Eye Tracking while Assessing Cancer Risk

FedCASIC 2019 Workshops

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Introduction and Tools
Introduction

- Melanoma Risk Assessment Tool (MRAT)
- Breast Cancer Risk Assessment Tool (BCRAT)
- Colorectal Cancer Risk Assessment Tool (CCRAT)
- The ten participants were clinicians who discuss information about cancer or cancer education with patients
- The UX testing incorporated eye tracking to allow those who were viewing live sessions to see where the participants were looking as they interacted with the tools on the desktop computer
- Eye-tracking for observational purposes only
Cancer Risk Assessment Tool: Research Questions

- The intended audience is clinicians who discuss information about cancer or cancer education with patients, patients, and people interested in assessing their risk of cancer.
- How can we make the risk assessment tools easier to use?
- How can we best write the questions so they are clear and easy to understand?
- How can we best use visuals and graphics to present results?
NCI Audience Research Lab
Melanoma Risk Assessment Tool: Introduction Page
Melanoma Risk Assessment Tool: Information Entry Page
Melanoma Risk Assessment Tool: Results Page

**Personalized Risk of Developing Melanoma Cancer**

- Although a patient's risk may be accurately estimated, these probabilities do not allow one to say precisely which patient will develop melanoma.
- Some patients who do not develop melanoma have higher risk estimates than those who do develop the disease.
- As a result, this tool was designed for use by health professionals. If you are not a health professional, you are encouraged to print these results and discuss them with your provider.
- The tool uses the answers provided to estimate a 5-year absolute risk of developing melanoma. This includes the patient's personal medical history, risk factor information, and an examination of the skin on the patient's back and shoulders.

**Patient's 5-Year Absolute Risk of Developing Melanoma**

0.4%

**Your Answers**

These results are based on how you answered the following questions:

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the patient’s race?</td>
<td>None</td>
</tr>
<tr>
<td>2. What is the patient’s age?</td>
<td>65</td>
</tr>
<tr>
<td>3. Does the patient live in the northern, central, or southern United States?</td>
<td>Southern</td>
</tr>
<tr>
<td>4. What is the patient’s gender?</td>
<td>Female</td>
</tr>
<tr>
<td>5. Is the patient’s complexion light, medium, or dark?</td>
<td>Medium</td>
</tr>
<tr>
<td>6. Ask the patient, After repeated and prolonged exposure to sunlight, at the age you are now, would you like to become very brown and deeply tanned, moderately tanned, lightly tanned, or no tan at all?</td>
<td>Moderately tanned</td>
</tr>
<tr>
<td>7. How many moles less than or equal to 3mm in diameter are on the patient’s back?</td>
<td>Twelve or more</td>
</tr>
<tr>
<td>8. How extensive is the freckling on the patient’s back and shoulders?</td>
<td>Moderate freckling</td>
</tr>
</tbody>
</table>
Breast Cancer and Colorectal Cancer Risk Assessment Tools
Method Summary
UX Test Method Summary

- Participants were asked about their healthcare profession and their role in discussing information about cancer or cancer education with patients.

- Participants were shown the three cancer risk assessment tools in random order on either a mobile phone, tablet, or desktop computer.

- Participants were asked to input hypothetical patient scenarios into the tools and then provide feedback about the tools’ functionality, clarity, and usefulness.
UX Test Method Summary, cont’d

- Following their interaction with the three cancer risk assessment tools, participants completed the System Usability Scale* (SUS) questionnaire to evaluate their perceived usability of the tools.

- Participants were then asked a few debriefing questions to close the interview.

Eye Tracking for Observational Purposes
Live Viewer
Benefits

1. Viewing the gaze data live informs observers about eye movement patterns
   - F-shaped reading pattern
   - Noticeability
   - Order of information entry
2. Increases stakeholder observation and participation
3. Increases support and buy-in for the research
Impact

1. Time to enter information into the tool was much shorter than expected.
2. The pages for the tools were updated iteratively as high impact issues were identified.
3. The questions and text were revised to use more plain language and areas were identified to provide further information and instructions.
4. Participants found it easier to use the tools on a desktop than on a tablet or mobile phone.
5. Changes were made to optimize information input on mobile devices.
6. Participants enjoyed using the tools and viewed them as valuable resources to use both at home and in a clinical setting.