Mareš).

On the other hand, a promising sign is that more and more health organizations are actively launching plain language initiatives, recognizing the need for clear communication. On June 30th, 2025, ISPOR announced that it will initiate a program that makes health research more accessible to the general public. The CEO and Executive Director of ISPOR mentioned that while health research provides valuable insight, most of the research is plagued by technical language that makes it difficult for patients and families to understand ("ISPOR Takes Health Research Mainstream With Plain Language Summaries"). Broader adoption of plain language in these initiatives would not only improve general comprehension but also

help reduce disparities for populations with low literacy or limited English proficiency.

A computation tool called the CohMetrix can play an important role in the implementation of plain language. As aforementioned, readability formulas are valuable tools that enable readers to gauge the comprehensibility of a text. However, unlike traditional readability formulas that only focus on surface-level features, the CohMetrix more accurately takes into account the psycholinguistic principles that we have discussed in the previous section. Specifically, the CohMetrix examines in-depth features such as syntactic complexity and cohesion (how well the points are connected).

According to studies, the CohMetrix outperforms traditional readability formulas in terms of classifying a text based on its difficulty, lending support to the claim that CohMetrix can be a suitable replacement for traditional readability formulas (Crossley 1). All in all, it seems that health professionals can significantly benefit from using the CohMetrix to make their writing clearer and understandable.

The government could provide funding to train health communicators in using advanced readability tools such as the CohMetrix. This will prompt more health professionals to use the CohMetrix and ultimately improve the quality of communication in the health industry.

Moreover, the government could also support the research surrounding the CohMetrix to continuously improve its accuracy and

precision. Supporting the development of the CohMetrix will equip researchers with a better tool and ultimately enable them to improve the comprehensibility of their writing.

## **Conclusion**

Low health literacy is a significant problem in the health industry, where slight misunderstandings can lead to detrimental health outcomes. Currently, more and more professionals in the medical sector are striving to adopt plain language practices, recognizing the urgent need for improved communication.

However, current plain language guidelines are not sufficient, as they only give rudimentary advice, such as using the active voice. Plus, readability formulas that are widely used today only focus on surface-level features (i.e., sentence length and word length) that are just tangentially connected to comprehensibility.

The psycholinguistic approach to plain language, which directly takes into account the cognitive mechanisms that underlie the process of reading, offers a more effective, generalizable method to write in plain language. Grounded in empirical and objective data, research on psycholinguistics gives insight into the characteristics of a text that make it difficult to understand.

Improving and fine-tuning plain language in the health sector is so important because it is an essential step to achieve equity. Indeed, complex language in the health industry can be especially

detrimental to minority populations, such as immigrants and individuals with cognitive disabilities. Improving plain language creates a more inclusive environment that ensures that everyone can receive the health care that they deserve. When plain language is informed by psycholinguistic principles, it becomes an even stronger tool for helping these vulnerable populations.

The CohMetrix, a readability tool that aligns with the psycholinguistics approach, can play an important role in the broader application of plain language; according to studies, the CohMetrix outperforms traditional readability formulas in gauging the difficulty of a text. Most importantly, government-level intervention is needed to ensure that plain language can be implemented in a systematic manner.

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