

Physician Decision Making Over the Telephone

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Physician decision-making behaviors were evaluated for 31 telephone encounters between trained patient simulators and 9 first-year residents, 11 third-year residents, and 8 practicing physicians on after-hours call. The following trends occur as physicians become more experienced: mean call length decreases, less time is spent on diagnosis, fewer diagnostic questions are asked, greater time is spent on management, and diagnostic reasoning becomes more intuitive. These findings suggest that previous models of good telephone decision making, which focused on empirical data collection, may not represent the process used by experienced physicians.

The investigation of clinical decision making in medicine is a recent development that evolved from broader studies of decision making in the social sciences, particularly psychology.¹ The medical literature has long contained personal statements about clinical judgment, but systematic investigation of decision making by physicians and medical students has occurred only during the past 15 years.^{2,3} Most studies have focused, however, on problem solving that occurs during face-to-face encounters in physicians' offices or in hospitals, not on the telephone.

The telephone is a major element in medical practice, particularly in primary care. As telephone contacts account for 11 to 50 percent of all medical encounters, and medical problems frequently present over the telephone, decision making on the telephone has a major influence on health outcomes and health system costs.^{4-7,8} An understanding of the process by which decisions are made on the telephone is therefore an important element in the study of physician decision making.

To date a few studies of telephone decision making have been reported. Several authors have concluded that health care providers perform inadequately when taking histories and managing medical problems on the telephone.⁹⁻¹² Others have found a wide variation in patient management among individual physicians, even in managing similar problems within the same setting.^{13,14} Many of the published studies have compared observed behavior with "ideal" behavior that was developed by a consensus of experts, a procedure that has obvious methodological biases.^{9,10,12,15}

Physician-patient telephone interaction has been an area of interest for several years at the Department of Family Medicine of the University of North Carolina at Chapel Hill. Beginning in 1976, all after-hours contacts involving physicians of the Department of Family Medicine were recorded on a sticker designed for research purposes, and data from these stickers were stored and analyzed by computer. Subsequently, educational programs for residents, medical students, and office staff were developed. Interest arose in the telephone decision-making process itself as a consequence of these activities, and a study group was formed in 1980 to investigate the topic.

This study sought to develop and test a model that describes the decision-making behaviors of first-year residents, third-year residents, and pri-

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mary care physicians and to compare and contrast the behavior of these groups.

Development of a Model of Telephone Decision Making

Based on practice experience, a study of the literature on clinical decision making, and observations of resident responses in simulated telephone encounters, the study group developed a model to describe the decision-making process on the telephone.¹⁶ The model proposes that most telephone calls follow a general flow of events as follows: (1) greeting and introductions, (2) problem identification, in which the reason for the call is brought out, (3) problem solving, in which a working diagnosis is made, and (4) management. In steps 3 and 4, the physician often seeks patient acceptance or agreement with the diagnosis and management plan. Variations in this flow of events, called "loops," occur as new data or hypotheses arise or as earlier data or hypotheses are contradicted.

Within the framework of this flow of events, a reasoning process takes place in which hypotheses are tested and management decisions are made. The reasoning process itself is dynamic, ranging along a continuum between rationality and intuition, a state Hammond has described as quasi-rational.¹⁷ A number of factors about the telephone setting were postulated to cause telephone decision making to be less analytical than decision making in the hospital or office. These factors include time constraints, lack of objective physical findings, more limited control over the decision-making environment, and a greater need to negotiate management with the patient. The study group considered management to be the paramount objective in telephone decision making, with diagnoses needing to be only sufficiently precise to guide immediate management decisions.

Methods

To evaluate the model described above, two telephone call simulations were selected for study from a bank of case vignettes that had been developed previously for resident education.¹⁸ The

specific simulations were chosen because they present two common problems and had been proven true to life through prior use. The first case, "A Feverish Child," involves a parent calling about her 15-month-old child who has had a cold for several days and is noted to have a rise in temperature (to 101° F). The second case, "Trouble at Work," involves a young adult with work-related stress, recurrent headaches, and borderline high blood pressure. Both vignettes include family data, past medical histories, hidden concerns (eg, in the second case, a family history of stroke), and details of the current problem. The vignettes were written in outline form for use by trained patient simulators.

Utilizing the case vignettes, telephone call simulations were presented anonymously to physicians on call and were tape recorded. Three physician groups were selected for the study: (1) first-year residents in family practice, (2) third-year residents in family practice, and (3) practicing physicians in internal medicine, pediatrics, and family practice who had been in office practice for five or more years.

Calls were placed in a manner to minimize the chance of the physicians suspecting that they were simulations, and all simulated calls were made after regular office hours. Consent to participate was obtained in writing at least one week prior to any simulated call. If the physician utilized an answering service and called patients back (rather than having patients call his home), the simulated call was made from a home within geographic proximity of the physician's office. The actor or actress performing the simulation identified herself as a patient of the partner or colleague of the on-call physician. Calls were recorded on a silent audio-recording device. Within 12 hours of completing the call, each physician was informed by telephone that the call had been a simulation.

Initially six simulations were transcribed verbatim for intensive study and utilized to develop a descriptive analysis system based on the decision-making model described above. The project group developed a list of all identifiable elements in those calls. Next, the elements were subdivided into content and process categories, with process elements further divided into those that relate to stages in the decision-making model and those that relate to communication skills. The

completed analysis system contained identical process measures for both telephone call simulations, with content items being different. Provision was made for adding content items in the analysis of additional taped simulations.

The group sought initially to define "good" case management by assigning point values to items on the content scale. To help make these assignments, 13 practicing pediatricians and family physicians were given a questionnaire on feverish children and asked to rate a list of content elements. Neither the physicians nor the project group reached a clear consensus, and thus the project group elected to report all items on an equal basis without assigning relative values.

The completed analysis system was then tested for interrater reliability through a series of trials and revisions. In this step, all members of the project group individually rated three or four taped simulations and compared results. Elements of the questionnaire that were rated inconsistently were reworded or revised, and the forms were retested on additional simulations. During this state of instrument development, the section rating communication style was eliminated because of poor interrater reliability.

Next, the analysis systems for the two simulated calls were evaluated by three practicing physicians using interpersonal process recall.¹⁹ This validation step involved the three physicians receiving a telephone call simulation anonymously, as previously described. Each physician was then visited by the principal investigator, who used the taped simulation as a stimulus for physician recall and verbalization of feelings and problem-solving strategies during the simulated encounter. All general elements of the decision-making model and the scoring system were upheld by this step, and no alterations in the scoring system were made. This step did, however, underscore that hypothesis generation cannot always be tested reliably through the scoring system developed in this project, as hypotheses are often not stated in physician-patient encounters.

The final analysis instrument included sections on history taking, management, process variables, timing of the call segments, and facilitative interviewing elements. From the file of telephone call simulations, the decision-making behaviors of

first-year residents, third-year residents, and experienced physicians were compared. Because of the small sample size and the exploratory nature of this study, the study group chose to look for trends rather than to apply statistical methods to the comparison of study groups.

Results

A total of 32 telephone simulations were attempted, all of which were completed. The headache simulation was received by 3 first-year residents, 6 third-year residents, and 5 practicing physicians. The feverish child simulation was received by 6 first-year residents, 6 third-year residents, and 6 practicing physicians. One practicing physician call could not be scored because the audiotape was lost; all other 31 calls were scored and are reported below. About one half of the telephone call recipients were specifically asked about the quality of the simulation, and none of those questioned had guessed that the call had been simulated.

All telephone calls followed the general format proposed by the authors' model. Each call had a readily recognizable identification, problem statement, first management statement, and agreement on management. In eight encounters (26 percent), the physician did not state an identifiable diagnostic hypothesis, and this absence was noted equally in all three physician groups. In no call was there clearly stated agreement between physician and patient on the diagnosis. The number of loops varied from none (in 48 percent of calls) to three, and in no call did a loop clearly create a major disruption in communication flow.

Content items for the simulations are reported in Table 1. For the headache simulation, all three physician groups performed similarly. There was, however, a slight trend for more experienced physicians to gather fewer items of historical data and to provide more management data. For the feverish child simulation, there was a clear tendency for more experienced physicians to gather less diagnostic information, with practicing physicians eliciting approximately one half as many historical items as interns. This simulation failed to show a clear trend in management, but interns provided the least management information of the

	Headache Simulation			Feverish Child Simulation		
	1st Year	3rd Year	Practicing Physicians	1st Year	3rd Year	Practicing Physicians
History Taking						
Medical history of problem	9.6*	9.4	9.6	14.0	12.2	6.6
Past medical history	3.6	2.8	2.2	0.3	0.5	0.4
Psychological data	2.3	3.2	1.6	1.0	1.3	0.8
Total	15.6	15.4	13.4	15.3	14.0	7.8
Management						
Explanation and reassurances	1.6	3.0	3.0	1.6	1.6	1.4
Instructions or advice	3.6	2.4	2.8	1.8	3.8	2.8
Total	5.2	5.4	5.8	3.4	5.4	4.2
*Scores indicate the number of data items elicited and management behaviors observed						

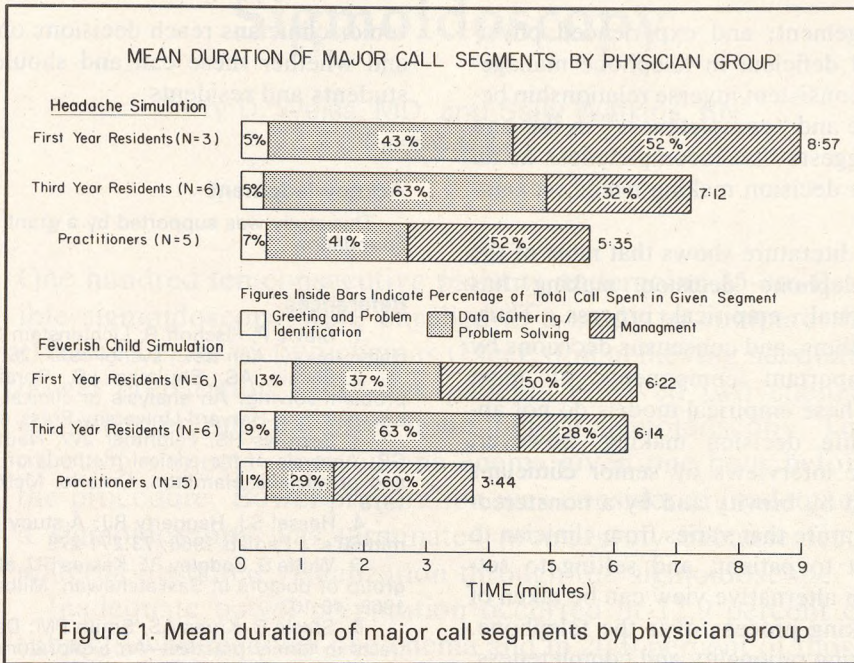
	Headache Simulation			Feverish Child Simulation		
	1st Year	3rd Year	Practicing Physicians	1st Year	3rd Year	Practicing Physicians
Facilitative vocalization (open-ended questions, supportive utterances, and reflect back)	34	21	9	14	24	3
Direct questions	27	26	13	14	15	5
Total	61	47	22	28	39	8

three physician groups.

Table 2 lists the questioning behaviors observed in the simulations. In general, far fewer questioning and facilitative behaviors were observed among the practicing physicians than among either resident group. Both direct and facilitative questioning behavior was affected, with practicing physicians providing approximately one third as

many observable questioning behaviors as first-year residents.

Timing and durations of telephone calls and their major segments are represented in Figure 1. For both simulations, mean telephone call length decreased with physician experience. All groups spent less than one minute on identification and the problem statement. Third-year residents spent



slightly greater time gathering data than first-year residents but spent less time in the management phase of the call. Practicing physicians spent less than one half as much time in data gathering than first-year or third-year residents but slightly more time in management than either resident group.

Discussion

This project sought to develop a method of studying and scoring physician decision making on the telephone and to apply the methodology to physicians at varying levels of experience. That the project was satisfactorily completed as proposed with relatively minor changes in design confirms the feasibility of the methodology. In addition to its feasibility, the methodology has several notable strengths. It presented situations that were indistinguishable from real-life patient encounters, provided an unobtrusive means by which entire encounters can be preserved for analysis, and controlled for some of the variability among patients in real clinical encounters.

The method does have limitations, however. Several steps in the implementation of this pilot study were particularly time consuming, most no-

tably the time and travel involved in placing telephone call simulations. In addition, the selection of subjects was not by means random, and physicians who were asked to participate may represent an academically inclined subgroup of physicians. Finally, a major problem with the study method is that it fails to represent some areas of physician decision making: it represents data collection, communication skills, organization, and time management; it only partially covers hypothesis generation, however, as many diagnostic hypotheses go unstated; and it does not measure the cognitive aspects of decision making—the intuitive and rational factors behind the behaviors.

All interviews followed the general flow of events that was postulated in the proposed model of telephone decision making. Clear trends appear when the behaviors of first-year residents, third-year residents, and experienced physicians are compared. Experienced physicians, it seems, spend less time and ask fewer questions in the diagnostic or problem-solving phase of an interview, while devoting as much or greater time to management than do residents. These findings are similar to those of Greitzer et al¹⁵ and of Perrin and Goodman.⁹ In previous studies "completeness" was identified as an important element of good

telephone management, and experienced physicians were rated deficient in telephone management skills. The consistent inverse relationship between experience and "completeness" in this and other studies suggests that incompleteness as an indicator of poor decision making needs reexamination.

Review of the literature shows that most of the research on telephone decision making has stressed a rational, empirical process. Thus, protocols, algorithms, and consensus decisions by experts are important components of most studies.^{9,10,15,20} These empirical models do not approximate real-life decision making, however, where diagnostic interviews by senior clinicians are characterized by brevity and by a nonstereotypic, adaptive nature that varies from clinician to clinician, patient to patient, and setting to setting.^{13,21} Thus, an alternative view can be taken of the decision-making process over the telephone. Rather than seeking rationality and completeness, physicians focus more on management as they gain experience. Problem solving itself is adaptive, at times algorithmic, but more often intuitive. The very nature of the telephone setting promotes a nonempirical approach because time, sensory cues, and environmental factors are under physician control less than during face-to-face encounters.¹⁸ Strasser and colleagues¹⁰ found that patients are more compliant when an unsystematic approach is used, supporting the utility of this approach. Further support for this view was gained from interviews with practicing physicians in this study. These physicians, in reviewing their audiotaped interviews, spoke of feelings and intuition about the seriousness of a problem and rapidly developed diagnostic hypotheses and treatment plans.

These findings pose a dilemma for educators and researchers. The accepted model of decision making, which emphasizes thoroughness, logic, and consistency, can be taught and evaluated relatively easily. Current teaching strategies do not, however, represent the methods used by experienced clinicians, who tend to be adaptive, unpredictable, and efficient. Traditionally, the role of education has been to teach a standardized method with the understanding that students will eventually develop shortcuts. Further study is needed to evaluate the specific methods by which

senior clinicians reach decisions on the telephone and whether these can and should be taught to students and residents.

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