

Guidelines for Establishing a Quality Assurance Program in an Electrodiagnostic Laboratory

Introduction

Society expects to receive quality service and physicians are expected to provide quality care to patients. Over the past 2 decades, many terms have been used to describe how quality of care could be improved, including medical audits, quality assurance, quality improvement, continuing quality improvement, and total quality improvement (TQI). The concept of Total Quality Management (TQM) was originally introduced by Deming² and was recently adopted by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

The approach to the issue of quality care in physician practice should be proactive. The goal of quality assurance is to improve patient care and satisfaction using ongoing monitoring and evaluation strategies. It is the responsibility of physicians to establish processes by which they can achieve this goal.

In an institution, it is the responsibility of the Board of Directors to establish, maintain, and support, through the Executive Director and President of Medical Staff, an ongoing Quality Management Program. The program should include effective mechanisms for reviewing and evaluating patient care. The plan should also

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provide for effective responses to the findings of such an evaluation. In a clinic or physician's office, the person responsible for establishing such a program needs to be identified prior to the implementation of the program.

The purpose of this document is to describe TQM/TQI and provide specific examples of some of the aspects of electrodiagnostic medicine (EDX) that could be monitored and evaluated. Guidelines for some of the aspects of care and indicators also are outlined.

The first step is to establish a TQM plan. The objective of the TQM plan is to preserve and enhance high-quality patient care. A TQM plan identifies a responsible person to oversee monitoring and evaluation of the services provided. In a TQM plan, the scope of the services is clearly stated and important aspects of care are identified.

The indicators relevant to given aspects of care, the threshold for evaluation, and the frequency of data collection and analysis are specified. The TQM plan has clear directions regarding communication of pertinent information and findings to the appropriate staff within the laboratory and the medical center, including the leaders of the organization. The TQM plan is appraised annually.

In an EDX laboratory, it is expected that organized EDX services are available to patients based upon an assessment of the needs of patients and referring physicians, and that these services are provided by competent professionals. Policies and procedures are outlined for receipt of referrals, timeliness of testing, reporting of test results, and dealing with emergency cases.

Definitions

Several important terms must be understood before establishing a quality assurance program. These terms are quality, process, outputs, feedback, total

quality improvement, and performance. (A glossary of terms is provided at the end of this document.)

Quality

JCAHO defines quality as “The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. Dimensions of quality include the following: patient perspective issues, safety of the care environment and accessibility, appropriateness, continuity, effectiveness, efficacy and timeliness of care.”³ The way services are delivered has a significant impact on overall patient care. (For example, the timeliness of responses to consult requests will significantly impact patient care outcome since it provides information to develop an effective treatment plan.) By developing measurements for the effectiveness of care provided, outcomes can be improved. Deming states that “The difficulty in defining quality is to translate future needs of the user into measurable characteristics, so that a product can be designed and turned out to give satisfaction at a price that the user will pay.”² Future needs are always changing and are unpredictable. Future needs may depend upon expected patient outcomes. One must think today regarding the future needs of patients, their families, and care providers. Measurable characteristics that help define future needs include monitors, indicators, and critical pathways in a plan of care.

The definition of a user has been broadened. The users are both internal (health care provider) and external (community vendors, patient, and patient’s family). The provider may be an individual or group of professionals and support staff. It is important to understand the relationships between the patient and the care providers.

Process

Process is a series of actions or operations leading to an end. Process transforms inputs into a value added output that conforms to the requirements of the user. Through a series of processes the patient receives the service. For example, for a patient to be seen in an EDX laboratory, there are several processes that have to be performed correctly if a satisfactory outcome is expected. Some of these processes include: receipt of a referral (this could be either written or verbal), scheduling of the testing, examination of the patient, interpreting the findings, and preparing a report for transmittal to the referring physician. Something

could go wrong at any of the above steps, leading to an unsatisfactory outcome. These processes are easily definable; however, other crucial elements will influence the outcome as well, such as parking facilities, facility environment, and the courtesy with which services are provided.

An example of an unsatisfactory outcome would be: A referral is received and an appointment for EDX studies is made for a certain day and time. The patient arrives at the facility on time, but is unable to find a parking space close to the clinic. Attempting to find a parking space makes the patient late in registering. At the registration desk, the patient is informed that because he or she is late the physician has begun an examination on another patient. Consequently the patient has to wait before being seen. Outputs of this scenario are an unsatisfied and disgruntled patient and a frustrated physician.

Outputs

Outputs (outcomes) are products or services resulting from a process. User requirements are the most important characteristics of process output. Measurement of the processes and outputs are critical to help meet these requirements and identify opportunities to improve services.

Feedback

Feedback is the communication that occurs regarding how well requirements are met. Feedback can be between the patient, referring physician, receptionist, and other care providers. Feedback pertinent to how well the requirements/outcomes were met can lead to a change in the process.

A hospital or clinic is a complex network of processes and providers. Each must work individually and collectively to satisfy patient needs.

Total Quality Improvement

TQI is a philosophy of organizational management that stresses satisfying users, eliminating waste, involving users in decision making, and making decisions based on data. Three key elements of TQI are: (1) understanding the situation, (2) analyzing data, and (3) improving the process. TQI is the application of quantitative methods and human resources to control and improve the materials and services supplied by the organization, the organization’s functioning, the processes resulting in quality services, and the satisfaction of user needs and expectations.

The primary goal of TQI is to ensure continuous improvement to meet or exceed patient and provider needs and expectations. The built-in premise is that there is always margin for improvement. One must strive for continuous improvement by promoting innovation and developing flexibility and effectiveness in all processes. The focus is to prevent an undesired outcome, rather than to act after an undesired outcome has occurred.

The new concept of quality assurance is to shift the primary focus from the performance of the individuals to the performance of the organizations' systems and processes, while continuing to recognize the importance of individual providers.

Performance

Performance is what is carried out and how well it is carried out. The level of performance is the degree to which what is carried out is effective and appropriate for the individual patient and provider. The level of performance will also be reflected in the timeliness with which the testing is provided to users who need it. The actions taken should be safe and delivered in a caring and respectful manner. The degree to which the organization performs is influenced by the way it designs and carries out a number of important functions. The results are reflected in the outcomes and satisfaction of those involved in receiving and providing care.

Performing Well

The effectiveness of the procedure is reflected in the degree to which the procedure, care, and intervention accomplish the desired and projected outcome(s). Appropriateness of a specific test is the degree to which the test carried out is relevant to the patients clinical needs, given the current state of knowledge. The various desired elements that help to perform the right service will include:

The *availability* of the needed test, procedure, and intervention to meet the patients needs.

The *timeliness* with which the needed test, procedure, intervention, or service is provided to the patient.

The *effectiveness* with which the care provided results in achieving the desired outcomes.

The *continuity* of the care provided. Continuity reflects the degree to which the care provided is

coordinated among practitioners, among organizations, and over time.

The *safety* of the test. Safety is the degree to which the risk of an intervention and the risk of the care environment are reduced for the patients and health care providers.

The *efficiency* of patient care. Efficiency is the degree to which the services provided reflect the relationship between the outcomes (results) and the resources used to deliver patient care.

The *respect and caring* given the patient. Respect and caring reflect the extent of patient and family involvement in decision making and to what degree the services provided are performed with sensitivity and respect for the patients needs and expectations.

Ten Steps Towards Developing a Quality Improvement Management Plan 3

Step 1: Assign Responsibility for Overseeing the Total Quality Improvement Management Plan

Oversight responsibilities include: designing the TQI plan, establishing quality improvement responsibilities, and setting strategic priorities for quality assessment and improvement. The TQI plan includes the details of how the subjects/topics of ongoing monitoring will be chosen, how the feedback is used to identify opportunities for improvement, how the priorities for assessment and improvement are set, how assessment and improvement instruments are used, and how the information gathered is disseminated.

Step 2: Delineate the Scope of Care

The TQI plan identifies key functions including managerial, clinical, and support functions of various departments. Attempts are made for the scope to be all inclusive. Key functions usually have the greatest impact on the quality of care the patient receives.

The plan also identifies all of the activities performed, including the types of patients served, range of activities involved in serving patients, types of staff involved in these activities, sites where the activities are carried out, and times when services are provided.

Step 3: Identify Important Aspects of Care

Important aspects of care and services that need to be monitored are identified. Priorities are established among important aspects of care and services to be monitored for any given time.

Step 4: Identify Indicators

Indicators relevant for a given aspect of care are identified. Indicators are measures that can be used to monitor care. These measures are related to processes and outcomes of care. Indicators are measures of specific events, occurrences, and facets of treatment that provide information about the quality of a particular aspect of care. These indicators need to be objective and are more productive and meaningful if identified and established by teams. Team members include those involved in providing that aspect of care.

Step 5: Establish Thresholds

Thresholds state when an evaluation must be initiated; however, the evaluation can be carried out even when the threshold has not been reached. Staff may want to evaluate an aspect of care to determine whether the variation should be reduced or whether the performance could be improved. Thresholds are based upon previous literature, staff experience, past performance, and customers' needs and expectations. Thresholds are stated either in positive or negative terms. For example, 90% of the patients are seen within 24 hours of referral. Another way of stating this is that no more than 10% of the patients will wait more than 24 hours after receipt of referral.

Step 6: Collect and Organize Data

Sources for data pertaining to each indicator are identified. How the data are to be collected and who is responsible for collecting the data is established. The decision must be made whether the data collection will be prospective or retrospective in nature. A decision also is made regarding the size and frequency of data collection and how often the data is to be organized and analyzed. The person responsible for organizing and evaluating the results is identified.

Step 7: Initiate Evaluation

Priorities for evaluation are established. Evaluation by the same team who selected the indicators and threshold is more appropriate and effective.

Opportunities to improve, and the methods to achieve these improvements, are identified.

Step 8: Take Actions to Improve Care

When evaluations have identified an opportunity for improvement, actions are outlined to improve patient care. The responsible person(s) who is/are going to implement the actions is/are identified. Recommendations are to be implemented in a timely manner.

Step 9: Assess the Effectiveness of Actions

Monitoring of the aspect of care is continued. Findings are subsequently reviewed to assess whether actions taken actually have improved care or service. Further decisions are made whether more actions and evaluations need to be carried out to achieve the set goals.

Step 10: Communicate Results to Relevant Individuals and Groups

The conclusions, recommendations, actions, and follow-up are reported to the appropriate individuals and groups. This reporting includes communication to the staff members responsible for providing care or service, chief of staff, quality improvement committee, and other appropriate managers.

Continuous Quality Management in Electrodiagnostic Medicine

Scope of the practice varies according to the setting in which the laboratory functions. For example, a laboratory in an academic setting has a different scope in view of the presence of residents and medical students. In such a situation, one of the key functions is resident supervision and education.

Other key functions may include: scheduling, reception of the patient, environment, promptness of the service provided, appropriateness of the procedure carried out, reporting of results and recommendations, patient and family education, and follow-up.

Examples of Aspect of Care

Process Evaluation

Monitoring and Evaluation of the Process for Scheduling. One first analyzes the users' needs and the present process for scheduling. Possible questions

that can be asked include: (1) Is there adequate staff to answer all the incoming requests for scheduling? (2) Is there a need to have a 24-hour answering system? and (3) Are the patients seen in a timely manner and is there a provision to respond to an emergency request?

Possible Indicators. (1) Patients are seen within a certain time frame; for example, within 1 week; (2) Emergency requests are responded to within 24 hours or the same day; and (3) In-patients are seen within 24 hours.

Possible Thresholds. (1) Ninety percent of the referrals are seen within 1 week; (2) One hundred percent of the emergency referrals are seen within 24 hours; and (3) Ninety percent of in-patients are seen within 24 hours.

Data Collection. Depending upon the clinic set up, the data is collected by the receptionist, clerical staff, or medical record personnel. Sources of data include: a log book, medical records, or computer generated reports.

Data Analysis. Data is analyzed (evaluated) monthly or quarterly. Analysis is carried out by a person who is not involved in scheduling.

Actions Identified. When opportunities to improve are identified, actions are recommended and implemented in a timely manner. Monitoring and evaluation of the aspect of care is repeated again to see if the actions have achieved the desired outcome.

Communication. The results of monitoring and evaluation are communicated to those who are interested in knowing the timeliness of the care provided; for example, the referring physicians. This communication may be carried out individually and verbally; however, it is best to provide a written report to the referring physicians, the management team, and the appropriate medical staff committees.

Utilization Monitoring and Evaluation

The services provided and their utilization are analyzed. Possible questions which can be asked include: (1) Are the patients being referred appropriately? (2) How many patients have failed to keep their appointments? (3) What actions are taken if patients do not show up for their scheduled appointments? and (4) What percentage of the patients referred to the clinic have positive findings?

No Shows. Tracking the number of patients who failed to keep their appointment is carried out. Policies and procedures are established to reduce this number to an acceptable level. Processes dealing with patients who fail to keep their appointments are established.

Possible Indicators. (1) The number of patients that failed to keep their appointment is monitored and (2) Follow-up contact is made with the patient via either a letter or a telephone call. The reason for failing to keep their appointment is asked and, if desired, another appointment is made. The referring physician is notified of this information.

Possible Threshold. (1) The number of patients that fail to keep their appointment does not exceed 10% of the total number scheduled during the month and (2) Contact is made with 100% of the patients who failed to keep their appointment and physicians are informed, by mail, regarding all patients who fail to keep their appointment.

Data Collection. Data are collected by the clerical staff on an ongoing basis.

Data Source. Information and findings are retrieved electronically or from the log book.

Frequency of Evaluation. Data are analyzed quarterly or monthly.

Analysis of the Data. Data are analyzed by the director of the laboratory. Opportunities to improve function are identified. Actions are recommended and implemented and the impact of the actions analyzed.

Communication. Findings are discussed and communicated with clinic staff, referring physicians, and the leaders of the organization.

Patient Satisfaction

Patients and staff need to be satisfied with the services provided and the way in which they have been provided. The AAEM has developed a patient satisfaction survey to help physicians collect this data.

Patient Satisfaction. Patients should be satisfied with the timeliness of the service provided, courtesy with which the services were provided, environment, and the physician's attitude.

Possible Indicators. (1) Are the services provided in a timely* manner? (2) Is the staff courteous? (3) Is

the environment safe and accessible? (4) Is the patient seen without undue wait* in the waiting room? (5) Is the procedure explained to the patient before starting? and (6) Does the physician explain the results at the end of the procedure?

Possible Thresholds. (1) Ninety percent of the patient services provided are conducted in a timely manner; (2) The staff is reported to be courteous by 75% of the patients; (3) The environment is reported to be accessible by 80% of the patients; (4) Seventy-five percent of the patients are seen within 30 minutes of their scheduled time; (5) The procedure is explained to 100% of the patients; and (6) The results of the testing are explained to 100% of the patients.

Data Collection. Data are collected using a questionnaire. The questionnaire (with a stamped addressed return envelope) is mailed to 20% of the patients seen during the past month. Data collection is carried out quarterly.

Data Analysis. Data analysis is carried out quarterly by the director of the clinic. Opportunities to improve care are identified and actions recommended. The impact of actions on patients is evaluated.

Communications. Findings are communicated to the referring physicians, other health care providers, and the leaders of the organization.

Procedure: Electrodiagnostic Testing

Electrodiagnostic studies are diagnostic tests; however, without adequate history and physical examination the test has very little value. Furthermore, adequate testing of various nerves and muscles is a prerequisite for correct interpretation and diagnosis. Common diagnoses encountered in a clinical EDX laboratory include: carpal tunnel syndrome, peripheral neuropathy, radiculopathy, plexus lesions, and myopathy. Depending upon the types of patients seen in a given laboratory, certain aspects of care could be monitored.

Aspects of Care to be Monitored

- 1 The presence of a provisional diagnosis, based upon adequate history and physical examination.*
- 2 Testing of appropriate* nerves for a given diagnosis.
- 3 Examination of appropriate* muscles for a given diagnosis.

- 4 Interpretation of the findings of nerve conduction studies (NCSs) and needle electromyography (EMG).

- 5 Education of the patient and the family regarding diagnosis, possible treatment options, and prognosis.

- 6 Timely reporting of the results to the referring physician.

Examples of Specific Aspects of Care

Carpal Tunnel Syndrome. Carpal tunnel is a high volume aspect of care.

Possible Indicators:

- 1 There is evidence that an adequate* history was taken.

- 2 Relevant* physical findings are documented.

- 3 An appropriate* and adequate* number of nerves are examined by NCSs.

- 4 Examination of appropriate* muscles (name muscles to be examined) with needle electrode is performed.

- 5 Interpretation is consistent with the results obtained.

- 6 There is documentation of patient and family education.

- 7 Timely* reporting of the results to the referring physician is carried out.

Possible Threshold. All the above indicators have a threshold of 100%.

Data Collection. Data collection is ongoing.

Data Source. Data are retrieved electronically and a report is generated by the computer.

Data Analysis. Data are analyzed quarterly by the director of the laboratory. Opportunities to improve patient care are identified. Actions are taken to

improve care and service. Impact of actions taken is examined.

Communication. Findings are presented and discussed at appropriate medical staff meetings.

Peripheral Neuropathy. Peripheral neuropathy is one of the common diagnostic problems seen in the EDX laboratory. Diagnosis is based upon adequate history and physical examination. NCSs of the appropriate nerves and needle electrode examination of the appropriate muscles help to confirm the diagnosis and define the type of peripheral neuropathy and the severity of the problem.

Possible Indicators:

- 1 There is evidence that an adequate* history was taken.
- 2 Relevant* findings of physical examination are documented.
- 3 An appropriate* and adequate* number of nerves are examined by NCSs.
- 4 Examination of appropriate* muscles (name muscles to be examined) with needle electrode examination is performed.
- 5 Interpretation is consistent with the results obtained.
- 6 There is documentation of patient and family education.
- 7 Timely* reporting of the results to the referring physician is carried out.

Thresholds. Thresholds are established. All the above indicators have a 90% threshold.

Data Collection. Data collection is on-going.

Data Analysis. Data analysis is carried out quarterly or monthly. Opportunities to improve care are identified. Actions are recommended and the impact of actions taken is examined.

Communication. Results and conclusions are reported at appropriate medical staff meetings and to the leaders of the organization.

Conclusion

EDX consultants now have the ability to improve the quality of patient care in an ongoing proactive manner. This document reviews current concepts of quality patient care. Important terms are both defined and explained. Ten steps for establishing a quality assurance program in an EDX practice are outlined and examples of projects which American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM [formerly AAEM]) members may find useful in introducing quality assurance initiatives in their own offices, clinics, and hospitals have been provided.

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Glossary

Critical Pathways - Optimal sequencing and timing of interventions by care providers for a particular diagnosis or procedure, designed to minimize delays, maximize quality of care, and better utilize resources.¹

Feedback - Communication regarding how well requirements have been met.

Important Aspect of Care - Aspects of care and service important enough to be monitored.

Indicators - Measures of processes or outcomes used to monitor care.

Inputs - Manpower, supplies, or information needed to do the desired work.

Outputs - The products or services resulting from a process or series of processes.

Performance - What is carried out and how well it has been carried out.

Processes - Activities that use inputs to produce value added outputs.

Quality - The degree to which services increase the likelihood of desired outcomes.

Quality Care - Doing the right thing, in a right way, while meeting user expectations in a cost effective manner, with minimum risk.

Scope of Care - All care services provided by the organization.

Thresholds - Stated levels which determine when further evaluation must be initiated.

Total Quality Improvement - Use of quantitative methods to improve processes, services and outcomes.

** These terms need to be defined in a prospective manner before monitoring has started. For example, description of an adequate history in a patient suspected of having carpal tunnel syndrome may include details such as onset, description, duration, and progression of symptoms. History might also include any aggravating or precipitating factors, history of associated medical problems such as diabetes mellitus, chronic alcoholism, recurrent trauma to wrist, wrist fracture, and pregnancy. Relevant physical examination documentation may include presence or absence of wasting and weakness of thenar muscles, sensory loss, Tinel sign, Phalen test, and range of motion of the cervical spine.*