Chapter e2: Health Literacy and Medication Use

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KEY CONCEPTS

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1. Limited health literacy is common and must be considered when providing medication management services.
2. Some groups of people are at higher risk for having limited literacy skills, but in general, you cannot tell by looking.
3. Patients with limited health literacy are more likely to misunderstand medication instructions and have difficulty demonstrating the correct dosing regimen.
4. Limited health literacy is associated with increased healthcare costs and worse health outcomes, including increased mortality.
5. Despite numerous efforts to improve safe medication practices, current strategies have been inadequate, and this may have a larger impact in patients with limited literacy.
6. Most printed materials are written at higher comprehension levels than most adults can read.
7. The United States Pharmacopeia has set new standards for prescription medication labeling to minimize patient confusion.
8. Several instruments exist to measure health literacy, but some experts advocate "universal precautions" under which all patients are assumed to benefit from plain language and clear communication.
9. Obtaining a complete medication history and providing medication counseling are vital components in the medication management of patients with limited health literacy.

BEYOND THE BOOK

BEYOND THE BOOK

Watch the YouTube video, "Health and the City" available online (https://youtu.be/ux6c3wYzRJM), and the TEDx Talk, "Are You Confused About Health Information? You're Not Alone" (https://www.youtube.com/watch?v=-x6DLqtaK2g).

Another exercise is useful for translating the material in this chapter to your local area. Working in small groups, make a list of the challenges in health literacy common in the geographic area your educational institution serves. Use resources such as census.gov and cdc.gov to explore the languages spoken in your area, the racial/ethnic background of residents, and cultural practices that can affect patient adherence to medication-related advice and counseling.

INTRODUCTION

Every day, thousands of patients are not taking their medications correctly. Some take too much. Others take too little. Some use a tablespoon instead of a teaspoon. Parents pour an oral antibiotic suspension in their child's ear instead of giving it by mouth because it was prescribed for an ear infection. Others are in the emergency department because they did not know how to use their asthma inhaler. It is not a deliberate revolt against the doctor's orders but rather a likely and an unfortunate result of a hidden risk factor—limited health literacy.

1 *Literacy*, at the basic level, is simply the ability to read and write. When these skills are applied to a health context, it is called *health literacy*, but health literacy is more than just reading and writing. The definition of health literacy has evolved from that of the Institute of Medicine in 2004 as some have questioned its meaning and point out the lack of consensus on what it represents.[1] To update and address health literacy in Healthy People 2030, Santana and colleagues provide the following definitions that address both personal and organizational health literacy. Among other key points, they incorporate a public health perspective and acknowledge that organizations have a responsibility to address health literacy as well.[2]

- **Personal health literacy** is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.
- **Organizational health literacy** is the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

While some have provided a rigorous definition for medication literacy,[3] we propose that ***medication literacy*** *is simply, the degree to which individuals have the ability to make informed decisions that lead to safe and effective medication use.*

Regardless of the definition, a growing body of evidence associates low health literacy with less understanding, worse outcomes, and increased cost.[1] These poor outcomes have led this topic to receive national attention by multiple government agencies including the Institute of Medicine (IOM), the National Institutes of Health (NIH), the Network of National Libraries of Medicine (NNLM), the Agency for Healthcare Research and Quality (AHRQ), and Healthy People 2030. In 2010, a National Action Plan to Improve Health literacy (Table e2-1) was developed by the US Department of Health and Human Services (HHS), and it provides a blueprint for efforts to improve health literacy across all sectors involved in health information and services. Using the first three goals, the US Centers for Disease Control and Prevention (CDC) adapted this blueprint to develop the CDC Action Plan to Improve Health Literacy in 2021.[4] Other countries have also included health literacy as a key priority in their policies and the World Health Organization (WHO) recommends health literacy as an instrument for achieving several key targets.[1] Indeed, health literacy should be a priority worldwide for the medical community, as its consequences are far-reaching and cross-cutting.

TABLE e2-1

Goals of the National Action Plan to Improve Health Literacy

Goal 1	Develop and disseminate health and safety information that is: • accurate • accessible • actionable
Goal 2	Promote changes in the healthcare system that improve: • health information • informed decision making • communication • access to health services
Goal 3	Incorporate accurate, standards-based, and developmentally appropriate health and science information and curricula in child care and education through the university level
Goal 4	Support and expand local efforts to provide: • adult education • English language instruction • culturally and linguistically appropriate health information services in the community
Goal 5	Build partnerships, develop guidance, and change policies
Goal 6	Increase basic research and the development, implementation, and evaluation of practices and interventions to improve health literacy
Goal 7	Increase the dissemination and use of evidence-based health literacy practices and interventions

Data from Reference 6.

More than one of every three American adults has difficulty understanding and acting on health information.[5] Patients with limited health literacy have less knowledge about how to manage their disease[1]; they misunderstand dosing instructions and warning labels on medication containers,[6,7] are less likely to read or even look at medication guides,[8] have limited ability for medication management because of limited ability to identify or distinguish their medications from one another,[9,10] and are less able to use a metered-dose inhaler (MDI) properly.[11] Limited health literacy skills have also been documented in caregivers of seniors and in parents of children. There is no question that limited health literacy is associated with adverse health outcomes including an increased mortality rate[12] and increased healthcare costs.[1]

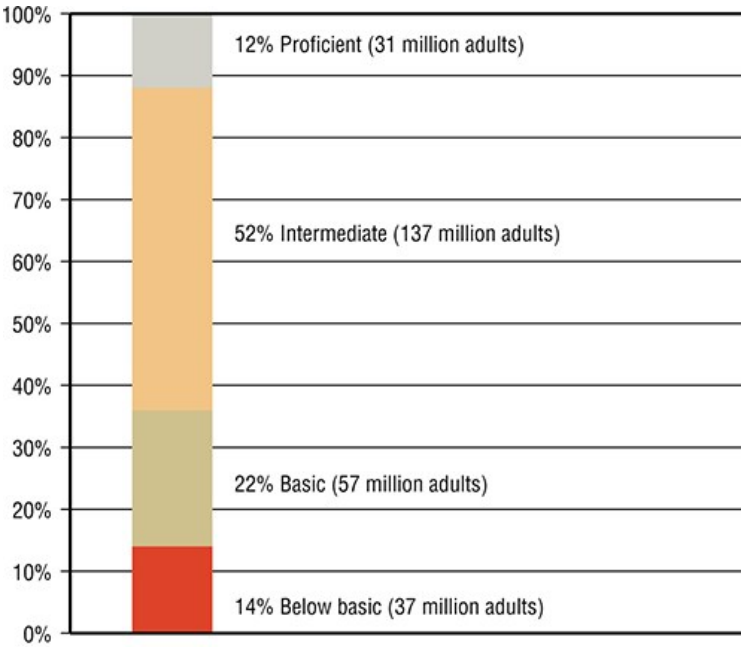
Current strategies for safe medication use have not been effective for the general population and are likely less useful for persons with limited health literacy. All health professionals need to acknowledge that limited health literacy is common and may be a barrier to improving health outcomes in their patients. They need to implement strategies for clear communication in order to enhance appropriate medication management. This chapter will review what is known about health literacy and present the evidence available as it relates to medication use.

PREVALENCE

According to the National Assessment of Adult Literacy (NAAL), 36% of Americans have limited health literacy skills, meaning that out of four levels, they function at the lowest two.[5] The NAAL survey was administered randomly to 19,000 adults (greater than or equal to 16 years of age) across the United States, and final results were reported in four skill levels: below basic, basic, intermediate, and proficient. Fourteen percent of Americans had health literacy skills that were considered below basic, 22% were at the basic level, 52% were at intermediate, and only 12% were considered proficient (Fig. e2-1). The *below basic* level is substantially below that which is necessary to function within the healthcare setting. Individuals in the *basic* level have skills to perform simple everyday literacy activities. They can read, understand, and use information in short and "simple" documents. *Intermediate* literacy levels include skills necessary to perform moderately challenging literacy activities. (Note that the NAAL considered interpreting prescription drug labels an intermediate-level task.) Individuals in the *proficient* level would have the least difficulty navigating the healthcare system. This group can analyze, integrate, and synthesize complex information. Approximately 3% of people surveyed were excluded from the analysis due to language barriers or cognitive disabilities. Thus, if you extrapolate and add this 3% to the 36% of people who measured at the two lowest levels and consider the estimated American population of 2020, approximately 130 million Americans have limited health literacy.[5,13]

FIGURE e2-1

Percentages of Americans aged 15 years or older in health literacy levels. *(Data from Reference 5.)*



Source: Joseph T. DiPiro, Gary C. Yee, Stuart T. Haines, Thomas D. Nolin, Vicki L. Ellingrod, L. Michael Posey: *DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 12e*

GROUPS AT HIGH RISK

It is generally not possible to tell if someone has limited health literacy simply by looking at or talking to them. Many persons with limited health literacy learn to hide it well and many are known to keep this secret to themselves. In one study, two-thirds of persons surveyed (68%) admitted to not telling their spouse about their reading difficulties and more than one-half had not told their children.[14] In a study of internal medicine residents and students, few of them recognized low literacy as a potential factor in patient nonadherence and hospital readmission.[15] It is important to note that health literacy is a context-dependent skill, meaning that people who function well in one environment may still struggle when presented with healthcare tasks. Thus, even people with adequate education levels may find it difficult to navigate the healthcare system due to lack of familiarity with the context. While it is important to remember that people of all ages, nationalities, and income groups are at risk for limited health literacy, there are some groups that are at particularly high risk that should be mentioned (Table e2-2).[5] This information can help assess the potential risk of limited health literacy in the patient population being served.

TABLE e2-2

Groups at High Risk of Limited Health Literacy

Age 65 years or older
Minorities
Spoke another language prior to formal education
Have less than a high school diploma
Live at or below the poverty line
Rate their overall health as poor
Have Medicaid, Medicare, or no insurance

Data from Reference 5.

As the Latino population in the United States continues to increase, this group and those with limited English proficiency (LEP) are at a high risk for limited health literacy and inappropriate medication management as they have lower health literacy scores.[5] Unfortunately, most pharmacies in the United States are not equipped with appropriate translation or interpreter services. In a telephone survey of 764 pharmacies, nearly 57% reported limited or no translation services available.[16] In fact, 45% of pharmacies admit to not being satisfied with their ability to communicate with patients that have LEP. In 2012, the United States Pharmacopeia (USP) set new standards for prescription container labeling and recommends that whenever possible, directions be provided in the patient's preferred language as well as English to minimize the risk of misinterpretation.[17]

Practices that serve Latinos or patients with LEP should be cognizant of their high risk and employ strategies for providing clear communication about appropriate medication management.

Children

What happens when adults with limited literacy become parents? Not surprisingly, a systematic review of the literature concludes that child and parent literacy seem to be associated with important health outcomes. Similar to data found in adults, children with limited literacy had worse health behaviors. These include a decreased ability for the parents and caregivers to safely and effectively use over-the-counter medications. If their parents had limited literacy skills, these children had worse health outcomes such as 50% more emergency department (ED) visits. In children with asthma, limited parental health literacy is associated with a greater incidence of emergency department visits, hospitalizations, missed school days, and greater use of rescue medications.[18] In another study, caregivers with low health literacy were more likely to report the use of a non-standardized dosing instrument.

While interventions in general are lacking, there are more that target improvement in knowledge than outcomes. One intervention using pictograms, brief counseling, and the teach-back method improved the likelihood of parents correctly dosing medicines and adhere to the regimen. Similarly, parents with low health literacy were less likely to make a dosing error with infant acetaminophen after receiving text-plus-pictogram instructions compared to text-only recipients. As in the adult population, effective interventions that improve outcomes and minimize health disparities are needed.

CONSEQUENCES

Table e2-3 provides a comprehensive list of studies to date evaluating health literacy and medication use. In particular, it provides a summary of the studies evaluating the effect of health literacy on medication knowledge and understanding, medication management, and medication adherence. One study evaluated the effect of health literacy on adverse drug events and found no association.[19]

TABLE e2-3

Studies Evaluating Limited Health Literacy and Medication Use

Citation and Literacy Measurement	Results		
	Knowledge		
Williams et al.[20] (TOFHLA)	Decreased understanding of how to take medicines: • Take on empty stomach → 65% incorrect • How many pills to take → 70% incorrect • How many refills left → 42% incorrect		
Davis et al.[6] (REALM)	Decreased understanding of instructions on prescription labels: • Two times more likely to misunderstand		
Davis et al.[7] (REALM)	Increased misinterpretation of drug warning labels: • Three to four times more likely to misinterpret		
Fang et al.[21] (S-TOFHLA)	Decreased understanding of mechanisms and side effects: • Warfarin works by thinning blood → 30% incorrect • Bleeding/bruising most common → 51% side effects incorrect		
Yin et al.[22] (TOFHLA)	Decreased awareness of weight-based dosing among caregivers of children: • 88.6% unaware		
Marks et al.[23] (REALM)	Decreased medication knowledge including name, dose, indication, and side effects: • 80% had medication knowledge score (MKS) below the median		
Mosher et al.[19] (REALM)	Decreased medication knowledge (name/indication):		
	Health literacy level	% correct of names	Indications
	• Low • Marginal • Adequate	32.2 54.6 60.8	61.8 77.4 81.4
	Medication Management		
Williams et al.[11] (REALM)	Decreased ability for proper use of metered-dose inhaler (MDI): • 88% with limited literacy had poor the MDI technique, compared with 48% of those with higher literacy levels		
Davis et al.[7] (REALM)	Decreased ability to demonstrate correct dosing: • 65% could not demonstrate, “Take two tablets by mouth twice daily”		
Persell et al.[10] (S-TOFHLA)	Decreased ability to name their medications: • 40.5% of those with limited health literacy vs 68.3% of other patients		

Kripalani et al.[9] (REALM)	Decreased ability to identify all of their medications: • 10-18 times the odds of being unable to identify
	Adherence
	Decreased adherence
Kalichman et al.[24] (WRAT-3) (TOFHLA)	Increased nonadherence to antiretroviral therapies: • Three to four times more likely to be nonadherent in the last 2 days
Graham et al.[25] (REALM)	Decreased adherence to antiretroviral medications: • 40% of those with limited health literacy vs 64% of other patients
Wolf et al.[26]	Increased likelihood to be nonadherent with antiretroviral therapies: • 3.3 times more likely to be nonadherent
Kripalani et al.[27] (REALM)	Decreased adherence to medication refills: • Two times more likely to be nonadherent
Noureldin et al.[28] (S-TOFHLA)	Decreased medication-taking adherence: • 54.2% of those with inadequate health literacy vs 69.4% of other patients
Lindquist et al.[29] (S-TOFHLA)	More likely to have unintentional nonadherence after hospital discharge • 47.7% (inadequate HL) vs 20.5% (adequate HL)
Bauer et al.[30] [3-item screener]	Patients with diabetes had more time without sufficient pill supply to newly prescribed antidepressants: • 41% vs 36%
Karter et al.[31] [single question]	Nonadherent patients more likely to report inadequate health literacy: • 51% vs 30%
Osborn et al.[32] (REALM)	Health literacy was associated with medication adherence: • $r = 0.12$
	Increased adherence
Hironaka et al.[33]	Increased adherence to daily multivitamins by infant caregivers: • Two times as likely to report high adherence
	No effect on adherence
Gatti et al.[34] (REALM)	Health literacy is not independently associated with adherence: • 52.4% vs 50.1% (difference not significant)

Paasche-Orlow et al.[35] (REALM)	Low health literacy not associated with lower odds of adherence: • Adjusted odds ratio = 1.93 (not significant)	
Mosher et al.[19] (REALM)	Health literacy is not associated with medication adherence:	
	Health literacy level	% of medications taken
	• Low • Marginal • Adequate	84 80 77
Bains et al.[36] (REALM-R)	Health literacy was not significantly related to medication adherence	
	Inconclusive effect on adherence	
Gazmararian et al.[37] (S-TOFHLA)	Suggestive but not conclusive that low health literacy predicts poor refill adherence	
Kripalani et al.[27] (REALM)	No consistent relationship found between health literacy and self-reported adherence	

REALM, Rapid Estimate of Adult Literacy in Medicine; TOFHLA, Test of Functional Health Literacy in Adults; WRAT-3, Wide Range Achievement Test.

Decreased Knowledge and Understanding

A number of studies have shown that patients with limited health literacy have less knowledge about their disease and how to manage it. For example, among patients with diabetes, 94% of those with adequate health literacy knew the symptoms of hypoglycemia, compared with only 50% of those with inadequate health literacy.[38] Similarly, persons with limited health literacy did not know about factors that could lower blood pressure such as weight loss and exercise. Other studies have also correlated limited health literacy with less knowledge about asthma, reproductive health, human immunodeficiency virus (HIV) infection, discharge instructions, and heart health.[39]

Several studies also confirm the association between limited health literacy and decreased understanding of appropriate medication use.[6-8,24] A study to examine patients' ability to understand instructions on medication labels concluded that lower health literacy was independently associated with misunderstanding of instructions.[6] Patients with inadequate and marginal health literacy had a relative risk of 2.32 and 1.94 of misunderstanding label instructions, respectively.

Warning labels are routinely used with prescription medications, yet a recent study indicated that these labels may not be useful for patients with limited health literacy. In fact, patients with low health literacy have a three times greater likelihood of incorrect interpretation of prescription warning labels and have a potential for misuse of their medications.[7] For example, in the warning label that states, "Do not chew or crush, swallow whole," some patients were interpreting it as "chew pill and crush before swallowing." Another study found an association between limited health literacy and deficits in warfarin-related knowledge.[21]

Lastly, patients with limited health literacy have difficulty understanding medication guides, which are educational materials mandated for some products by the FDA, and most admit to never looking at them.[8]

Decreased Ability for Medication Management

Limited health literacy has also been associated with a decreased ability for "medication management"—the ability to self-administer a medication

regimen as it has been prescribed.[9] Examples of functional skills necessary for medication management include correct identification of medications, opening the appropriate containers, proper selection of the correct dose, and timing of administration, as well as appropriate use of containers such as MDIs, nasal sprays, and eye drops.

Studies indicate that patients with limited health literacy are unable to name or identify their own medications.[9,10] Persell and colleagues conducted a study to assess the relationship between health literacy and patient recall of their antihypertensive medications.[10] He found that only 40.5% of patients with inadequate health literacy were able to name any of their antihypertensive medications, compared to 68.3% of those with adequate health literacy. In this same study, inadequate health literacy was also associated with a greater number of unreconciled medications (64.0% vs 37.8%). Similarly, in another study, patients with inadequate literacy skills had 10 to 18 times the odds of being unable to identify all of their medications, compared with those with adequate literacy skills.[9]

In a study to determine the relationship of literacy to the MDI technique of asthma patients, researchers concluded that inadequate literacy was strongly correlated with improper MDI use.[11] Compared with patients with adequate health literacy, more patients with inadequate health literacy were unable to demonstrate proper MDI use (88% vs 48%).

Uncertain Effect on Medication Adherence

Results of studies evaluating the relationship between limited health literacy and medication adherence are conflicting. Several studies in patients using antiretroviral medications for the treatment of HIV infection indicate that patients with limited health literacy are less likely to be adherent to their medications.[24-26] Persons with inadequate health literacy were more likely to have lower refill adherence,[27] decreased medication taking,[28] and more likely to have unintentional nonadherence after a hospital discharge.[29] In contrast, several studies concluded that health literacy is not independently associated with adherence,[34-36] another study showed a strong trend,[37] and yet another study actually found an increase in adherence.[33]

A major barrier to consolidating data from adherence studies is that there is no generally accepted “gold standard” for measuring medication adherence, making overall conclusions difficult. Further studies are needed to adequately determine the true relationship between health literacy and medication adherence.

Worse Health Outcomes

The AHRQ has published two reports that summarize the literature available regarding the association between health literacy and outcomes.[40,41] In the first report, they identify most of the studies evaluated as being “fair or good,” and overall, they report that there is an association between lower literacy and adverse health outcomes.[40] In one study evaluating the association of health literacy with diabetes outcomes, the investigators found that patients with limited health literacy have worse control of their diabetes and are more likely to report complications such as retinopathy and cerebrovascular disease.[42] In a recent study, the majority of patients with poorly controlled diabetes (A1c greater than 8%) were more likely to believe that their diabetes was well controlled if they had low health literacy. Thus, they may be less likely to make changes to improve control.[43]

The second AHRQ report reinforces the initial link between limited health literacy and worse health outcomes.[41] Patients with limited health literacy have a higher risk for emergency care use, less use of preventive services, poorer skills in taking medications, and more hospitalizations. Low health literacy was also found to be a significant, independent risk factor for hospital reutilization within 30 days after hospital discharge.[44] This can be costly since accountable care organizations will be reimbursed less for hospital reutilization within 30 days of discharge.

Unfortunately, inadequate health literacy has even been linked to increased mortality in community-dwelling elderly persons.[12] Baker and colleagues studied 3,260 Medicare managed-care enrollees to determine whether low health literacy independently predicted all-cause mortality. Crude mortality for persons with inadequate health literacy levels was more than twice as high as in those with adequate health literacy (39.4% vs 18.9%). Even after adjusting for confounding factors such as demographics, socioeconomic status, and baseline health, participants with inadequate health literacy had a hazard ratio of death of 1.52 compared with participants with adequate health literacy. The authors concluded that inadequate health literacy independently predicts all-cause mortality in community-dwelling elderly persons. A different study of older adults confirmed the increased risk of mortality in those with low health literacy (hazard ratio = 1.40).[45] In a cohort study of patients hospitalized for acute heart failure, low health literacy

was associated with a 32% increased risk of death. This increase was found after adjusting for age, gender, race, insurance, highest level of education, hospital length of stay, and comorbid conditions.[46] A recent review of health literacy and outcomes reinforced previous data and noted that patients with heart failure and low health literacy had greater rates of readmission and cardiac mortality.[47]

Increased Healthcare Costs

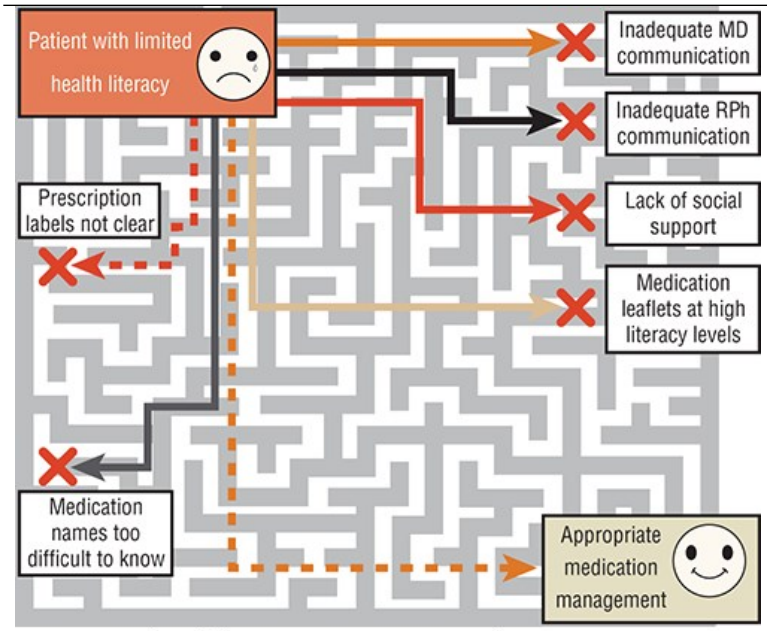
4 A systematic review concludes that the economic implications of limited health literacy are substantial.[48] Patients with limited health literacy tend to seek medical care when they are sicker, leading to higher use of emergent care and longer hospitalizations. Thus, it is no surprise that caring for persons with limited health literacy is associated with higher healthcare costs. At the health system level, limited health literacy may account for a 3% to 5% increase in total costs.[48] The increased cost at the individual patient level may range anywhere from $143 to $7,798. Howard and colleagues found that persons with inadequate health literacy incur higher healthcare costs and use medical services inefficiently, especially emergency department care.[49] Another approximation of the cost of limited health literacy to the American economy ranged from $106 to $238 billion annually, equal to about 7% to 17% of all personal healthcare expenditures.[50] A large-scale study demonstrated higher healthcare costs in the Veterans Health Administration (VHA) patients. Of 92,749 veterans, the mean per patient cost for those with inadequate and marginal health literacy was significantly higher ($31,581) compared with the cost of those with adequate health literacy ($17,033). It is estimated that the healthcare cost of veterans with marginal and inadequate health literacy was $143 million dollars more over a 3-year period.[51] A brief summary outlining the cost of low health literacy estimates an increased cost to hospitals of $12.6 billion per year. This author reinforces the importance of taking time to help patients understand their medications and address obstacles to obtain their best possible outcomes.[52]

SHORTCOMINGS OF CURRENT SAFE MEDICATION PRACTICES

5 Despite our most sophisticated efforts to encourage safe medication use, our current strategies have been insufficient and ineffective, especially for patients with limited health literacy. Figure e2-2 depicts the maze of medication information that patients are expected to navigate and several of the barriers that patients with limited health literacy may encounter.

FIGURE e2-2

Medication information maze. Communication barriers and the complexity of current medication information make it difficult for any patient to achieve appropriate medication management, but these barriers are even more significant in a patient with limited literacy skills.



Source: Joseph T. DiPiro, Gary C. Yee, Stuart T. Haines, Thomas D. Nolin, Vicki L. Ellingrod, L. Michael Posey: *DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 12e*

Patient Information Leaflets

6 Although the average American adult reads at about the eighth-grade level, numerous studies indicate that most handouts exceed this level.[53] In a survey of 251 primary care adult patients, only 23% reported having ever looked at the accompanying medication guides. Patients with lower literacy were less likely to have looked at the medication guides (16.7% vs 32.9%). Because of this, and the fact that the medication guides were written at the 11th and 12th grade level, the authors concluded that they probably were not useful to patients with limited literacy skills.[8] Raynor and colleagues also found that consumer medication information handouts do not meet people's information needs. People did not value the written information they received about medicines, and providing the leaflets did not increase their knowledge. People tended to want information that was tailored to them with a balance of both benefit and harm. They also wanted information before the drug was prescribed to decide if it was the right medicine for them; this is often not done. Overall, they found a gap between what the patients wanted and what the medicine leaflets provided.[54]

Medication Labels

Poor medication labeling has been cited as a potential cause for medication errors. Indeed, the USP attributes about one-third of all medication errors to confusion with product labeling.[55] Shrank et al. assessed 85 labels on pharmacy-dispensed medications for format, context, and variability. Their evaluation concluded that the most prominent portion of the label included the name of the pharmacy or logo in 84% of all the labels reviewed. In addition, the smallest font sizes were used to display the medication name (an average of 8.9 points) and medication instructions (9.3 points). Color and boldface were used to highlight items most useful to the pharmacist as opposed to highlighting the information that is most useful to the consumer. Warning instructions were highly variable among all labels depending on the pharmacy.[56]

7 A group of health literacy experts has pointed out, "inadequate patient understanding of prescription dosing instructions and warnings is prevalent and a significant safety concern."[57] In a report published by the IOM, experts advocate for standardization of prescription medication labels in efforts to minimize patient confusion and improve patient safety. This report examines what is known about how medication-container labeling affects patient safety and discusses evidence-based approaches to address the identified problems. As precedents for such national standards, the report cites the successfully reformed nutrition facts on food product labels and standardization of over-the-counter labels by the FDA.[57]

Based on the available evidence and expert recommendations, the USP released a new set of standards in 2012 for patient-centered medicine labels.[17] Enforcement will be at the discretion of each state, but it is expected that applying these standards will reduce adverse drug events and medication

misuse. The standard provides a universal approach on how prescription labels should be organized in a "patient-centered" manner. For example, the label should include the indication for use and provide explicit instructions in the patient's preferred language. Medical jargon should be avoided. For instance, use *heart* instead of *cardiac* and use numeric instead of alphabetic characters (eg, *2*, not *two*). A list of USP standards is presented in Table e2-4 with examples that incorporate them shown in Fig. e2-3.

TABLE e2-4

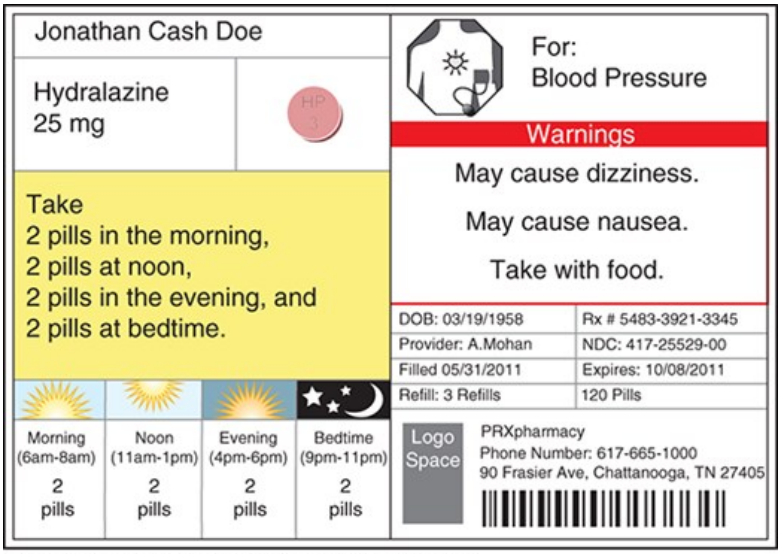
USP Prescription Container Label Standards to Promote Patient Understanding

Standards	Description
Organize the prescription label in a patient-centered manner	Place label elements in an order and format that makes it easy for patients to find and understand
Emphasize instructions and other information important to patients	Format the label in a way to stress what is essential to the patient by: • Making prominent the information that patients must have in order to use medications correctly and safely (ie, patient name, drug name and strength, and directions) • Placing dosing instructions in the same order every time (ie, dose > route > frequency) • Making less prominent and placing away from dosing instructions less important information such as pharmacy name, prescriber, fill date, etc.
Simplify language	Use simple, clear, and concise language that avoids unfamiliar words and medical jargon
Give explicit instructions	Use unambiguous dosing instructions by: • Using numbers instead of words (ie, 2 instead of two) • Use explicit time periods such as morning and evening instead of twice a day • Avoid wording such as "take as directed"
Include purpose for use	Unless the patient objects when asked, include on the label in simple terms the indication included on the prescriber's prescription (ie, high blood pressure instead of hypertension)
Limit auxiliary information	Present in simple explicit language only the information essential for patient's understanding and safe medication use
Address limited English proficiency	Provide label directions in the patient's preferred language when possible
Improve readability	Among many other recommendations to make labels easy to read include: • High contrast between font and background • Simple fonts such as Arial or Times New Roman • Normal sentence capitalization (not all capitals or all lowercase) • Adequate white space between lines of text as well as sections of the label • Horizontal text only (no vertical warning labels) • Not abbreviating important information

Data from Reference 30.

FIGURE e2-3

Examples of evidence-based medication labels incorporating recommendations from the ACP and United States Pharmacopeia, Chapter 17.[17,57,58] Notice that the most important parts are in the left section, in larger font, and highlighted. Numbers are used instead of words; directions are explicit and on individual lines. These labels also include the indication for use in the upper right section, and a Universal Medication Schedule (UMS) graphic in the lower left. *(Data from References 58 and 59.)*



Source: Joseph T. DiPiro, Gary C. Yee, Stuart T. Haines, Thomas D. Nolin, Vicki L. Ellingrod, L. Michael Posey:
DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 12e

In addition to the USP standards, the American College of Physicians (ACP) Foundation also recommends the use of a universal medication schedule (UMS) to convey and simplify dosage and/or use instructions; a visual aid with standard intervals (eg, morning, noon, evening, and night) can simplify dosing and reinforce text instructions (see the bottom of Fig. e2-3).[57,59]

Counseling by Physicians and Pharmacists

Communication failure has been reported to be the underlying cause of about 10% of adverse drug events.[60] Patients with limited health literacy are significantly less likely to ask questions of their providers.[61] About one-half of the prescriptions taken each year are used improperly, and an estimated 96% of patients do not ask questions about their medications.[62]

Unfortunately, provision of verbal counseling by prescribers and pharmacists has been disappointing. Though the exact prevalence of counseling behaviors is uncertain, the Healthy People 2010 Final Review indicated that patients received verbal counseling about 26% of the time from prescribers and only 6% of the time from pharmacists.[63] In addition, when physicians make an effort to communicate when prescribing new medications, they often fail to communicate critical elements of medication use. Tarn et al. found that physicians only communicate about three of the five expected elements of drug information (name of medication, purpose, dose and timing, duration, and adverse effects) when initiating new prescriptions.[64] Furthermore, in 2011, only 64.1% of adults reported that instructions from healthcare providers were easy to understand.[65]

In efforts to improve these numbers and thus medication safety, Healthy People 2030 included several objectives involving the quality of communication between patients and their healthcare providers. Specific goals include increasing the proportion of adults whose healthcare providers check their understanding of instructions from 26.6% to 32.2% and decreasing the proportion who report poor communication with their healthcare providers from 8.9% to 8%.[66]

Medication Names

Each year, the FDA approves dozens of new molecular entities, all of which need brand and generic names. Despite the intricate process of naming a drug and guidelines developed by the United States Adopted Names Council, drug mix-ups still occur in the dispensing process.[67] If these mix-ups occur with health professionals, imagine the confusion it causes to the consumer with limited health literacy. It can be overwhelming and dangerous.

A 2007 study assessed the relationship between health literacy and patient recall of their antihypertensive medications. Overall, regardless of their literacy level, more than 40% of patients were unable to name any of their antihypertensive medications. When considering literacy levels, patients with limited health literacy fared worse in terms of recalling the names of their blood pressure-lowering medications (31.7% vs 59.5%). After adjusting for age and income, this difference was almost threefold (odds ratio 2.9).[10] In another survey of 100 patients, researchers found that participants could provide the names of only 55.8% of their medications.[23]

The United States Adopted Names Council follows a set of guiding principles when naming new medications. The first guiding principle is "A nonproprietary name should be useful primarily to healthcare practitioners, especially physicians, pharmacists, nurses, educators, dentists, and veterinarians."[68] Notice that *consumers* or *patients* are not considered in this guiding principle, even though they are the ones who need to know the name the most. We should resolve to do better.

METHODS FOR IDENTIFYING PATIENTS WITH LIMITED HEALTH LITERACY

Informal Assessments

The shame associated with limited literacy often prevents patients from receiving appropriate medical care, as they tend to hide their reading problem. In addition, healthcare providers often do not consider low health literacy in their patient care.[15,69] As previously mentioned, certain groups are at higher risk for limited health literacy, but even people with adequate literacy levels who are unfamiliar with the healthcare context may have difficulty navigating the healthcare system and often go undetected.

Common Signs

The following are common signs that may suggest a person has limited health literacy skills[14,70]:

1. Reads slowly
2. Has difficulty telling a coherent story
3. Fills out forms incorrectly or incompletely
4. Uses excuses such as, "I forgot my glasses," "I'll read this later," or "I don't have time to read this now. Can I take it home?"
5. Brings along a friend or family member for assistance
6. Fails to show up for appointments or is late for refills
7. Does not ask questions for clarification
8. Has difficulty following instructions
9. Nods in agreement or expresses understanding but does not truly understand information

Medication Review

A medication review may be useful in identifying patients with limited health literacy skills. If the refill history is accessible, one might find that they often forget to refill their medications on time or never pick them up. They may not be able to verbalize a list of their medications despite having a short list. If the medication bottles are available, the patient can be asked to state the name, use, and dosing instructions for each of their medications. Patients with limited health literacy may not be able to respond accurately. They may say, "I take them just like it says on the bottle," or they have to look at the pill color and shape before they can respond.

If patients have a medication reconciliation list from their last visit, they may hand over the list to the health professional and say, "This is everything that I am taking." However, when probing a little further, they likely do not know the contents of that list, and it may not be exactly what they are taking.

When asked to read a medication label that says, “Take one tablet by mouth once daily at bedtime,” they may recognize the pill and say it reads, “Take one every day,” because they have memorized the instructions that may or may not match the container label. When picking up refills, patients with limited health literacy may ask the pharmacist for the old bottles because they depend on their personal markings such as an *X* on the cap.[71]

Formal Measures

8 Because of the high prevalence of inadequate health literacy, many experts recommend that health professionals practice “universal precautions” by trying to communicate as clearly as possible with *all* patients and family members.[72] Others suggest that professionals should screen patients’ health literacy and then tailor communications accordingly. It is not clear which approach is best.

A number of instruments have been developed to assess health literacy in both English and Spanish. These instruments can identify patients with “low,” “marginal,” “inadequate,” or “below basic” skills, all of which mean that the patient has limited health literacy. An article by Mancuso provides a comprehensive review of health literacy assessment tools.[73]

Two of the most widely used measures of health literacy are the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test Of Functional Health Literacy in Adults (TOFHLA). These tests are mainly used in research, but they can be used in practice.[73] Additionally, a survey revealed that patients do not mind having their literacy assessed in the clinical setting. More than 98% of patients agreed to a literacy assessment in a routine health visit, including 46% of patients with limited literacy skills.[74]

The REALM is a word-recognition test and estimates health literacy based on patients’ ability to pronounce a list of medical terms. The TOFHLA consists of a reading comprehension section to measure prose literacy and a numeracy section. Passages with health information have words that have been deleted, and the patient is to choose the correct word from a list of four options. The Newest Vital Sign (NVS) assesses health literacy by having patients review a nutrition label and answer six questions about the label.[73]

While there are continued calls for comprehensive measures of health literacy, there is just as much interest in developing specialized versions, as well as short versions of instruments for rapid assessment of literacy skills. Helitzer and colleagues have developed a disease-specific web-based tool called TALKDOC which measures women’s health literacy of Human Papilloma Virus and cervical cancer.[75] The Parental Health Literacy Activities Test (PHLAT) and its Spanish version have been developed to assess the literacy and numeracy skills, such as preparing infant formula correctly and dosing medication accurately, that parents need to safely care for infants and children.[76,77] In addition to shorter versions of the REALM (shortened-REALM) and TOFHLA,[73] one-item measures have been developed and evaluated for rapid screening of health literacy skills which have subsequently been incorporated into a four-item brief health literacy screening tool called BRIEF.[78] The Recognize and Address Limited Pharmaceutical Literacy Skills (RALPH) interview guide was developed to assist pharmacists in assessing patients’ medication literacy, or their ability to understand and apply instructions for safe and effective medication use, during a typical patient counseling session.[79]

As with all tests, each has its limitations. For example, S-TOFHLA does not assess numeracy unlike its parent test, TOFHLA.[73] While the NVS was validated in people of all races with an average age of 41 years, a smaller study of African Americans with a mean age of 73.2 years determined that the NVS took 8 minutes longer to administer and was overall not as applicable in this age group.[80] Griffin et al.[81] and Haun et al.[82] found significant variation in categorizing test-takers between inadequate and marginal health literacy in groups given both the REALM and S-TOFHLA assessments. Further, the BRIEF tool was validated in a predominately white male English-speaking veteran population which may not be generalizable to other populations.[78] While the RALPH interview guide was designed for seamless incorporation into a medication counseling session, its linkage to each patient’s unique medication regimen and lack of objective, uniform scoring limits its utility in research.[79]

Table e2-5 provides a list of these commonly used assessment tools.

TABLE e2-5

Methods to Assess Health Literacy

One-Item Measures[78,83]	Length (minutes)	Interpretation/Scoring

"How confident are you filling out medical forms by yourself?" (0, extremely; 1, quite a bit; 2, somewhat; 3, a little bit; 4, not at all) "Qué tan seguro(a) se siente al llenar formas usted solo(a)?" (0, extremadamente; 1, mucho; 2, algo; 3, un poco; 4, para nada)	≤1	Positive answers for low health literacy are "somewhat," "a little bit," or "not at all" Positive answers for Spanish speakers are: "a little bit" or "not at all"
"How often do you have someone help you read hospital material?" (0, none of the time; 1, a little of the time; 2, some of the time; 3, most of the time; 4, all of the time)	≤1	Positive answers are "some of the time," "most of the time," and "all of the time"

Multi-item Measures

Assessment Tool	Description	No. of Items	Length (minutes)	Interpretation/Scoring
National Assessment of Adult Literacy (NAAL)[5]	Main purpose was to measure general literacy but included items specifically to assess health literacy	28	(Not for practice; survey done every 10 years)	Below basic Basic Intermediate Proficient
Shortened rapid estimate of adult literacy in medicine (Shortened-REALM)[73,a]	Word recognition list. Patients read a list of 66 common medical words and are scored on correct pronunciation	66	2-3	0-44 Low 45-60 Marginal 61-66 Adequate
Short test of functional health literacy in adults (S-TOFHLA)[73]	Patients must fill in words that have been deleted systematically from a sample text of common health instructions; words are selected from a list of multiple-choice options. Excludes numeracy testing	36	7	0-16 Inadequate 17-22 Marginal 23-36 Adequate
Short Assessment of Health Literacy for Spanish Adults—50 (SAHLSA-50)[84,a]	Based on REALM and reading a list of common medical words in Spanish (includes two association words; key and distracter)	50	3-6	0-37 Inadequate
Newest Vital Sign (NVS)[73]	Patients review a nutrition label and answer 6 questions about the label	6	3	0-1 indicates >50% likelihood of marginal or inadequate literacy; 2-3 indicates possibility of limited literacy; and 4-6 adequate literacy
Short Assessment of Health Literacy—	Based on REALM and SAHLSA-50 (includes two association words; key and distracter). High correlation between words	18	2-3	0-14 Inadequate

Spanish and English (SAHL-S&E)[85,a]	used in both versions and adequate to compare Spanish and English speakers together			
Brief Health Literacy Screening Tool (BRIEF)[78]	Patients answer four questions and respond on a 5-point Likert scale	4	<2	4-12 Inadequate 13-16 Marginal 17-20 Adequate
Medical Term Recognition Test (METER)[86]	Self-administered medical word recognition test. Contains 40 medical words and 40 nonwords	80	2	0-20 Low 21-34 Marginal 35-40 Functional
Health Literacy Skills Instrument 10-item short form (HLSI-SF)[87]	Based on NAAL with four domains of health literacy skill assessment: reading/writing, numeracy, listening, and information seeking (Internet navigation)	10	5-10	<70% Below basic literacy 70%-81% Basic literacy ≥82% Proficient literacy
Recognizing and Addressing Limited PHarmaceutical literacy (RALPH)[79]	Interview guide for use by pharmacists in patient counseling, with three health literacy domains: functional, communicative, and critical	10	Variable, incorporated into prescription counseling	No objective scoring An inability to discuss medication information or search for medication information indicative of limited pharmaceutical literacy skills

[a]Except for the REALM, a Spanish version is available for all methods. SAHLSA-50 is available only in Spanish.

STRATEGIES FOR CLEAR COMMUNICATION ON MEDICATION MANAGEMENT

Increase Health Literacy Awareness

The first step toward improving communication on medication management in individuals with limited health literacy is to recognize that limited health literacy is common. A survey revealed that pharmacists in only 7% of community pharmacies attempt to identify literacy-related needs among the individuals they serve. Most pharmacists seemed to be surprised and unaware that some of their customers may have difficulty reading.[69] In fact, only 12% of American adults have proficient health literacy skills.[72]

Therefore, it is likely that most health professionals, including pharmacists, will be serving individuals with limited health literacy skills. As such, professional schools should incorporate health literacy into their curricula and areas of competence. Much work remains to be done in this area, but efforts are under way. This chapter itself is a tribute to these efforts.

Some disciplines are promoting health literacy awareness by incorporating the need to address this cross-cutting topic in their accreditation standards.[88] Curricular modules have been developed to introduce pharmacy students to the implications of limited health literacy on medication management and provide them with the tools to address medication adherence barriers. Topics covered include health literacy assessment, critique of patient education materials and medication labels, and communication strategies to promote patient understanding.[89] In an introductory program, third-year pharmacy students determined the impact of using health literacy communication tools in a group of independent-living senior residents. They found that using these health literacy tools increases patient understanding, empowerment, and commitment to medication adherence.[90] Medical schools and residency programs have also explored different ways to incorporate this topic in their training. A 2-hour workshop was

developed for physician residents to improve assessment of adherence and their medication counseling skills. One month after this intervention, physicians reported a significant improvement in these areas.[91]

Obtain a Complete Medication History

9 Perhaps one of the most essential components necessary to improve medication management in patients is obtaining a thorough and complete medication history. This is important for all patients regardless of their health literacy level. However, because patients with limited health literacy have difficulty naming their medications and are more likely to mismanage their medications, taking a complete, baseline history of what they are taking is especially valuable.

Medication histories are equally important in all clinical settings, including hospitals, communities, home health, long-term institutions, and ambulatory centers. The hospital accreditation body, the Joint Commission, has recognized medication reconciliation (comparing a medication list to what a patient should be receiving) as a crucial step in promoting medication safety and minimizing medication errors. A systematic review suggested that electronic medication reconciliation may contribute to a reduced rate of medication errors and discrepancies at hospital discharge, but study heterogeneity limited definitive conclusions.[92] Further research is necessary to identify medication reconciliation best practices associated with improved patient outcomes.

Table e2-6 provides a list of recommended strategies and questions for obtaining a complete and accurate medication history.[93-95] A video example of how this can be done in a manner sensitive to health literacy is also available at https://youtu.be/It8KfitBeeE.

TABLE e2-6

Helpful Strategies and Questions for Obtaining a Complete Medication History

Preparation

- Before speaking to the patient, if available, obtain a list of their most current medications from their medical records or electronic health system
- This will help elicit information that the patient may have forgotten
- A quick review may also reveal patterns about their refill history

Determine person responsible for medicine regimen

- Do you take your medications on your own or does someone else like a family member or friend help you take them?
- If patient has a caregiver helping with the medication regimen, include them in the interview

General questions

- Do you have your medication containers with you?
- If yes, the patient may use them to proceed and answer the following questions
- If not, ask if they have a list of the medications they take and proceed
- What are your medication allergies?
- How many different doctors write prescriptions for you?
- Which pharmacies do you use to fill your prescriptions? What is their contact information (phone number and address)?
- How do you pay for your medicines? What is the name of your insurance plan?
- What language do you prefer to have on your medicine containers?

Determine complete list of medicines

For each medicine that you take, please tell me the (1) name and dose, (2) the reason you take it (indication), and (3) exactly how you take it. … How many times a day?

Do you take any medicines that you buy over-the-counter without a prescription such as Tylenol or Advil?

Do you take any herbal products, home remedies, vitamins, or other dietary supplements?

Do you take any medicines that you bring from another country such as Canada or Mexico?

Do you take any medicines that are bought over the Internet?

Do you get medicines from other places such as a dialysis unit or another clinic (eg, vitamin B_{12} shots)?

Do you use medicines that are not taken by mouth? For example, patches, inhalers, suppositories, creams, drops, liquids, injectables, nasal sprays?

Do you have medicines that you take only once a week or once a month?

Assess adherence

How do you remember to take your medicines on a regular basis so that you do not forget a dose (eg, pill box, leave pill bottle by toothbrush, set alarm, line up pill bottles)?

How many doses of your medicines have you missed in the last week?

On a scale of 0-10, how well do you remember to take your medicines every day or as prescribed? 0 means you forget to take them all the time, and 10 means you never miss a dose.

When did you take the last dose of each medicine?

If medication containers are available, look at the last refill date and determine if the patient is currently on his or her refills. Look at the date it was filled, how many doses were dispensed, and how many are left now as a rough indicator of adherence.

Data from References 93-95.

Conduct Pharmacy Health Literacy Assessments

A pharmacy health literacy assessment measures how well the pharmacy is serving patients with limited health literacy skills.[96] It is an important first step to improve the quality of medication management for individuals with limited health literacy. The assessment tool developed with funding from AHRQ is comprehensive and is made up of three complementary parts: (1) an "assessment tour" completed by objective auditors (here, barriers for clear communication are noted as well as the physical environment of the pharmacy and staff interaction with patients), (2) a survey completed by staff (this helps determine how "friendly" the pharmacy environment is toward individuals with limited health literacy), (3) focus groups with pharmacy patients (the intent is to collect detailed feedback from patients about their experience with pharmacy services), and (4) using assessment results—after all the data are collected and summarized, a tangible action plan should be developed for improved services to help individuals with limited health literacy.

CREATE EASY-TO-READ MATERIALS

As previously mentioned, efforts should be made to make health information materials easily accessible and understandable, this includes electronic health information.[97-101] eHealth literacy needs tend to be overlooked and not considered when developing eHealth programs.[97] Consider that your audience's reading age is likely lower than you might expect. The average American reads at the 7th to 8th grade level,[98] but unfortunately, most health information is written at a higher grade level.[8] Thus, most sources and studies suggest readability of health information not exceed a 6th-grade reading level.[97–101]

It is important to keep in mind readability and some general principles that are known to make handouts easy to read. They may be helpful either in creating material or as a checklist for determining the appropriateness of a handout. Some of the principles are similar to ones used in verbal communication such as using plain language, focusing on one to three key messages, and incorporating suitable illustrations. The "Plain Writing Act of 2010" Public Law 111-274 requires enhancement of citizen access to information and services; public materials must be written clearly so the public can understand and use the information. This plain-language initiative provides several useful tips on creating written handouts that are easy to read.[102]

An innovative mixed-model approach was used to develop patient package inserts (PPIs). Comprehension scores were 90% in participants with limited health literacy.[103] The three phases included: (1) content development; (2) focus group testing; and (3) comprehension testing. Additionally, a study of hypertension knowledge demonstrated that personalizing health information to learning style preferences and literacy level improves patient understanding.[104] Thus, a number of evidence-based methods and recommendations can contribute to optimal delivery of health information.

Use Interactive Multimedia and Assess the Need for Digital Literacy

Many interventions have shown that interactive multimedia formats (eg, videos, animated characters) are effective in patient educational materials to improve health outcomes in adolescents, older adults, and people with low socio-economic status.[97,105] Positive health literacy effects have resulted from education about Websites and online apps, including knowledge of health conditions, use of technology, search skills, use of health information, and confidence in finding and using eHealth resources.

All these improvements contribute to achieving an objective of Healthy People 2030: increasing the health literacy of the population. However, when implementing technical tools, it is important to evaluate and assess the need for digital literacy to ensure patient understanding. Often, while many adults own technical devices, they do not uniformly have the skills or capabilities to properly obtain the necessary online health information.[106] Using interactive multimedia and assessing the need for digital literacy has become even more important with the increased use of telemedicine.[106]

Recognize Limited Pharmaceutical Literacy

It is well known that people with limited health literacy are at higher risk for medication-related adverse outcomes. However, identifying this high-risk population is difficult with the limited tools available to help identify these patients.

Research generally uses multiple tools or measure to assess health literacy and readability of online health information (eg, eHEALS, S-TOFHLA, and REALM). The RALPH interview guide helps shine light on medication/pharmaceutical literacy (see Fig. e2-4).[79] As previously mentioned, the RALPH tool

does not provide an objective score but rather an "indication" of whether a patient may be experiencing difficulties with their medications. It supports pharmacists seeking to provide tailored care, improve the comprehension of medication information, and ultimately use of these agents; the tool is also useful in identifying patients who could benefit from teach-back educational sessions.

FIGURE e2-4

RALPH Interview Guide. (*Reprinted from Vervloet M, van Dijk L, Rademakers JJ, et al. Recognizing and Addressing Limited Pharmaceutical Literacy: Development of the RALPH interview guide. Res Social Adm Pharm. 2018;14:805–811.*)

Medicine being discussed: .....

Does the patient **ask you** to **read** the text on the medication label **out loud**?
- ❑ Yes
- ❑ No

1. Can you tell me **what** you use this medicine for?
Answer: Answer correct? ❑ Yes ❑ No ❑ Patient does not know
2. Can you tell me **how** you should use this medicine (*according to the medication label*)? *If necessary, ask about the frequency and the timing of the intake*
Answer: Answer correct? ❑ Yes ❑ No ❑ Patient does not know
3. *If there is a special precaution/warning on the medication label.* Can you tell me **in your own words** what the precaution/warning means?
Answer: Answer correct? ❑ Yes ❑ No ❑ Patient does not know

4. What do you do if the information about this medication given by the pharmacist is **different** from the information you are given by the physician, for example, on how often you should take the medicine?
❑ Patient searches for the correct information in or asks for clarification from **reliable sources** ❑ Patient searches for the correct information or asks for clarification, but **not necessarily in/from reliable sources** ❑ Patient **does not search** for the correct information **nor asks for clarification**

5. Imagine you have **a question** about this medicine, for example, about how you should take it, how easy or difficult is it for you to ask one of your healthcare providers *(e.g. physician, pharmacist, pharmacy technician)* this question?
❑ Very easy ❑ Quite easy ❑ Quite difficult ❑ Very difficult
6. Imagine you have **concerns** about this medicine, for example about possible side effects, how easy or difficult is it for you to discuss these concerns with one of your healthcare providers *(e.g. physician, pharmacist, pharmacy technician)*?
❑ Very easy ❑ Quite easy ❑ Quite difficult ❑ Very difficult

7. How easy or difficult is it for you to find information about this medicine **in words you understand**? For example, if you want to find out whether you can take another medicine without a prescription from the drugstore (paracetamol or a cough syrup) alongside this medicine.	
❑ Very easy ❑ Quite easy ❑ Quite difficult ❑ Very difficult	❑ *Patient does not look for information. Reason:*

8. If you come across information about your illness or this medicine in the newspaper or the Internet, how easy or difficult is it for you to judge whether this information is **relevant to you**?	
❑ Very easy ❑ Quite easy ❑ Quite difficult ❑ Very difficult	❑ *Patient does not come across any information. Reason:*
9. If you come across information about your illness or this medicine in the newspaper or the Internet, how easy or difficult is it for you to judge whether this information is **reliable**?	
❑ Very easy ❑ Quite easy	❑ *Patient does not encounter any information. Reason:*

❑ Quite difficult ❑ Very difficult	
10. How easy or difficult is it for you to **decide together with your healthcare provider** about the treatment of your illness, for example, whether you might want to try another medicine?	
❑ Very easy ❑ Quite easy ❑ Quite difficult ❑ Very difficult	❑ *Patient does not want to participate in the decision making. Reason:*

USE TIPS FOR TELEMEDICINE COMMUNICATION

As a result of the need to adapt care during the coronavirus pandemic, healthcare systems and professionals across the globe increased their use of telemedicine as a means of physical distancing. While this has increased accessibility to many by delivering care via telephone and video in place of in-person visits, many patients struggle with the use of technology (eg, slow internet connections and lack of access, ehealth portals, messaging services, email, downloading and viewing attachments, uploading information and pictures).[101,106] Hence, using plain language and clear communication to decrease barriers for patient understanding is considered a best practice in healthcare (see Table e2-7).

TABLE e2-7

Clear Communication Tips for Telemedicine Encounters

Preparing for encounters
• When making appointments, confirm the patient's phone number and a back-up number if possible • Ask patients to create a written list of concerns in advance • Use easy-to-read informed consent forms, if needed, for virtual visits (https://www.ahrq.gov/health-literacy/informed-consent-telemedicine.html) • Ask patients to gather data, such as vital signs or blood sugar readings, in advance • Ask patients to have prescription medication containers available for reference if needed • Make a back-up plan in case the conversation gets cut off • Make sure mobile phones and laptop or tablet computers are charged and have adequate prepaid minutes available when needed • Have pen and paper ready to write a message in case the patient cannot hear you
Privacy
• Both parties should find a quiet and private space to talk, if possible • Position yourself to avoid other people being visible in the background • Turn up volume on devices to a comfortable level • Identify yourself by name, role, and institution • Identify patients with two identifiers such as name and date of birth • Find out who, besides the patient, may be listening in, what their relationship is to the patient, and whether you have permission to discuss personal information • Tell patients if other healthcare personnel may be listening to your conversation • Use a headset to support privacy if needed • Develop and follow a policy for protecting privacy when leaving voice messages for patients
Hearing
• Check that patients are hearing you adequately

• Offer video sign language interpretation or captioning services to people who are hearing impaired
Clear communication
• Use health literacy universal precautions for all encounters • Use professional medical interpreters when needed • Establish the agenda at the outset • Use plain language; avoid unnecessary or undefined medical jargon • Avoid information overload; focus on 1 to 3 key messages • Repeat/summarize key information and recommendations • Use multiple teaching channels when possible, including visual aids and written summaries • Elicit information using open-ended questions, such as "What questions do you have?" • Use the teach-back method to confirm clear communication and patient comprehension
Memory aids
• Encourage patients and caregivers to have a pen and paper available for taking notes • If appropriate, encourage patients to have another person with them to provide a second set of ears • Arrange for patients to receive a written summary of the encounter

Data from Reference 101.

Improve Medication Counseling Skills

Perhaps a key point to remember about health and medication literacy is the vital importance of proper medication counseling. The National Conference of Pharmaceutical Organizations (NCPO) agreed that appropriate counseling on the use of medications should be a key goal of healthcare reform in a 2009 policy statement, "From Reform to Revolution: Maximizing the Power of Proper Medication Use in Patient Care."

In a study of hospital discharge instructions, several interventions were used to educate patients before discharge. The usefulness of each intervention was evaluated with a follow-up telephone call to 125 patients. The three interventions that patients found most useful were (1) speaking with a pharmacist about their medications before discharge, (2) receiving an illustrated medication list, and (3) a follow-up telephone call after discharge. Patients with limited health literacy indicated the greatest benefit.[107]

The following 10 points provide suggestions for pharmacists and other health professionals on how to improve their medication-counseling skills:

1. *Take the time to counsel:* Taking the time to provide verbal counseling about medications is especially crucial in patients with limited health literacy.

2. *Create a relaxed and nonthreatening environment:* Many patients with low health literacy are embarrassed about the difficulty they have understanding health-related information. While they may not take the initiative to disclose this information, they are amenable to discussing health literacy and learning in the right environment. Thus, a first step toward effective medication counseling is to create a friendly and relaxed environment for the patient.[71] Take the time to listen and give the patient enough time to feel comfortable. Try to understand the patient's perspective.

3. *Use plain language:*[108] Speak clearly using plain and common words. Pay attention to the patient's own terms and use them in the medication conversation.[101,108] Table e2-8 has examples of alternative lay terms to common medical terms. Avoid vague terms. For instance, oral and written instructions should be to "take medication 1 hour before breakfast," not "take medication on an empty stomach." Tell patients what you want them to do. Use instructions such as, "Stop taking this medicine if you get pregnant," instead of "this medicine should not be taken during

pregnancy." Another example is, "Do not drink alcohol with this medicine," which is preferred over, "Alcohol should not be mixed with this medicine." In addition, use identifiers such as the time of day. For example, say, "Take 1 tablet in the morning and 1 at bedtime," rather than "take twice daily."

4. *Show the patient each medication while counseling:* Open the medication containers so that the patient can see the colors and shapes of the tablets or capsules.[109] This will help them recall your instructions. For liquids, show patients or caregivers the correct dose with a marking on an oral syringe. These syringes are the most accurate dosing method for liquids.[110]

5. *Focus on one to three key points and repeat them frequently:* Limit the number of messages and tell patients only what they *need* to know. Skip details that are "nice" to know.[108] Reinforce these same key messages by repeating them.

6. *Have patients repeat instructions:* An evidence-based strategy of verifying patient understanding is to use the "teach-back" method.[111] Patients are asked to repeat the instructions or information they were given to ensure that the key concept has been understood and remembered. If the concept is not repeated correctly by the patient, the health professional clarifies and tailors the explanation and reassesses patient recall. This cycle of explaining, assessing, and clarifying is repeated until the concept is understood. This technique is termed "the interactive communication loop in clinician–patient education" by Schillinger and colleagues.[111] They found that when physicians applied this interactive communication strategy for their patients with diabetes, glycemic control improved. Findings of a study assessing patient understanding of prescription labels suggested that professionals should go further by asking patients to "demonstrate" or "show" how they will use medications. Davis and colleagues found that even though some patients could verbalize the correct instructions on the label (eg, take two tablets twice daily), they could not "demonstrate" the correct dose.[6] Of note, this group included persons with adequate health literacy levels.

7. *Encourage patients to ask questions:* Never ask, "Do you have any questions?" Instead, ask, "What questions do you have?" Create an environment in which patients feel comfortable asking questions. The professional might say, "Sometimes I give people a lot of information about their medicines and it can be confusing … so I would like to ask you, what questions do you have?"

8. *Use pictures or illustrated medication schedules:* Research indicates that pictures help patients understand how to take their medicines,[112] and these may be particularly useful in patients with limited health literacy skills. A review of the literature found that pictorial aids improve recall, comprehension, and adherence.[113] Researchers have developed prototypes illustrated medication schedules (see Fig. e2-5),[114] as well as a guide on how to create simple versions using word-processing software.[115] These daily schedules provide the patient with a picture of the actual medicine, the name of the medicine, the indication, and specific dosing instructions. Assessment of such tools reveals that more than 80% of patients thought they were useful and easy to understand.[114] Other work confirms that these illustrated daily medication schedules improve medication self-efficacy and adherence among at-risk, community-dwelling older adults.[116]

9. *Supplement the interaction with patient-friendly educational material:* Written medication information can be helpful to supplement and reinforce specific counseling points if it is easy to read. Nonwritten material may also be useful in communicating medication information to patients. Alternative forms to written information include pictures/pictograms, videos, audiotapes, modules on disks, and interactive internet sites. Studies indicate that these modalities are increasingly effective.[97,105] However, some of these new media focus solely on medication information; research on their effectiveness is limited. Table e2-9 provides some helpful resources for pharmacists, other health professionals, and patients.

10. *Review patients' complete regimens and consolidate all medicines into their daily schedule:* In addition to providing information about each individual medication to the patient, it is important to consider the use of agent in the context of the full medication regimen. This is especially necessary when a regimen includes multiple medications, each with specific requirements such as taking on an empty stomach or taking at bedtime. Patients may be easily confused with multiple requirements and either make their regimen more complicated than necessary or compromise their care by not taking their medications appropriately.

FIGURE e2-5

Example of a personalized illustrated daily medication schedule. Such visual tools can help patients keep better track of all the medicines they take on a regular basis. (*For information on how to create such tools, visit:* http://www.ahrq.gov/patients-consumers/diagnosis-treatment/treatments/pillcard/index.html#Acknowledgment.)

Your Pharmacy

Date: July 5, 2005
Page 1 of 1

Name: John Doe
MRN# 400598

Johny's Pharmacy
001 Georgia Ave, Chattanooga, TN 37408
423 616.4307 fax: 423 616.6506

Pill Names	Used for?	Instructions	Morning	Afternoon	Evening	Night
Esomeprazole 20 mg	Heartburn	Take 1 pill 1 time a day	1 pill			
Spironolactone 25 mg	Heart	Take 1 pill 1 time a day	1 pill			
Lisinopril 20 mg	Blood Pressure	Take 1 pill 1 time a day	1 pill			
Fluoxetine 20 mg	Depression	Take 1 pill 1 time a day the first 2 weeks. After that, take 2 pills 1 time a day				
Furosemide 40 mg	Reduce Water	Take 2 pills 2 times a day	2 pills		2 pills	

Source: Joseph T. DiPiro, Gary C. Yee, Stuart T. Haines, Thomas D. Nolin, Vicki L. Ellingrod, L. Michael Posey: *DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 12e*

TABLE e2-8

Examples of Suggested Alternatives for Common Medical Terms

Medical Term	Alternative
Angina	Chest pain
Fatigue	Tired
Adverse reaction	Side effect
Acid reflux	Heartburn
Lipids	Cholesterol
Insomnia	Trouble sleeping
Subcutaneous	Under the skin
Nasal	Nose
Topical	On the skin
Administer	Give
Hypertension	High blood pressure
Contraception	Birth control

TABLE e2-9

Electronic Resources for Pharmacists, Health Professionals, and Their Patients

- Websites
- Apps

TECHNOLOGY

Technology is now more pervasive and easier to access in the United States than ever. Cellular phones, tablet and other types of computers, and electronic and digital devices such as “smart” thermostats, watches, and medical sensors have become smaller, faster, and cheaper. Their use and adoption have also increased. The percentage of US homes with a computer has risen from 8.2% in 1984 to 92% in 2018. Likewise, Internet use in American homes has increased from 18% in 1997 to 85% in 2018.[117]

Despite these advances, stark disparities remain in technology use and Internet access among Americans based on variations in incomes, education levels, age groups, geography, and ethnicities (Table e2-10).

TABLE e2-10

Computer and Internet Use for Households: 2018

Household Characteristics	% Households with Computers	% Households with Internet Access
Age of householder		
15-34 years	97.8	90.9
35-44 years	97.6	91.9
45-64 years	94.3	88.0
65 years and older	80.1	73.2
Race and Hispanic origin of householder		
White alone, non-Hispanic	92.2	86.8
Black alone, non-Hispanic	87.8	77.9
Asian alone, non-Hispanic	96.5	92.4
Hispanic (of any race)	92.0	82.4
Limited English-speaking household		
No	92.2	86.0
Yes	82.6	69.9
Household income		
<$25,000	76.9	64.7
$25,000-$49,999	89.7	81.1
$50,000-$99,999	96.3	91.1
$100,000-$149,000	98.5	95.6
$150,000 and more	99.0	97.1
Educational attainment of householder		
Less than high school graduate	74.9	63.1
High school graduate (includes equivalency)	85.6	76.6
Some college or associate's degree	94.6	88.4
Bachelor's degree or higher	97.8	94.6

Adapted from File T, Ryan C. Computer and Internet Use in the United States: 2013. American Community Survey Reports, ACS-28. Washington, DC: U.S. Census Bureau; 2014. Available at: http://www.census.gov/library/publications/2014/acs/acs-28.html.

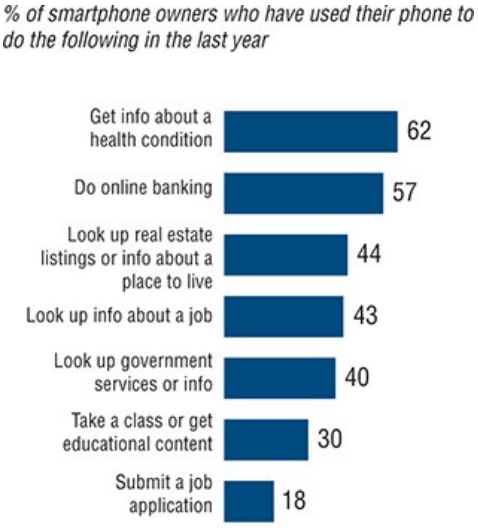
A 2018 US Census Bureau report showed that the majority of households with a computer were English speaking, younger, had a higher income, more education and lived anywhere in the United States. A similar pattern can be seen with regards to Internet access. Only 73.2% of the older population had Internet access. Households that were black or Hispanic (77.9%, 82.4%) tended to have less Internet access compared with whites and Asians (86.8%, 92.4%). Households with Internet access also tended to be English speakers, have a higher income, and more education.[117]

A Pew Research Center survey in 2015 showed that 92% of Americans have a mobile phone (68% smartphones, 34% traditional cell phones). An important finding was 7% that was classified as "smartphone-dependent" users, meaning that they have a smartphone but do not have Internet at home other than their mobile data plan nor do they have other device options for accessing the Internet such as a computer or laptop. These users tended to be low-income, black, or Hispanic.[118]

In terms of how smartphones were used, the survey showed that 97% of respondents use their smartphone for text messaging, 92% for calls, 89% for Internet, and 88% for email. Young users (aged 18-29 years) also use their smartphones heavily for social networking services (91%) compared with other age groups. Figure e2-6 shows that 62% of respondents have used their smartphone to look up information about a health condition.[118]

FIGURE e2-6

Use of smartphones for health information and other purposes (% respondents). *(Reprinted with permission from U.S. Smartphone Use in 2015. Pew Research Center, Washington, D.C., 2015. http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015.)*



Technology and Health Literacy

Digital health is changing the landscape of healthcare and how involved individuals can participate more in their own care. Unfortunately, access to electronic resources and connectivity may incidentally leave behind populations with the greatest vulnerability. Use of technology by people with low health literacy differs significantly from those with adequate health literacy. Patients can have difficulty discerning what online information is credible and with how to use information in positively affecting their own or another's health. Individuals with adequate health literacy are more likely to contact their healthcare provider through messaging services compared with those with low or marginal health literacy.[119] Additionally, those with low health literacy were more likely to use social networking sites and mobile apps than search engines to obtain health information, and preferred text-limited communication channels (eg, text messaging and radio) to receive this information.[120]

Thus, low health literacy is associated with a digital divide despite increased ownership of smart devices, use of text messaging, and social media.

Improvements in care could result from a focus on people's lack of a skill set for performing online tasks, disparities in access, and guiding users to find online and digital health information.

One study showed that in the United States, approximately 77% of the adult population owns a smart device and 15% a wearable device. Approximately 58% of respondents to a large survey reported downloading a mobile health application for improving their health.[100] In a study of digital literacy of hospitalized patients undergoing transitions of care, use of smart devices was lower in those with less health literacy (67.1% vs 78.3% among those with adequate health literacy); Internet access followed this pattern (75.7% vs 90.9%, respectively). Significantly more participants with low health literacy needed assistance in performing online tasks (70.4%) versus those with adequate health literacy (44.6%).[106]

Unfortunately, when it comes to Internet use for accessing patient portals and other online services, patients with low health literacy were 70% less likely to sign on or use the site.[121] Among the 59% of US older adults who use the Internet, an even smaller percentage of those with low health literacy (9.7%) used it for health information purposes compared with those with adequate health literacy (31.9%).[122] As more technology is incorporated into healthcare systems, populations with the greatest vulnerability will need close attention to minimize the already great health disparities.

Technology and Medication Adherence

Table e2-3 shows that the current evidence for the association between health literacy and medication adherence is inconclusive. However, available data indicate that medication adherence is challenging to many people Nationwide, an estimated 75% of Americans have trouble taking their medicine as directed; approximately 125,000 annual deaths result from nonadherence to medications. Indeed, poor adherence is a major public health challenge, and it is logical that people with low health literacy likely have even a bigger challenge.

Current technology trends have helped to address primary nonadherence (not filling or picking up a prescription) by increasing the use of electronic health records (EHRs) to electronically transmit prescriptions or "e-Prescribe" medications directly to the pharmacy. This eliminates the need for patients to carry a paper prescription to the pharmacy. This solution has also allowed for prescription insurance formularies to be available to the prescriber at the point of entry and to reduce patient costs and waiting time by selecting drugs that are less expensive or do not require prior authorizations, both of which are barriers to obtaining medication.

Prescription insurance plans and pharmacies have also begun to share patient claims information, refill history data, and missed refill alerts with connected providers to help reduce duplication, coordinate care, reconcile medications among multiple prescribers, and increase patient safety.

While primary nonadherence and discontinuation of medications are being addressed on a national level, inconsistent use of medication by the individual patient has been a bigger challenge. To improve medication adherence, different technologies are emerging. Table e2-11 provides examples of technologies that can increase medication adherence.

TABLE e2-11

Examples of Electronic Technologies to Improve Medication Adherence

	Examples	Comments
Electronic Reminders	• Alarm clock • Email reminder • Mobile phone calendar • Text messaging • Reminder alerts when doses are due	• Inexpensive • Easily accessible • Sound alerts
Smart Pills Smart Bottles Smart Caps	• Proteus Discover system • AdhereTech • GlowCap • SMARxT Med Reminder • e-pill Multi-Alarm TimeCap	• Costly • May require Internet/cellular connectivity • Sound and light alerts • Notification and tracking systems • Caution with cap switching
Electronic Medication Dispensers	• MedicaSafe • Philips Medication Dispensing Service • Med-E-Lert Automatic Pill Dispenser	• Moderately expensive • Controlled access capability • Notification and tracking systems • Need to replenish monthly

Mobile Technology[125]	• Smartphone apps (Top 4)
	  ○ Mango Health
	  ○ MyMeds Medication Management
	  ○ MediSafe Meds and Pills Reminder
	  ○ Dosecast Medication Reminder
		• Free or inexpensive
		• Easy to difficult usability
		• Pictures and visual reminders
		• May require Internet connection
		• Gamification and rewards
		• May be limited by operating system

Directly Observed Therapy[126]	• eDOT	• Use of mobile devices or webcam-enabled computers • Live virtual meetings with clinician at a specific day and time to watch the patient take his or her medication/use inhaler in real time • Could provide immediate instruction or correction to the patient for medication taking or proper device use • Requires Internet connection • May be limited by user/patient or operating system

Two literature reviews provide evidence that text messaging improves medication adherence rates, at least in the first 6 months, but conclude that

larger and longer studies need to be conducted.[123,124] Electronic medication dispensing devices, such as MedicaSafe, are available to not only remind patients to take their medication but also allow prescribers to monitor progress. This is important for medications that are costly, such as oral hepatitis C treatments, and when adherence is extremely important, such as with tuberculosis treatment or posttransplant immunosuppression.

Lastly, as mobile technology has become widely available, so have applications (apps) that can be used on smartphone devices. Use of apps for improving medication adherence has yielded mixed results, but trends indicate overall improvement in self-care behavior and attitudes.[127] One randomized controlled study showed that a Spanish app improved medication adherence in older adults, including some with no experience using this technology.[128] In 2021, Treichler et al. ranked apps based on ratings, availability, and features (Table e2-12).[129] Many other apps are available that connect patients directly to their pharmacy and are designed to provide refill reminders as well as easily request refills.

TABLE e2-12

Top 10 Medication Reminder Apps for 2022

Application Name	Uniqueness	Additional Functions
1. Medisafe	Best overall	Helps caregivers manage prescriptions for loved ones
2. MangoHealth	Best for Android users	Provides rewards for incentives
3. RoundHealth	Best for iOS users	Easy to use and set notifications
4. DoseCast	Best paid app	Can sync reminders across multiple devices
5. MyTherapy	Best for non-English speakers	Available in 30 languages
6. LadyPillReminder	Best for women's health	Birth control reminder
7. CareZone	Best for healthcare management	Keeps track of physician appointments
8. Care4Today	Best for activity tracking	Measures vital statistics
9. MedPlan	Best for health education	Educational tools
10. Groove Health	Best artificial intelligence tool	Can answer questions about medications

Although more studies are needed to evaluate the effect of technology-based adherence interventions, current trials suggest combinations of in-person communication with automated reminders or triggers are more effective.[130]

CONCLUSION

Limited health literacy is a prevalent and often overlooked problem. It continues to be a priority area for the federal government in the United States, numerous national and international organizations, and researchers seeking to improve patients' understanding of health and in turn improve health outcomes.

As technology improves and access increases, improved eHealth interventions that meet the users' needs should be developed. Health literacy leads to improved medication adherence. Health professionals need to consider that many of their patients have limited literacy skills and may also have limited Internet connectivity and/or knowledge and skills needed for using online applications and technology. Health literacy, eHealth literacy, and digital health are important factors to consider in improving appropriate medication use.

ABBREVIATIONS

ACP	American College of Physicians
AHIP	America's Health Insurance Plans
AHRQ	Agency for Healthcare Research and Quality
CDC	Centers for Disease Control and Prevention
EHR	electronic health record
FDA	Food and Drug Administration
HHS	Department of Health and Human Services
HIV	human immunodeficiency virus
IOM	Institute of Medicine
LEP	limited English proficiency
MDI	metered-dose inhaler
NAAL	National Assessment of Adult Literacy
NCPO	The National Conference of Pharmaceutical Organizations
NIH	National Institutes of Health
NVS	Newest Vital Sign
PHLAT	Parental Health Literacy Activities Test
RALPH	Recognize and Address Limited Pharmaceutical Literacy Skills
REALM	Rapid Estimate of Adult Literacy in Medicine
TOFHLA	Test of Functional Health Literacy in Adults
WRAT-3	Wide Range Achievement Test
UMS	Universal medication schedule
USP	United States Pharmacopeia
VHA	Veterans Health Administration

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SELF-ASSESSMENT QUESTIONS

1. Which of the following factors is associated with the Healthy People 2030 goal for health literacy?
   A. Medication literacy
   B. Personal health literacy
   C. Organizational health literacy
   D. All the above
   E. Only B and C
2. Which of the following are the most widely used measures of health literacy?
   A. TOFHLA and REALM
   B. NVS and S-TOFHLA
   C. PHLAT and shortened-REALM
   D. RALPH
3. Materials should be written at what reading level for most patients to comprehend:
   A. Eighth grade

B. Twelfth grade

C. Seventh grade

D. Sixth grade and below

4. Which of the following is the standard of care or “gold standard” to measure medication adherence?

A. There is no “gold standard”

B. Pharmacy refill history

C. Morisky scale

D. REALM

5. Which of the following are the most vital components in the medication management of patients with limited health literacy?

A. Medication reconciliation

B. Completing a medication history and counseling

C. Medication counseling

D. Provider education on the importance of medication counseling

6. What is a useful strategy to identify patients with limited health literacy?

A. Health literacy questionnaire

B. Pharmacy refill history

C. Medication list

D. Medication review

7. Which of the following groups are at high risk of limited health literacy?

A. Patients with commercial health insurance

B. Age 50 years or older

C. Income at or below the poverty line

D. Patients who rate their overall health as fair

8. Which of the following has been consistently shown as a consequence of limited health literacy in the literature?

A. Decreased ability to name and identify medications

B. Decreased medication adherence

C. Increased understanding of how to take medications

D. No effect on proper use of metered-dose inhalers

9. Which of the following is recommended to improve patient understanding of medication labels?

A. Make the pharmacy name prominent

B. Use words instead of numbers (two instead of 2)

C. Use vertical warning labels to maximize space

D. Include the indication for use

10. How can healthcare providers promote clear communication in a telemedicine patient visit?

A. Allow patients to complete visits while working or driving for their convenience

B. Use the teach-back method to ensure patient comprehension

C. Do not proceed with telemedicine visit if patient unable to connect via video

D. Offer a written summary of the visit if requested by the patient

11. Which is an example of a concern regarding use of technology by patients with limited health literacy?

A. There are no differences in technology use between patients with low or adequate health literacy

B. Most patients with low health literacy do not use technology at all to find health information

C. Patients with low health literacy are more likely to seek health information from less credible sources

D. Patients with low health literacy are more likely to use online patient portals to access their health information

12. Which of the following best defines personal health literacy?

A. The ability to read and write

B. The ability to speak the same language as one's healthcare professional

C. The ability to use information to inform health-related decisions for oneself

D. The ability to understand medical terminology and jargon

13. What tool was developed to assist pharmacists in assessing patients' medication literacy?

A. RALPH

B. REALM

C. BRIEF

D. TALKDOC

14. Medication nonadherence is associated with appropriately how much of the American population have trouble taking their medications and how many deaths per year?

A. 30% of Americans; approximately 125,000 annual deaths

B. 75% of Americans; approximately 125,000 annual deaths

C. 50% of Americans; approximately 300,000 annual deaths

D. 75% of Americans; approximately 300,000 annual deaths

15. Which of the following could be an indicator of limited pharmaceutical/medication literacy?

A. Able to explain what the warning label on their prescription means in their own words

B. Able to explain how to take their medications correctly

C. Patient does not ask questions when given conflicting information from different healthcare providers

D. Patient asks several questions about their new medication during counseling session

SELF-ASSESSMENT QUESTION-ANSWERS

1. **E.** To update and address health literacy in Healthy People 2030, Santana and colleagues provide the following definitions that address both personal and organizational health literacy. Among other key points, they incorporate a public health perspective and acknowledge that organizations have a responsibility to address health literacy as well.[2]

   Personal health literacy is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

   Organizational health literacy is the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

2. **A.** Two of the most widely used measures of health literacy are the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test Of Functional Health Literacy in Adults (TOFHLA). These tests are mainly used in research, but they can be used in practice.[73]

3. **D.** Most sources and studies suggest readability of health information should not exceed a 6th-grade reading level.[97-101]

4. **A.** A major barrier to consolidating data from adherence studies is that there is no generally accepted "gold standard" for measuring medication adherence, making overall conclusions difficult.

   See Table e2-6 for examples of other medication adherence questions/strategies.

5. **B.** Perhaps one of the most essential components necessary to improve medication management in patients is obtaining a thorough and complete medication history. This is important for all patients regardless of their health literacy level. However, because patients with limited health literacy have difficulty naming their medications and are more likely to mismanage their medications, taking a complete baseline history of what they are taking is especially valuable.

   Perhaps a key point to remember about health and medication literacy is the vital importance of proper medication counseling. The National Conference of Pharmaceutical Organizations (NCPO) agreed that appropriate counseling on the use of medications should be a key goal of healthcare reform in a 2009 policy statement, "From Reform to Revolution: Maximizing the Power of Proper Medication Use in Patient Care."

6. **D.** A medication review can be useful in identifying patients with limited health literacy skills. If the refill history is accessible, one might find that they often forget to refill their medications on time or never pick them up. They may not be able to name or provide a list of their medications even when on just a few medications. If the medication bottles are available, the patient can be asked to state the name, use, and dosing instructions for each of their medications. Patients with limited health literacy may not be able to respond accurately. They may say, "I take them just like it says on the bottle," or they have to look at the pill color and shape before they can respond.

7. **C.** See Table e2-2 for examples of groups at high risk of limited health literacy

8. **A.** See Table e2-3 for a literature review on effects of limited health literacy on various aspects of medication use. Decreased ability to name and identify medications has consistently been shown in multiple studies. While limited health literacy has been associated with decreased medication adherence in some studies, others have shown increased medication adherence or no effect at all.

9. **D.** See Table e2-4 for guidance on prescription labels. USP recommends the most important information for correct and safe medication use to be prominent, such as patient name, drug name and strength, and directions. Prescriber and pharmacy name can be less prominent. It is also

recommended to use numbers instead of words (2 instead of two) and to avoid vertical warning labels.

10. **B.** See Table e2-7 for clear communication tips for telemedicine visits. It is recommended for both parties to have a quiet, private place to talk. Conducting a visit while the patient is driving or at work may not allow them to focus on the visit. The teach-back method is a means of allowing the patient a chance to repeat back instructions provided and the opportunity for the healthcare provider to correct misunderstandings. While audio and visual telemedicine visits may allow for multiple teaching channels to be used, not all patients may have access to video and must interact by telephone only. Written summaries of the visit should be provided to patients regardless of whether they request it.

11. **C.** See the "Technology and Health Literacy" section, which highlights differences between patients with low and adequate health literacy with regard to use of technology.

12. **C.** See the "Introduction" section for health literacy definitions. The ability to read and write describes literacy in general. While the ability to speak the same language as one's healthcare provider and to understand medical terminology and jargon may contribute to improved understanding of health information, health literacy also involves using information gathered to inform health-related decisions.

13. **A.** The Recognize and Address Limited Pharmaceutical Literacy Skills (RALPH) interview guide was developed to assist pharmacists in assessing patients' medication literacy, or their ability to understand and apply instructions for safe and effective medication use, during a typical patient counseling session.[79]

14. **B.** Table e2-3 shows that the current evidence for the association between health literacy and medication adherence is inconclusive. However, available data indicate that medication adherence is challenging to many people nationwide; an estimated 75% of Americans have trouble taking their medicine as directed; approximately 125,000 annual deaths result from nonadherence to medications. Indeed, poor adherence is a major public health challenge, and it is logical that people with low health literacy likely have even a bigger challenge.

15. **C.** See RALPH Interview Guide for indications of limited pharmaceutical literacy. A patient's ability to explain how to safety and correctly take medications in their own words would indicate adequate health literacy. While a patient with limited pharmaceutical literacy may have more medication-related knowledge gaps, asking several questions about a new medication is not an indicator on its own. Rather, it would indicate adequate pharmaceutical literacy since the patient would be seeking medication information from a reliable source (the healthcare provider). A patient who does not ask questions or seek clarification despite receiving conflicting information from different healthcare providers is more likely to have limited pharmaceutical literacy.