Defining System Requirements for Quality Assurance in Health Care

HMOs' Own Computerized Databases May Be Used to Assist in QA Definition and Execution

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Health maintenance organizations (HMOs) find that quality assurance (QA) is a vital but difficult process to define and accomplish. The present article suggests how HMOs' own computerized databases may be used to assist in QA definition and execution. The author also presents some real-life examples to illustrate the utility of the database.

Confusion rapidly overcomes the person who even begins to think about defining automated computer systems' requirements for quality assurance (QA) in health care. This confusion results from the basic problem of defining health-care QA. Measures of quality in health care are not easily obtained. If different health professionals are asked how they measure quality, their answers will be vastly divergent. Some physicians will say that quality care has been delivered if the patient is cured. Other physicians will be more conservative and suggest that making patients more comfortable represents quality care. Administrators of health care will offer different and varied responses to the query. Some will point to waiting time for services. Some will look at the appearance of the physical plant in which the health-care services are provided. Others might look to patient satisfaction with the service. Those with interests in ancillary areas will want to know if clinical laboratories produce valid and reliable test results or if

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treatment protocols are followed consistently and completely. The list goes on and on. Therefore, in order to define QA system requirements, the audience must first be defined.

Once the audience has been described, or, as is in many cases, the audience has defined itself by requesting QA systems assistance, the issue of measurement arises. In all areas of QA (including those already described) one is likely to discover that the audience has some amorphous ideas about quality. Like pornography, they know quality care when they see it, but they cannot really define it. What exists then is the age-old problem of quantifying information so it can be measured and evaluated, and change can be detected over time. This is precisely where supportive systems personnel can play a critical role in helping to assure that quality services are actually being delivered.

When systems people are asked to help support a QA program at a managed health-care service site, they are also likely to be required to help in defining, vis-a-vis quantification, the data that are to be collected. Although the requesting agency may have many ideas, some very good and others not so good, it is the job of systems personnel to help determine what data can be collected and used effectively by the hardware/software configurations available. With careful planning and good working relationships between all concerned parties, a successful automated system for aiding QA can be developed.

Quality assurance is a continuously

evolving activity, and systems personnel should be intimately involved with providers and administrators in developing QA projects. As QA evolves, so does the need for systems that support these activities. The job can never be entirely completed.

What follows is a description of how QA is supported by automated systems at Comprehensive Health Services/WELLCORP (a medium-sized mixed-model HMO) and how they have been developed over time.

MEMBERSHIP SYSTEMS

The first step in insuring quality services is understanding who the member/patients are. Consequently, a system that maintains membership demographic information was developed. This membership system contains such data as: patient name, address, telephone number, date of birth, sex, enrollment date, and employer group, to name but a few. The key variable used by this and other systems at this HMO is the patient health plan identification (HPID) number. (As an aside, all the systems and databases described here are linked by the HPID number.)

When beginning any QA project, the population of interest is first defined. For example, during one recent QA study at the health plan, medical personnel were interested in determining if all adults over 39 years old who had visited the health plan's providers during the past year had received all tests that are part of the routine physical examination protocols. Although the actual QA data needed

was to be found in the medical records department, a roster of all those members over 39 years old had to be obtained. This roster was supplied by the membership system.

In retrospect, it may seem quite obvious that a member or patient system should contain date of birth and sex. However, these are variables that can be easily overlooked when establishing a member file. Frequently, when establishing a patient database, administrators will rightfully be concerned with patient identification, location, and eligibility status. These are variables that are vital to running a successful business. The HMO has to communicate with its members and know at all times just exactly who is eligible for different health services and who is not. Date of birth or sex may seem superfluous to such requirements. Some administrators may suggest that if anyone wants to know a patient's sex or age, they can easily go to the patient's chart. Although this may seem reasonable, it only works if the patient's name and

WELLCORP. These include an ambulatory care or "encounter" system, an inpatient "hospitalization" system, and a "referral" system, to name but three. However, for the present discussion, they will be treated as a unit, since the focus is only on those aspects that support QA.

As was suggested in the first example, to review whether routine examination protocols were being followed, and to what extent, it became necessary to isolate those older patients who had been seen during the year before the study. Briefly, this criterion was used to be fair to the physician staff. If a patient had not been seen by the health plan's providers, it would have been impossible for the physicians to administer the required tests and examinations. Moreover, the sample was restricted to the previous year only because of interest in current quality of routine examinations. For this particular QA study, there was no interest in assessing the quality of care provided in years past. Thus, it was necessary to look not only at the

resulting database can be for QA. Again, using the current example, a roster of potential study candidates was developed by accessing not only the membership system, but the encounter system as well. Essentially, the systems were queried for a listing of all members over 39 years old who had been encountered during the previous 12 months. If necessary, even more criteria could have been selected. There may have been interest in only the internal medicine department's protocols. If this had been the case, an additional filter of department code could have been added. Or, only cardiac patients might have been selected if interest had been restricted to heart treatment.

Quality control, however, is not restricted to events and information about medical treatment per se. As previously described, the encounter system can record other information as well, although some of these data might appear superfluous. The encounter form is also used to collect time-related data at an almost micro level. There are six points of time recorded for each encounter: (1) appointment time, (2) patient arrival time, (3) start of service (i.e., when vital signs are taken), (4) start of exam by physician, (5) end of exam, and (6) departure time. Although the time recording of so many events may seem like overkill, the data are in fact invaluable in measuring the quality of the treatment process. The availability of these time elements provides answers to such questions as:

Quality assurance is a continuously evolving activity.

ID are known prior to the need to know the age. As the example indicates, when it comes to QA, the age of interest may be known but not the patients who fit age criteria.

The experience at CHS/WELLCORP has been that many QA activities start by restricting the population of interest. Age and sex are critical variables of restriction in health care. Two other real and recent examples of QA activities requiring this information include a review of mammography and Pap smear results (which are both age- and sex-sensitive) and a review of immunization amongst the youngest patients (which is only age-sensitive). In this first example, QA of routine examinations, age is not the only selection criterion. Rather, there is also interest in those patients older than 39 years who had visited CHS/WELLCORP during the prior year. This restriction on the sample database required a second system that is not only important for running a health business, but for QA as well.

UTILIZATION SYSTEMS
For practical reasons, utilization systems are divided into several separate and distinct databases at CHS/

membership system but at the utilization system as well.

Every time one of the patient-members visits a clinic, an encounter form is prepared that includes a detailed description of the visit. This is automated and is in addition to the data and details that are recorded manually in the patient's medical chart by medical personnel. The encounter form that travels around the health center with the patient includes such demographic variables as the patient's HPID number (remember, the key variable), name, and group status. In addition, the form is used to collect data on all services provided. These include: primary, secondary, and tertiary diagnoses and procedures; number of prescriptions written; lab, x-ray, and other orders; and type of visit. Data are also collected on: the primary provider, date of service, appointment and service times, the department where seen, and any follow-up orders. Essentially, a summary description of the visit is recorded on this form for input into the automated encounter system.

From this brief description of the encounter data that are collected, it can easily be seen how supportive the

1. How close to appointments do patients actually arrive?
2. How long do patients have to wait before services begin?
3. How much time do physicians of different specialties spend with their patients?
4. How much time do patients spend at the clinic?

Several years ago, while investigating the waiting time parameter, it was discovered that a majority of scheduled patients were arriving 15 to 30 minutes late. As the investigation dug deeper into the data, it was observed that patients who arrived 15 to 30 minutes after their scheduled appointment were seen faster and had shorter waiting times than did patients who had arrived on time or were early for their appointments. Practically speaking, patients were being re-

warded for arriving late and punished for arriving on time. Perceptive patients were obviously more aware of this than clinic staff, and so many of them came late. Needless to say, some changes were made in the way patients were handled by reception staff.

In coming to grips with issues such as patient waiting time, physician scheduling, and determining how many physicians are necessary for each specialty, the addition of these time elements has proved to be invaluable. By suggesting that these data be collected and automated, systems people helped the HMO improve the quality of service in a very consumer-oriented arena.

HIGH-RISK CASE MANAGEMENT

Recently, CHS/WELLCORP added a new system to the array of automated databases. The system is referred to as "High-Risk Case Management." In the past, when a patient telephoned for assistance after clinic hours, a complicated set of events might take place. If the on-duty triage nurse could not make a rapid decision on what to advise the particular patient, she might send one of the security guards to the closed medical records department to retrieve the patient's medical record. It would take time for the guard to get the record, even when he or she knew where to look. At times, the records might not be found quickly enough to be of any practical assistance.

In order to facilitate the after-hours triage nurse's ability to make decisions, it was decided that a mini-medical record should be available and on-line at all times. As staff worked their way through the planning of this new system, additional features were added. Besides including medical information such as physician notes, diagnoses, and drugs prescribed for the patient, this system would have a tickler subfile for any follow-up care or service that might be required. For example, if a patient had been recently discharged from a hospital and required a two-week postoperative appointment, this could be recorded in the system. If the two weeks had passed and the patient was not seen, the system would start generating a notice of the missed appointment in an exception report issued, on demand, by physicians and nurses.

Currently, the case management system is a two-screen, on-line record

that provides a wealth of summary medical information to those with access to the system. Again, using the HPID number as a key variable, this database is associated with all the other pertinent databases at the health plan. However, there is one unique addition to this system. There is a flag that lets all other systems know that a particular patient is a high-risk managed case. Whenever anyone on any system, such as membership or appointments, enters a HPID number, if the patient is a case managed patient, the screen of information that is returned will include a prominently displayed and flashing "CM." This flag notifies the observer that there is more information available on this particular patient (if in fact, such medical information is necessary to conduct the business at hand).

The case management system is also useful in helping the HMO control costs. Those patients that are likely to incur very high expenses for the HMO, if treatment protocols are not rigorously followed, are watched quite closely by this system. When treatment events that are supposed to happen, do not, the system knows it and lets concerned staff know.

SPREADSHEETS

Perhaps one of the more important tools that has been made available for QA is spreadsheet software. During the past six years, CHS/WELLCORP has kept current with the developing art of spreadsheet analysis and modeling. Currently, staff use a spreadsheet called 2020 on main computers, and the better known spreadsheet, SUPERCALC 5, on desktop computers.

Since these spreadsheets have become available, the presentation of

generated by the mainframe, spreadsheets are used to put the numbers into more user-friendly oriented reports. As user demands change, the changes can be more quickly and easily implemented through the use of spreadsheets. Consequently, QA reports can be generated more quickly than might be the case if original mainframe programming was required.

INDIVIDUAL STUDIES

Several systems have already been described that assist the QA process. Although a couple of QA examples have already been presented in describing these systems, several more-recent QA studies that were extensively supported by the data processing people should be mentioned.

The 1986 Patient Satisfaction Survey. The system was used to generate five random samples of patient-members who had used any of five health centers during 1986. As with one of the earlier examples, a list of patients who had recently used medical services was needed. However, in addition to recent use, it was also important to know which health center was visited by these patients. The management information systems helped develop the rosters of people who would be surveyed about satisfaction with different CHS/WELLCORP clinic sites. If differences were found, it could be learned from the patients which clinics were better rated, and how to improve the lower-rated ones.

The Rate of Pregnancy Among Teenagers. As is true in most urban settings, the rate of teenage pregnancy at CHS/WELLCORP is uncomfortably

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QA data to senior management has become much more efficient. As the need for various types of QA reports has developed, spreadsheets have assisted staff in responding quickly.

Although the spreadsheet software is not directly related to the collection of data, it does permit the management of data. After complete, and therefore, complex data reports are

high. By accessing membership, encounter, and hospital utilization systems, a listing was produced of those women younger than 19 years who had become pregnant and their outcomes during the past several years. Although some literature had already suggested it, one of the observations confirmed that many young women were using abortion as a form of birth

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small business market is that the ownership of these corporations is fairly stable, as is the employee rolls, and they don't require the hard sell. Ms. Silverstein stated that direct mail advertising and word-of-mouth reviews "are the best ways to attract members [of small businesses] into your health plan." In short, health plans should spend more time selling their wares to these small businesses, which are a vast managed care resource both in the present and in the future.

SETTING THE STAGE FOR THE 1990S

Wayne Moon, Chairman of the GHAA, stated that 13% of the present U.S. population is enrolled in a total of 614 HMOs across the country. On this 30th anniversary year, GHAA has positioned itself as the definitive trade organization for the managed health-care industry. As such, Mr. Moon exhorted the membership to move ahead with the changing tide of managed care. "Equity, efficiency, and excellence will provide the underpinnings of the survival of our industry. Thirty-seven million Americans are not adequately insured. We must improve [health-care] equity.

"Our responsibility is to refine our organization's cost-efficiency. We must renew our commitment to efficiency in managed care. Despite our best efforts, we will not be able to offset the effects of general inflation, the aging of the population, and increasing costs of new technology." He explained that in the near future, society must determine when the cost of health-care delivery is too high for the saving of a single life.

"The most important unfinished business is the measurement of quality. I urge you to cooperate with industry quality initiatives." Mr. Moon closed by stating that the health-care field is changing from a social to a business form of medicine. "I believe that this is now changing back again. I want to encourage this reversal. Our social obligations outweigh the profit motive." Mr. Moon is correct, and from the diversity of the presentations at Group Health Institute, it seems that the GHAA is actively seeking to motivate that return to the social provision of medical care.

New Products

Antifungal Medication Available

Glaxo Inc. of Research Triangle Park, North Carolina, has introduced a new antifungal medicine for athlete's foot. Oxistat Cream is available by prescription in 15- and 30-g tubes for treatment of fungal infections such as body ringworm, jock itch, and athlete's foot. The active medication is osiconazole nitrate 10 mg/g, in an off-white, opaque cream base. The cream is to be applied daily.

For more information, contact Jim Shamp of Glaxo at (919) 248-2576.

Calcium Antagonist for Subarachnoid Hemorrhage Introduced

Miles Inc. of West Haven, Connecticut, has obtained permission from the Food and Drug Administration to market a new calcium-channel blocker for use in patients with subarachnoid hemorrhage caused by a ruptured cerebral aneurysm. Nimodipine, marketed by the manufacturer as Nimotop, is said to improve neurological deficits caused by spasms in these patients. As of now there are no known contraindications. The most frequently reported adverse reaction is a decrease in blood pressure, occurring in 3.8% of patients who are administered the recommended dose. Nimodipine is given orally in doses of 60 mg q4h for 21 days, and treatment should commence within four days of the subarachnoid hemorrhage.

For more information, contact Florence Cohen of Miles at (203) 937-2786 or Susan South of Burson-Marsteller at (212) 614-4221.

Digitally Controlled Hearing Aid

3M of St. Paul, Minnesota has unveiled a new digitally controlled hearing aid. The 3M MemoryMate hearing aid is a small, behind-the-ear aid with push-button controls. According to 3M, the hearing aid is custom programmed by a computer to enhance one's capability of hearing in up to eight different environments, for example, to maximize speech clarity, for casual listening, for listening to music, etc.

For more information, contact Karyn T. Goad of 3M at (612) 733-2138.

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control. Medically, this can be a disastrous form of family planning. The HMO now provides counseling for those who are apparently using abortion as a form of birth control.

Disenrollments as a Result of Transportation Problems. In a two-phased approach, QA systems helped reveal a very specific problem for some patients regarding transportation to the clinic site. First, the membership system was used to produce a listing of all individuals who had voluntarily disenrolled from the health plan. All these people were surveyed for reasons why they terminated their association with the plan. Once all this information had been collected, it was used to establish a new database that was studied extensively using automated methods of analysis. One of the most useful findings was that many patients did not disenroll because of something inherently wrong with the health plan. Rather, what was discovered was that at one site, many pa-

tients had difficulties actually getting public transportation to it. The major bus line used by many of them ended several blocks shy of the clinic. Some winter days in Detroit can be brutal, making it quite difficult for the ill and infirm to travel very far on foot. Based on the obtained data, the HMO was able to convince the Detroit Department of Transportation to extend the bus line right up to the clinic door.

CONCLUSION

The few pages provided here do not permit more than a cursory examination of how automated systems can be used to assist and support the HMO in its QA activities. However, it is hoped that what was presented will provide incentive and assistance in developing other QA systems and activities.