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#### **Authors**

Patel, Vimla L.

Leprohon, Judith

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## Decision Making Strategies in Emergency Telephone Triage Situations

Vimla L. Patel & Judith Leprohon  
McGill University

This paper addresses the use of strategies and their relationship to underlying knowledge during decision-making in emergency telephone triage situations. Decision-making in these situations involve making decisions under uncertain and time-limited conditions. We assert that decision-making and coping with uncertainty involves knowledge-intensive processes. Skilled decision-makers with experience use pre-stored decision heuristics about specific situations that are connected to their underlying knowledge of the domain. Subjects with less relevant experience, but with domain knowledge, exploit this knowledge to make decisions. This paper deals with experienced decision-makers who have knowledge of contextual situations but have little knowledge of the underlying specific medical disorders.

In this presentation, the focus will be on the use of decision making strategies under urgent (20-30 seconds) and less urgent (up to a few minutes) situations related to telephone "triage", where a health professional makes decisions regarding the urgency of the presented complaint. In the Montreal Emergency Medical Services System, Urgences Santé, nurses assume the first-line response to incoming calls from the population through the 9-1-1 emergency lines and their task is to assess the urgency of each health-related call and determine the appropriate intervention. This involves making decisions under particular constraints: limited time, availability of partial or unreliable information without face-to-face encounter with the patient, and emotionally-charged communication of information.

Decision-making strategies used by 34 nurses during telephone triage were studied as a function of task urgency and complexity in the real world environment using transcripts of verbal recordings of the nurse-caller dialogue. Explanations of the decision-making process were elicited immediately after the decisions were made for action.

Each nurse was asked to select two calls within a specific period of time. After each selected call, she disconnected herself from the

system in order to write down a summary and explanation of the care without being interrupted by another call. The final sample included 50 calls.

The data were analyzed as follows: (a) accuracy of triage decisions; (b) verbal dialogues were first analyzed using techniques of discourse analysis such that we could focus on the negotiations between the nurse and the *caller* in the triage situation; and (c) summaries and written explanations obtained from the nurses were analyzed using techniques of propositional analysis, and propositions were represented in the form of semantic networks to relate decision-making aspects to the organization of knowledge and the use of decision-making strategies.

The results showed that in a high urgency situation the nurses used simple rules based on patient symptoms communicated by the caller. These decisions were most often accurate decisions. However, almost 45% of the explanations to justify the decisions were inaccurate or incomplete, reflecting the fact that in urgent situations, the most conservative decisions were made without understanding the reasons for action. For complex cases, problem hypotheses were generated and the strategies used were in the causal direction to explain the symptoms. These reasoning strategies resulted in inaccurate decisions. The nurses' lack of causal knowledge about the patients' clinical problems is reflected in their inability to support backward reasoning, which is knowledge-dependent.

Alternative decision-making strategies were used in situations of moderate or low urgency. These included (1) identification of the basic needs in the situation, and (2) negotiations about how to meet these needs. These decisions were most often accurate, showing a holistic rather than analytic approach in making decisions. In these cases, nurses have the knowledge of contextual situations (but not the details of the disorders) and are able to exploit this knowledge in making decisions. This research is discussed within the context of real-life decision making under uncertainty.