

## Include *Cognitive Walkthrough* in Proactive Risk Assessments

One of the goals of a robust medication safety culture is to create systems in which potential failures or risks can be identified and addressed before a patient experiences any actual harm. This is only possible if one can proactively identify the precise nature of any “accidents waiting to happen”, along with interventions to address these situations that do not unintentionally introduce other potential risks. The discipline of human factors engineering\* is increasingly being adopted to help with this process. Within this discipline, a method called cognitive walkthrough is a useful technique to identify risk. This bulletin provides information about cognitive walkthrough and offers a practical introduction on how it should be carried out for a proactive risk assessment such as failure mode and effects analysis (FMEA).<sup>1,2</sup>

### What Is a Cognitive Walkthrough?

A cognitive walkthrough involves physically walking through the process or task of interest, examining the mental activities required at each step and the challenges experienced. This method goes beyond the current practice in healthcare of relying on incident data, individual opinion, or collective “brainstorming” by a team to identify potential risks, errors, or failure modes. It is one of many tools employed by human factors engineers to gain an in-depth understanding of a process or task from the perspective of the primary end-user (e.g., front-line practitioner).

A cognitive walkthrough can be used to help identify risks and assess solutions. In this technique, a participant (i.e., a representative user, such as a front-line practitioner) is asked to simulate all or part of a task and to “think out loud” while performing the simulation. The intent of thinking out loud is to allow observers to comprehend the task from the participant’s viewpoint as it is being carried out. The participant expresses the reasons for any decisions

made or actions taken during the simulated task, as well as any frustrations, confusion, or doubts. The cognitive walkthrough can help to identify specific parts of the process or task that may not match the participant’s goals, understanding, or abilities, along with aspects that may be inefficient or that pose an excessive cognitive or physical burden.

### Why Conduct a Cognitive Walkthrough?

A cognitive walkthrough helps the FMEA team to better understand, from the perspective of the practitioner, the process or task under review. Its approach to identifying failure modes (potential risks) is more structured than that of brainstorming, and can be complementary to brainstorming. Interestingly, it can also help to identify potential failure modes not recognized through incident reports or reviews.

### When Should a Cognitive Walkthrough be Conducted?

This technique should be used anytime there is an interest in understanding the potential risks associated with a particular task or set of tasks. An organization may encounter many situations in which it will want to conduct a cognitive walkthrough, such as during a prospective risk assessment, before implementing a new process or policy, when learning about a practitioner’s frustrations, or even retrospectively, after discovering a close call or an error (e.g., through a root cause analysis).

A cognitive walkthrough can be easily utilized in any setting, from acute care to home care. In fact, this method has been employed by ISMP Canada in a number of FMEA projects, such as one involving emergency medical services (EMS).<sup>3</sup> Cognitive walkthrough analyses in the EMS project were used to proactively evaluate a medication kit and protocol forms, all of which had been recently redesigned. The goal of this project was to improve the usability of materials involved in the medication use process and, ultimately, to reduce the potential for errors.<sup>2</sup>

### Who Can Facilitate a Cognitive Walkthrough?

Any individual on the FMEA team or within the organization that wants to learn about potential risks can facilitate a cognitive walkthrough, even someone without specialized knowledge of the process, task, or equipment being evaluated. However, it is important that the facilitator

\* Human factors engineering is the discipline concerned with understanding how humans interact with the world around them. It draws upon applied research in many areas, such as biomechanics, kinesiology, physiology, and cognitive science, to define the parameters and restraints that influence human performance. This knowledge can be used to design systems so that they are compatible with human characteristics. Conversely, if systems are not compatible with human characteristics, performance can be adversely affected.<sup>1</sup>

be someone in whose presence the participant (the person who will be thinking out loud) feels comfortable when expressing their thoughts. Therefore, it is preferable that the facilitator be impartial, without any vested interest in the process or task under review. It is also important that the participant be allowed to “think out loud” without the facilitator voicing any criticism.

### **Who Should Act as the Participant?**

The participant (the person who “thinks out loud” during the cognitive walkthrough) should be representative of the population that typically carries out the task. Avoid recruiting people who are biased, for example, the person who designed the process or selected the equipment being evaluated. Sometimes it is worthwhile to recruit 2 types of participants, someone who is highly experienced with the task and someone who is new to the task, as their differing perspectives can help in identifying a broad range of potential risks.

### **How Is a Cognitive Walkthrough Conducted?**

#### ***Step 1: Create the Scenario***

A scenario is created to provide context for the task that the participant will be performing. In order to create the scenario it may be useful for the facilitator to observe the processes of interest to identify task-related information. Information that will be helpful for the participant might include the practice location, any events occurring just before initiation of the process, the tools or information that will be available to carry out the process, the presence of other individuals who are available to help, details of the task, and perhaps other contextual information, such as time constraints or other demands (e.g., multitasking).

For example, the following scenario was developed for the participants in the FMEA for the EMS project mentioned above. The paramedic (the participant for the walkthrough) and his/her partner are responding to a call for a patient who is complaining of chest pain. The participant is asked to think out loud while simulating the activities that would usually be performed when such a call is received.

#### ***Step 2: Identify the Location***

When possible, a cognitive walkthrough should be conducted in the work area where the activity is typically performed in order to provide a realistic scenario. This allows the members of the FMEA team to gather information about the setting, including the layout of the work area(s), the equipment used, the people involved, and any other relevant sources of information. If it is not possible to conduct the walkthrough in the actual work area, a quiet room may suffice but is not ideal. If the walkthrough is conducted away from the usual practice site, any supporting material typically used when

performing the process or task should be brought to the test location.

For example, materials used in the EMS cognitive walkthrough included medication kits containing real medications, as well as syringes, a calculator, forms, clipboards, writing instruments, and communication equipment.

#### ***Step 3: Walk Through the Task or Activity***

The facilitator should explain the scenario to the participant and describe the task to be performed. The participant is then asked to think out loud while performing the task.

To encourage participants’ verbal reflection, the facilitator should emphasize that it is the system (e.g., a form, a piece of equipment, or a process) that is being assessed, not the participant. The facilitator should note points of confusion or difficulties experienced by the participant and should help the FMEA team to identify any aspects of the system that may be causing a potential risk or failure mode. The facilitator may need to give the participant some examples of what is meant by the instruction to “think out loud”.

A number of other things should be kept in mind during a cognitive walkthrough:

- The facilitator should avoid leading the participant and should instead allow the participant to carry out the process or task without specific instructions.
- The facilitator may need to remind the participant to verbalize his or her thoughts. Helpful prompts include questions like the following: “What are you trying to decide?” “What are you looking at right now?” or “What are you thinking of doing next?”
- If the participant appears to be struggling or experiencing confusion or frustration, the facilitator can ask questions such as “What made that difficult?” “What made you think that?” or “How did you decide to do that?”
- The facilitator should only help the participant to complete a specific step in the task if the participant is completely perplexed after having had the opportunity to try various approaches.
- Participation is voluntary. Therefore, participants may withdraw if desired or if they feel uncomfortable at any time during the cognitive walkthrough.

#### ***Step 4: Assimilate the Information***

All information gathered from the walkthrough should be assimilated to proactively identify any weak areas in the activity or task. Processes, policies, forms, and even the layout of the work area can be redesigned with the newly acquired information. The outcomes of the walkthrough also provide a more complete understanding of the challenges that participants face in their daily work.

For example, in the EMS project, redesigning the medication order form helped to mitigate the risk of administering incorrect medications by making the algorithm and corresponding medication choices clearer.<sup>3</sup>

### Conclusion

A cognitive walkthrough provides a structured, systematic approach to getting at information that might otherwise be

missed. It can be a vital part of an FMEA, yielding valuable information for FMEA teams. The information gained may include the context in which a process is used, the nature of the physical and mental activities involved, the way in which the task fits into overall workflow, interactions or communications with others, and the usability of materials required to complete each task. In short, a cognitive walkthrough can help organizations to recognize additional opportunities to improve safety.

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(i) through the website: [http://www.ismp-canada.org/err\\_report.htm](http://www.ismp-canada.org/err_report.htm) or (ii) by phone: 416-733-3131 or toll free: 1-866-544-7672.

ISMP Canada can also be contacted by e-mail: [cmirps@ismp-canada.org](mailto:cmirps@ismp-canada.org). ISMP Canada guarantees confidentiality and security of information received, and respects the wishes of the reporter as to the level of detail to be included in publications.

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