classification systems (with or without management reporting facilities), and several brands of heart monitor that not only display heart rhythms and sound rate alarms, but also print the date, time, rhythm interpretation, and the patient's name and room number on hard-copy rhythm strips. Turnkey systems were not designed to interface with the hospital's general purpose computer, and it is usually difficult or impossible for the in-house EDP department to build an interface. Therefore, nurses cannot extract the source data locked up in the turnkey system. Data inaccessibility means nurses cannot use their own data to obtain information other than what the turnkey system produces—unless they retype all the source data into another computer. In the near future, computer and software vendors should plan on some big changes in the attitude of their nursing customers and toward inflexible systems.

The nursing department's inability to move its data across systems has been accepted because nurses have not realized that automated data transfer should be possible, nor have they demanded that capacity. However, as nurses as a group are rapidly becoming more computer literate. As nurses become more fully attuned to the capabilities of computers they will become less tolerant of systems that will not grow with them. They will be frankly intolerant of systems which deny them information, the sources of which are known to be in the computer. Nurses are already getting tired of being told reports cannot be generated because needed data are scattered among storage devices attached to incompatible processors. (Of course they may do this to the bearer of the bad news, the EDP personnel, rather than to the cause of the problem). The tendency of nursing departments to look to turnkey systems to solve their processing problems will inevitably lead to the establishment of fragmented computer systems, a solution every bit as undesirable in computers as it is in patient care.

For the immediate future, nurses may have to continue to accept some incompatibility among their hardware items. Very few nursing departments have the resources to build their own integrated computer support systems, particularly since in most hospitals, nursing applications are not given a high priority by the in-house EDP department. As long as nurses have to go outside the hospital to get their computer applications, some fragmentation is almost inevitable. Here are some suggestions for nurses who want to limit the amount of systems fragmentation in their department. First, where choices exist, it makes more sense to select a "off-the-shelf" system that can be easily interfaced with whatever equipment is in place than to select a system for which no interface has been written. (Never listen to a salesmen's glib assurance that another hospital had "no trouble" interfacing this product with a computer just like yours. If an interface exists somewhere, it probably won't work on your equipment). Second, try to find a vendor who has or will build a version of his/her product to run on your equipment. Given the limited selection of software for nursing, you probably won't find many programs that can run on equipment you already have. Fourth, if the vendor can't rewrite the software to run on your equipment, try to contract with his/her company to develop a method of getting out at least the raw data entered— in machine readable form. Fifth, if none of these approaches work, consider negotiating with a software house or contract programmer to write custom applications programs in a language available on the in-house computer. Or if the in-house computer cannot be made available, the nursing administration can select one brand of microcomputer and establish it as the allowed hardware. This rule will not prevent fragmentation. It will, however, allow the nursing department to integrate their fragmented system for a reasonable price sometime in the future.

**PROCESS OF DIAGNOSTIC RELATED GROUPS IN AUTOMATION**

Roy L. Simpson, R.N.
Corporate Manager, Nursing Systems
Hospital Corporation of America
Information Systems

Paula Y. Eleazar, RRA
System Representative
Hospital Corporation of America
Information Systems

As prospective reimbursement evolves, clinical data and financial data will be merged. As nursing systems evolve, one can only project the increased demand for nursing administrators' roles in the design of systems to increase dramatically. The concept of the "working DRG" is indeed worthy of automation by hospital nursing management if they are to effectively operate in the new prospective payment environment. It is explained as follows:

Upon admission, a provisional diagnosis and any expected operative procedure should be obtained from the physician. Historically, the information obtained concerning a patient's condition on admission has been sketchy, at best. It will now become increasingly important to obtain complete and accurate diagnostic data. This will facilitate the assignment of an admission (or "working") DRG to begin the monitoring process of the patient's hospital stay.

The pre-admission systems in hospitals will merit close scrutinization as requirements for admission data become more stringent. Medical staff/education outlining hospital admission requirements and penalties for misuse of these requirements must be accomplished. Admitting department personnel will need administrative backing to enforce these procedures. Hospital management may want to consider educating physicians' office staff(s) to encourage the prompt submission of pre-admission data. Proper diagnostic terminology with inclusion of any pre-existing conditions as well as estimates of length of stay are desired.
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 this vein, utilization review now acquires a revitalization of its importance and functions. 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 to 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 as been described as