

# Human-Driven Clinical Assessments: Telephone Triage Supported by Artificial Intelligence

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CCS Concepts: • **Human-centered computing** → **User interface design**; *User centered design*; *Empirical studies in interaction design*.

Additional Key Words and Phrases: clinical assessment, decision-making, telephone triage, human-AI collaboration

The introduction of intelligent data-driven interfaces in healthcare services can challenge the autonomy and clinical competence of healthcare providers. Patient-facing symptom checkers are automating the work of telephone triage nurses in assessing patient urgency, but these systems exclude several vulnerable patient groups and overlook tele-nurses' competent interaction with their patients. In a design-oriented project (RE-AIMED, see <https://re-aimed.com>) we have explored how we can design an AI-based recommender system for aiding telephone triage nurses in local emergency medical communication centers. The RE-AIMED system is designed to promote natural, free-flowing conversations between nurses and patients, avoiding the pitfalls of rigid, algorithm-driven interactions that can feel impersonal and stilted. Rather than automating the clinical assessment process, the system provides nurses with dynamic suggestions for conversation topics, and organizes the questions and symptoms that have already been discussed. In this way the system is geared towards supporting rather than undermining the triage nurses' professional autonomy and clinical expertise. The system is based on extensive empirical research and co-designed with triage nurses.

Our design-led research serves as an example of how we can design intelligent health interfaces with an explicit focus on anchoring the design choices in the work practice and clinical competence of the triage nurses and can contribute to discussions on agency and control for health care providers. Further, continuous AI support can generate valuable data on how conversations progress, including how patients express symptoms for critical conditions. This data may, in turn, be used to enhance the nurses' ability to communicate with the patients and thereby improve the elicitation of the information needed to make appropriate medical decisions. In designing for control, we contend that it is important to consider the balance between how much a system should seek to guide a conversation, and how much it should support alternative paths the conversation may take. Any known critical symptom combinations are currently marked subtly in the interface, and nurses can choose to explore different critical combinations that are present or nearly present. By analyzing how tele-nurses engage with the system's functions, we can gain a deeper understanding of clinical assessments and how they may be augmented by human-machine collaboration.

The research also illustrates how a human-centered AI approach can be a way to advance equal access to health services. Vulnerable patient groups, including those with learning difficulties, dementia, and mental health conditions, that can be excluded by automated services, can be better served when having access to empathetic, situation-aware, and competent tele-nurses who are performing human-driven decision-making—supported by AI.