Once this admission diagnosis is obtained, all information is forwarded to the medical records department with no more than a twelve-hour delay. Arrangements must be made between medical records and admitting for prompt receipt of admit information.

The medical records department then codes the diagnoses and operation procedures using the ICD-9-CM and the DRG should be assigned at this point. Since DRG assignment is extremely time-consuming and cumbersome, the use of computer software is almost mandated.

This same information, including Medicare average length of stay, the prospective payment rate, and identifying information is made available on a daily basis to the Utilization Review Coordinator. The UR Coordinator should also receive a printout of actual accumulated charges on a daily basis for comparison to the payment rate. In most hospitals, the tools are already in place to monitor admissions and hospital stays. Only a restructuring of an old technique (or process) is now required. In the past, length of stay was the measuring factor for certification of continued stay. This will now be revised to encompass other criteria such as the allotted prospective payment rate as it relates to actual costs. Parameters should be established relating to this payment rate, as well as quality of care, for effective utilization review under the prospective payment environment. “Focused” review can be worked into this concept to save time.

The UR Coordinator then utilizes pre-established parameters to determine review dates for continued stay. As parameter levels are reached, the UR Coordinator can determine from additional documentation, or from developments in the patient’s regimen of care, that a DRG re-assignment is in order to a more or less intensive DRG. In the instance of inadequate chart documentation, the attending physician can be contacted and adjustments made accordingly.

Data for the new DRG assignment must be received by the medical record department. An interim output form is generated for further use by the UR Coordinator. This process can be repeated as many times as necessary during the patient’s stay.

Upon discharge, a final DRG assignment should be made based on final diagnosis and operations and supplied by the medical records department to data processing within 3-4 days to facilitate the billing process.

### Systems to Support Clinical Decision-Making

**Judy G. Ozbolt, Ph.D., R.N.**

#### Decision Problems in Nursing

Throughout the nursing process the nurse must remember large quantities of patient data, relate the data to an up-to-date nursing knowledge base, and use the data and the knowledge to make decisions that will benefit the patient. All this must be done quickly and at the appropriate time, so that the nurse can take action to promote recovery and to prevent potential complications before they occur.

Some of the decisions the nurse must make include the following: What data should I collect? When must I ask follow-up questions to confirm and describe a possible problem? When can I conclude that no problem exists in an area I am exploring and move on to something else? How much data is enough to reach a nursing diagnosis? Now that I have made a diagnosis, what objectives are appropriate? Which intervention or group of interventions would be most effective in helping the patient reach the objectives? Is the care I am providing to this patient having the desired effect?

As nurses make these decisions, they find themselves in a double bind. On the one hand, they need to avoid errors: the patient’s well-being depends upon the quality of their decisions. On the other hand, they need to reach their decisions quickly, without wasting time collecting unnecessary data or waiting to see whether their preliminary hunches were correct and the patient is, indeed, developing a complication.

The nurse’s dilemma is compounded by human limitations in the ability to process information. Research by Edwards [1, 2] and his colleagues among others, shows that humans have a finite memory; there is a limit to the number of pieces of information they can consider simultaneously and apply to making a decision. Furthermore, humans are conservative decision-makers. Even when they already have enough information to reach a decision, they will collect more data before committing themselves. It is not surprising, then, that nurses sometimes feel overwhelmed by the mass of patient data, or that they may take a “wait and see” attitude when the very earliest signs of a possible developing complication appear.

#### Technological Aids to Decision-Making

Some recent technological advances may offer nurses the means to facilitate clinical decision-making. Artificially intelligent expert systems relate specific data from individual patients to a stored clinical knowledge base via rules and relationships that are programmed into the system. Such systems are developed through the process of knowledge engineering, which has been described as
...bring the principles and tools of AI research to bear on difficult applications problems requiring experts' knowledge for their solution ... It is the nature of building complex computer programs that represent and reason with the knowledge of the world.\footnote{2}

A variety of medical and scientific applications programs has been developed to deal with the tasks of interpreting data, diagnosing, monitoring, and planning. Examples of these programs together with prescriptions for knowledge engineering to deal with different kinds of problems are provided in "The Organization of Expert Systems, A Tutorial."\footnote{5}

One expert system developed for medical applications, CONSULT-I(R)\footnote{6} seems particularly well-suited to potential nursing applications. Bayes' Theorem has been suggested as a means of reaching decisions less conservatively and therefore more efficiently than by the usual human methods (Edwards, 1972). However, there are some difficulties in applying Bayes' Theorem in clinical situations because the theorem assumes that the multiple data items that may be considered in reaching a decision are independent of one another. Nurses know that many of the facts they consider are interrelated. CONSULT-I includes an extension of Bayes' Theorem to include complex classes and states where there are dependencies among features. It may, therefore, offer a means of supporting nursing diagnoses, which are complex, multiple, and not mutually exclusive.

The Challenge to Nursing

Only nurses can fully understand and appreciate the kinds of decisions they must make in practice. Yet nurses generally have little knowledge of decision theory or of the principles of artificial intelligence and knowledge engineering. It is largely for this reason that the current generation of nursing information systems and other applications programs offers little or no support for decision-making, even though nursing care could benefit greatly from support that would help nurses to make decisions sooner and with greater certainty. Nursing must develop its own experts to participate in developing decision-support systems. The goal is a computerized system for nursing care that will help to collect data by branching appropriately to follow-up questions or to other areas of inquiry, produce lists of nursing diagnoses with their respective probabilities (since no diagnosis is ever a certainty); propose objectives appropriate to the diagnoses; and provide lists of nursing interventions with their relative probabilities of success. Ideally, such a system would be constructed to learn from experience, so that actual success rates were fed back to improve predictions.

A computerized system can never replace the nurse as a decision-maker. Responsibility and authority for decisions will always rest with the professional nurse. Nurses have the opportunity, however, to create systems that combine the nurse's unique ability to be sensitive to patients and interpret the meaning of items of information with the computer's superior ability to remember, scan, and aggregate data. Such nurse-computer dyads would make better decisions than either could make alone, and nursing would gain a powerful tool for improving patient care.

References


