Health Literacy Online

A guide to writing and designing easy-to-use health Web sites

- Strategies
- Actions
- Testing Methods
- Resources

U.S. Department of Health and Human Services
Office of Disease Prevention and Health Promotion

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Contents

About This Guide

More Americans are going online than ever before. According to a 2006 survey, 80 percent of Internet users have looked for health information on the Web.[1] As a result, both public and private institutions are using the Internet to streamline the delivery of health information and connect people and services in exciting new ways.

Yet the transition to online health information and services poses a unique set of challenges for Web users with limited literacy skills or limited experience on the Internet. For many of these users, the Web is stressful and overwhelming—even inaccessible. Much of this stress is the result of complex health content and poorly designed Web sites.

The U.S. Department of Health and Human Services' Office of Disease Prevention and Health Promotion (ODPHP) has written a research-based how-to guide for creating health Web sites and Web content for the millions of Americans with limited literacy skills and limited experience using the Web. The strategies in this guide complement accepted principles of good Web design and thus have the potential to improve the online experience for all users, regardless of literacy skills.

This guide is written for Web designers, Web content specialists, and other public health communication professionals. We offer an overview of how to:

- Deliver online health information that is actionable and engaging.
- Create a health Web site that's easy to use, particularly for people with limited literacy skills and limited experience using the Web.
- Evaluate and improve your health Web site with user-centered design.

Why Design Easy-to-Use Web Sites?

- Although the problem remains largely invisible, millions of Americans have a hard time reading. As many as half of U.S. adults have limited literacy skills.[2]
- Even more Americans—as many as 9 out of 10—have limited health literacy skills. This means they have trouble understanding complex health information.[2] As more health information and services move online, Web developers and professionals must find new and better ways to communicate health information to the public.
- The number of older adults using the Internet continues to grow. A significant number of older Web users are searching for health information. However, age-related changes in vision, hearing, and cognition affect older adults' use of the Internet.[3]

Taken individually, each of these factors presents a challenge for Web developers and health professionals. Taken together, they represent an urgent need for innovative design—and redesign—of health content on the Web.

Several factors affect how well users can find, understand, and use information on the Web, including:

- Access to computers and experience online
- Ability to read and understand printed text
- Complexity of information on the Web
- Usability of the Web in general and Web sites specifically[4,5]

Clearly written content, uncluttered Web sites, and simple navigation dramatically improve the performance and experience of Web users, including those with limited literacy skills.

Studies show that simplifying your Web site improves the experience of all users, not just those with limited literacy skills.[4,6] Clean layouts and familiar language are more usable for everyone.[7]

Building On the Principles of Usability

The latest research in Web design supports creating easy-to-use Web sites. This guide builds on the principles of Web usability and adds to existing best practices by providing research-based strategies for writing and designing health Web sites that are accessible to users with limited literacy and limited health literacy skills.

Drawing on experience with healthfinder.gov, this guide synthesizes lessons learned from ODPHP's original research with more than 700 Web users and the small but growing body of literature on the Web experiences of users with limited literacy skills. The strategies outlined in this guide are supported by the *Research-Based Web Design and Usability Guidelines, 2nd edition (Usability Guidelines),*[8] developed by the U.S. Department of Health and Human Services in partnership with the General Services Administration. The relevant chapters of the *Usability Guidelines* are listed at the end of each section.

Terminology: Literacy and Health Literacy

- "Literacy" is a person's ability to read, write, speak, and solve problems at levels needed to function in society.[9]
- "Health literacy" is a person's capacity to find, understand, and use basic health information and services needed to make appropriate health decisions.[10]

Although literacy and health literacy are distinct constructs, they are closely related. Literacy has been found to be a predictor of health literacy.[11] Roughly 1 in 3 adults has limited literacy skills; however, a far greater number of adults (as many as 9 in 10) struggle with complex health information.[2,11] In other words, a person may be extremely literate and still have difficulty interpreting and acting on health information—whether it's online or in print.

The aim of creating easy-to-use health Web sites is to reach as many Web users as possible, especially those adults who are overwhelmed by everyday literacy tasks. For this reason, this guide refers to Web users with limited literacy skills; it's assumed that these Web users, and millions more, likely have limited health literacy skills as well.

A Note on the Research

Most of the recommendations in this guide are based on original research studies conducted on behalf of ODPHP (detailed in Appendix D). ODPHP used proxy measures to identify a sample of adults with limited literacy and limited health literacy skills based on statistics from the health literacy component of the 2003 National Assessment of Adult Literacy. Individuals included in many of the studies referenced in this guide met the following criteria:

- High school education or below
- Below the poverty threshold
- Have not searched for health information online in the past year

Participants were recruited from community settings likely to serve people with limited literacy and health literacy skills, including federally funded community health centers.

ODPHP's studies pertain specifically to the delivery of online health promotion and disease prevention content. Much of the research focused on communicating actionable information and motivating users to adopt healthy behaviors. The communication and usability strategies outlined in this guide also apply more generally to the delivery of health information on the Web.

Throughout the guide, we incorporate quotes from Web users with limited literacy skills who participated in our usability studies. These quotes speak to the valuable role Web users play in writing and designing effective Web sites.

What We Know About Web Users With Limited Literacy Skills

Many adults with limited literacy skills have had little training and experience searching the Web. They struggle not only with reading the content on the page, but also with retaining and managing new information as they move through a Web site.[4,5,12]

Several key characteristics and common behaviors of users with limited literacy skills affect how they perform on a Web site. Many of the following characteristics are common to *all* Web users; however, the degree to which they occur is greater for users with limited literacy skills.

Willing and Able

Most importantly, we know that users with limited literacy skills are generally:

- Willing to use the Web to access health information
- Successful in accomplishing their tasks when Web sites are designed well[4–6]

More often than not, poorly designed Web sites—more than limited literacy skills—contribute to users' challenges online.

Simple navigation and clear content can help adults with limited literacy skills find, understand, and use health information on a Web site.

Skipping Instead of Scanning

Most Web users skim and scan a Web page before they read.[7,13] They may read the first few words or sentences on a page and then scan the rest of the headings and bulleted lists on the page until they find what they're looking for.

Users with limited literacy skills have a hard time scanning headings and subheadings to grasp and manage the information on a Web page. Instead, these users have a tendency to do one of the following:

- Read every word on the page.
- Skip over entire chunks of dense text.
- Start clicking on links instead of reading the content.[4,5,14–17]

Instead of jumping from one heading to the next, users with limited literacy skills may skip and land in the middle of a page, or even the middle of a paragraph.[4]

Web sites with short, stand-alone sections of text written in plain language can make it easier for adults with limited literacy skills to find information and absorb and retain what they read.[4,12,14,15,18] In fact, one study found that users with limited literacy skills skip over a paragraph when it contains more than three lines of text.[15]

➔ Use short chunks of text and bulleted lists.

Difficulty Searching

Users with limited literacy skills avoid searching. Instead, users prefer to browse topics using an alphabetical list (even if the list is long).[4,16,19] When they do use the search function, they may have difficulty spelling the search term.[4,5,16,19]

➔ When designing your site, include both a search function and another way to browse the content, such as an "A to Z" list. Be sure to compensate for misspellings in the search box and to limit the number of results on a page.

Focusing on the Center of the Screen

Research with users with limited literacy skills indicates that they tend to have a narrow field of view.[4,5,12,15,18,20] As these users read through a page, they are less likely to notice content above, below, or to the sides of their focus of attention. Links and content in the right margin are often mistaken for advertisements or ignored.[12,20]

Moreover, many users with limited literacy skills don't scroll.[4,5,18,20] This means they are only seeing the content in the center of their screen.

- ➔ It's important to keep key text above the fold when possible. "Above the fold" means that the text fits on the screen and can be read without scrolling.
- ➔ Use only left and center navigation elements.

Easily Overwhelmed

Dense text, small font size, content in the margins, complex sentences, and too many links can overwhelm users with limited literacy skills. As a result, users may skip over key content or give up their search prematurely, often settling for incomplete or vague information.[4,7,12]

Even content written in plain language can be overwhelming if too much text is together in one paragraph or there is not enough white space on the page.

- ➔ Display content clearly on the page and avoid clutter.

Limited Working Memory

Users with limited literacy skills, including many older adults, reach "information overload" more quickly than users with stronger literacy skills. Those with limited literacy skills are less likely to remember content from previous pages, and they rarely look ahead or back on a page.[4,15,16,18] As a result, you can't rely on context to orient users or to add meaning to the text on the screen.

In one study, users with limited literacy skills were prompted to enter their age and sex into a Web-based tool. When they viewed the results, many users had difficulty making the connection between the results page and the data they entered on the previous screen.[15]

➔ To compensate for users' limited working memory, use clear, stand-alone headings and sections that function independently. Include plenty of visual cues to orient users on the site.

Simple Navigation

Users with limited literacy skills are often less experienced using the Web. They may be unfamiliar with—and often may ignore—common navigational elements such as drop-down menus, clicking buttons and links, or breadcrumbs.[5,12,15,18,20,21]

Breadcrumbs are found near the top of the page and look like this:

Home > Quick Guide to Healthy Living > Nutrition and Fitness

In one study, even after being shown how to return to a home page, users with limited literacy skills had difficulty repeating the task from a different page on the site.[18–20]

Studies with users with limited literacy skills found that they had success with simple tabbed navigation with linear (numbered) pages.[16,17]

➔ Use obvious step-by-step navigation, such as numbered pages and "previous" and "next" buttons, whenever possible.

A Brief Introduction to User-Centered Design

Question: How do I know whether my Web site meets the needs of users with limited literacy skills?

Answer: By involving users with limited literacy skills throughout all stages of Web site development. This is called user-centered design.

User-centered design is accomplished through an iterative process. The iterative process can be summed up in three words: Test. Revise. Repeat.

Imagine spending money and time designing a Web site from start to finish, only to discover that your users are unhappy with the site or unable to find what they are looking for (or both).

Instead, involve users as codesigners. Have users try out your Web site early on, and continue to test different sections of your site as you develop them. Fine-tune as you go to avoid a major overhaul. This is iterative design.[22]

> *The key to iterative design is to continually apply what you learn from users to improve your site.*[8]

Summary of Iterative Design and Testing Methods

Common iterative design methods are briefly described here. At the end of each chapter, we suggest specific methods and tips you can use to test and improve your Web site.

Individual Interviews

Individual interviews involve talking to users one on one, either in person or over the phone. Unlike a usability test, you aren't watching the participant work. You are finding out background information about their information preferences, habits, and experiences.[8,23]

Focus Groups

Focus groups are similar to individual interviews, except that you are interviewing several participants (typically 5 to 10) at once. A moderator facilitates the focus group and uses a script to lead the discussion. Focus groups are used to learn about users' beliefs, attitudes, or reactions to a design or prototype.[8]

Task Analysis

Conduct a task analysis to find out what users are trying to accomplish on your Web site and how they currently accomplish those tasks.[8,13,23,24] What steps do they take? What tools do they use? A task analysis can be done through observation or interviews.

A task analysis can help you "unpack" the requirements or demands put on users to accomplish a task on your site. Often we make false assumptions about Web users' knowledge or skills. For example, we may assume users know what BMI (body mass index) stands for or that users will correctly interpret the meaning of an icon or symbol.

Personas and Scenarios

A persona is a made-up individual who embodies the characteristics of the real users you may have interviewed and the data you gathered. When creating a persona, include demographics, values, access to technology, and quotes.[7,8,13,25–27]

It helps to give your persona a name and a picture. Keep your personas in mind as you design your site. Ask yourself: Would Susan use this? How would Joe approach this task?

Once you've developed personas for your site users, you are ready to develop scenarios. Scenarios are short stories that describe the goals and tasks of your users.[7,8,24] They can help paint a realistic picture of how personas use your Web site.

Card Sorting

Card sorting can help you group or organize information on your Web site. Many people use card sorting to help with information architecture. The topics and information featured on your site are listed on index cards. Participants are asked to sort or organize the cards into categories that make sense to them. You also can use card sorting to prioritize information by importance.[23]

Prototypes

A prototype is a mockup of your Web site, similar to a rough draft. Start with a paper prototype or wireframe. (A wireframe is an illustration of the layout of a Web page.) Each piece of paper represents a page of your Web site. Users tell you which information or link they would click on, and you show them the new piece of paper (or "screen").[8,22,24,28,29]

As you get further along in the development process, consider building a clickable prototype. This HTML (hypertext markup language) "shell" lets users click through several screens of content.

Usability Testing

In usability testing, a moderator observes a user performing tasks on your Web site. Have participants "think out loud" as they use the site to help you understand their approach and process. Note where users have problems or get lost.[22,30,31]

Six Strategies for Writing and Designing Easy-to-Use Health Web Sites

In the six chapters that follow, this guide presents specific strategies with examples for writing and designing health Web sites that are accessible to users with limited literacy skills.

1. Learn about your users and their goals.
2. Write actionable content.
3. Display content clearly on the page.
4. Organize content and simplify navigation.
5. Engage users with interactive content.
6. Evaluate and revise your site.

Each strategy includes:

- Actions
- Examples
- Iterative design methods and tips

1. Learn About Your Users and Their Goals

The Basics

The key to creating good Web content is to understand your intended users and to design information based on their specific wants and needs. The goals are to:

- Write health content your users need in words they understand.[7]
- Organize the content so that it's easy to find.

Before you design your site, think about the content you will provide and how it will be used.

Research shows that targeted health information gets users' attention and promotes learning.[32] For example, information can be targeted to users' age, sex, culture, health status, motivation, or readiness to change.

Actions at a Glance

1.1. Identify your users. Who are they?

1.2. Understand their motivations. Why are they here?

1.3. Understand their goals. What are they trying to do?

Actions

1.1. Identify your users. Who are they?

Are they looking for health information for themselves or someone else?

Many users with limited literacy skills are searching for health information for a family member or friend. As a result, they often prefer to print or e-mail the information they find online.[16,33,34]

➔ Consider including health content targeted to caregivers and family members.

What are the social and cultural characteristics of your intended users that might influence how they perform on the site?[13] (Consider age, education, economic status, and experience with the Internet.)

What are the technological characteristics that influence how users perform on the site? (Do they have broadband access? Do they have a home computer?)

- If Web users don't have broadband access, graphics and other features will take a long time to load.
- Many users with limited literacy skills access the Internet at the house of a friend or family member. Some go online at a public library or community center. This may affect the type of health information they search for, the length of time they spend searching, and the degree of personal health information they provide.[5,34]

1.2. Understand their motivations. Why are they here?

Motivation drives the search for health information and influences users' performance on a Web site.[32,33] Understanding users' motivations will help you target health promotion content to meet their information needs and expectations.

Example

ODPHP's research identified the following motivations for online health information seeking:

- Those seeking information about a health problem affecting them or someone they know
- Those seeking to find out whether they have a health problem or reason to be concerned
- Those seeking information on how to prevent the onset of health problems[32,33]

Studies found that users' motivations tend to shift, often frequently.[7] In response, target content to multiple motivations for seeking health information.

The formula below was developed based on the motivations identified in the previous example. It's designed to move users from "I want some information about a topic" to "I want to do something about it."

Try it!

Follow this proven formula for presenting health promotion information:

- Describe the health behavior.
- Describe the benefits of taking action.
- Provide specific action steps.

(For more information, see Section 2.)

1.3. Understand their goals. What are they trying to do?

Most Web users have a specific goal in mind. Typically, they are trying to answer a question.[4,7,12] Ask your users what they want to know. Then decide how to give them that information.

Iterative Design Methods and Tips

Methods

- Individual interviews
- Focus groups
- A task analysis
- Personas and scenarios

Tips for designing and testing your Web site with users

- In this early phase of iterative design, use focus groups and interviews to talk to people who might use your Web site. Consider interviewing intermediaries who work with Web users with limited literacy skills. These could include public librarians, health care providers, and adult educators. Find out how your Web site could help them serve their clients better.

- Once you've observed and interviewed potential users, create user personas and scenarios. Use these to guide you through the next phase of content development.

- If you are revising an existing Web site, start with a usability test. Collect benchmark data on how long it takes people to find the information they need. After you revise the site, repeat the test to see whether you have successfully improved usability.

Refer to *Research-Based Web Design & Usability Guidelines* sections:

1:2, 1:3, 1:4, 1:6, 1:7, 1:11

2. Write Actionable Content

The Basics

Writing for the Web is different than writing for print. Most Web users are looking for specific information or an answer to a question.[7] They typically don't stay very long on one page (the average time on a home page is about 27 seconds).[7,35]

When it comes to health information, users want to quickly and easily:

- Understand the health problem or behavior
- Find out how to take action[14,16,36]

Content is the most important element of your Web site.[7,13] Aim for health content that is:

- Brief and to the point
- Actionable and engaging

"Actionable" means you are focusing on health behavior. Tell users what you want them to do and how to do it.

Engagement is the process of involving users in health content in a way that motivates them to take action. Interactive tools and checklists are examples of engaging content. When applied to online health information, high levels of engagement can lead to health behavior change.[37]

Take note: **Plain language is not enough.** If you want your users to adopt healthy behaviors, you must write actionable health content. Plain language alone will not get you to your desired outcome.

Actions at a Glance

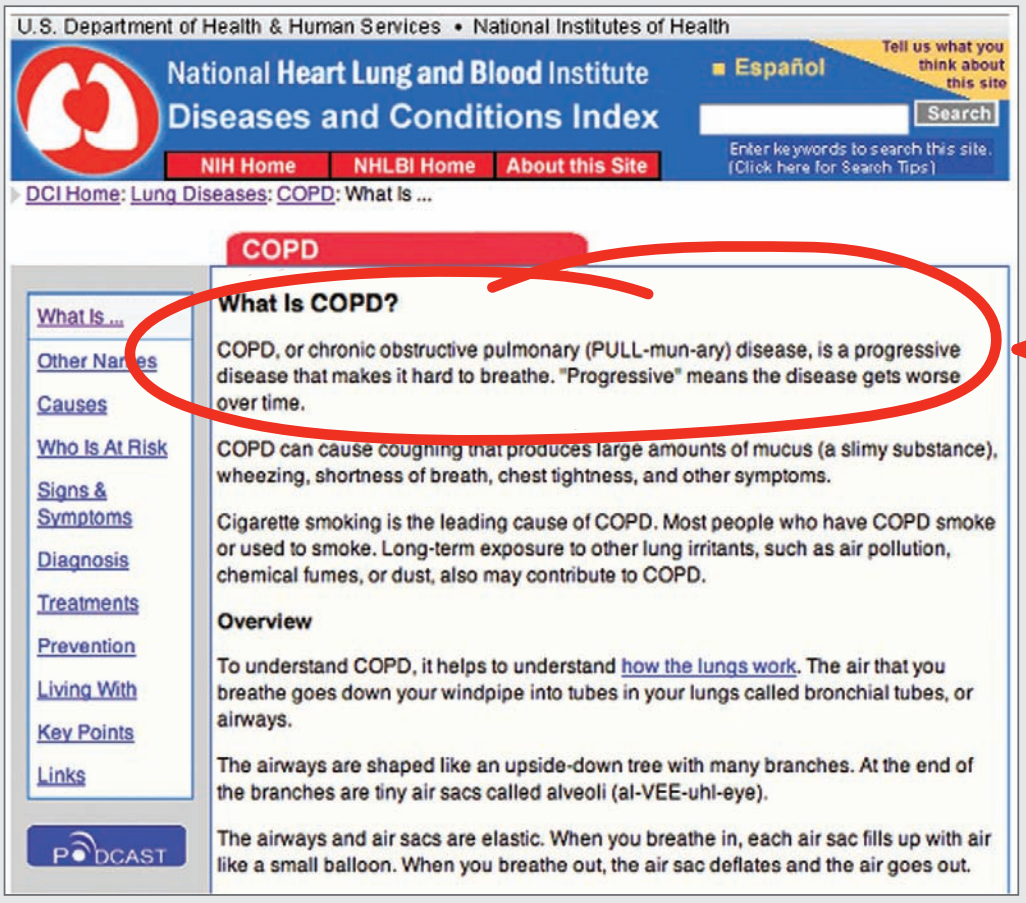
2.1. Put the most important information first.
2.2. Describe the health behavior—just the basics.
2.3. Stay positive and realistic. Include the benefits of taking action.
2.4. Provide specific action steps.
2.5. Write in plain language.
2.6. Check content for accuracy.

Actions

2.1. Put the most important information first.[13]

Many users with limited literacy read only the first few words on a page or paragraph. If they think the content will be easy to get through, they may keep reading. If they think it might be too difficult, they will skip to a different spot on the page.[4,5,14,16,18,20,38]

Exhibit 1



Source: www.nhlbi.nih.gov/health/dci/Diseases/Copd/Copd_WhatIs.html

This NHLBI Diseases and Conditions Index Web page puts the most important information about this lung disease—just the basics—first. Additional information about lung function comes later.

In card-sorting exercises, Web users with limited literacy skills prioritized the following types of health information as most useful:

- Basics I need to know (Understanding)
- I would like to learn more (Assessment)
- I can do this (Overcoming Barriers)
- How will this help me? (Motivators)
- Ways I can take action (Strategies)
- Where can I go for help? (Community Resources)

Common comments from users included:

"Just tell me what I need to know."

"Get my attention. Then get to the point."

2.2. Describe the health behavior—just the basics.

Start by introducing the prevention behavior. Users want specific behavioral guidance.[16,17,19,21,34] In other words, tell users what to do and how to do it. Focus on behavior rather than background information and statistics.

Health information does not need to be comprehensive. Instead, usability research has shown that many users prefer to learn "just the basics" about a health topic.[36] What do your users *need* to know to take action? Keep your information direct and to the point.

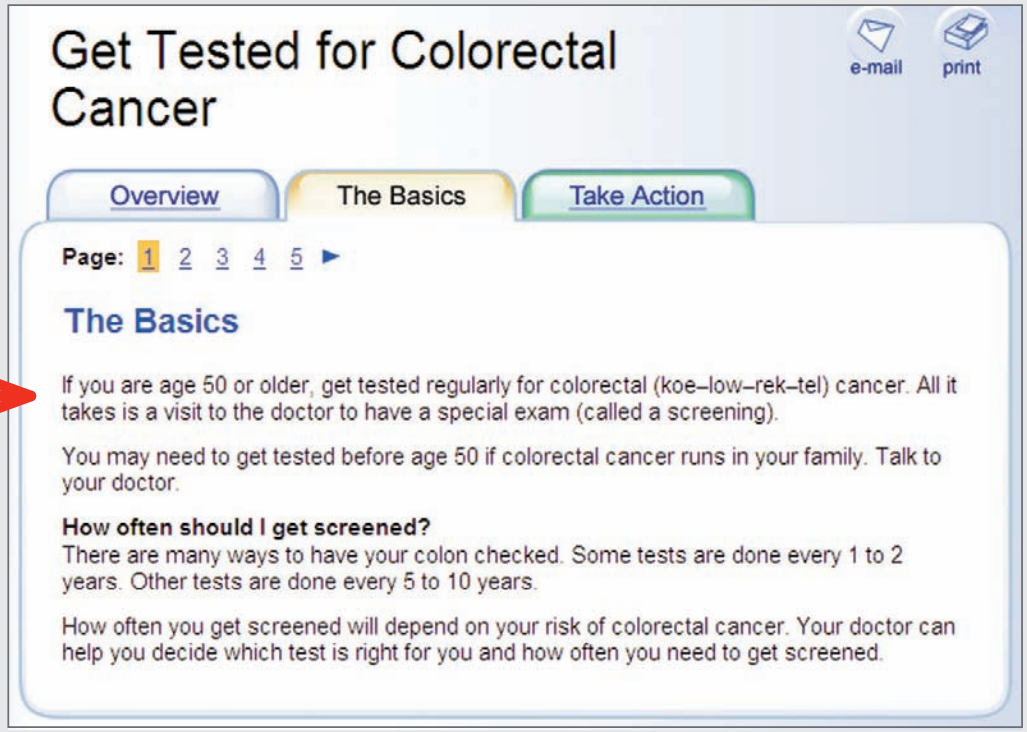
➔ Make your information actionable and specific.

Example

Instead of:
Blood pressure is the force of blood against the walls of your arteries. Blood pressure should be checked often.

Start with:
Check your blood pressure every 2 years, especially if you are age 40 or older.

Exhibit 2



Start with the behavior.

Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=15&areaID=1

The first sentence on this page from healthfinder.gov includes the behavioral recommendation (regular screenings after age 50).

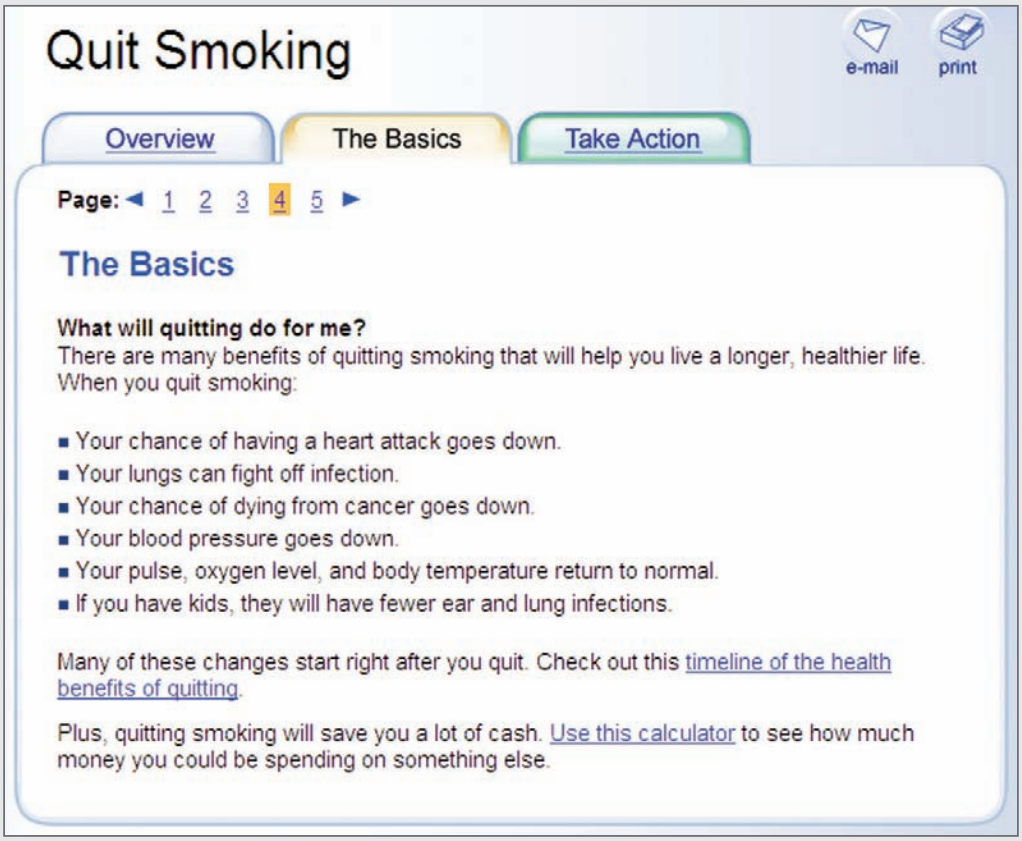
"I like this Web site because it gives you the information you want right away. It gives you the basics, not too much to read."

2.3. Stay positive and realistic. Include the benefits of taking action.

Users overwhelmingly prefer a positive tone. During card-sorting exercises, in addition to basic health information, users prioritized information on motivators and overcoming barriers to behavior change over information on risks and barriers.[12,14,19,21,23,25,36,39]

➔ Tell users what they can gain from adopting the desired behavior.

Exhibit 3



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=24&areaID=1&TopicContentID=409

This healthfinder.gov Web page clearly lists the social, physical, and financial benefits of quitting smoking, instead of focusing on the risks and consequences of continuing to smoke.

Be positive. Instead of telling people what *not* to do, give them positive reasons to change their behavior.

> **"Losing just 10 pounds can help lower my blood pressure? I didn't know that."**

- Limit the use of the following words when writing health recommendations:
  - Don't
  - Unless
  - Not
  - Should

People must overcome many perceived and actual barriers on the road to health behavior change. It's important to acknowledge these barriers and offer encouragement and motivation.[40]

- Focus on tips and tools for *overcoming* barriers rather than on the barriers themselves. Be realistic.

Example

If you don't have time to exercise for 30 minutes at once, try to get moving for shorter 10-minute periods throughout the day. Remember: It's not all or nothing. Ten minutes of exercise is better than none!

"My favorite part [about the Web site] is that the suggestions applied to me."

2.4. Provide specific action steps.

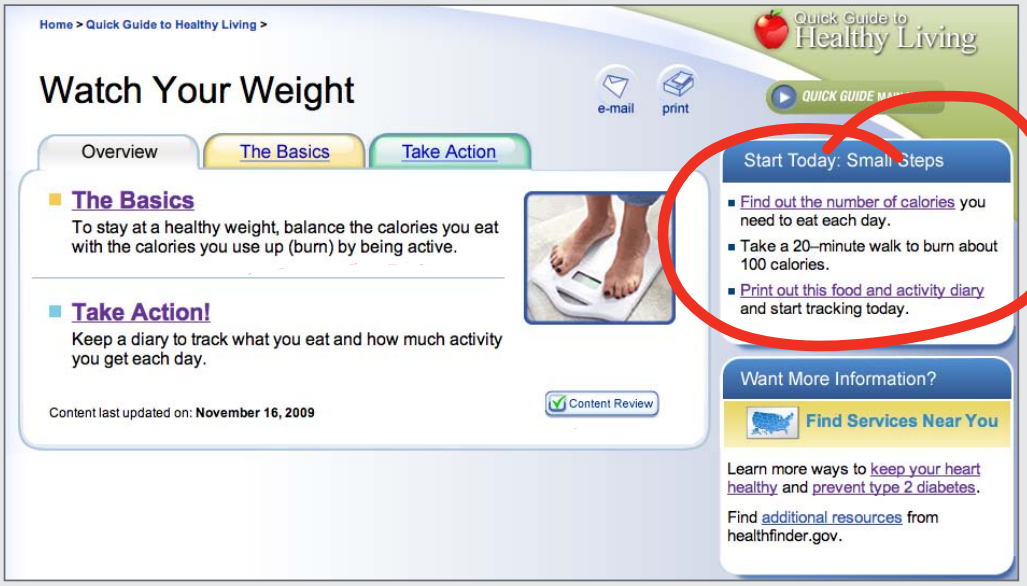
Give users the tools they need to get started. Users gravitate toward action steps, especially things they can do immediately.[16,17,19,21,34]

➔ Instead of telling users *what* to do, tell them *how* to do it.

Breaking behaviors down into smaller steps improves users' self-efficacy.[16,17,19,21,34] Self-efficacy is an individual's judgment of his or her ability to succeed in reaching a specific goal. Self-efficacy is an important predictor of health behavior.[40,41] Breaking behaviors into smaller steps gives users choices about which steps feel realistic and doable.

➔ Include steps users can take immediately.

Exhibit 4



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicId=25

This healthfinder.gov Web page uses a Start Today box with specific action steps. These steps are concrete and easy to achieve.

➔ As part of your action steps, engage users with interactive content such as menu planners, printable checklists, and questions to ask a doctor (see Strategy 5).

"This is good information because a lot of times, I take information to the doctor and ask questions about diet issues, what to avoid, and medications."

2.5. Write in plain language.

Keep paragraphs and sentences short and simple. Use language that is familiar to your users.[4,7,12–15,18]

Use familiar language and an active voice. Writing in an active voice means that the subject of your sentence performs the action. An active sentence is easier to understand and generally requires fewer words.[3,7,13,38]

Active: Check your blood pressure every 2 years.

Passive: Blood pressure should be checked every 2 years.

- Use everyday examples to explain medical or technical concepts, and write in a conversational tone. Use words and images that users can relate to.

Example

When you get a mammogram, the nurse will place your breasts between two plastic plates and take a picture of each breast.

- When introducing a medical term, clearly define the term the first time you use it. Define the word in context rather than use a glossary or scroll-over definition.

Example

If you have high blood pressure, you may need treatment. High blood pressure is 140/90 millimeters of mercury (mmHg) or higher. The medical term for high blood pressure is hypertension.

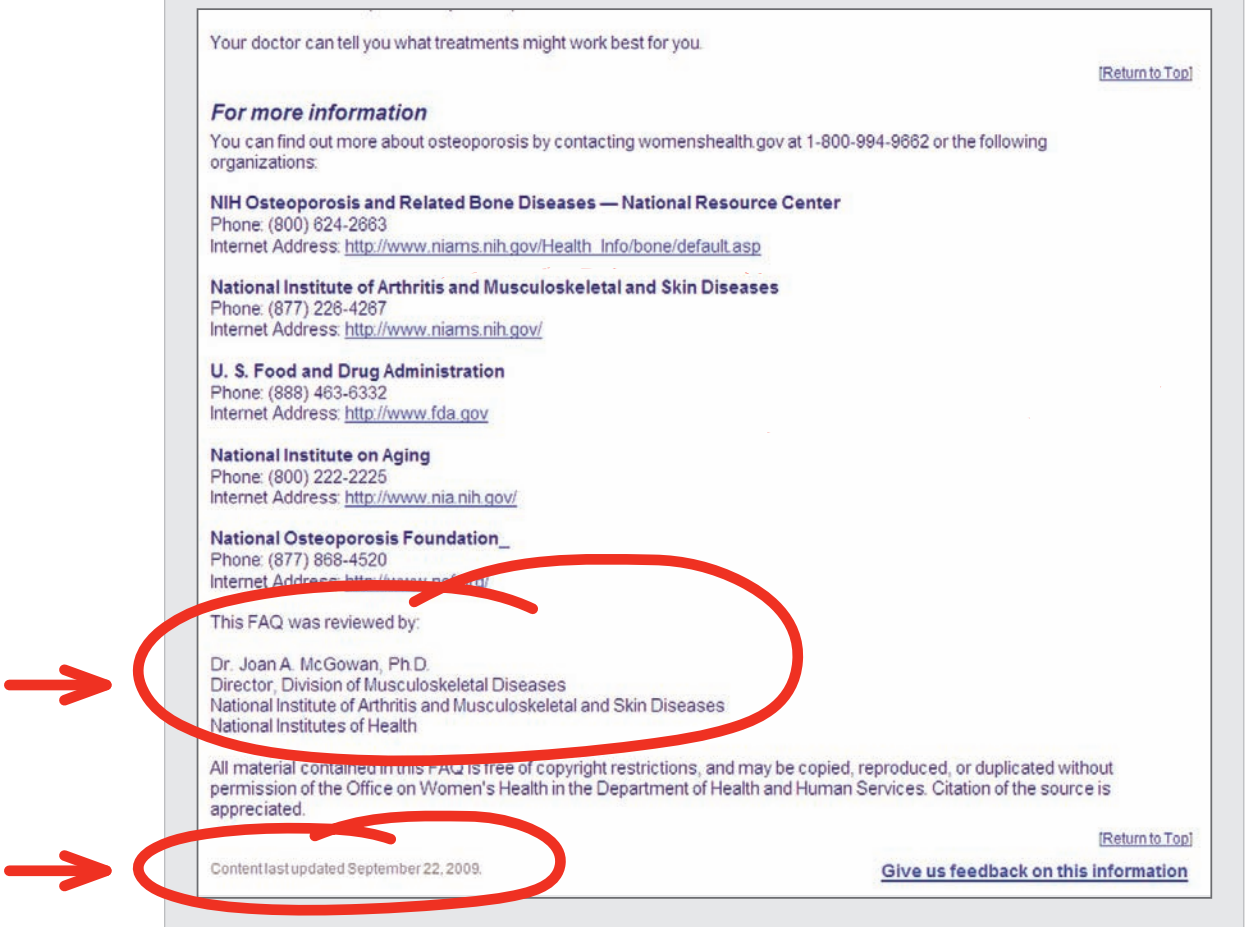
"I like [this Web site] because it's easy for everyday people like me to read. No big words or medical terms."

2.6. Check content for accuracy.

Have a subject matter expert or panel periodically review your health content for accuracy.

- Indicate the date the content was last reviewed and the reviewer's name and contact information. This gives your content more credibility with Web users.

Exhibit 5



Your doctor can tell you what treatments might work best for you.

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For more information

You can find out more about osteoporosis by contacting womenshealth.gov at 1-800-994-9662 or the following organizations:

NIH Osteoporosis and Related Bone Diseases — National Resource Center
Phone: (800) 624-2663
Internet Address: http://www.niams.nih.gov/Health_Info/bone/default.asp

National Institute of Arthritis and Musculoskeletal and Skin Diseases
Phone: (877) 226-4267
Internet Address: http://www.niams.nih.gov/

U. S. Food and Drug Administration
Phone: (888) 463-6332
Internet Address: http://www.fda.gov

National Institute on Aging
Phone: (800) 222-2225
Internet Address: http://www.nia.nih.gov/

National Osteoporosis Foundation
Phone: (877) 868-4520
Internet Address:

This FAQ was reviewed by:

Dr. Joan A. McGowan, Ph.D.
Director, Division of Musculoskeletal Diseases
National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health

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Content last updated September 22, 2009.

Give us feedback on this information

Source: www.womenshealth.gov/faq/osteoporosis.cfm#m

The date the content was last reviewed, as well as the name and contact information of the reviewer, is clearly displayed on this Web page from the Office on Women's Health.

➔ Use a style guide to keep your content consistent.

A style guide is a document that lays out the rules for writing content for a specific Web site. A style guide can help you keep track of grammar, spelling, and writing preferences. (For example, is it “Web site” or “website”?)

You also can use a style guide to keep track of headings and font size.

A style guide should be an evolving document. Writers and editors will likely add to it over time. Be sure to keep it easily accessible.

Try it! Keep a style guide online as a wiki, a Web site that allows for the easy creation and editing of Web documents via a Web browser.

Iterative Design Methods and Tips

Methods

- Card sorting
- Prototypes
- Usability testing

Tips for designing and testing your Web site with users

➔ Use card sorting to find out how users rank content by most to least useful or most to least likely to do.

➔ Build a paper prototype to find out what content users are most likely to "click" on.

➔ Test user comprehension using content in a paper prototype (see Section 6.3).

Refer to *Research-Based Web Design & Usability Guidelines* sections:

1:1; 2:5; 15:1–5; 15:7; 15:9–11

3. Display Content Clearly on the Page

The Basics

Writing easy-to-read Web content is only the first step. If you want people to understand the content, the next step is to make it *look* easy to read.

Even health content written in plain language can look overwhelming if too much text is together in one paragraph or if there is not enough space on the page.[4,7,15,18]

Web design and content go hand in hand. Use white space (also called active or blank space), layout, font, and color to help users understand the content on your Web site.

Actions at a Glance

3.1. Limit paragraph size. Use bullets and short lists.
3.2. Use meaningful headings.
3.3. Use a familiar font in at least 12-point type.
3.4. Use white space and avoid clutter.
3.5. Keep content in the center of the screen and above the fold.
3.6. Label links clearly.
3.7. Use images that facilitate learning.
3.8. Use bold colors with contrast. Avoid dark backgrounds.
3.9. Make your site accessible to people with disabilities.

Actions

3.1. Limit paragraph size. Use bullets and short lists.

All of the following triggered Web users with limited literacy skills to skip over content:

- Dense “walls” of text
- Long sentences
- Paragraphs with multiple numbers in the text
- Long words
- Paragraphs with more than three lines[4,7,11]

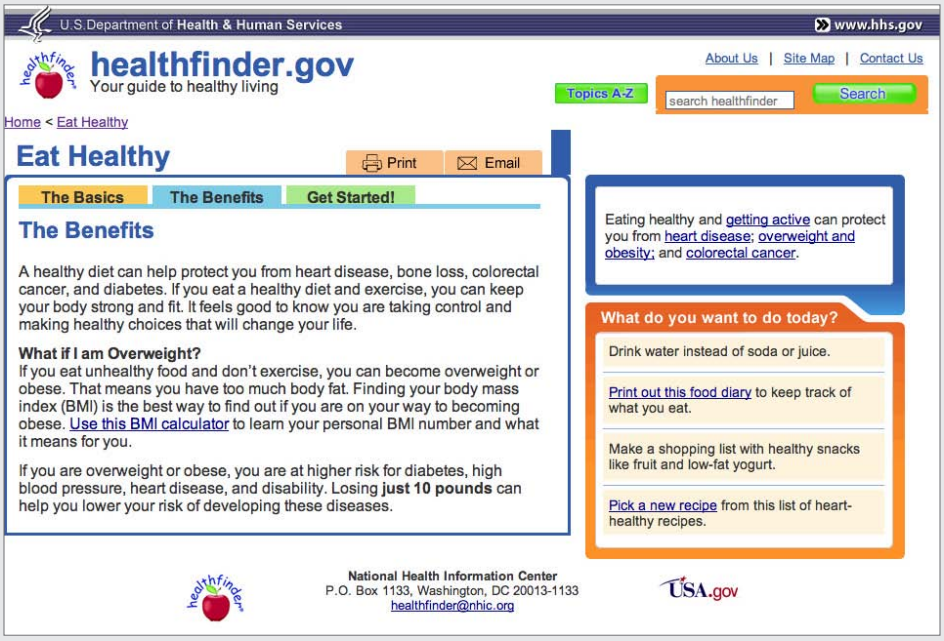
Write for users’ limited working memory. Use clear, stand-alone sections or “chunks” of text.

➔ Use small chunks of text with lots of headings.[7,13]

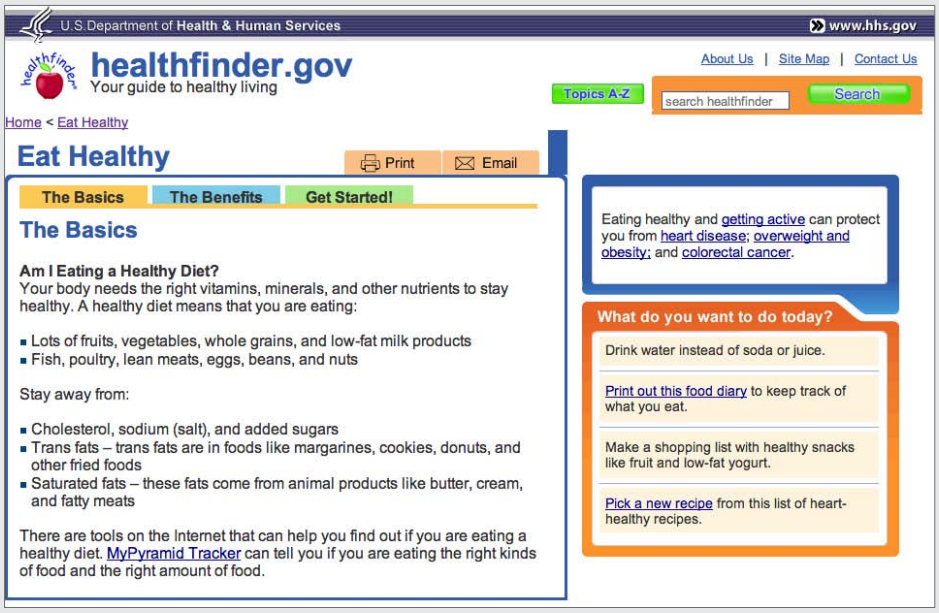
➔ Turn sentences into lists.[7,13]

Exhibit 6

Version 1



Version 2



Source: www.healthfinder.gov

Compare these two Web pages from healthfinder.gov. Testing showed that users did not read Version 1, where information was presented in paragraphs of text. However, Web users did read Version 2, where information was presented in bulleted lists and smaller "chunks" of text.

3.2. Use meaningful headings.

As people scan your Web page, they often will read only the headings to determine whether the health content is relevant to them. It is important to make your headings as specific as possible.[7,13]

➔ Create a subheading, or "teaser" text, underneath each heading to give the user additional clues.

Example

Main heading: **Get Active**

Subheading: Aim for 2 hours and 30 minutes of activity a week.

In the example above, both the heading and the subheading start with verbs. This is a good practice to follow when you are writing actionable content.

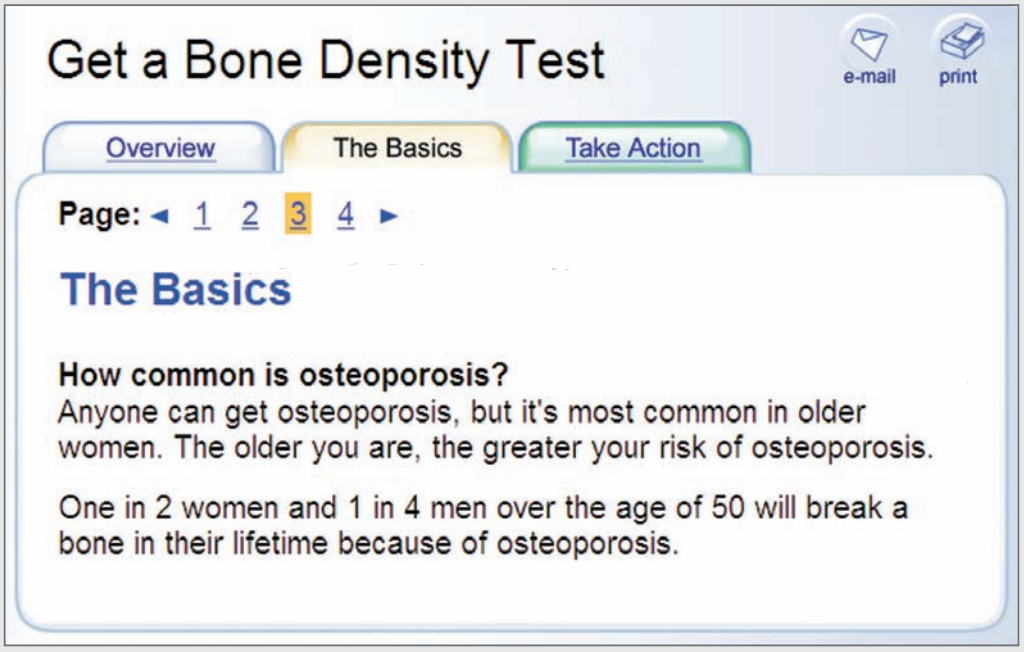
Try it! When appropriate, try using questions as headings.[7] Use "I" and "me" to reflect the voice of the user.

For example, when discussing mammograms, common questions include:

- How will this benefit me?
- How much does it cost?
- What happens if the doctor finds something wrong?
- How often do I need to get tested?
- Does it hurt?
- Are there any risks associated with the test?
- What if I don't have time?

Make sure your headings don't "float" on the page. There should be more space above a heading than between the heading and the text that follows.[7] The goal is to create discrete chunks of content that comprise a heading and related text or bullets.

Exhibit 7



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=12&areaID=1&TopicContentID=299

On this healthfinder.gov Web page, information about osteoporosis is organized using questions as headings. There is more space before the heading than after, creating clear "chunks" of text.

3.3. Use a familiar font in at least 12-point type.

There are two categories of fonts: serif (with "arms and feet") and sans serif (without "arms and feet").

Example

- Arial is a sans serif font.
- Times New Roman is a serif font.

There has been much debate about whether serif or sans serif fonts are easier to read online. Most usability and literacy experts recommend using sans serif fonts such as Arial or Tahoma.[3,7] Because sans serif fonts are commonly used on the Web, they are more familiar to users.

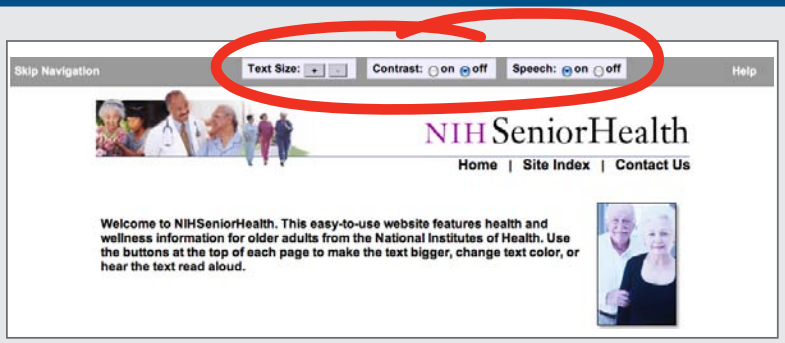
Pay attention to font size. A small font size is more difficult to read, especially for users with limited literacy skills and older adults.

- Use at least a 12-point font. If many of your users are older adults, consider using a 14-point font.[3,7,8]

> **"I could read the words without my reading glasses."**

- Let users adjust the size of the text on the page.[7] Web designers can enable this feature by using relative type size. However, it's important to test out your Web page with different font sizes to make sure it's still easy to read and navigate.

Exhibit 8



Source: http://nihseniorhealth.gov

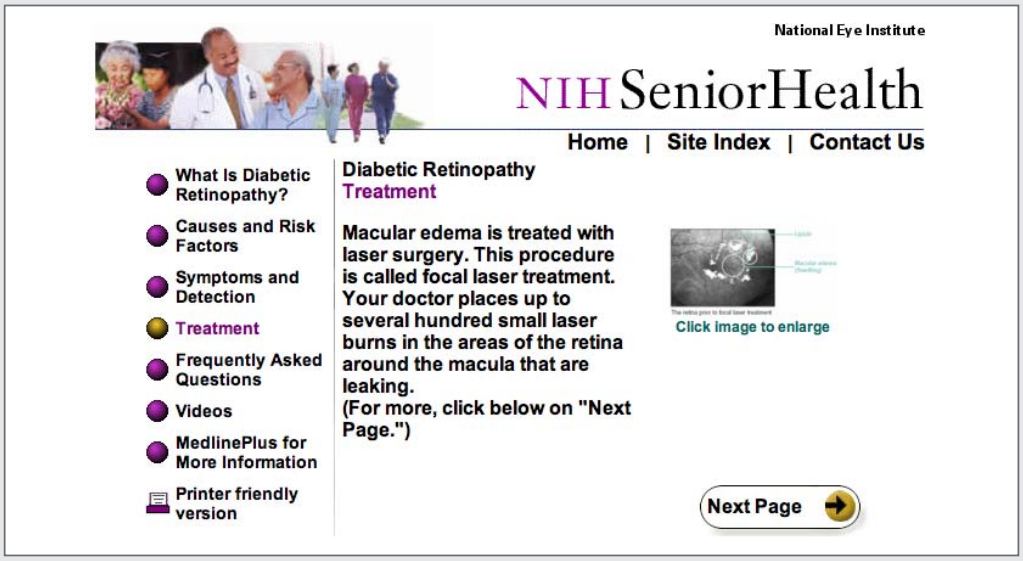
NIH SeniorHealth includes a toolbar on every page that lets users change the text size, adjust color contrast (colored text on a black background), and activate a screen reader that reads aloud the text on the page.

3.4. Use white space and avoid clutter.

Clean, crisp Web pages are easier to read.[7,13] They are also less distracting and less overwhelming for people with limited literacy skills.

➔ Use white space inside your main content area to break pieces of information into chunks. Leave space between sections of text and around images and buttons.

Exhibit 9



Source: http://nihseniorhealth.gov/diabeticretinopathy/whatisdiabeticretinopathy/01.html#skip2

This page from NIH SeniorHealth includes space around the image and "Next Page" button, which helps the site look clean and uncluttered.

3.5. Keep content in the center of the screen and above the fold.[6,7,13]

Many users with limited literacy skills don't scroll. This means they are only seeing the content in the center of their screen.[4,5,15,18,20]

➔ Make an effort to keep text above the fold. "Above the fold" means that the text can be read without scrolling down. If you need to continue text below the fold, provide strong visual cues to prompt users to scroll down the page for more information.

Try it! View your Web site using different monitors and browsers to see how your content displays on the screen.

Caution: Horizontal lines or large sections of white space at the bottom of the screen are sometimes mistaken for "false bottoms" and stop people from reading further.[7]

3.6. Label links clearly.

Users with limited literacy skills tend to click on links rather than read the content on a page; this is sometimes called "link hopping."[4]

Link directly to tools and resources that supplement and support your text.[16,34] Avoid linking to pages with redundant content. Instead, allow users to "drill down" for more detailed information.[12,16,34]

➔ Limit the number of links on a page.

Here are four rules to follow when including links on a Web page:

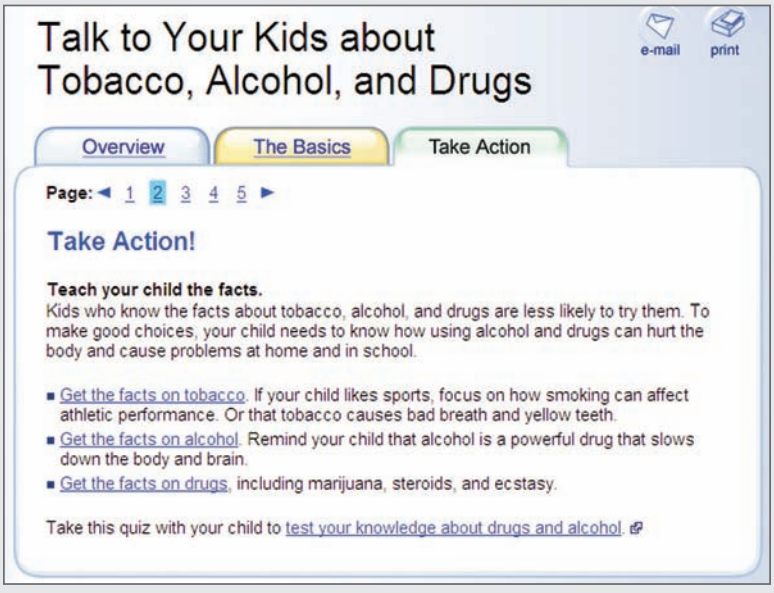
1. Make links obvious by underlining them.[3,13]
2. Make links long enough to "grab" easily.[3,7]
3. Use descriptive link labels so there are no surprises.[7,13]
4. Use action verbs in link titles.[3,7]

Example

Instead of: Visit this Web site to search for heart-healthy recipes.

Try: Find heart-healthy recipes your whole family will enjoy.

Exhibit 10



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=65&areaID=5&TopicContentID=359

Links on this healthfinder.gov Web page follow all four rules for link labeling. For each link, readers have a good idea of what to expect. Avoid these link labels:

- **Click here**
- **Print**
- **Learn more**

3.7. Use images that facilitate learning.

Including pictures along with written text can help users with limited literacy skills find, understand, communicate, and use health information. [16,17,42–44]

Exhibit 11

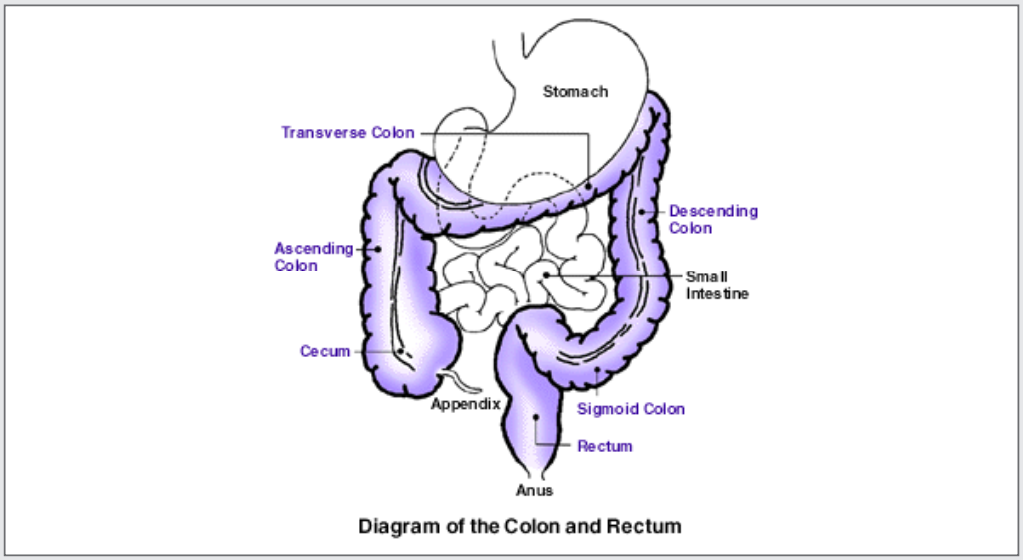


Diagram of the Colon and Rectum

Source: www.cdc.gov/cancer/colorectal/glossary.htm

This simple line drawing and caption from CDC.gov explain the location of the colon and rectum.

- Use simple, realistic pictures to illustrate health behaviors and medical concepts.

Web users prefer photographs of "real" people rather than illustrations or people who look like models.[15] However, when illustrating an anatomical or medical concept, simple line drawings are often most effective.[42]

- Include a descriptive caption that explains the picture.[42]

Be sure your graphics support your text rather than detract from it. Busy, bright, or animated graphics are distracting and often mistaken for advertisements.[21]

- Use alternative text (called an “alt tag” or “alt text”) to describe graphics for people using screen readers.

3.8. Use bold colors with contrast. Avoid dark backgrounds.

Black text on a white or very light background is the easiest to read.[7,13] Keep the background clear (avoid patterns and images).

3.9. Make your site accessible to people with disabilities.

All Federal Government Web sites must be accessible to people with disabilities. This is often called Section 508 compliance (referring to Section 508 of the Rehabilitation Act).[45]

Design a Web site that works for everyone. Here are a few of the important considerations addressed under Section 508:

- Make sure screen readers and other software can read your site.
- Choose strong color contrast, especially for buttons.
- Test plug-ins and other software for accessibility.[13]

To learn more about accessibility, visit www.w3.org/WAI or www.section508.gov/.

Iterative Design Methods and Tips

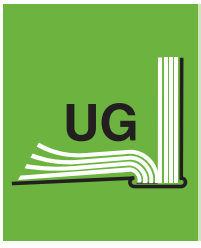
Methods

- Prototypes
- Usability testing

Tips for designing and testing your Web site with users

➔ Conduct user testing with paper or clickable prototypes. If you build a clickable prototype, gauge how much content can fit on a screen. Experiment with heading sizes, space, and color contrast.

➔ If you are using a clickable prototype or developmental Web site for usability testing, be on the lookout for dense chunks of text that trigger skipping.



Refer to *Research-Based Web Design & Usability Guidelines* sections:

3:1; 3:5; 6:1; 6:3; 6:5; 6:10; 6:11; 9:1; 9:2; 9:3; 9:4; 10:1; 10:3; 10:6; 10:9; 10:14; 11:1–8; 11:10; 11:11; 12:4; 14:8; 14:15; 14:16; 15:6; 16:2; 16:4; 16:6

4. Organize Content and Simplify Navigation

The Basics

This section discusses two important concepts:

- **Content Organization** (also called Information Architecture)
  Information architecture is the way information is categorized on a Web site. It typically involves a category structure (taxonomy) and labels. For example, think of browsing through a bookstore. Clearly labeled sections (Mystery, Nonfiction, Teen, Business) help you find what you're looking for. Good content organization helps users find information quickly.
- **Navigation**
  Navigation refers to how users move through the pages of your Web site. Elements of navigation include menus, tabs, headings, bread-crumbs, site maps, and "back" or "next" buttons.

Keep content organization and navigation simple and consistent. Users are typically topic-focused.[7,13] Organize and label your content according to your users' needs, and use terms that are familiar to them.

Actions at a Glance

4.1. Create a simple and engaging home page.
4.2. Use labels that reflect words your users know.
4.3. Enable easy access to home and menu pages.
4.4. Make sure the "Back" button works.
4.5. Use linear information paths.
4.6. Include simple search and browse options.

Actions

4.1. Create a simple and engaging home page.

The home page should be an easy entry point to the content on your Web site. Research indicates that Web users with limited literacy skills have difficulty processing multiple concepts at the same time.[3–5] Include as few elements as possible on the home page.

Exhibit 12

Source: www.healthfinder.gov

White space and short links create a clean home page on healthfinder.gov.

- A useful home page is mostly links and short descriptions.[7,13] Use white space and large buttons.
- Limit the amount of text on the home page.[13]
- If you include information in more than one language, link to the non-English sections right from the home page.

4.2. Use labels that reflect words your users know.

Use the words of your Web users, rather than technical or "catchy" terms.[7] This enables users to find content more quickly.

People have different mental models (methods) for grouping health information.[20,34] To help different users find what they need, repeat topics under multiple categories. For example, based on card sorting, content on mammograms appears under three categories on healthfinder.gov: Cancer, Women, and Screening.

Exhibit 13

Source: www.girlshealth.gov

This Web page from the Office on Women's Health includes a navigation bar with audience-appropriate category labels (the site is for girls aged 10 to 16). For example, the mental health section is labeled "your feelings."

4.3. Enable easy access to home and menu pages.

Include large buttons that take users back to the home page or the main menu pages on the site.[13,18,19] Web users with limited literacy skills typically don't use breadcrumbs.[13,18]

- Avoid drop-down menus, especially those that require internal scrolling.
- Use a clear lefthand navigation menu. Indicate where users are in relation to the rest of the site.[13,18–20]

Exhibit 14

Source: http://nihseniorhealth.gov/falls/homesafety/01.html

NIH SeniorHealth uses a strong lefthand navigation menu. The current section is highlighted with a different color in the navigation bar so users can easily see where they are in the site.

4.4. Make sure the "Back" button works.

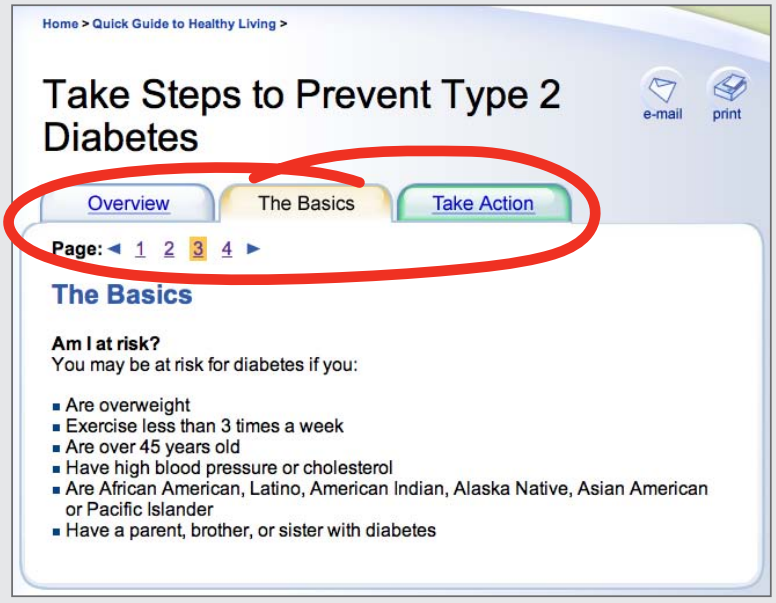
Web users with limited literacy skills often depend on the "Back" button to navigate a Web site.[21] Make sure this button works predictably and consistently.

- ➔ If users are entering data into a registration page or form, ensure that the information does not get deleted when users select the "Back" button.

4.5. Use linear information paths.

Using linear navigation (numbered pages) helps Web users with limited literacy skills move through the content on your Web site.[12,16,17] Linear navigation can be combined with tabs (typically running horizontally across the top of the page) to organize content and simplify navigation.

Exhibit 15



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=73&areaID=1&TopicContentID=469

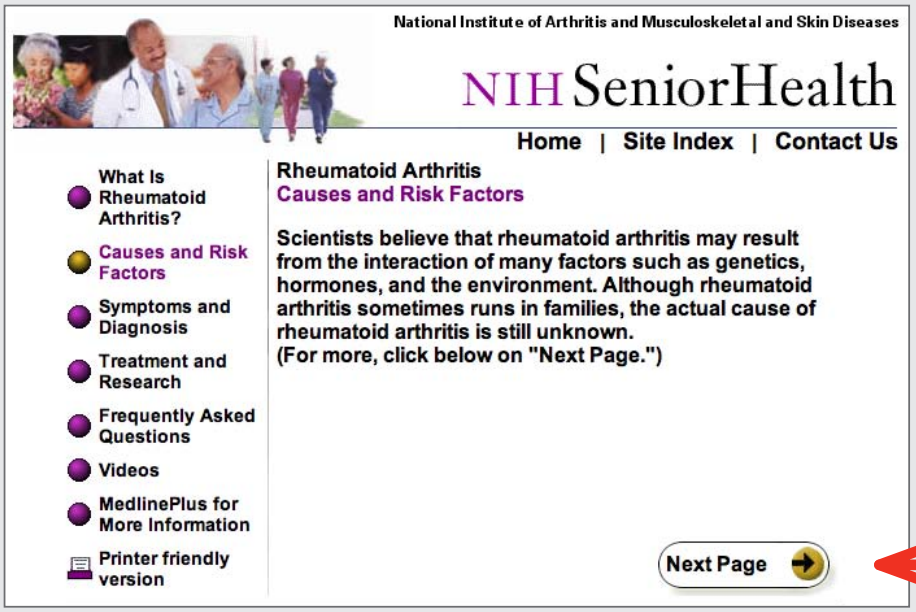
The healthfinder.gov Quick Guide to Healthy Living uses tabs to organize content (Overview, The Basics, Take Action). Within each tabbed section, pages are numbered so users can move easily through the content.

Linear information paths move users through a topic using a series of pages or screens. Each topic on the site has its own linear path. The content progresses from general to more specific.

> **"I like that you can click on the page numbers at the bottom and go directly to other pages."**

Allow users to move easily from page to page by providing "Next" and "Back" buttons as well as clickable page numbers at the top or bottom of each screen.[3,13,15,16,18,20]

Exhibit 16

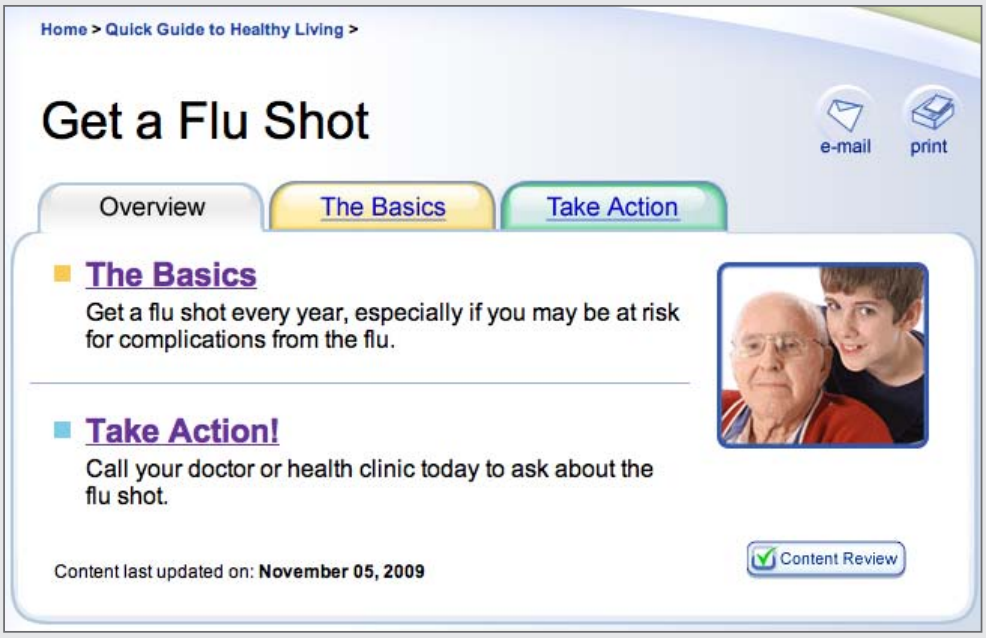


Source: http://nihseniorhealth.gov/rheumatoidarthritis/causesandriskfactors/01.html

On this Web page from NIH SeniorHealth, the "Next Page" button is large and clearly labeled.

On the first page of each topic, give the user a short overview of the content. Provide a link to each subsection for users who wish to skip directly to a specific section.

Exhibit 17



Source: www.healthfinder.gov/prevention/ViewTopic.aspx?topicId=18

The Overview tab on this healthfinder.gov Web page gives a brief summary of the content and links users directly to the section that interests them.

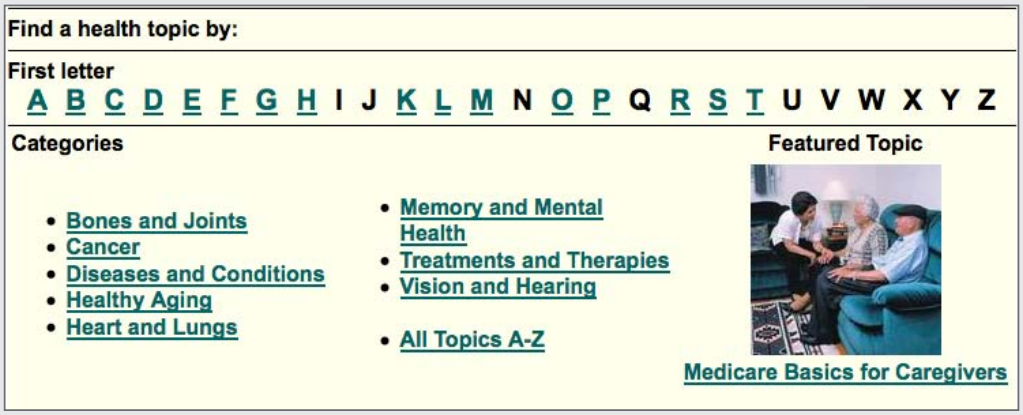
4.6. Include simple search and browse options.

Many users with limited literacy skills will browse through categories of content rather than use a search box.[4,5,16,19] This may be because these users:

- Don't see the search box (many users with limited experience on the Web don't know where to look for a search box)
- Are worried about spelling mistakes
- Are overwhelmed by search results

➔ Include multiple ways to browse for topics (for example, by topic category and using an A to Z list).

Exhibit 18



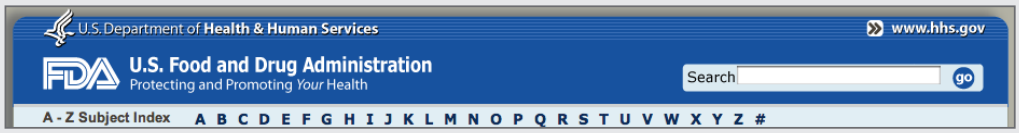
Source: http://nihseniorhealth.gov

The NIH SeniorHealth Web site allows users to search for health information by topic categories or an A to Z list. Note that some letters (in black) aren't linked to anything; they are still included so that users see a familiar alphabet.

During usability testing, some users with limited literacy skills clicked a "search" button without entering any terms in the search box.[15] Consider using the "search" label together with a "get started" or "go" button. This will help signal to users that they must first enter a term(s) and then submit or "go."

➔ When designing a search function, use a large text box with obvious buttons.

Exhibit 19



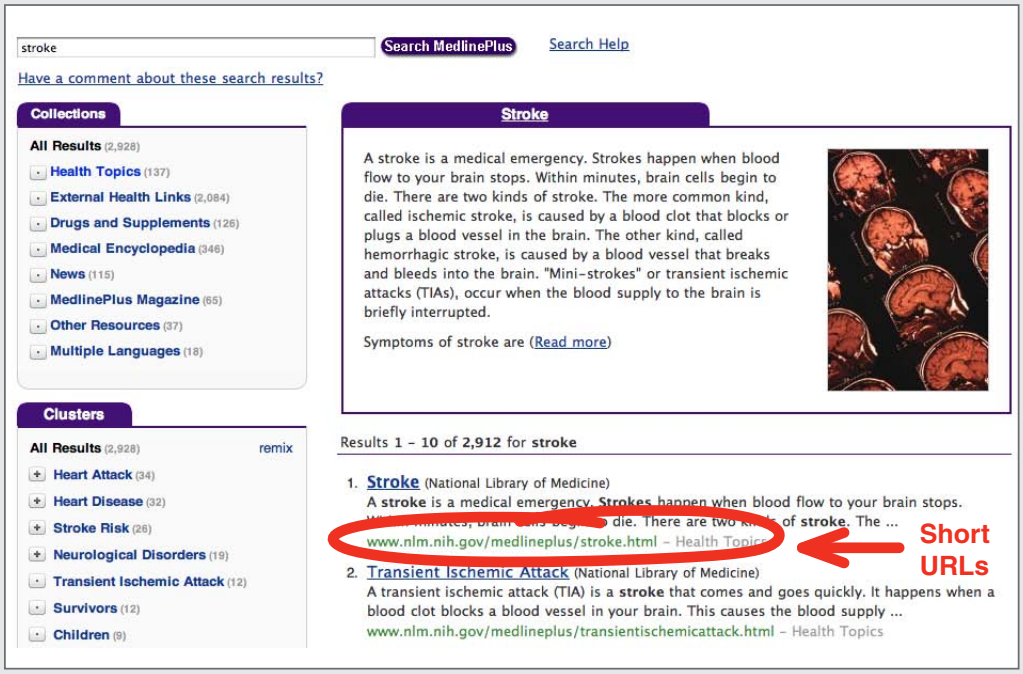
Source: www.fda.gov

The Food and Drug Administration (FDA) Web site's Search box is clearly labeled and has an obvious "go" button to submit the search request.

Here are three rules to follow when designing a search function:

1. Allow for common misspellings.[4,13]
2. When displaying search results, limit the number of results displayed on a page. Use numbered pages to avoid scrolling.[4,13] Use white space and a large font.
3. Use clear page titles and include a brief plain-language description of each result.[4,13] Avoid using long URLs in search results, if possible.

Exhibit 20



Source: http://vsearch.nlm.nih.gov/vivisimo/cgi-bin/query-meta?v%3Aproject=medlineplus&query=stroke&x=0&y=0

This search results Web page from MedlinePlus displays clear titles and short URLs for the linked results. A brief description written in plain language appears above the top results. Only 10 results show per page.

Iterative Design Methods and Tips

Methods

- Card sorting
- Prototypes
- Usability testing

Tips for designing and testing your Web site with users

➔ Use card sorting to group the content on your Web site into categories. Once you have initial categories established (sometimes called a "seed structure"), conduct another round of user testing to confirm the structure. Have participants suggest labels for the categories.

➔ If resources are tight, build a limited prototype of the home page and a few secondary navigation pages. This should be enough to test with users to determine whether the content is organized well.

Refer to *Research-Based Web Design & Usability Guidelines* sections:

2:13; 5:1; 5:2; 5:4; 5:5; 5:7; 7:1; 7:4; 7:12; 8:1; 8:4; 13:11; 16:4; 16:5; 17:1; 17:4; 17:5; 17:6

5. Engage Users With Interactive Content

The Basics

Invite Web users to customize content to their interests and provide feedback about their experiences. Examples include:

- Printing information out or e-mailing it to a friend
- Taking a poll or rating the quality of information on the site
- Entering personal data such as age or weight to get tailored information
- Using calorie or body mass index (BMI) calculators, activity logs, recipe finders, personal assessments, and quizzes

Interactive tools increase user engagement.[32] Section 2 introduced the idea of engagement. Engagement is the process of involving users in health content in a way that motivates them to take action.[37] Interactive tools that provide personalized health content can engage users and promote learning.

Actions at a Glance

5.1. Include printer-friendly tools and resources.

5.2. Simplify screen-based controls and enlarge buttons.

5.3. Include interactive content that users can tailor—but not too much.

5.4. Incorporate audio and visual features.

5.5. Explore new media such as Twitter or text messaging.

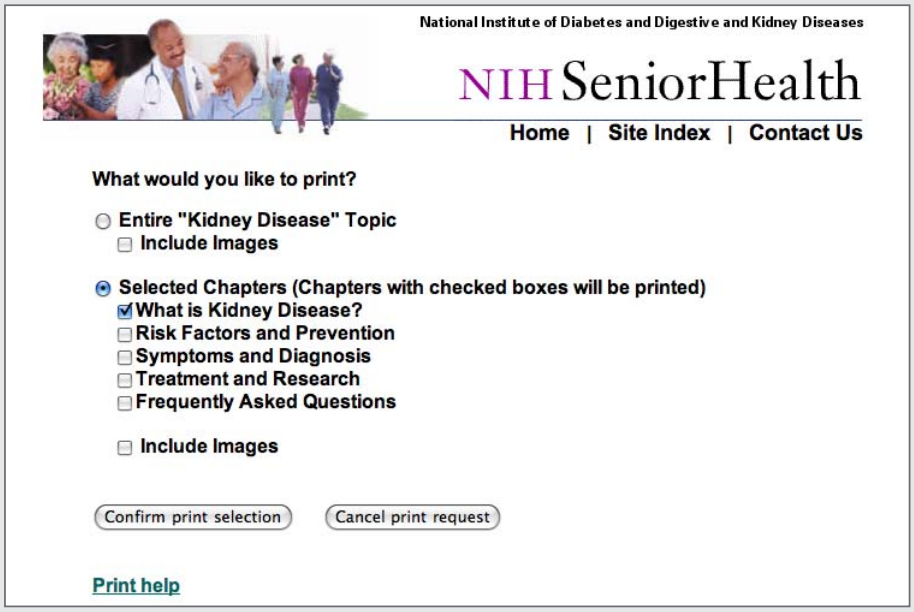
Actions

5.1. Include printer-friendly tools and resources.

Many Web users with limited literacy skills prefer to print pages from a Web site rather than read text on a computer screen.[6,13,16,34] Also, they may want to share health information with family members or friends who don't have access to a computer or post it on their refrigerator.

➔ Provide a link to printable pages. Make the link or icon clearly visible. If possible, give users the option to print a single page, a complete section, or just a portion of the text.

Exhibit 21



Source: http://nihseniorhealth.gov/kidneydisease/selectPrint.html?dir=/kidneydisease/whatiskidneydisease

Users of NIH SeniorHealth's Web site can print an entire topic or select specific pages. They also can choose whether to include images in the printout.

"I would like to print this page and show it to family members who need this information."

5.2. Simplify screen-based controls and enlarge buttons.

Design buttons that are easy to find and click on by making them:

- Large
- Bright
- Contrasting color from the surrounding text and background
- Obviously clickable[3,13,18,20]

Keep in mind that widgets and tools that are too flashy are often interpreted as advertisements.[21]

➔ Some users with limited literacy skills did not understand the term "submit." Use an alternative label such as "go" or "get started" for buttons.

5.3. Include interactive content that users can tailor—but not too much.

Users want personalized health information, but they don't want to enter a lot of personal data.[14,15,19]

Exhibit 22

Source: www.womenshealth.gov/pregnancy/mom-to-be-tools/ovulation-due-date-calc.cfm

This interactive Ovulation and Due Date Calculator from the Web site for the Office on Women's Health asks for the date of the user's last menstrual period and the number of days in her menstrual cycle.

Exhibit 23

Source: www.healthfinder.gov

The myhealthfinder tool on healthfinder.gov prompts users to enter their age, sex, and pregnancy status to get personalized recommendations. Users can specify whether they are searching for information for themselves, a child, or someone else.

Create a link between the information entered by users and their results.[15] This can help compensate for users' limited working memory.

"I'm very comfortable [entering my age]. That way, I get exact information for me, not different age groups."

Exhibit 24

myhealthfinder Results

e-Mail Print

The following recommendations come from the U.S. Preventive Services Task Force.

You said you are a **man** aged **48**. Here are important ways you can stay healthy:

Doctors recommend that **all** men aged 48:

- Get Adult Booster Shots
  Get important adult shots (vaccinations).
- Get Your Blood Pressure Checked
  Get your blood pressure checked at least every 2 years.
- Get Your Cholesterol Checked
  Get your cholesterol checked every 5 years starting at age 35.
- Talk With Your Doctor About Taking Aspirin Every Day
  Talk to your doctor about taking an aspirin every day to help lower your risk of heart attack.

Source: www.healthfinder.gov/prevention/myhealthfinder.aspx

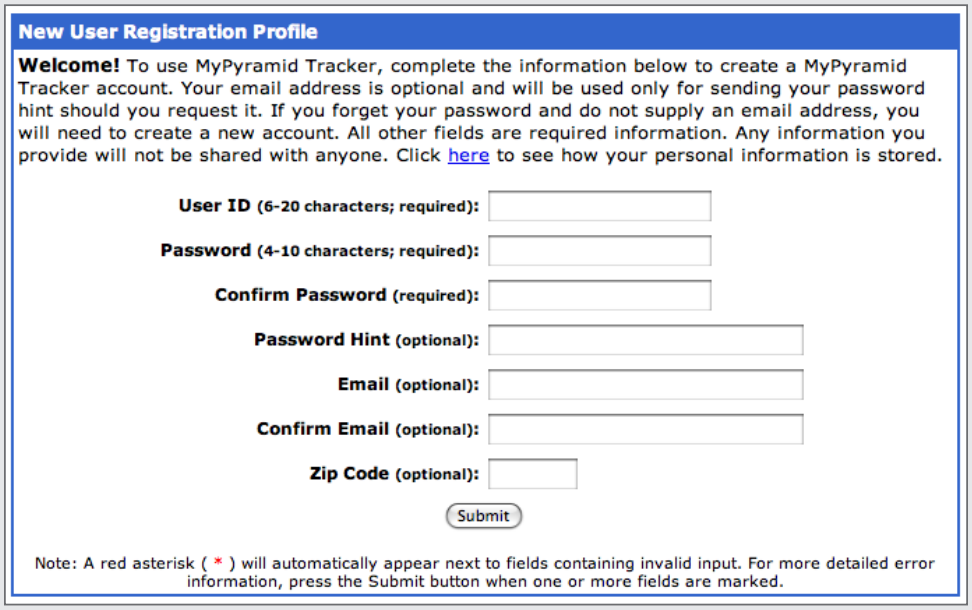
The myhealthfinder results page from healthfinder.gov includes a summary of the user's personal information entered on the previous screen.

→ Keep required information to a minimum, and avoid creating accounts or sign-in pages.

If your content requires a registration page, ask for the minimum amount of information. Be sure to:

- Distinguish between logging in and registering.
- Make the username an e-mail address.
- Keep registration to no more than three screens, and provide cues (for example, "page 1 of 3").
- Display input fields as a vertical list.
- Include a final results page with questions and responses.
- Display fields that need corrections on a new page. Include instructions for correcting information.[46–48]

Exhibit 25



New User Registration Profile

Welcome! To use MyPyramid Tracker, complete the information below to create a MyPyramid Tracker account. Your email address is optional and will be used only for sending your password hint should you request it. If you forget your password and do not supply an email address, you will need to create a new account. All other fields are required information. Any information you provide will not be shared with anyone. Click here to see how your personal information is stored.

User ID (6-20 characters; required):

Password (4-10 characters; required):

Confirm Password (required):

Password Hint (optional):

Email (optional):

Confirm Email (optional):

Zip Code (optional):

Submit

Note: A red asterisk (*) will automatically appear next to fields containing invalid input. For more detailed error information, press the Submit button when one or more fields are marked.

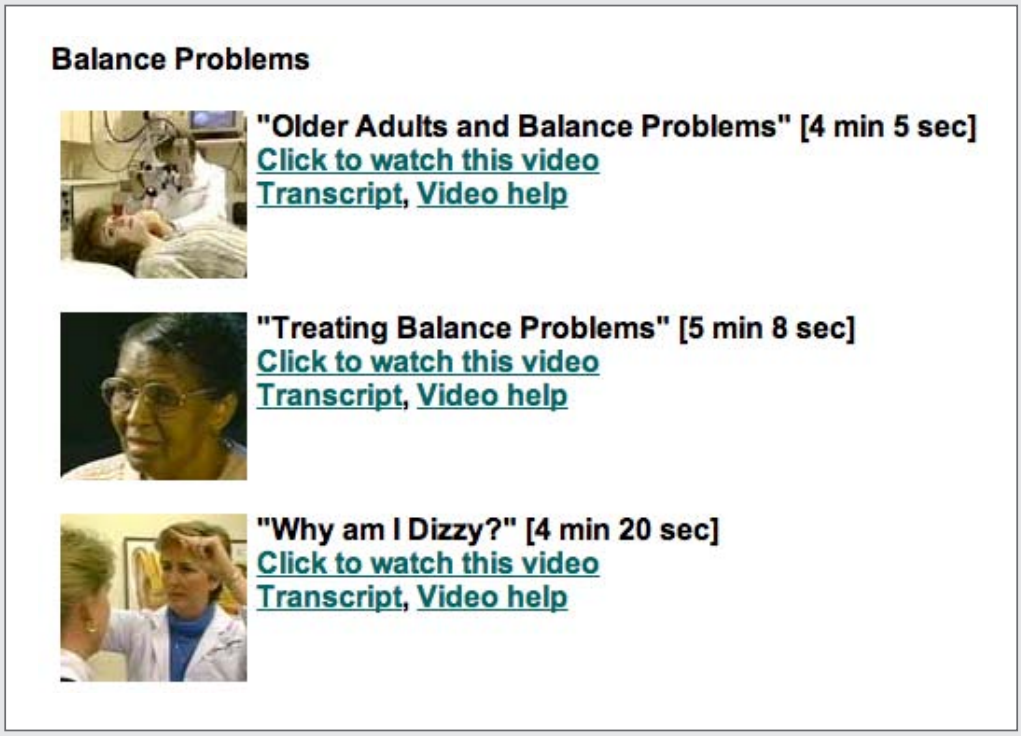
Source: www.mypyramidtracker.gov/Default.aspx?Module=6

This registration form for the MyPyramid Tracker Web site displays fields as a vertical list.

5.4. Incorporate audio and visual features.

Whenever possible, provide health information in multiple formats, such as audio clips, video clips, or slide shows. Be sure to include a text alternative or transcript. There is some evidence that audio and video can enhance comprehension and retention of online information; however, more research is needed.[49–51]

Exhibit 26



Source: http://nihseniorhealth.gov/videolist.html#balanceproblems

NIH SeniorHealth offers short video clips on popular health topics. Each video includes a transcript and a help tool.

5.5. Explore new media such as Twitter or text messaging.

Text messaging, blogs, Twitter, and Webcasting are examples of new media. To date, there has been little testing of new media with users with limited literacy. We expect this will change in the near future.

What we know about new media leads us to believe it holds potential for reaching people with limited literacy skills for several reasons:

- Communications are shorter (a message on Twitter is 140 characters or less).
- The tone is conversational.
- Most messages are user-generated.

Exhibit 27

Source: http://twitter.com/healthfinder

healthfinder.gov links to news releases through Twitter updates.

Text messages, also known as SMS (short-message services), are increasingly being used to reach the public with health messages.[52,53] Text messages can be used for one-way messaging (tips and reminders) or two-way communication.

Many of the groups receptive to the use of text messaging for health, such as adults below the poverty threshold and immigrants and refugees, are also likely to have limited literacy skills.[2,52,54]

Exhibit 28

Source: www.aids.gov/widgets-and-badges

Instructions appear on AIDS.gov for mobile phone users to send a text message with their ZIP code to "KNOWIT" (566948). Within seconds, they will receive a text message identifying an HIV testing site near them.

Iterative Design Methods and Tips

Methods

- Prototypes
- Usability testing

Tips for designing and testing your Web site with users

➔ During testing, observe participants using the input fields for interactive or personalized tools.

➔ Give users a sample task to perform with the tool. Do users know how to use the tool without prompting?

Refer to *Research-Based Web Design & Usability Guidelines* sections:

2:12; 2:15; 13:2; 14:4

6. Evaluate and Revise Your Site

The Basics

These guidelines have discussed several methods to test your Web site with users. This section addresses some of the lessons learned from conducting user testing with people with limited literacy skills.

Refer to pages 9–11 for a brief overview of iterative design methods.

Actions at a Glance

6.1. Recruit users with limited literacy and limited health literacy skills.

6.2. Choose experienced moderators.

6.3. Test comprehension in multiple ways.

6.4. Consider user engagement and self-efficacy.

6.5. Create plain-language testing documents.

Actions

6.1. Recruit users with limited literacy and limited health literacy skills.

Most screening tools designed to measure health literacy skills (such as the Test of Functional Health Literacy in Adults and the Rapid Estimate of Adult Literacy in Medicine) must be administered in person and intended for patients in a clinical setting.[55]

These options may not be practical or very useful for Web and health content developers, especially those who are using a private company's recruitment database. Instead, a proxy for health literacy can be used based on commonly collected demographic data.[55]

ODPHP used the following proxy for identifying Web users with limited health literacy skills:

- High school education or below
- Below the poverty threshold (a household income of $40,000 or below)
- Have not searched for health information online in the past year

➔ Recruit from community contexts (e.g., adult learning centers, federally qualified community health centers, senior centers) using trusted community recruiters. You're more likely to get participants from your target populations.

Consider having the community recruiter or representative attend the focus group testing session in an informal capacity, such as a greeter.

Pretest your protocol with at least one participant with limited literacy skills to fine-tune tasks and timing.

6.2. Choose experienced moderators.

Whenever possible, use moderators who have experience working with people with limited literacy skills or with people with limited experience on the Internet. Local colleges and universities may be a good place to find experienced and affordable moderators.

Expect testing sessions with users with limited literacy skills to progress at a slow pace. It's strongly recommended that you pretest your protocol with participants with limited literacy skills to fine-tune tasks and timing.

- During sessions, have the moderator both read tasks aloud and provide them in writing (one task per sheet). This will remind users of the task you are asking them to accomplish.

6.3. Test comprehension in multiple ways.

To evaluate user comprehension:

- Have participants think out loud as they complete tasks.
- Ask participants to describe what they've read in their own words.
- Ask participants to describe what action they would take after reading the content.

Participants with limited literacy skills tend to focus on the specific task—sometimes to a fault. Remind users that you're less interested in the answer and more interested in where and how they would look to find the answer.

6.4. Consider user engagement and self-efficacy.

Ultimately, you want users to act on the important health promotion messages in your content. User engagement and self-efficacy are two important predictors of adopting healthy behaviors. Similarly, characteristics of the content itself—such as relevance, coherence, and tone—may increase the likelihood that users will take action.[38]

In addition to standard measures of usability and comprehension, consider using a mix of quantitative and qualitative measures (defined in Appendix B) designed to assess the following:

- User engagement
- User self-efficacy
- Acceptability of the content
- Applicability of the content

These measures can be adapted for online health promotion content.

6.5. Create plain-language testing documents.

Write your screeners, consent forms, and moderator guides in plain language. See Appendix C for sample testing documents.

➔ As a general rule, limit the number of tasks and questions when conducting usability testing with users with limited literacy skills. Be realistic about what can be accomplished in the time designated for each session.

In addition to providing easy-to-read consent documents, consider using a consent process that does not rely on participants' health literacy skills or English proficiency. See the AHRQ Informed Consent and Authorization Toolkit for Minimal Risk Research from the Agency for Healthcare Research and Quality (AHRQ) for more information.[56]

Iterative Design Methods and Tips

Methods

- Clickable prototypes
- Usability testing

Tips for designing and testing your Web site with users

➔ Pretest your protocol with at least one participant with limited literacy skills to fine-tune tasks and timing.

➔ If participants get stuck on a task, redirect them by asking where and how they would look to find the answer.

Refer to *Research-Based Web Design & Usability Guidelines* sections:

Chapter 18

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Appendixes

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Appendix B: Sample Measures

Below are sample measures used by ODPHP to evaluate users' level of engagement with online prevention content and their level of self-efficacy. Also included are sample measures for the acceptability and applicability of Web content as well as a proxy measure for health literacy.

Engagement

The eHealth Engagement Scale* was adapted from commercial advertising research. The scale includes rating 10 descriptors ($\alpha = 0.90$), including absorbing, attention-grabbing, stimulating, surprising, suspenseful, thought-provoking, convincing, believable, not dull, and clever (1 = Strongly Agree; 5 = Strongly Disagree). Internal reliability of each of the two multi-item subscales of the eHealth Engagement Scale was 0.878 for "Involving" and 0.805 for "Credible."

Self-Efficacy

The self-efficacy scale was adapted from the *Guide for Constructing Self-Efficacy Scales,* where Bandura† proposes measuring self-efficacy by having participants rate their level of confidence in taking an action. The scale used by ODPHP includes the following three items: "This information made me feel more confident that I can do something"; "This information made me feel more prepared to do something"; and "This information made me feel more prepared to do something in the next month" (1 = Strongly Agree; 5 = Strongly Disagree).

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* Lefebvre, R. C., Tada, Y., Hilfiker, S., & Baur, C. (in press). The assessment of user engagement with ehealth content: The eHealth Engagement Scale. *Journal of Computer-Mediated Communication.*

† Bandura, A. (2006). Guide for creating self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307–337). Charlotte, NC: Information Age Publishing.

Acceptability

Acceptability is the extent to which the intended users like the tool/content and find it easy to use. ODPHP operationalized acceptability (based on the 2006 report, *Expanding the Reach and Impact of Consumer E-Health Tools*‡) with two items. They include "This information was easy to use" and "This information was presented in ways that I could easily understand" (1 = Strongly Agree; 5 = Strongly Disagree).

Applicability

Applicability is the extent to which the tool/content is relevant to the needs of the intended user; in other words, does it help him or her in his or her everyday life? ODPHP operationalized applicability (based on the 2006 report, *Expanding the Reach and Impact of Consumer E-Health Tools*) with two items. They include "This information was useful to me" and "This information gave me some specific ideas about what to do" (1 = Strongly Agree; 5 = Strongly Disagree).

Limited Health Literacy

ODPHP used proxy measures to identify a limited health literacy sample based on statistics from the health literacy component of the 2003 National Assessment of Adult Literacy. Individuals included in the limited health literacy sample met the following criteria: have a high school education or below, have an annual household income below the poverty threshold (under $40,000), and have not searched for health information online in the past year.

‡ Office of Disease Prevention and Health Promotion. (2006). *Expanding the reach and impact of consumer e-health tools.* Rockville, MD: Author. Retrieved from http://www.health.gov/communication/ehealth/ehealthtools/default.htm

Appendix C: Sample Testing Documents

INFORMED CONSENT

The Agency for Healthcare Research and Quality (AHRQ) has developed an *Informed Consent and Authorization Toolkit for Minimal Risk Research* to facilitate the process of obtaining informed consent and Health Insurance Portability and Accountability Act (HIPAA) authorization from potential research participants.

The AHRQ toolkit includes a sample Informed Consent Form written in plain language. The sample form can be accessed at http://www.ahrq.gov/fund/informedconsent/icform1.htm.

SAMPLE SCREENER

Our desired participants are women, with a mix of age and other characteristics, who have some (but limited) experience using the Internet.

Age: People aged 18 and older

Gender: Mostly female

Education: High school equivalent or less

Ethnicity: An ethnically mixed group if possible

Income: Household income of $40,000 or less

We will exclude from participation users who:

- Have participated in a usability test or focus group within the past year.
- Conduct market research or design and develop Web sites.
- Are unable to speak or read English enough to complete the study.
- Have actively looked for health information on the Internet in the last year.
- Are everyday users of the Internet.
- Are unable to use a computer.

Hello,

This is NAME from COMPANY. We are doing a research study on a health Web site. If you qualify, we will pay you $75 to participate in a 1-hour meeting at LOCATION. This is a research study. We are not selling anything. Other people who have participated have found it to be interesting and fun. Does it sound like something you would be interested in?

Great. Let's find out if you qualify. I have a few simple questions to ask. This should only take a few minutes. At some point, I may end the questions if I discover you don't qualify. This has nothing to do with you. We simply are looking for people who meet certain criteria.

[Insert standard questions about participation in market research…]

How often do you use the Internet?

___ Every day [REJECT]

___ A few times per week [CONTINUE]

___ About once per week [CONTINUE]

___ Less than once per week [CONTINUE]

___ Never or hardly ever [REJECT]

Over the past year, have you looked for information on the Internet about a health problem that you or someone you knew had?

___ Have done this often [REJECT]

___ From time to time [Include only a few in this category]

___ Hardly ever [CONTINUE]

___ No [CONTINUE]

[Insert standard demographic questions…]

In this study, you will be asked to try out a Web site. This is not a group study; you will meet one-on-one with a researcher. You will be recorded on both audio and video. Are you comfortable with this?

___ Yes [CONTINUE]

___ No [REJECT]

In this research study, we will be asking you questions about how you use the Internet, and we will ask you to try out some Web sites. It will take about 1 hour. When you're done, we will pay you $75. We really appreciate your help. I have the following times available.

[Insert standard questions about scheduling]

[End]

Appendix D: Overview of ODPHP Original Research

ODPHP commissioned 15 studies over a period of 4 years to inform the development of an online collection of prevention and wellness content and to redesign healthfinder.gov. More than 750 people aged 18 to 84 participated in these studies. Special care was taken to recruit and test adults with limited literacy skills.

Below is an overview of the iterative research process, followed by a brief description of each study.

Formative Research Phase

- Literature Review
- Web Site (Content) Analysis
- Expert Interviews
- Structured Interviews
- Mental Models Study
- Card-Sorting Study

Prototyping Phase

- Prototype Test (Paper and Clickable)
- Usability Studies 1 Through 4

Postlaunch Quality Improvement Phase (Ongoing)

- Card-Sorting Study
- Widget Usability Test
- Intermediary Interviews
- Usability Study 5

Formative Research Phase

Literature Review

ODPHP conducted a literature review to answer the following questions:

- Which audience characteristics are the strongest determinants of homogeneity in terms of seeking prevention information?
- In what ways and to what extent is currently available prevention information responsive to these patterns?
- Is prevention information that is targeted in content design and delivery more effective than information that is not targeted?
- How can prevention information be presented effectively online?

The literature generally supported the finding that tailored and targeted materials that respond to individual characteristics, such as readiness to change, can be effective in engaging interest and leading to health behavior change. The review also found that interactive information is more engaging and motivating than information that is not interactive.

Web Site (Content) Analysis

ODPHP reviewed content on nine prevention topics available from four leading health Web sites: American Cancer Society, Mayo Clinic, WebMD, and Family Doctor. Based on this review, the authors made several general recommendations for designing health information for Web sites, including:

- Keep content at a reasonable length.
- Use headings and subheadings.
- Use hyperlinks so users can explore relevant content.
- Provide interactive tools as appropriate.
- Convey information using graphics or visual displays.

Expert Interviews

Subject-matter experts in nine health content areas identified common questions asked by members of the public. The goal was to identify audience segments based on motivations for seeking information. The audience segments developed from the expert interviews included:

- Segment 1: Those seeking information about a health problem for themselves or someone they know.

- Segment 2: Those wanting to find out whether they or someone they know has a health problem or reason to be concerned about a health problem.
- Segment 3: Those seeking information to help prevent the onset of health problems.

Structured Interviews

ODPHP conducted structured interviews with 200 diverse participants between the ages of 18 and 65 to test the audience segmentation strategy mentioned above. Examples of key findings include:

- The audience segmentation strategy was validated (significant differences were found in motives/preferences between the three segments).
- Respondents did not remain in a particular audience segment over time.
- Content should reflect the needs/motives of each segment.

Mental Models Study

Indepth interviews were conducted with 35 English-speaking adults, aged 18 to 65, with limited health literacy. The primary intent of this research was to determine how people naturally group disease prevention topics (i.e., their “mental models”) to inform the development of a prevention prototype. Examples of key findings include:

- Participants grouped the topics of nutrition, obesity, and physical activity together.
- Other topics were commonly stand-alone concepts, such as preventing falls and getting flu shots.
- Participants associated the topics of talking to kids about smoking and talking to kids about substance abuse.

Card-Sorting Study

Eighty-one diverse participants completed the card-sorting study. As a result of the study, ODPHP created a prioritized list of the most useful types of content across the three audience segments. These content types emerged as generally "useful" and "important":

- Basics I need to know (Understanding)
- I would like to learn more (Assessment)
- I can do this (Overcoming Barriers)
- How will this help me? (Motivators)
- Ways I can take action (Strategies)
- Where can I go for help? (Community Resources)

Prototyping Phase

Prototype Test (Paper and Clickable)

ODPHP developed and tested a prevention information prototype with a diverse, nationwide sample of 300 adults. Participants evaluated the prototype and prevention content on measures of engagement, self-efficacy, acceptability, and applicability. Examples of key findings include:

- Participants found the content acceptable (relevant and useful), but did not rate it as highly for inspiring self-efficacy.
- Qualitative data showed participants' preference for the following content characteristics:
  - Informal, clear, and concise writing
  - "Tabbed" organization
  - Actionable information with a small-steps approach
  - Interactive tools
  - Graphics that aid understanding
  - An interface that allows users to "drill down" through related chunks of information

Usability Study 1

ODPHP performed an initial usability study with 40 adult women with limited health literacy skills recruited from federally qualified community health centers in Baltimore, MD. The study was designed to observe and record any problems encountered by users as they navigated the prototype, to learn whether changes to the content and interface design would positively affect self-efficacy measures, and to gauge levels of understanding and engagement. Examples of key findings include:

- Participants particularly liked checklists, lists of questions to ask a doctor, access to related resources, graphics that aid understanding, and options to print.
- The tabbed approach helped orient participants to where they were in the content.
- Participants found the interactive tools (e.g., calculators, quizzes, menu planners) useful because they were immediate, relevant, and in context.
- Providing small steps for taking action helped improve participants' self-efficacy.
- Content organization of "What is the behavior?" (basics), "Why is it important to me/relevance?" (benefits), and "What do I do about it?" (take action) was logical to participants.

Usability Study 2

ODPHP conducted a second usability test with 13 adult women with limited health literacy recruited from federally qualified community health centers in Baltimore, MD. This test was performed to validate changes made from the prior usability test (Usability Study 1) and to continue to test levels of engagement, self-efficacy, and understanding. Examples of key findings include:

- Participants had difficulty using the search function and often clicked on the "Search" button without entering a search term.
- Most users expected to see a list of topics in an "A to Z" format.
- When using the myhealthfinder tool, participants did not easily connect the information they entered into the tool with the search results they received.

- Tab navigation needs to be more clearly delineated.
- Participants preferred photographs of "real" people to icons.
- Participants noticed content at the center of the page more than top, bottom, and side content.

Usability Study 3

ODPHP performed a third usability test with seven diverse participants recruited in Knoxville, TN. This study provided an overall test of the new healthfinder.gov site and of the changes made based on previous testing. Examples of key findings include:

- Most participants used the A to Z section, rather than the search box, to browse.
- When prompted to use the search function, participants had little trouble and were able to scan the results page easily.
- Participants were able to navigate easily back to the home page through strong lefthand navigation.
- Participants particularly liked the photos of "real" people and the "take action" content.

Usability Study 4 (myhealthfinder)

ODPHP conducted a usability test on the first iteration of the myhealthfinder tool with 15 diverse participants. Examples of key findings include:

- Participants had difficulty signing in. Many attempted to sign in even though they had never created an account.
- Many participants had difficulty creating an account. For example, they did not distinguish between required and optional fields, had difficulty creating a unique username and password, and did not understand error messages.
- Participants did not want to enter personal information (e.g., height, weight, smoking status).
- Participants often skipped over context and welcome information.
- Participants needed more than just recommendations; they wanted corresponding "how-to" information.

Postlaunch Quality Improvement Phase (Ongoing)

Card-Sorting Study

ODPHP conducted a card-sorting activity with 30 adults with limited health literacy recruited through the WIC program (Special Supplemental Nutrition Program for Women, Infants, and Children) in Alexandria, VA, and from a federally qualified community health center in Baltimore, MD. During each of four focus group sessions, participants completed two card sorts to refine the organization of the Quick Guide to Healthy Living topic pages and to develop categories and labels for a new Quick Guide landing page. Examples of key findings include:

- Participants had difficulty understanding the Benefits tab and tended to organize all information in the Basics and Take Action categories.
- Participants were very interested in one-page, printable action-oriented topics and tools using bullet points instead of paragraphs.
- Participants preferred topics to be placed under multiple categories.
- Participants tended to like categories of information labeled for certain groups (e.g., women, older adults, parents).

Widget Usability Test (Be Active Your Way) (Two Rounds)

ODPHP held two usability tests with 18 participants recruited from adult literacy programs in Washington, DC. These studies specifically focused on the usability, usefulness, and understandability of a widget providing targeted physical activity tips. Examples of key findings include:

- Participants did not notice the widget on the left and right margins.
- Many participants thought the sidebar graphic (widget icon) might be an ad.
- Participants didn't respond well to the word "barriers."
- Participants often glossed over difficult words, such as "moderate" and "vigorous."

- Participants often ignored or skipped over very short words like “is” and “in.”
- Participants wanted to use the “Back” button rather than other navigational elements.

Intermediary Interviews

ODPHP conducted interviews with 10 health intermediaries recruited from WIC programs and federally qualified community health centers. The goal of the interviews was to obtain feedback on how healthfinder.gov content could better serve WIC and community health center clients. Examples of key findings include:

- Participants thought the organizational structure of the content (Basics, Benefits, Take Action) was logical and would help them explain prevention behaviors to their clients.
- Participants cautioned that content should reflect the cultural sensitivities and economic realities of priority audiences.
- Participants liked the use of positive, empowering language.
- Participants suggested an increase in the use of images and symbols to make points “stick.”

Usability Study 5

ODPHP conducted a fifth usability test with nine participants with limited health literacy recruited through two community adult learning centers in Columbia, MD, to provide feedback on a new Quick Guide landing page and topic structure. Examples of key findings include:

- Participants often missed items on the right side.
- Participants struggled with scrolling or didn’t scroll at all.
- Participants had high success rates in finding topics through the Quick Guide organizational structure.
- Participants easily noticed and used the lefthand navigation.
- Participants needed everything that looked “clickable” to be “clickable” and wanted navigational elements to be big and easy to notice.

Appendix E: Resources for Creating Easy-to-Use Web Sites

CDC Scientific and Technical Information: Simply Put

This guide will help you translate complicated scientific and technical information into material that captures and keeps the interest of your intended audience.
Available at http://www.cdc.gov/DHDSP/cdcynergy_training/Content/activeinformation/resources/simpput.pdf

Clear & Simple: Developing Effective Print Materials for Low-Literate Readers

This guide, developed by the National Cancer Institute, outlines a process for developing publications for people with limited literacy skills. The process was derived from communications, health education, and literacy research and practice. Writers who have produced low-literacy materials contributed their expertise.
Available at www.nci.nih.gov/cancerinformation/clearandsimple

Creating Websites That Work

Kathryn and Michael Summers provide step-by-step information and tools for developing effective Web sites.
Houghton Mifflin Company, 2005

Letting Go of the Words: Writing Web Content That Works

Janice (Ginny) Redish provides a comprehensive and accessible overview of writing Web content, with screenshots and examples included throughout.
Morgan Kaufmann Publishers, 2007

NIA: Making Your Website Senior Friendly

This publication summarizes the best practices of the National Institute on Aging (NIA) Web site, NIH SeniorHealth (http://NIHSeniorHealth.gov). Providing practical guidance to developers of Web content, this publication uses examples to illustrate points such as using action verbs in headers and incorporating video, audio, and pictures to better reach the older population.
Available at www.nia.nih.gov/HealthInformation/Publications/website.htm

PlainLanguage.gov

Designed to improve communication from the Federal Government to the public, this Web site contains excellent tools and examples of plain language.
Available at www.plainlanguage.gov

Quick Guide to Health Literacy

This toolkit from the U.S. Department of Health and Human Services (HHS) provides content development tips and explains “why” to improve health literacy as well as “how to” do it. You will find user-friendly, action-oriented materials that can be easily referenced, reproduced, and shared with colleagues.
Available at www.health.gov/communication/literacy

Accessible Health Information Technology (Health IT) for Populations With Limited Literacy: A Guide for Developers and Purchasers of Health IT

The evidence-based guide from the Agency for Healthcare Research and Quality includes a checklist for Web site developers as well as general recommendations for improving the accessibility of all health IT.
Available at http://healthit.ahrq.gov/portal/server.pt/gateway/PTARGS_0_1248_803031_0_0_18/LiteracyGuide.pdf

Usability.gov

This Web site is a great reference for conducting usability testing and user-centered design. The site includes checklists, descriptions of methods, and sample testing documents and research protocols.
Available at www.usability.gov

Research-Based Web Design and Usability Guidelines

These guidelines are based on more than 400 separate sources of research and have been reviewed by experts from across Government, industry, and academia. Each guideline includes a "relative importance" rating as well as a "strength of evidence" rating.
Available at www.usability.gov/guidelines/index.html

Easy-to-Use Health Information on the Web

- healthfinder.gov
  www.healthfinder.gov/prevention
- MedlinePlus
  www.nlm.nih.gov/medlineplus/easytoread/easytoread_a.html
- NIH SeniorHealth
  http://nihseniorhealth.gov/listoftopics.html
- WomensHealth.gov
  www.womenshealth.gov/topics.cfm

Appendix F: Annotated Bibliography

Dailey, S. (2005). NIHSeniorHealth.gov: Empowering older adults with health information. *Journal on Active Aging, 4(2),* 61–62. Retrieved from http://nihseniorhealth.gov/jactaging.pdf

This background piece heralds the award-winning work of the National Institute on Aging and the National Library of Medicine on the NIH SeniorHealth Web site (http://NIHSeniorHealth.gov). The article describes the purpose of the Web site and provides an overview of some of the lessons learned.

Echt, K. V. (2002). Designing Web-based health information for older adults: Visual considerations and design directives. In R. W. Morrell (Ed.), *Older adults, health information, and the World Wide Web* (pp. 61–88). Mahwah, NJ: Lawrence Erlbaum Associates.

Echt summarizes the research behind Web-based interface design and explains the special considerations necessary to design Web-based health information for older adults. This chapter includes clear guidelines for layout, organization, navigation, and graphics.

Freimuth, V. S., & Mettger, W. (1990). Is there a hard-to-reach audience? *Public Health Reports, 105*(3), 232–238.

This article dispels myths, deconstructs assumptions about "hard-to-reach" audiences, and offers alternative perspectives to highlight the strengths of different audience segments, encouraging innovative approaches to communication.

Kaphingst, K. A., Zanfini, C. J., & Emmons, K. M. (2006). Accessibility of Web sites containing colorectal cancer information to adults with limited literacy (United States). *Cancer Causes and Control, 17*(2), 147–151.

Kaphingst and colleagues found that many colorectal cancer Web sites were too difficult for the average American adult and much too difficult for adults with limited literacy to use. Common problems with the sites included the following: lack of review of key ideas; insufficient use of illustrations for key messages; crowded layout and long line lengths; small type size; lack of cues to highlight key content; and lack of interactive features.

Kodagoda, N., & Wong, W. (n.d.). Why design for people with reading difficulty and low literacy. Retrieved from http://designtoread.editme.com/files/2008Liverpool/kodagoda_and_wong.pdf

This document summarizes previous research conducted by the authors on users with low literacy and the Web. The authors explain the benefits of semantic Web technology and offer design guidelines for users with low literacy.

Lefebvre, R. C., Tada, Y., Hilfiker, S., & Baur, C. (in press). The assessment of user engagement with ehealth content: The eHealth Engagement Scale. *Journal of Computer-Mediated Communication.*

This article describes the psychometric testing and evaluation of the eHealth Engagement Scale, which was adapted from commercial advertising research. Internal reliability of each of the two multi-item subscales of the eHealth Engagement Scale was 0.878 for "Involving" and 0.805 for "Credible." The eHealth Engagement Scale may prove to be an important mediator of user retention of information, intentions to change, and ultimately efforts to undertake and achieve behavior change.

Morrell, R. W., Dailey, S. R., & Rousseau, G. K. (2003). Commentary: Applying research: The NIH Senior Health Project (pp. 134–161). In N. Charness & K. W. Schaie (Eds.), *Impact of technology on successful aging* (pp.134–161). New York, NY: Springer Publishing.

This chapter offers a detailed outline of the special considerations, design principles, and methodology implemented in the NIH Senior Health Project. Not only do the authors explain the unique needs of aging populations, including their usability testing procedures and results, but also they clearly lay out detailed guidelines for Web content development for aging populations.

Neuhauser, L. (2001). Participatory design for better interactive health communication: A statewide model in the U.S.A. *Electronic Journal of Communication/La Revue Electronique de Communication, 11*(3,4). Retrieved from www.cios.org/EJCPUBLIC/011/3/01134.html

This article provides an example of how participatory design was used by hundreds of parents and people with disabilities to create a health Web site for 33 million residents of the State of California.

Nielsen, J. (2005). Low literacy users. *Jakob Nielsen's Alertbox*. Retrieved from www.useit.com/alertbox/20050314.html

This Web site provides an overview of the user population with lower literacy as well as practical tips for improving the usability of Web sites.

Summers, K., & Summers, M. (2004). Making the Web friendlier for lower-literacy users. *Intercom*, June, 19–21. Retrieved from http://iat.ubalt.edu/summers/papers/intercom%20making%20web%20friendlier.pdf

The authors describe some of the online behaviors of limited literacy users. These behaviors, such as avoiding search functions or reading every word, often contradict developers' most basic assumptions. It's important to address these issues in developing online prevention content.

Summers, K., & Summers, M. (2005). Reading and navigational strategies of Web users with lower literacy skills. Retrieved from http://iat.ubalt.edu/summers/papers/Summers_ASIST2005.pdf

This research article summarizes results from a study that sought to understand the differences between the reading and navigational strategies of users with low literacy skills and those with medium to high literacy skills. The authors offer strategies and design principles to make Web-based medical content usable and accessible for lower literacy adults.

Zarcadoolas, C., Blanco, M., Boyer, J. F., & Pleasant, A. (2002). Unweaving the Web: An exploratory study of low-literate adults' navigation skills on the World Wide Web. *Journal of Health Communication,* 7(4), 309–324.

Based on an ethnographic study of a group of low-literate adults, the authors identify specific navigational and content issues that present barriers for this population. They discuss preliminary assumptions that can be used to inform the development of Web tools for low-literate adults and directions for future applied research.

Zarcadoolas, C., Pleasant, A. F., & Greer, D. S. (2006). Health literacy and the Internet. In *Advancing health literacy* (pp. 117–140). San Francisco: Jossey-Bass.

This book chapter brings together the research from two worlds: health literacy and the Internet. The authors explain the strengths and weaknesses of using the Internet to communicate health information. In addition to reviewing key research findings, the authors outline specific challenges, opportunities, and ethical issues. This chapter contains applied exercises and an abbreviated glossary of commonly used Internet jargon.