**APPLYING HUMAN FACTORS TO TELEHEALTH**

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Telehealth is understood by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as “the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, and public health and health administration.” These technologies provide a viable option for patients to receive clinical health care remotely. Now more than ever, telehealth systems have been used to increase access to essential health services during the COVID-19 pandemic. Not only that, but these efforts simultaneously work to minimize the risk of virus transmission. In order to ensure these systems are efficient, effective, and align with human capabilities, it is imperative they coincide with human factors (HF) standards and methods.

**HF Standards for Telehealth System Design and Evaluation**

Abiding by human factors standards promotes product safety, interoperability, ease of use, and common understanding amongst users. By following a user-centered design approach, end-users are placed within each phase of the design process thereby ensuring design decisions are tailored to their needs. Telehealth measures in particular must work to support a wide array of user groups ranging from patients, to caregivers, to health care personnel, all of which differ in health literacy and competence. Therefore, it is crucial that representative users play an active role in telehealth design and evaluation in order to closely meet the needs of all user groups. The International Standards Organization (ISO) Standard 13407: Human Centered Design Process for Interactive Systems looks to do just that. This report provides guidance on performing human-centered design activities throughout the life cycle of an interactive system. It is applicable for telehealth system alike as it encompasses both software and hardware development and outlines recommendations for involving end-users in this process. A standard more centralized to telecommunication systems is the European Telecommunications Standards Institute (ETSI) EG 201-472: Human Factors; Usability evaluation for the design of telecommunication systems, services and terminals. This document discusses the application of current human-centered design process standards from the ISO 13407 on telecommunication systems, terminals and service design as well as a focus on usability assessment techniques in telecommunication or software design areas. The ETSI EG 201-472 is a very useful resource detailing user centered design methods for the development and evaluation of telehealth systems.

**HF Methods for Telehealth System Design and Evaluation**

There are several human factors methods that can be performed to ensure telehealth efficiency, effectiveness, and usability. The following discussion will consider methods that are suited for current regulations surrounding COVID-19 that can be conducted remotely. Before developing a telehealth prototype, it is essential to gather feedback from representative users on their clinical needs and preferences. This can be done through interviewing users, but also through an activity known as sketching. In this method, users are asked to sketch their perfect system thereby placing them at the center of the design process. Sketching is a great way to bounce around design ideas amongst users and developers. A method for inspecting user interfaces is known as a heuristic evaluation. A heuristic evaluation is an inspection method used to identify and resolve prominent user interface design issues prior to usability testing. It consists ideally of three to five evaluators each of whom judge the compliance of the system with usability principles or heuristics. Usability issues are then documented on a severity scale and presented to the designer for review. This method is a great way to pinpoint and correct design flaws with telehealth interfaces prior to evaluating a product on users. Usability testing is a critical technique used to identify usability problems encountered by representative users while also assessing product satisfaction. For telehealth systems in particular, it is beneficial to have representative users walk through simulated scenarios. Simulations are very useful for understanding end-user interactions. This can be done simply by recording observations as end-users walk through sessions of simulated tasks that coincide with their day-to-day workflow. To properly collect this information, it is critical to set up a software tracking system to capture data points such as user key strokes and mouse movements. Screen and audio recording is also recommended in order to capture as much data as possible. During these sessions, the user should think aloud as they navigate the system in order to capture their thoughts and impressions. It may also be of benefit to allow health care practitioners to navigate the system as if they were patients so they may have an understanding as to how their clients will interact with the system.

The following human factors standards and methods support the need for efficient, effective, and usable telehealth products. Especially now during the current pandemic where telehealth measures are being rapidly produced to provide remote health care, it is essential they work as intended.

Keep an eye out for next week’s newsletter where the team will explore current human factors efforts made by The National Center for Human Factors in Healthcare for improving care delivery in response to the COVID-19 pandemic.

**References**

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