DRAFT Usability Evaluation of NIH's Health Information Page

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Executive Summary

UserWorks, Inc., under the National Institutes of Health (NIH) contract for RPTOP #158, conducted a 16-person usability study with representative users of NIH's Health Information Page. Through the present usability study, OLIB wanted to determine if the site effectively meets its mission of information dissemination, if users are satisfied, and if users consider the content credible and useful.

OLIB outlined several areas of concern centering on communication, satisfaction, navigation, and external issues. These issues were addressed in the study through a combination of pre and post-test questionnaires, along with probing questions asked at appropriate junctures during the individual sessions.

Because of limitations regarding imposing paperwork burdens on participants, only nine of the sixteen participants were asked to complete an intake questionnaire and post-test questionnaire. These nine participants were from the health consumer group. The remaining participants, including the health professionals, were asked the post-test questions verbally at the beginning and at the end of their session; the questions helped to ascertain their areas of interest regarding the health topics and to obtain their overall comments at the conclusion of the study. This final report also discusses findings from the previous usability study of the NIH home page (conducted in February 2000 under subcontract to Quantum Research Corporation, a division of Macro International), where appropriate.

Participants were asked their preference for Internet Explorer or Netscape and were given the option to utilize either browser. Almost every participant expressed a preference for Internet Explorer; three participants indicated they had version 6.x installed, and one indicated version 5.x. Operating systems were roughly evenly split between Windows 98, Windows 2000, and Windows XP.

From our sample of 16 participants, the most popularly cited web sites used to locate health information included using search engines in general, but there was specific mention of Google (3), Yahoo (2), and Medline; the most frequently cited government web sites included NIH (3), CDC, and the Department of Veterans Affairs. WebMD (3) and Johns Hopkins (2) were also mentioned. Participants generally could not recall specific aspects they preferred on web sites, except for a couple of participants who mentioned the spell checker feature on search engine sites. One participant, however, said that the information provided through the Health Information Page web site compared favorably to WebMD, concluding that it was "more in-depth and not as basic as WebMD."

For the first two tasks, participants were asked to find information pertaining to a health topic of interest to them. They were not prompted to use a particular navigation feature (Browse, Most Requested Topic, Search, Find) in these initial two tasks. In actual use of the web site, the navigation feature chosen as the "first click" in the first task was also

selected as the "first click" for the second task. Search was by far the most frequent "first click."

There was a 92% success rate in completion of tasks. Of 77 tasks attempted by 16 participants, only six failed to be completed either due to time constraints or because participants were facing difficulty. The first two tasks were based on topics of interest to participants and had slightly lower success rates; however, the overall architecture of the Health Information Page was consistently successful in helping participants get to the information they were seeking.

There were, however, two related issues that emerged from this present study which continue to beleaguer participants. Regardless of how participants navigate to the topic landing pages, t**he agency/bureaucratic organization of information confuses participants.** This is a **persistent** problem from the previous usability study, as participants did not comprehend that the various NIH institutes are the structure by which available disease information is presented. Also**, "Resources" in the left navigation is not helpful** since it does not readily correspond to any page heading or link to any obvious anchor point. This is also a **persistent** problem.

As suggested by many participants, information is more useful if it is organized by subtopic, rather than by the producing or sponsoring institute or center. Participants implied they would prefer to see information about basic facts (fact sheets), patient advocacy, causes, treatment, and symptoms. The related links were seen as useful, as were the links to search Medline and Clinical Trials. Institutes and centers can still be referenced, but could be treated as information "sponsors," e.g., NIMH and others, that would allow users to search for more detailed information as needed.

Overall, participants were enthusiastic about the site and the information it provided. Some asked if it was a live site, what the URL was, and could they go back and use the site later. Several remarked that the liked the site's simple layout, that it didn't distract them from finding information.

Participants thought that the information on the site was very trustworthy; the average of nine ratings on the post-test questionnaire for finding information on the site was 6.0, on a scale of one to seven, with one being "extremely low" credibility and seven being "extremely high" credibility. As a result, participants agreed that they would use the site again in the future (6.0) and recommend the site to others (5.7).

Introduction

UserWorks, Inc., under the National Institutes of Health (NIH) contract for RPTOP #158, conducted a 16-person usability study with representative users of NIH's Health Information Page. Through the present usability study, OLIB wants to determine if the site effectively meets its mission of information dissemination, if users are satisfied, and if users consider the content credible and useful.

Methodology

Sixteen participants were recruited for this present study; the participant interviews were conducted at UserWorks' facilities in Silver Spring, Maryland, in November 2003. All participants were asked to read and sign the video consent form that was discussed at the time of recruitment. At the time of select individuals' sessions, UserWorks asked participants to complete a brief questionnaire that informed the development of the initial two tasks the participant would complete.

Because of limitations regarding imposing paperwork burdens on participants, only nine of the sixteen participants were asked to complete an intake questionnaire and post-test questionnaire. These nine participants were from the health consumer group. The remaining participants, including the health professionals, were asked the questions verbally at the beginning and at the end of their session; the questions helped to ascertain their areas of interest regarding the health topics and to obtain their overall comments at the conclusion of the study. Participants were asked their preference for Internet Explorer or Netscape and were given the option to utilize either browser.

Using the moderator's guide, the study administrator interviewed each participant individually in a single session lasting approximately 90 minutes; each participant completed assigned tasks on the Health Information Page. After each task, participants verbally evaluated the site for ease of navigation; if the task was completed, participants were also asked to rate their satisfaction with the information found, and the understandability of content for that task. Finally, select participants were asked to complete a post-test questionnaire asking them questions about their overall satisfaction with the site.

Participants and health topics

Sixteen participants took part in the usability study. The participant groups consisted of the following:

- Six health professionals, including a nurse practitioner, a public health worker, a health writer, a health educator, and two health researchers
- Ten health consumers, including two caretakers, three with a family history or concern for a health condition, and five with a health condition

All participants were asked about their interest in the spectrum of health conditions; for purposes of the usability study, the following health topics were discussed in detail:

- Arrhythmia – 4 participants
- Asthma – 2 participants
- Back pain – 1 participant
- Deep vein thrombosis – 3 participants
- Diabetes – 3 participants
- Learning disabilities – 1 participant
- Sickle cell anemia – 1 participant
- Sleep apnea – 1 participant
- Weight loss/dieting – 1 participant

Participant browser preferences

One of the "Key Questions" from the test plan addresses the browsers/platforms that the target audiences are using to view the Health Information Page. While a study of web logs will reveal a more comprehensive answer, our sample of 16 participants can provide some insight.

Almost every participant said they used Internet Explorer, except one participant who uses their AOL (Netscape) browser. One participant also indicated that he used an Internet Explorer browser on a Macintosh.

When asked about which version they had installed, three participants indicated they had version 6.x installed, and one indicated version 5.x. Operating systems were roughly evenly split between Windows 98, Windows 2000, and Windows XP.

Web sites used by participants

Another "Key Question" asked about web sites target audiences frequent and the features participants preferred. From our sample of 16 participants, the most popularly cited web sites include the following.

- Sites to conduct searches (search engines in general) (5), but specific mention of Google (3), Yahoo (2), and Medline
- Government web sites including NIH (3), CDC, and the Department of Veterans Affairs
- Commercial sites, such as WebMD (3) and pharmaceutical manufacturers' sites
- University-affiliated sites, such as Johns Hopkins (2), GWU, and Yale Medical School web site
- Other specialized websites, such as CareFirst's breast cancer awareness site and Medscape's cardiology page

When probed about features of other web sites they liked, participants generally could not recall specific aspects they preferred, except for a couple of participants who mentioned the spell checker feature on search engine sites. Applicability of this suggestion is discussed further in the "Findings for Search" section. One participant, however, said that the information provided through the NIH Health Information Page web site compared favorably to WebMD, concluding that it the Health Information Page web site was "more in-depth and not as basic as WebMD."

Objectives and outcomes

OLIB outlined several areas of concern (see "Key questions and overarching concerns" below) that focus on communication, satisfaction, navigation, and external issues. These issues were addressed in the study through a combination of pre and post-test questionnaires, along with probing questions asked at appropriate junctures during the individual sessions.

To obtain qualitative data, UserWorks encouraged participants to identify positive and negative aspects of the Health Information Page, including features such as appearance, layout, navigation, special features, speed, intuitiveness, users' preferences and practices, ease of use, loading time, and aesthetics. Participants also commented on the overall appearance of the pages, including layout, font style, and size.

Usability outcome measures were derived from data collected during the study and are based on observation of task performance and post-session analysis of the data. Outcome measures include the following:

- Success or lack of success in finding the desired information
- Types of errors or inappropriate choices made
- Common themes (positive and negative) found in comments made about the interface and content
- Results from questionnaires completed by participants

Usability issues were compiled and are discussed in the "Findings and Recommendations" section.

For purposes of this study, the usability issues (findings) are rated according to a severity scale. The ranking includes the following:

- **High** severity problems – prevent task completion or cause loss of data
- **Medium** severity problems – do not prevent task completion but slow performance or cause frustration
- **Low** severity problems – issues that cause momentary confusion, are a nuisance, or matters of opinion or individual preference

This final report also includes references to the previous usability study of the NIH home page (conducted in February 2000 under subcontract to Quantum Research Corporation,

a division of Macro International), where appropriate. It should be noted that the previous usability study included tasks, such as finding a summer job or a lecture at NIH, that were not part of the present study. Thus, only selected problems are discussed in this present study. These problems previously identified are classified two ways.

- **Persistent** problems are those that continued to cause difficulty
- **Debatable** problems were identified in the last round but not in this round; these are problems we would have expected to see arise again but did not

In addition, where appropriate, findings and recommendations from the October 2003 heuristic usability review/competitive analysis are discussed in this present study.

The recommendations that follow address, as appropriate, the information architecture of the site, labeling of links and menu items, screen layout and messaging, search results presentation, and user feedback on the presentation of available content.

Findings and Recommendations

The previous NIH usability study, mentioned earlier, pointed out some of the problems that we observed. We discuss those problems in relation to problems we identified and note whether the problems are persistent or new to this present study.

Key questions and overarching concerns

Navigation

There was a 92% success rate in completion of tasks. Of 77 tasks attempted by 16 participants, only six failed to be completed either due to time constraints or because participants were facing difficulty. The first two tasks were based on topics of interest to participants and had slightly lower success rates; however, the overall architecture of the Health Information Page was consistently successful in helping participants get to the information they were seeking.

The organization of the main navigation features seemed to work for most participants, with two participants commenting straight away that they liked that Search was available in a convenient, obvious spot on the page. Overall, participants thought that finding information on the site was relatively easy; the average of nine ratings on the post-test questionnaire for finding information on the site was 5.6, on a scale of one to seven, with one being "difficult" and seven being "easy." When asked at the end of each task how helpful the site was in getting them to the information they were seeking, participants' ratings closely corresponded to the post-test questionnaire; on the same seven-point scale, participants rated how easy it was to find information as 5.9.

The first two tasks were designed to discover participants' preferences in navigating the site using the four main options presented to them. Based on interest relative to the health topics designated for this study, participants were asked to use any of the main navigation features (Browse, Most Requested Topic [MRT], Search, or Find). Popularity of these options as a "first click" is charted below.

Task #1 first click:

- 3 chose Browse first
- 3 chose MRT first
- 8 chose Search first
- 2 chose to Find by category first

Task #2 first click:

- 5 chose Browse
- None chose MRT
- 9 chose Search
- 2 chose Find by category

Generally speaking, the navigation feature chosen as the "first click" in the first task was also selected as the "first click" for the second task, as well. There was an exception, however, in the case of three participants who initially chose MRT in the first task but then each chose another option (Find, Browse, Search). One participant who clicked on Find first then chose Browse as the first click in the second task.

The reasons that participants gave for their selection of a "first click" varied. MRT was selected out of curiosity or because participants deemed it a quick route to detailed information. Browse was often selected because participants were already familiar with the concept of finding information alphabetically. Find was chosen because it too was deemed to have detailed information, and one healthcare professional likened Find to the *Merck Manual* <http://www.merck.com/mrkshared/mmanual/sections.jsp>. The popularity of Search is partially due to participants' familiarity with or preference for searching and Search's central placement on the page (as viewed on an 800x600 monitor). Search proved frustrating for several users, however, because some results were not retrieved as expected, namely "full-text" results with highlighted text (in the manner of Google) and queries using selected abbreviations (such as "DVT") failed while others did not (such as "ADD").

In the remaining tasks, participants were asked to attempt to use a different option in order to obtain their opinions about those navigation features. Those opinions are discussed in detail in the following sections.

With regard to the right-side navigation (On This Page) on the home page, one participant summed up participants' overall comments by saying that he looked for goal-based navigation, such as "Look up drug information," instead of "Drug Information." Similarly, viewing information on the topic landing pages by bureaucratic organization isn't as important as being able to scan information by topic.

One of the key questions asks, "Does the current architecture resolve the navigational problems reported in the pilot usability study?" A related question asks, "Are there any navigational 'hang-ups' in the processes that must be performed using the new page? In what specific ways does the interface design aid or hamper task flow?" The previous usability study identified a medium-severity problem where participants had difficulty returning home from a web site outside the National Institute of Health web site, e.g., returning home from Medline and from the National Cancer Institute web site. With regard to the present study, this problem is **persistent**; several users encountered problems using the Home button when asked to return to the starting page (Health Information Page [HIP]). Participants' expectations for the Home button to return to HIP were not met.

Short of opening a new browser window every time an NIH institution's fact sheet is selected, there does no seem to be an easy resolution. As discussed later, awareness by many participants of the fact that NIH is comprised of various institutions is secondary to their desire to obtain needed information; that the information comes from NCI or NIMH is less important. If users are told that they are being taken to an external site in the new window, they may be more annoyed by a new window opening than by the helpful message it contains. It is more likely that the slight inconvenience of using the browser's Back button to return to the HIP can be tolerated than the added inconvenience of launching multiple new windows. Workable alternatives to alert users that they are going

off site is to indicate so with an interim page or dialog box, or to include a button for the Health Information Page in a consistent location on every page.

Credibility

Overall, participants thought that the information on the site was very trustworthy; the average of nine ratings on the post-test questionnaire for finding information on the site was 6.0, on a scale of one to seven, with one being "extremely low" credibility and seven being "extremely high" credibility. As a result, participants agreed that they would use the site again in the future (6.0) and recommend the site to others (5.7).

When participants were asked about how they judged the information on a web site to be trustworthy or not, they said they usually relied on gut instinct. When encountering a site for the first time, they assessed its credibility by comparing it to what they already thought they knew, but they rarely checked the site against other sites. Overall, branding, such as a recognizable name like Yale, and a trustworthy appearance were most commonly cited as a means for judging credibility. With regard to HIP, participants said that the while the page could include additional images of people, the "information is on target, credible, and useful."

Findings for the Home Page (as a Whole)

Awareness and audience

One Key Question asks if users are aware of NIH's research mission. Awareness of NIH, its purpose, affiliation within the Federal government, and institutes and centers remains limited. Because of the prominent logo, participants could easily identify who sponsored the Health Information Page site, but knew little of the sponsor and less of the institutes and centers. When asked about the intended audience and information available on the site, another Key Question, participants were generally very accurate about pointing out that the general public was the intended audience and that information about seemingly any major health issue could be located. Few participants from the general public, however, were confident in their knowledge and familiarity with NIH. Health professionals generally understood the research nature of NIH and that the HIP provided health information.

Labeling

Overall, participants appreciated the effort to use terms that the general public could understand. A couple of participants felt the information was initially intended for technically minded health professionals, but then indicated that the site was easy to use with information they (health consumers) could understand and use. A **persistent** problem dealt with the labeling of some links on the home page, such as the list of Special Programs.

A couple of participants wondered why **the links in Special Programs were separated rather than integrated** into the demographic or common conditions area of Find. (**Low** severity)

Recommendation 1

While the information in Special Programs is integrated at lower levels on the topic landing pages, the nature of the links is more cross-disciplinary, and thus more difficult to fit neatly into one category in the Find area. Alternatively, Other Health Agencies and Special Programs could be combined into Related Links, which is a label that is more familiar. Healthfinder could be included in this grouping, as well.

Call the NIH and Contact information under On This Page confused participants. Several participants remarked that they thought the information was redundant; they also wondered why contact information would be listed twice. (**Low** severity)

Recommendation 2

Combine both links to "Contact Us."

Medline, Library References, Clinical Studies, and Drug Information can be repurposed. Medline and Clinical Trials by themselves on the home page were not meaningful to many participants from the general public; however, when a search query did not yield desired results, the link to search the database and/or the clinical trials database was very desirable. (**Medium** severity)

Recommendation 3

Some of these resources could be well served with their own respective landing pages. For example, combine drug related information, such as the drug information database, CEDAR, and IBIDS into an integrated section called Drug Information under Health and Wellness in the Find feature. Rename Procedures to Symptoms and Treatment and include expanded sections that allow users to find clinical trials information and resources on tests ("procedures" was too medical, as was "manifestations"). The databases in Library References can also be linked to in the search results page in the "Look up [X]" section, in addition to being included in a section to Find Articles.

Health consumer participants said that, usually, if they were not sure about a link, they probably wouldn't use it. The most frequently mentioned included links for Medline Plus on the home page, the institute acronyms on the topic landing pages, and the advanced search options after a query had been conducted. Participants very rarely made the connection between the acronyms on the left side of the topic landing pages and the names of the institutes and centers in the main content area. In addition, if a PDF version

were the only link offered, participants would probably download it but not really understand what the PDF abbreviation meant. Other issues with labeling were technical terms for resources; for example, one participant said he didn't care what Medline is, and that he just wanted to get information from it (referring to a link at the bottom of a search results page).

Layout

One participant noticed that information below the fold seemed to be more technical and that healthcare professionals probably would make use of those resources more than those above the fold. There was no strong, overwhelming call for a section dedicated to health professionals from the health professionals. If there were an intention, however, to develop a subsection for health professionals, key phrases (such as Medline) would allow medical and professional users to home in on those items when needed. Several health professionals indicated, though, that they already use those features through other means. It was interesting to note that one participant wondered why there was no section for kids, i.e., KidsHealth.nih.gov.

Findings for Browse

The Browse section was not problematic for most participants. Participants were accurate in ascertaining its purpose and how it functions. Participants suggested including more see also references for acronyms, e.g., "DVT *see* Deep Vein Thrombosis."

The spacing of topics (an alphabetical list of five items separated by white space from another list of five items) was initially cited as odd, but participants noted that the layout did make it easy to scan. Participants suggested keeping like words together, for example all words that begin with DA would be listed together so that no topics beginning with DE spanned any of those sets.

Findings for Most Requested Topics

While Search was the most popular first click, Most Requested Topics seemed to be the biggest disappointment, functionally speaking. Participants were somewhat frustrated with the prospect of not being able to quickly skim but rather having to read each health topic. Listing the topics alphabetically (also suggested in the heuristic review) was a frequent suggestion. One participant noted that if she didn't see her topic listed in the first "screen" (first seven lines displayed), then she would bypass that option. When asked to use MRT in subsequent tasks, however, participants liked that it was able to efficiently direct them to the topic landing page.

> **Participants could not quickly scan Most Requested Topics.** They could not grasp the seemingly arbitrary order of the topics in the combo box. A couple of participants wondered if the order of topics was based on popularity. (**Medium** severity)

Recommendation 4

As mentioned in the heuristic usability review, organize the Most Requested Topics in alphabetical order.

Regarding labeling, one participant commented that he didn't know what "Colorectal Cancer" was and asked if it was colon cancer. If that was the case, he suggested using the simpler term, "Colon Cancer." Another participant suggested that Most Requested Topics should be renamed if the listing of topics were to be kept in non-alphabetical order. This participant suggested renaming it to "This Week's Hot Topics," for example if the list were updated weekly.

Some participants selected a topic from MRT and hit Enter with no result. Several more participants tried to double click on the topic with no result. One participant suggested adding the "go" button to the right so it would be more obvious; another suggested that the double-click option be "activated."

Participants wanted to double click on a topic to select it. Several participants wanted to be able to double click on the MRT topic of interest, thinking the double click would work. In addition, one participant said he **didn't notice the "Go" button** and that it should be located to the right of the combo box and that the double click action should also be enabled. (**Medium** severity)

Recommendation 5

Consider reformatting the combo box as a dropdown list; this will forestall the tendency to double-click a topic if coding for the double-click action it is not feasible. This reformatting also allows for the "Go" button to be in closer proximity, i.e., to the right, of the dropdown box.

Findings for Search

A problem identified in the earlier usability study, that is, being able to correctly spell the name of a disease in order to obtain good search results, seems to have been effectively addressed. Spelling help was used in a couple of cases and was seen as a useful tool. One problematic term, "arrhythmia," caused some spelling headaches for one impatient participant, but the spell checker feature was noticed and was used. One person described the Google "did you mean" feature but said the feature provided on the HIP site was fine.

Several participants had complaints about the search results, including saying the results were insufficient, too general, and/or did not really allow (extensive) searching on acronyms (e.g., DVT). When receiving too many search results, participants would refine search using additional terms, try again with new terms, or indicate that they would go elsewhere at that point.

Few would scan the content of the "overwhelming" results, but those who did suggested that the **search results page needs to be organized to permit scanning**. Most pages have left navigation that indicates what's on the page. Search results, especially on long pages, do not contain this. (**Low** severity.)

Recommendation 6

Include left navigation On This Page to list the major sections from the resulting search, e.g., Categories, Health Topics, Publications, and Look Up This Topic.

One participant was surprised that **a search on ADD resulted in only one hit**; this particular participant was used to seeing more extensive search results like Google. Further, the participant who searched on the string "add" (with quotes) couldn't understand why a search with quotes didn't work. At this point, the participant noticed that there are probably predefined topics and suggested expanding topics in the database or allowing sitewide searching. (**Medium** severity)

Recommendation 7

If the database cannot be expanded to include a sitewide search, consider adding more acronyms to the existing database to improve search results. Consider using these acronyms to expand the Browse and Find sections, as well.

Whether effective feedback is provided users who fail to find (search effectively for) information is **debatable**. Several participants wanted to be able to use an advanced search feature or utilize advance search tools, e.g., wildcards, quotes, and Boolean operators within their search query, not knowing the option was available AFTER conducting a query. A few noticed the "match" dropdown but did not use it until probed about it. While the participants used these advanced search features, the automatic "ORing" of their query did not produce the expected or desired results. In a related vein, when participants' searches yielded few or no results, some noticed the Medline and Clinical Trials options to find their topic at the bottom of the page. They explored those links and commented that the information displayed there was just what they were looking for. These options are seen as useful, especially when results from the Search database are limited.

Some participants eventually realized, and stated so verbally, that simpler searches, sometimes one-word queries, were more effective than more detailed searches with more terms (e.g., deep vein thrombosis cancer), which ended up with a larger set of search results than expected or desired. While it is probably not feasible to implement, one participant suggested option via using radio buttons to allow the option to search the health topics database only or to conduct a sitewide search of NIH's resources.

Findings for Find

The effort to use Find was often mentioned by participants as a reason not to use it, i.e., the cognitive effort to deduce the most appropriate category/topic. A couple of participants noted that they liked the way topics are organized under Find, but then they said that would use Search before they would use Find. When asked to explain this interesting statement, one participant said she probably would not use Find because "the other ways are so much easier to use. I'd have to stop and think if asthma could be under 'Lungs and Breathing.' Search is a lot easier."

A participant stated that, "the correlations between my topic and the categories are harder to make." For example, participants were asked about where they might click for information about lung cancer. Most stated the expected Cancers or Lungs and Breathing links. Cancer was more popular since participants said it would easier to find lung cancer in the Cancer section rather than all the other ailments that don't relate to lung cancer under Lungs and Breathing. When asked where information about "hot flashes" might be located, participants suggested Women's Health, Endocrine System (Hormones), Pregnancy and Reproduction, and Symptoms and Manifestations. The first two are the best choices, but the variety of responses shows that some topics are not easily categorized, which ultimately lead to the variety of possibilities participants identified.

In using the categories via Find (and also in Browse), participants remarked that they liked the "see also" references. It was interesting to note that if the participants were guided to a related topic, some would scroll down to the related topic to click on its title rather than click on the hotlinked topic; when asked about this, a couple of participants indicated that they thought it would take them further down the page to the topic and then they would have to click on that topic to get to the topic landing page.

When asked which, if any, topics were missing, participants suggested these to add to Common Conditions/Diseases:

- Diabetes
- Eating Disorders
- HIV/AIDS
- STDs

… and potentially any topic that is listed under Most Requested Topics since it could be considered a "common" condition if so many people request information about the health topic. One participant was particularly enthusiastic about the organization of topics under Find, and suggested that a listing of symptoms and related topics, i.e., expand on topics for cryptic terms such as "manifestations," might also be due an expansion.

> **Revisit the labeling of Common Conditions/Diseases and Procedures**. (**Medium** severity)
>
> **Recommendation 8**

Participants consistently stated that they wanted to see more "common conditions" listed and that the topics listed under Procedures were not meaningful to them. Consider adding Diabetes, Sexually Transmitted Diseases, and HIV/AIDS (perhaps co-located with Infections) in Common Conditions/Diseases. Also, consider breaking out Procedures from Therapies, and just using the term Symptoms or finding a synonym for Manifestations, such as Warning Signs.

Findings for Content

Overall, participants thought that the information on the site was relatively easy to understand; the average of nine ratings on the post-test questionnaire for understanding information on the site was 6.3, on a scale of one to seven, with one being "difficult to understand" and seven being "easy to understand." Font attributes (size, style, color) were rated highly (6.2), as was the level of appropriateness of the information for the general public (6.1). A couple of participants were not fond of the lack of images, but others liked the uncluttered look of the home page. Participants did suggest including images both to illustrate points and to provide visual interest on the page.

A key question asked about participants' overall satisfaction with the content. Broadly speaking, participants seemed satisfied with the level of detail provided about the diseases and conditions; the average of nine ratings on the post-test questionnaire for finding information on the site was 4.3, on a scale of one to seven, with one being "too little detail" and seven being "too much detail." (Note that in this case, "neutral" can be seen as satisfied since the average indicates that there was not too much detail, nor that detail was lacking.) The ratings ranged from 3 to 6, with three ratings each of 4 and 5. When asked at the end of each task about their satisfaction with the information provided (asked only if they had completed the task), participants' ratings, on the same scale, averaged 5.9. In addition, at the end of each completed task, participants were asked to rate the understandability of the information; on a scale of one to seven, participants rated the information provided 6.6 (on the average).

With regard to the health topics of interest, one participant commented that sickle cell anemia lacked detailed information, as did the topic landing pages for arrhythmia and specific learning disabilities. A couple of participants said the information was a good starting point, but they didn't initially see that they were provided with the level of detail they wanted. For example, one participant was looking for information about how pesticides affect asthma. If more detailed information is indeed available from a particular institute, users could be made aware of this fact at this point in their exploration. As discussed in more detail later, links to institutes within NIH would be most useful if offered as contacts "for further information" and presented immediately following the set of links on a health topic provided by that institute. (Such links are currently provided prior to the list of publications published by a given institute, where they tend to be overlooked.).

Reading content

Overall, participants seemed satisfied with way disease and condition information was presented to facilitate scanning; the average of nine ratings on the post-test questionnaire for finding information on the site was 5.9, on a scale of one to seven, with one being "difficult" to scan and seven being "easy" to scan. It was difficult to obtain specific recommendations from participants about missing information that should be included on the topic landing pages; most said that they would just do a search in their favorite search engine or perhaps search the site to see if they could find what they were looking for.

In actuality, however, participants missed segments of content in the process of scanning links. If they tended to find information above the fold, then they tended not to scroll below the fold to look for more information. This tendency is **persistent**, as it was evident in the first usability study where participants were not able to locate information that was present on the bottom of the HIP.

> In the topic landing pages, for example, those who did scroll down often said that **the information was overwhelming**. They had to spend time to read everything on the page to find what they wanted. (**Medium** severity)
>
> **Recommendation 9**
>
> Organize information by common categories, e.g., Fact Sheets, Treatment, How to Prevent [X], so that users can quickly scan information. Organization by institution was not helpful to participants. (There is further discussion about this in "Topic landing pages.")

Participants were asked about their preferences for reading content online or printing instead. Likelihood to print out or read online depended on the participant's ultimate purpose for the information. Usually, it would be printed out and read if the participant felt the information was:

- Important
- Too long to read on screen (ranging from a couple of screens to several pages of text)
- Necessary to read now, but no time to read on screen

A few participants noted that they would also bookmark the page, read it online and take notes, email the link to a friend, or cut and paste relevant sections to save or email. As far as format goes, participants just wanted to be able to scan information easily and quickly. Several noted that the PDF format (while not calling it "PDF format" specifically) was not easy to scan online, especially because of the columns in which fact sheets tended to be published.

> **It is hard to read PDFs online and few participants knew what PDF meant**; even fewer preferred information in that format. In addition, PDFs may not be selected because some users have slow connections; participant wants option to have other formats available. (**Medium** severity)

Recommendation 10

Locate alternative formats, especially scannable HTML versions, which area meant to be read online. If this is not possible, consider asking NIH institutes and centers to identify documents targeted for conversion to non-PDF formats and list those as they become available.

Participants reacted positively to checklists, especially when they mistakenly believed it to be "interactive," even noting that they would like to see more interactive features, such as a form that determines their risk for gestational diabetes. Participants rated very highly content that provided tables of contents, navigation within documents, and how-to information.

Topic landing pages

These topic landing pages successfully, in part, address an earlier identified need for participants to be able locate information in the manner and on the topic they expected, regardless of who produces the information or where it's located. However, because participants are not familiar with NIH, let alone its bureaucratic organization, the way information is organized by institute and center on the topic landing pages is not useful. Further, the acronyms in the left navigation have no meaning to most participants.

The agency/bureaucratic organization of information confuses participants. This is a **persistent** problem, as participants did not comprehend that the various NIH institutes are the structure by which available disease information is presented. (**High** severity)

Recommendation 11

As suggested by many participants, information is more useful if it is organized by subtopic, rather than by the producing or sponsoring institute or center. Participants said they'd like to see more information up front that talked about basic facts (fact sheets), patient advocacy, causes, treatment, and symptoms. The related links were seen as useful, as were the links to search Medline and Clinical Trials. Institutes and centers can still be referenced, but could be treated as information "sponsors," e.g., NIMH and others, that would allow users to search for more detailed information.

As suggested in the heuristic review and supported in the present usability study, the acronyms in the left navigation on the topic landing pages were not understood. Probing with a couple of participants led to guesses that the abbreviations probably related to the different institutions and centers listed to the right.

"Resources" in the left navigation is not helpful since it does not readily correspond to any page heading or link to any obvious anchor point. This is also a **persistent** problem. (**High** severity.)

Recommendation 12

Organizing the information by some other means, such as What is X, How is X Treated, etc. since those topics seem to correspond to the types of questions that participants had. In particular, participants reacted favorably to the organization information on NHLBI DCI site. Having the institution listed first makes users just overlook the information because they're focused on the topic rather than who produced it.

External content

One participant explained that he liked how main words and phrases are bulleted, in bold or otherwise highlighted (linked) so that he doesn't have to read a lot. This participant explained that he liked being able to find information quickly. This corresponds to Nielsen's findings that users prefer to hunt for information (skim, scan, select) before taking the time to read something in depth. This "information scent" indicates whether users feel they are getting closer to the desired information or if they feel frustrated because links (labels, implied information) do not meet expectations. Pogo-sticking behavior (randomly clicking links) indicates that labels and information are not meeting users' expectations. A few users encountered this problem in searching for a way back to the HIP starting page and when exploring some sections of the Find categories.

In linking to external pages, one participant was not sure why the layout changed when he linked to an institute's fact sheet. Other participants were unfazed and said they noticed the change in layout since they realized they were being linked to external sites. Upon further investigation, participants did not realize these sites were in fact institutes and centers affiliated with NIH. If the goal of the site is to get users to information, then the site is succeeding. If the goal is to also educate users to the fact that these institutes and centers are part of NIH, then this is not being conveyed. To paraphrase one participant, the participants don't care who has the information, they just want to answer their health questions.

Several participants indicated surprise at seeing information on an interim page for "Controlling Your Asthma," which implied one would have to pay to view the information. This was not surprising, conceptually speaking, since some commercial web sites do require registration and payment, but the cost information caught their attention before the fact that seeing the publication online was free, as was ordering a copy of the publication.

A link to an asthma brochure surprised some participants who expected to read the document directly. On the interim page for "Facts About Controlling Your Asthma" <http://www.nhlbi.nih.gov/health/public/lung/asthma/asth_fs.htm> with a screen setting at 800x600, it is not apparent until a user scrolls down that the brochure is available in PDF. (**Low** severity)

Recommendation 13

> Where possible, link directly to the PDF version (provide file size) and/or link to other alternatives for users not familiar or desiring to see PDFs. (The use of HTML alternatives would also address one participant's concern about downloading potential viruses from unknown web sites.)

Participants seemed split in their preference for seeing the interim page; several wanted it to link directly to the document while others were confused by the misperception of having to pay for information (probing revealed a need for more careful reading). Others wanted to be able to see information in non-PDF formats; some indicated they didn't know what PDFs were.

On a couple of occasions, participants were looking for information about learning disabilities and the link to the publication showed a page saying the publication wasn't available. It was helpful that it wasn't just a 404 error, but if a database is maintained manually, the link should be regularly checked using LinkBot or a similar tool.