**Project title:  Study of Electronic Health Record Usability**

**Part 1 – Web Survey of EHR Usability**

**Web survey questions**

**Demographic Questions**

- Please indicate your age range.

    o  18 - 24
    o  25 - 34
    o  35 - 44
    o  45 - 54
    o  55 - 64
    o  65 or older

- Which one of the following educational background descriptions applies to you?

    o  Some high school
    o  G.E.D. (General Education Development)
    o  High school diploma
    o  College degree
    o  Associate's degree
    o  Undergraduate degree; specify which one (e.g., BA, BS)
    o  Graduate degree; specify which one (e.g., MA, MS, PhD, MD, RN)
    o  Special certifications; specify which ones
    o  Other; describe

- What is your occupational title?

- How many years have you worked as a [occupation title]?

- Describe your primary job responsibilities.

- What is your comfort level using computers in the workplace

    o  *Low*: I am somewhat intimidated using computers
    o  *Medium*: I am relatively comfortable using computers
    o  *High*: I am very comfortable using computers

- What is your comfort level using computers at home?

    o  *Low*: I am somewhat intimidated using computers
    o  *Medium*: I am relatively comfortable using computers
    o  *High*: I am very comfortable using computers

- How frequently do you use computers outside of work?

    o  *Rarely*:  Less than once a month
    o  *Infrequently*: Several times a month
    o  *Regularly*: Several times a week or more

**Experience Interacting with EHRs**

- How long have you have you been interacting with your current electronic health record system (what we will now refer to as an EHR)?

- Did you have any prior experience with EHR systems? *[If yes],* in what ways are these EHR systems different?

  *[If yes],* did you find that certain EHR functions or EHR-facilitated tasks were easier to perform using one of the EHR systems rather than the other(s)? Please explain.

- Please respond to the following statement: I am confident with the EHR system.

  - o Strongly agree
  - o Agree
  - o Neither agree nor disagree
  - o Disagree
  - o Strongly disagree

- In general, do you like or dislike the EHR?  Why?

- Please respond to the following statement regarding your current EHR system: The EHR system is easy to use.

  - o Strongly agree
  - o Agree
  - o Neither agree nor disagree
  - o Disagree
  - o Strongly disagree

- What EHR characteristics make it particularly easy to use?

- What EHR characteristics make it particularly difficult to use?

- Describe the environment(s) in which you use your EHR (e.g., in the exam room with the patient, during rounds, in an office, at an open workstation in the unit, at home)?

- On what kinds of device(s) do you interact with your EHR (e.g., workstation, workstation on wheels, laptop computer, PDA, smartphone)?

- How do you interact with your EHR (e.g., touchscreen, mouse and keyboard, keypad, stylus, voice entry)?

- Which of these methods of interacting with the EHR do you prefer?

**Learning Experience**

- How did you learn to use your EHR?

- What three things would you teach new staff members about your EHR to help them do their work?

- What three things would you teach new staff members about your EHR to help them to avoid frustration, inefficiency, or errors?

- Please respond to the following statement regarding your current EHR system: The EHR system is easy to learn

    o Strongly agree
    o Agree
    o Neither agree nor disagree
    o Disagree
    o Strongly disagree

- How much time did you spend learning to use your EHR before you started interacting with it on a routine (i.e., daily or weekly) basis?

- What made your EHR easy versus difficult to learn to use?

- What would make an EHR easier to learn to use?

- Compared to when you started to use your EHR, in what ways do you now use your EHR differently?

- What stumbling blocks did you encounter when learning how to use your EHR?

- Do you think a new colleague could learn to interact with the EHR system with limited training? How much training do you think a new colleague would need to perform the necessary EHR tasks?

**Functions**

- Does your EHR include all of the functions (i.e., features or tools) you need to do your job?

- Which (if any) functions are missing?

- If applicable, what workarounds do you employ to compensate for missing functionality?

- Which (if any) functions are unnecessary?

- If applicable, what workarounds do you employ to compensate for any functions of your EHR that are unnecessary and/or overly complex?

- Please respond to the following statement about your current EHR system. The EHR system provides the right amount of functionality.

    o Strongly agree
    o Agree
    o Neither agree nor disagree

- o Disagree
- o Strongly disagree

- Please respond to the following statement about your current EHR system. The EHR system's functions are well organized.

  - o Strongly agree
  - o Agree
  - o Neither agree nor disagree
  - o Disagree
  - o Strongly disagree

**Tasks**

- Do you interact with your EHR at specific times of the day, as needed, or both?

- What percentage of your time do you spend interacting with your EHR?

- Of the total time that you spend interacting with your EHR, what percentage of the time are you inputting information?

- Of the total time that you spend interacting with your EHR, what percentage of the time are you reading or searching for information?

- Please respond to the following statement regarding your current EHR system: When interacting with the EHR, I often find myself performing troubleshooting tasks to solve problems with the EHR system.

  - o Strongly agree
  - o Agree
  - o Neither agree nor disagree
  - o Disagree
  - o Strongly disagree

- What are the most common types of troubleshooting tasks that you perform when interacting with your EHR?

- Please respond to the following statement about your current EHR system. The EHR helps me do my work effectively.

  - o Strongly agree
  - o Agree
  - o No opinion
  - o Disagree
  - o Strongly disagree

- In what ways does the EHR make your job easier?

- In what ways does the EHR make your job more difficult?

- *Test administrator to participant:* I'm going to ask you to think about the tasks you perform with the EHR to fulfill your job responsibilities. I'm particularly interested in common tasks that are directly related to your job responsibilities, tasks you consider urgent, tasks you consider particularly difficult, and tasks that you consider most critical to positive patient outcomes.

- Regarding <u>common</u> EHR tasks (those that the participant performs most frequently when s/he uses the EHR system):

    o What are the most common tasks you perform interacting with your EHR?

  For each of these common tasks:

    o Describe/demonstrate the basic steps you follow to perform the task.

    o Describe EHR characteristics that facilitate or hinder the task.

    o Describe the goal that is met by the task.

    o Are there any other tools or systems that you use to complete the task?

    o How would you change the EHR to make this task easier to perform?

- Regarding <u>urgent</u> EHR task (those that require immediate attention and must be completed quickly):

    o What are the most urgent tasks you perform interacting with your EHR?

  For each of these urgent tasks:

    o Describe/demonstrate the basic steps that you follow to perform this task.

    o Describe EHR characteristics that facilitate or hinder this task.

    o Describe the goal that is met by the task.

    o Are there any other tools or systems that you use to complete the task?

    o How would you change the EHR to make this task proceed faster?

- Regarding <u>difficult</u> EHR tasks (those that are mentally demanding or require multiple steps to complete):

    o What are the most difficult tasks you perform interacting with your EHR?

  For each of these difficult tasks:

    o Describe/demonstrate the basic steps that you follow to perform this task.

    o Describe EHR characteristics that facilitate and hinder this task.

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- o Describe the goal that is met by the task.

- o Are there any other tools or systems that you use to complete the task?

- o How would you change the EHR to make this task easier to perform?

- Regarding critical EHR tasks (those that have a significant effect on patient safety and/or the quality of the patient's care):

  - o What are the most critical tasks you perform interacting with your EHR?

  For each of these critical tasks:

  - o Describe the basic steps that you follow to perform the task.

  - o Describe EHR characteristics that facilitate and hinder the task.

  - o Describe the goal that is met by the task.

  - o Are there any other tools or systems that you use to complete the task?

  - o How would you change the EHR to ensure this task is performed correctly?


**Teamwork**
- Are there times when you and others view information on your EHR at the same time? Please describe.

- Are there times when you and others enter related information into your EHR during roughly the same time period? Please describe.

- In order of frequency, who else do you interact with to perform EHR-related tasks?

- Please respond to the following statement regarding your current EHR system: When working collaboratively with others, the EHR allows us to adequately document and coordinate the work.

  - o Strongly agree
  - o Agree
  - o Neither agree nor disagree
  - o Disagree
  - o Strongly disagree

- How well does your EHR help you to be aware of what your teammates' actions and interactions with the EHR?

- How well does your EHR help you to communicate with your teammates?

- How well does your EHR help you be aware of your patients' statuses?

- How well does your EHR help you to communicate with your patients?

**Use Safety**

- Please respond to the following statement about your current EHR system. The EHR enables me to protect against potential risks to patient safety.

    o Strongly agree
    o Agree
    o No opinion
    o Disagree
    o Strongly disagree

- Can you cite cases when your EHR poor usability could cause a potential risk to patient-safety if you do not establish workarounds?

- Can you cite cases when your EHR caused wasted resources (i.e., time, paper, work)?

- Can you cite cases when your EHR provided incorrect information? What could be the potential consequences?

- In your opinion, for which (if any) kinds of user entries does your EHR perform an accuracy check?

- Does your EHR sufficiently alert you when you have made a mistake, such as omitting critical information or entering the wrong information?

- Does your EHR allow you to recover readily from your mistakes, such as undoing critical actions?

- Does your EHR allow you to go back easily to the previous screen?

- Are you confident that information you enter is stored or sent in the manner that you intended?

**Design qualities**

- Please respond to the following statement about your current EHR system. The EHR enables me to work efficiently:

    o Strongly agree
    o Agree
    o Neither agree nor disagree
    o Disagree
    o Strongly disagree

- How does your EHR facilitate or impeded a logical workflow?

- Does your EHR enable you to work at an appropriate pace or not?

- What would you change about your EHR to make it more efficient to use?

- Do you consider your EHR's onscreen information legible or not?

- Do you consider your EHR's screens visually appealing or not?

- Do you consider your EHR's onscreen information well-organized or not?

- Does your EHR's information presentation focus your attention on the most important information or not?

- Describe EHR design characteristics that make information easier to read and understand.

- Does your EHR use consistent onscreen elements (e.g., buttons, labels)?

- Does your EHR give you adequate feedback when you perform an action?

- Can you easily interpret the correct meaning of your EHR's icons and labels?

- Do you feel that you know what your EHR is doing at all times, such as retrieving data versus waiting for you to input data?

- What would you change about your EHR's design in terms of its visual appearance?

**Wrap-up**

- Is there anything else you would like to tell us about your current EHR system that would help ensure the usability of future EHRs?

**NOTE:** This questionnaire contains collection of information requirements subject to the Paperwork Reduction Act (PRA).  Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subject to penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.  The estimated response time for this questionnaire is **60** minutes.  The response time includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.  Send comments regarding this estimate or any other aspects of this collection of information, including suggestions for reducing the length of this questionnaire, to the National Institute of Standards and Technology, Attn., **Svetlana Lowry, svetlana.lowry@nist.gov, (301) 975-4995.**  The OMB Control No. is 0693-0043, which expires on 10/31/2012.