

## The Challenge of Meeting JCAHO Standards for Nuclear Medicine

When a memo arrives in the mail indicating that the Joint Commission will inspect the hospital in two weeks, anxiety increases while you prepare what you think is a reasonable quality assurance (QA) presentation. The inspection is held and you are told the results—either you passed or you did not. If you did pass, the QA activities are put on the back burner for a while (maybe until the next inspection) as you return to the task of producing nuclear images and/or in vitro test results. This scenario may have been acceptable (and relatively common) in the past; however, the rules were changed several years ago and a passive lick and a promise approach to the Joint Commission on Accreditation of Health Care Organizations (JCAHO) standards are no longer acceptable.

This editorial presents the history of the JCAHO as well as the present standards applicable to nuclear medicine services, and offer a few suggestions on how to accomplish the necessary task of monitoring patient care in order to identify problems, propose solutions, and monitor the outcome of those solutions. Examples of monitoring items and criteria of quality are discussed in addition to the resources available through the American College of Nuclear Physicians (ACNP).

### HISTORICAL PERSPECTIVE

A plan of monitoring the results of patient care was in use in a London tuberculosis sanatorium in 1910 when a visiting American surgeon, Edward Martin, conceived the idea that an American College of Surgeons could be formed that would use the sanatorium plan to look at the end results of hospital treatment and standardize surgical treatment based on the examination of hospital records (1). At the time, hospitals in the United States varied widely in services offered and in mortality rates from common surgical procedures. Record-keeping was not a requisite for patient care. Histories and physicals were irregularly performed and documented. Although surgery was fast developing into the form known today, anesthesia and asepsis were still very rudimentary in most institutions.

In 1913, The American College of Surgeons (ACS) was founded and the Carnegie Foundation funded initial ACS

efforts to start a hospital standardization program, culminating in a conference in 1917 and publication in early 1918 of a "Standard of Efficiency." These standards were first applied in "field trial" voluntary inspections of 692 hospitals, including some of the most prestigious. Only 89 hospitals were found to meet these first standards, but 109 subsequently corrected deficiencies and were approved. In late 1919, the initial Standard of Efficiency was modified to a five-item "Minimal Standard" containing items pertinent to the formation of a medical staff composed of licensed well-trained physicians, requirements for written medical records, and requirements for pathology and x-ray departments (1). These 23 lines of text, filling less than half a journal page, have expanded to over 300 pages entitled the "Accreditation Manual for Hospitals," published by the JCAHO. As of 1950, 3,290 U.S. hospitals were accredited. Currently, 5,000 hospitals and 2,800 other health care organizations are accredited. The average hospital patient knows little about JCAHO accreditation, but accreditation is viewed as a sign of meeting minimal standards in the eyes of federal and state health agencies and many insurance companies, making duplicate inspections by these parties unnecessary. Some state agencies, however, have leveled criticism at the JCAHO recently (2). Hospitals in New York and California have been cited by state authorities and/or closed because of serious violations of state health codes despite recent certification by the JCAHO.

The focus of accreditation standards and sponsorship of the inspection program have undergone major changes. In 1951, the ACS joined with the American College of Physicians, American Hospital Association, American Medical Association, and the Canadian Medical Association to form the Joint Commission on Accreditation of Hospitals (JCAH). The Canadians later withdrew to form their own Canadian Council on Hospital Accreditation. In the mid-1960s, the "Minimal Standard" was revised and new "optimal achievable" standards were promulgated in 1970 (1). These standards continued to be revised, focusing on systematic, quantifiable audits of patient care. Unfortunately, this phase of auditing led to a preoccupation with reporting numerical results while the essential tasks of problem finding and solving were relegated to a less important role. In 1979, numerical audits were dropped in favor of integrated hospital-wide programs encompassing all quality assurance activities, with orientation on

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problem finding, solving, and monitoring the results of the proposed solutions (1). The Accreditation Manual is revised yearly, although the nuclear medicine section has not changed substantially since 1984. Minor changes in the requirements for fulfilling the dictates of the standards (too numerous to list in this article) are seen from year to year. The name of the JCAH was changed in the fall of 1987, to the Joint Commission on the Accreditation of Health Care Organizations, reflecting an increased interest in monitoring nonhospital, managed-care facilities, and organizations with promulgation of standards for these facilities.

Future revisions of the "Accreditation Manual for Hospitals" are a certainty, based on pressure from state and federal agencies, insurance companies, medical specialty societies, and society in general to oversee the delivery of health care that has increased in technologic complexity. The American Medical Association has proposed that three elements of patient care be assessed for problem identification and solving: structure, process, and outcome (3). Structure refers to facilities, equipment, and personnel (including credentialing of health personnel). Process means the movement of a patient through a health care system (e.g., how nuclear medicine studies are requested, scheduled, performed, and reported). Outcome includes the results of the health care services and how the patient perceives the services. Outcome analysis promises to be an emphasized topic for the JCAHO in the future, particularly for diagnostic services such as nuclear medicine. Imaging diagnoses can be compared with surgical results and/or results of other diagnostic modalities to determine accuracy. The cost/benefit of performing nuclear medicine studies can be analyzed. Patient comments about the nuclear imaging process or interaction with technologists and physicians may be elicited through questionnaires. Poor diagnostic accuracy, low cost/benefit ratio, or negative patient comments will serve as a strong impetus for change in the structure or process of nuclear medicine services.

The voluntary aspect of accreditation is somewhat conditional—either the hospital is accredited by the JCAHO or a state or federal agency will inspect the hospital. In many states, JCAHO accreditation is a requisite for a hospital to be licensed. The eligibility for a hospital to receive Medicare funds centers on being JCAHO accredited (1). Furthermore, many insurance companies demand accreditation, or they simply refuse to pay for services. Obviously, no hospital can continue providing services for the general public and be denied payment due to nonaccreditation. Indirectly, it is a self-serving duty to assist in maintaining JCAHO accreditation—jobs will be at stake if the hospital is not paid for the services it renders.

## NUCLEAR MEDICINE STANDARDS

In the 1989 "Accreditation Manual for Hospitals" (4), the standards for nuclear medicine services are divided into four major parts: credentialing; policy and procedure; record keeping; and quality assurance. The reader is encouraged to obtain a copy of the Standards and read it thoroughly on a yearly

basis, noting changes that may affect the written QA program of the nuclear medicine service. Compliance with the standards requires a teamwork approach, including administration, technical staff, and medical staff. In my opinion, it is absolutely unacceptable that a radiologist or nuclear physician would attempt to disassociate him/herself from the duty of meeting JCAHO standards. The economic symbiosis of the hospital and the nuclear medicine practitioner depends on JCAHO accreditation!

*Standard 1* discusses credentialing of providers of nuclear medicine services at the physician level. It requires a medically and administratively competent director of the nuclear medicine service who is responsible for the QA program, safety programs, Nuclear Medicine Procedure Manual, consultations, and planning for new space and equipment.

*Standard 2* outlines the requirements for policy/procedure manuals pertaining to the work and safety of the nuclear medicine service, including performance of all procedures, listing of radiopharmaceutical doses, radiation safety, and infection control procedures.

*Standard 3* states minimal requirements for records regarding diagnostic and therapeutic nuclear medicine procedures and consultations.

*Standard 4* discusses the QA program of the nuclear medicine service. The remainder of this editorial addresses this issue. Basically, Standard 4 dictates that a planned and systematic program must be implemented to find significant problems in patient care, propose solutions to these problems, and determine the effectiveness of these solutions; each of these items must be documented.

## MEETING THE JCAHO STANDARDS

Meeting these standards, particularly Standard 4, sounds rather easy. In fact, it is easy, but you must (with the active participation of the Medical Director) develop a program and implement it on a regular basis. I am able to devote ~2–4 hr a month to perform my quality assurance duties, and the total time spent by me (as Medical Director) and my staff is ~4–6 hr/mo. Drafting the initial program took ~20 hr. It is advisable to create the program on a word processor if possible, and keep it on some form of computer media to allow easy revision in the future. Probably the easiest way to start drafting a QA program is to obtain a copy of the JCAHO Standards. Consider each standard and each required characteristic step-by-step, writing what your department does to meet those standards/characteristics. You must have the cooperation of the Medical Director of the nuclear medicine service (a required characteristic). The responsibility for the implementation of the program is the Medical Director's. Routine collection (i.e., monthly, not just in the couple of months preceding a JCAHO inspection) of information about various aspects of the nuclear medicine service must occur, and these data must be assessed to identify problems in patient care. Additionally, objective criteria reflecting current knowledge and clinical experience in nuclear medicine must be developed to monitor and evaluate the services provided to the

patient. Problems must have solutions implemented, and the effectiveness of the solutions must be evaluated and reported as a part of the hospital-wide QA plan. As previously stated, both steps must be documented. Finally, the effectiveness of the overall QA plan must be evaluated annually and documented. If outside sources provide some nuclear medicine services, then the provided services must be monitored and evaluated in the same manner as the hospital-based services.

## QUALITY ASSURANCE PROGRAM

The QA program currently used in the nuclear medicine department at my institution incorporates data derived from various sources. Since the major clinical functions of this nuclear medicine department are radionuclide imaging and in vivo assay (i.e., thyroid uptake, blood/plasma volume studies), a QA review is conducted for each of these functions. Monitoring and evaluation of each function is accomplished through the *routine* collection of the following data:

### 1. Volume of Service Indicators

Number and type of imaging procedures performed monthly.

Number and type of thyroid uptakes, blood/plasma volume and Schillings tests performed monthly.

Number and type of nuclear medicine imaging studies that were cancelled as well as failed appointments and the reason for cancellation/failed appointments recorded monthly.

Number and type of imaging studies performed on an emergency basis after usual operating hours, recorded monthly.

### 2. Quality Indicators

Completion of "Quality Of Nuclear Imaging" data sheet for 5% of the total number of imaging procedures considered on a monthly basis. An imaging procedure is defined as all activity yielding a single patient report (see Fig. 1.)

Monthly recording of the number and types of scans directly correlated to the surgical gross/microscopic pathology results and the accuracy of scan diagnosis versus pathology results.

Recording the number and types of equipment malfunction and repair monthly.

### 3. Irregular Event Indicators (These data are reported monthly as they occur)

Patient complaints/comments.

Physician complaints/comments.

Radiopharmaceutical misadministrations.

Patient incident reports and adverse reactions to radiopharmaceuticals.

Procedures repeated due to poor initial imaging or unexpected biodistribution of tracer and the known or

QUALITY AND APPROPRIATENESS OF NUCLEAR IMAGING CASE REVIEW SHEET	
PATIENT NAME:	_____
NUCLEAR MED. #	_____
DATE OF SCAN	_____
SCAN TYPE	_____
TECHNICAL QUALITY:	ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE <input type="checkbox"/> EXPLAIN: _____ _____
DOSE USED:	_____ ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE <input type="checkbox"/>
INDICATION FOR SCAN:	_____ _____
IS THIS INDICATION A COMMONLY ACCEPTED ONE?	YES <input type="checkbox"/> NO <input type="checkbox"/>
CLINICAL CORRELATION (SURGERY OR BIOPSY RESULTS OR CLINICAL COURSE):	_____ _____
CORRECT DIAGNOSIS	<input type="checkbox"/> INCORRECT DIAGNOSIS <input type="checkbox"/> CANNOT DETERMINE <input type="checkbox"/>
PROBLEMS IDENTIFIED IN THIS CASE:	_____ _____
COMMENTS:	_____ _____
SIGNATURE OF REVIEWER, DATE OF REVIEW:	_____
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FIG. 1. Sample of patient report form.

suspected reason for such occurrence (does not include repeated gallium scan images to assess movement of tracer in bowel).

In vivo assays repeated at physician request because of suspected inaccuracy of initial results and the outcome of the repeated assay.

### 4. Additional Parameters (These data would be recorded and summarized as it becomes available or is earmarked for review for a given month)

Performance on American College of Nuclear Physicians-College of American Pathologists Transmission Imaging Simulator programs.

Assessment of turnaround time for performance of nuclear imaging procedures from time of order to placement of report on an inpatient's chart or into an outpatient physician's hospital mailbox.

Assessment of referring physician satisfaction with the nuclear medicine service by questionnaire.

Assessment of in- and outpatient satisfaction by questionnaire.

**5. Other Performance Indicators** (To be reviewed on an "as needed basis")

Example: thallium scan results versus cardiac catheterization findings.

These routinely collected data are reviewed by the Nuclear Medicine Quality Committee (NMQC), composed of the director and the Chief Technologist. Other health professionals (nurses, technologists, etc.) or hospital administrators are invited to attend as needed. The NMQC meets at least quarterly (in actuality we meet monthly—it becomes too difficult to evaluate three months worth of data at one time). The previous month's (or quarter's) data are reviewed and important problems identified. Opportunities to improve care are identified. Plans to improve care are proposed. Results of plans formulated or resolution of problems identified previously are discussed. Written minutes of the NMQC are kept along with the monthly data summaries and a listing of problems identified/resolved. A quarterly report of the findings and actions of the NMQC is submitted with the director's signature to the hospital's QA committee.

### QUALITY PERFORMANCE CRITERIA

Objective criteria of good quality performance are drawn from the current knowledge and clinical experience of the director and others in the community hospital practice of nuclear medicine in the United States. Criteria of quality for regularly collected data include:

1. How adequate is the technical quality of the nuclear medicine images?  
Is the information density appropriate?  
Is there evidence of patient motion?  
Was the proper collimator used?  
Were enough images obtained?  
Was the patient sufficiently cooperative to allow adequate imaging to take place?  
Was computer processing adequate for diagnosis (when applicable)?  
Were there problems with film exposure or processing?
2. Is the injection technique appropriate (i.e., little or no evidence of infiltration)?
3. Are the radiopharmaceutical doses within guidelines stated in the Nuclear Medicine Procedure Manual?
4. Are images performed for indications stated in standard textbooks or the peer-review literature of nuclear medicine? (This is a primary arbiter of appropriateness.) [One way to track appropriateness is to include the indication for a scan as a sentence in the written scan report.]
5. Are nuclear medicine imaging diagnoses accurate as

determined by surgical findings, biopsy specimens, or the clinical course of the patient?

6. Were equipment malfunctions promptly recognized and repaired without decreasing the quality or availability of patient care?
7. Did any physicians or patients express complaints? What was done as a response to the complaint?
8. Were there any adverse reactions to the radiopharmaceuticals? What reporting to the local radiopharmaceutical supplier or the FDA ensued? What were their comments?
9. Was a report of the imaging results and a diagnosis handwritten in the patient chart progress notes; communicated verbally to the attending physician by the nuclear physician; or typewritten/computer generated and placed in the chart within 24 hr of scan performance, with the exception of nonemergent scans performed on weekends?
10. Is the performance on the ACNP imaging phantom program at or above the mean performance of other nuclear physicians/facilities participating in this program?
11. Did the results of blood/plasma volume tests, radioiodine uptake tests, and Schilling's tests agree with the clinical course or physical findings in the patient?
12. Are all equipment logs, reports of radiopharmaceutical calibration, disposal records, and safety records in good order?

Obviously, it took thought and time to develop the above QA program, and the document is constantly evolving. To help this evolution, we have found it worthwhile to obtain and share knowledge of recent JCAHO inspections with neighboring institutions. The experience at a neighboring hospital may reflect the emphasis and/or questions JCAHO inspectors will ask when you are inspected. For example, our facility was asked about crossreading during our last inspection. Crossreading is the process of having one nuclear radiologist/physician read a set of studies while another radiologist/physician reads the same studies and scoring the amount of agreement or disagreement between them. The JCAHO has suggested that a single practice physician hire another physician to provide crossreading! My solution is to take a subset of the scans read by the locum tenens (substitute) nuclear physician who works for me when I am on vacation or at a meeting in another city. I read these scans blindly (i.e., without knowing how the first physician interpreted the scan) and score my results in terms of total agreement, partial agreement, or disagreement with the other physician's interpretation. I do this for 40–60 scans once every six months.

### PRACTICE AUDIT

The ACNP can assist in identifying items for quality review. The ACNP Practice Audit Program Inspectors' Manual\* (5) is available for use as a guide. This document covers almost all aspects of QA in nuclear medicine and can serve as good

background for the development of a QA program. The ACNP conducts in depth inspections of nuclear medicine facilities, using a trained inspector who is a practicing nuclear medicine physician. These inspections are a part of the Practice Audit Program and provide three years' accreditation for those who pass. At this time, the JCAHO does not recognize the ACNP Practice Audit, but the ACNP inspections are in much greater depth than those provided by the JCAHO.

### SUMMARY

The JCAHO is the premiere organization in establishing QA standards for hospitals in the United States. Although the JCAHO standards for nuclear medicine may seem burdensome, the diligent study of these standards and drafting of a regularly-applied QA program will allow any good nuclear medicine facility to pass JCAHO inspection. More importantly, application of a rigorous QA program will further the goal of nuclear medicine in general: to provide the best diagnostic services possible, now and for many years to come.

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**Editor's Note:** The author, John W. Laude, MD, is the chairman of the Quality Assurance and Practice Audit Committee of the American College of Nuclear Physicians and is a certified nuclear medicine technologist.

### NOTE

\* For further information on the Practice Audit Program, contact The American College of Nuclear Physicians, 1101 Connecticut Ave. NW, Suite 700, Washington, DC 20036.

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