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— GUIDELINE —

# Using an EHR System as a Quality Improvement Tool in Your Healthcare Practice



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## Introduction

Electronic health record (EHR) systems provide the framework for systematic documentation of patient health information. When used properly, EHR systems also can serve as valuable tools for quality checking and long-term quality monitoring.

EHRs offer opportunities to collect and analyze data – activities at the core of delivering quality patient care, preventing errors, and minimizing risk. Yet, the challenge for healthcare practices is understanding how to aggregate and evaluate the data, analyze the results, and develop strategies and initiatives that will help support quality improvement (QI).

QI relies heavily on auditing. Typically, the term “auditing” has been associated with the financial aspects of business. However, ongoing validation of clinical information through auditing also is important from both continuity of patient care and risk perspectives.

Auditing can be daunting and overwhelming, especially for individuals who are not familiar with the audit process. This guideline will describe the audit process in detail and discuss how you can use your healthcare practice’s EHR system to enhance auditing and QI activities. Understanding how to better use your system for these purposes has the potential to increase patient safety and satisfaction, reduce the likelihood of billing issues and/or fraud allegations, and support reimbursement.

### Risk Consideration

Although EHRs have many beneficial functions, they also can contribute to medical errors and patient safety events. In an analysis of malpractice cases involving EHRs, CRICO Strategies identified various user errors and system problems that contribute to malpractice allegations, such as incorrect information in the EHR, copy/paste errors, conversion issues/hybrid paper and electronic charting, poor system design, data routing failures, and system malfunctions.<sup>1</sup>

If you are considering an EHR upgrade, or if you are purchasing an EHR system for the first time, talk with potential vendors to ensure you obtain the optimal features that support quality monitoring and risk reduction.

## Objectives

The objectives of this guideline are to:

- Define the concept of QI and its underlying principles
- Describe, in detail, the process of auditing and how to develop an effective audit policy
- Highlight a number of high-risk areas that you should consider as possible audit measures, and describe how an EHR system can assist with data collection and auditing
- Discuss how EHR reports are an integral part of the audit process and how healthcare practices can use these reports
- Explain the importance of a comprehensive auditing process that culminates in data analysis, communication of results, and development and implementation of corrective actions

## Quality Improvement

QI, in the context of healthcare, is a systematic approach for ensuring consistent and safe patient outcomes. This approach includes a process for analyzing and using data to plan corrective action steps. As you begin to consider opportunities for improvement, it is helpful to remember that the concept of QI relies on several basic tenets:

- 1. Errors are more likely the result of process breakdowns than human missteps.** For example, if a patient is allergic to a drug but receives it anyway, it could be the result of a failure to properly use allergy alerts built into the practice's EHR system.
- 2. Evaluating data is the best way to identify and solve problems.** Without data, a healthcare team might decide to "fix" something that isn't broken. For example, in the scenario above, an initial reaction might be to reprimand the provider who prescribed the contraindicated drug. However, if the office consensus was to "turn off" the system's built-in allergy alerts, then the process itself is deficient and risky. Without data, the team may be unable to measure the size and frequency of a problem. They may waste time and money correcting only one symptom of a larger problem. The practice might suffer financial loss and deteriorating morale, possibly even losing valuable employees.

- 3. Those who own the process should be involved with solutions to the problem.** Those who actually do the work are integral partners in the quality process. Some experts even advise that decision-making should occur at the level of expertise rather than authority – a novel concept for many organizations. In the scenario above, if all providers and office staff had been included in the design and implementation of the EHR system and had thoroughly understood the importance of the system, the patient's allergic reaction might have been avoided.

The Agency for Healthcare Research and Quality (AHRQ) notes that an essential element of incorporating health information technology (health IT) into QI efforts is a practice culture with a strong commitment to, and leadership support for, using these technologies for improvement purposes. Additionally, AHRQ recommends that healthcare practices establish QI committees that meet routinely and report back to staff about activities and progress.<sup>2</sup>

## Conducting an EHR Audit

### What Is an Audit?

An audit is a way of measuring system outputs against expectations that have been defined in policies, procedures, standards, or guidelines. Auditing is the cornerstone of a robust QI program. A comprehensive auditing policy might help (a) increase the quality of patient care, (b) improve patients' perceptions of your practice, (c) decrease liability risks, and (d) positively affect your bottom line.

You can use auditing to identify areas for improvement and develop action plans. Further, you can use the data collected during auditing to monitor the results of corrective actions.

### Who Should Be Involved in an Audit?

For the best audit design and patient outcomes, the entire healthcare team should participate. This includes the practice's healthcare providers and clinical and administrative staff. Staff members responsible for EHR implementation and ongoing maintenance of the system also should be involved in the audit.

Most processes and outcomes that audits measure involve multiple people in the practice. Thus, everyone's input and participation is beneficial. Who will perform the audit is best determined by the practice team as the audit is designed.

### Selecting the Correct Measures

When selecting quality measures, or metrics, to include in your audit, you should consider several things. First, review with your team the original objectives for implementing the EHR system. Make sure that the team has working knowledge of the data elements and definitions associated with your system. Providing the team with a list of these elements and definitions will be helpful.

Information regarding evidence-based standards and your practice's involvement in mandatory and voluntary quality data reporting initiatives also is relevant to the audit that you design. For more information, see the "Recommended Measures to Audit" section of this guideline.

### Developing an Audit Policy

At minimum, the audit process that your practice implements should include the elements described in this section.

#### *Definition*

All quality measures must be clearly defined so that more than one person can produce the measure results without difficulty or concern that results cannot be compared from one audit to another.

Remember, one of the goals of QI is to measure results over time, take action, and monitor the improvements made as a result of those actions. Without a clear definition of what is being measured, an audit will be difficult to replicate.

#### *Goal*

To determine whether a quality measure is relevant, and whether the information gathered will be useful, the team should establish a goal for each measure. A goal, or objective, should broadly describe the result of a strategy, a desired future condition, or achievement.



For example, your goal might be to communicate test results to patients within an appropriate timeframe based on type of result and the patient condition.

### *Target*

The team also should establish a target to determine the significance of the actual audits results. A target is a numerical value of a quality metric.

For example, using the situation described above, your target might be to communicate (a) 90 percent of all standard test results within an appropriate timeframe set by office policy, and (b) 100 percent of all critical tests results within an appropriate timeframe established by applicable professional guidelines.

The team should establish its target with the following considerations:

- Knowledge of evidence-based literature related to the specific measure
- Knowledge of “best practice” results in comparable settings
- Historical data within your healthcare practice
- Knowledge of external requirements – e.g., pay-for-performance benchmarks

Additionally, when establishing a target, the team should consider whether (a) the goal of the measure is to ensure that something always happens or never happens, (b) the target is based on average performance or best practice performance, and (c) the target can be achieved immediately or in the long term.

### *Methodology*

The team should consider the method that it will use to obtain necessary data. One option is to utilize the prebuilt and custom-built reports that are an integral part of the EHR system. For example, using the test tracking example above, your methodology might involve running system reports to identify all test results that have been received but are still pending follow-up with patients.

### *Frequency*

The team also will need to determine how often to measure metrics and monitor results. For metrics that have an immediate impact on patient safety, consider more frequent measurements, such as daily or weekly. For example, if one of the audit measures is to evaluate how often critical test results are communicated within a specified timeframe, you should monitor this measure on a frequent basis.

On the other hand, you might want to evaluate the time the practice's entire patient population must wait between a request for an appointment and actually being seen in the office. For this measure, monitoring on a monthly or quarterly basis might be necessary to ensure an adequate sample of data.

Over time, you might be able to decrease the frequency of audits if your results demonstrate improvement.

### *Corrective Actions*

The final element of auditing to consider is what steps you will take to improve the results if your target is not met. Developing corrective actions is crucial to the overall success of your QI plan. These actions might involve a realignment of resources or a reprioritization of tasks. Any actions taken should be focused on improving the overall process.

## **Recommended Measures to Audit**

The following suggested measures are intended to help healthcare providers begin to use the data available in their EHR systems to enhance patient care and services. All measures recommended represent either high-risk aspects of care and/or care documentation.

### **Appointment Processes**

#### *Time From Request to Appointment*

Knowing how long patients have to wait from the time they call your office for an appointment until the actual appointment date is a measure of accessibility. Your practice can use its EHR system to track times between appointment requests and appointment availability, allowing staff to identify possible scheduling inefficiencies within the office.

Some teams might find that their EHR systems do not have the capability to track this information, but their scheduling systems do. Using the scheduling system, the team can generate a report with the appropriate data.

When you audit time from request to appointment, your team should examine both the appropriateness of the wait time and triage. For example:

- Is the patient calling for an appointment for his/her annual examination, or is he/she having problems?
- If the patient is having problems, does he/she need an appointment today, tomorrow, or sometime this week?

### *Cancelled and Missed Appointments*

For both patient safety and liability reasons, healthcare practices need thorough processes for identifying, addressing, documenting, and following up on cancelled and missed appointments – especially in regard to nonadherent or difficult patients.

You should be able to use your practice's EHR system to manage these processes. For example, office staff might use the system to generate a daily report showing all appointments for that day that were cancelled or missed. This information will help pinpoint and streamline follow-up communication and tracking.

Further, with thorough data input, the system can generate reports showing whether follow-up has occurred, how quickly it occurred, and the outcome of the follow-up. This information provides solid documentation of the practice's efforts on behalf of the patient.

## **Patient Encounters**

### *Chief Complaints*

When patients' chief complaints or reasons for visiting are documented in the EHR, the system can generate reports that identify trends, such as communicable diseases (e.g., influenza). Once trends are identified, you can use the information to manage various aspects of your practice. For example, the information may help you anticipate an increased need for resources, such as supplies or staffing.

### *Problem List*

If your practice maintains a problem list for each patient, determine whether your EHR system has the functionality to make the list a required field or mandatory screen. This setting will help enforce appropriate review of the list, documentation of any changes in the patient's health status, and acknowledgment by the healthcare provider. Additionally, work with your EHR vendor to ensure the problem list displays prominently in each patient's record.

### *Patient/Family History*

Your EHR system should have a standard method for documenting patients' personal and family health histories. The system can use the information entered into the patient/family history to generate patient health reminders and alerts for preventive health screenings, creating a more comprehensive approach to patient care.

### *Copy and Paste Function*

The function that enables copying and pasting of patient health information is common in many EHR systems. However, if copied and pasted information is inaccurate or outdated, serious patient safety events can occur.

Work with your EHR vendor to ensure that a mechanism is in place to make copied and pasted material easily visible within the record. Additionally, staff training and education about the safe use of copy and paste is an important safety precaution.

Once you have the ability to identify copied and pasted information, use of the function should be regularly monitored and assessed through an audit process.

#### **Resource**

For detailed information about problems and solutions related to copy and paste, see the Partnership for Health IT Patient Safety's [\*Toolkit for the Safe Use of Copy and Paste\*](#).

## **Patient Communication**

Healthcare teams can use their EHR systems to help manage patient communication. To realize the full benefits of the system, staff should diligently document all communication,

including front desk, on-call, answering service, and electronic communication – in each patient’s electronic record.

### *Patient Reminders*

The patient reminder functions in EHR systems were specifically developed to improve patient outcomes and help providers reduce the risk of overlooking critical components of care or missing specific timeframes. For example, your EHR system might offer preventive health reminders for annual examinations, Pap smears, prenatal visits, vaccinations, screening colonoscopies, and more.

Turning off these reminders is not advised, as it eliminates the benefits that the system offers and exposes your practice to additional risk. Systems that allow for customization of patient reminders will support practices’ specific patient populations and accommodate ongoing changes in evidence-based standards.

### *Patient Education*

Patient education features available in your EHR system can help you provide patients with appropriate educational materials. Ideally, the healthcare providers in your practice will document in the EHR system all education provided to patients. The practice can use this information as part of the EHR audit process to proactively identify any opportunities for improvement.

## **Medication Management**

### *Medication List/Reconciliation*

Your practice can use its EHR system to link patients’ medication lists to their problem lists and disease-specific protocols, creating a more comprehensive approach to medication reconciliation. Also, the EHR system is an excellent tool for monitoring patients’ prescription refills and/or extended drug therapy.

Further, by using the report functions in your EHR system, you can identify gaps or redundancies in your practice’s medication reconciliation process.

### *Drug Interaction and Allergy Alerts*

EHR systems are capable of alerting providers to potentially dangerous drug interactions and allergies. These alerts can sometimes be overwhelming; however, when implemented as part of a well-designed system, they can protect patients and help prevent prescribing errors.

Work with your EHR vendor to (a) ensure your practice is realizing the full potential of the system's alert functions, and (b) tailor the alerts to meet the specific needs of your practice and patient population.

Also, it is imperative to note that drug and allergy alerts work only if current data are available for the system to analyze. Thus, remind the providers in your practice to review patients' allergies at each office visit and update the system promptly.

### *E-Prescribing*

Many EHR systems have built-in electronic prescribing functionality. Features of e-prescribing may include a formulary, weight-based dosing formulas, and automatic generation of medication lists as prescriptions are written. Some systems also may integrate e-prescribing with test results, patient problem lists, and disease-specific protocols.

E-prescribing builds a robust patient/drug database, supports evidence-based disease management, optimizes the selection of medications, and reduces the risk of prescribing errors. E-prescribing also may help providers respond more promptly to patients' medication needs.

Auditing your practice's e-prescribing process is strongly recommended to identify any potential problems and ensure safe patient outcomes.

### *Prescription Data*

You can use your practice's EHR system to generate reports from patients' medication lists or from the e-prescribing function. Your practice may want to use the data in these reports to:

- Develop or curate patient educational materials for medications that are frequently prescribed in your practice

- Determine whether any of the medications ordered by providers are associated with extreme risks
- Identify patients who are receiving medications that have been recalled or removed from the market

## Information Management

### *Release of Information*

To ensure patient confidentiality and HIPAA compliance, your practice can use its EHR system to track the release of patients' health information. Security safeguards generally are built into EHRs to ensure only authorized staff can print information from the electronic record.

Using the EHR to create an aggregate report of information your practice has released can help identify where the requests for information originate. This type of trending can provide some insight into your practice for QI or resource utilization opportunities.

### *Amended and Incomplete Records*

The goal for any office is to have few, if any, amended records. Auditing records on a regular basis can show when and how often records are amended.

Your practice also can use its EHR system to audit the completeness of patients' health records. Are all components of the record in place and completed, including all required signatures? Is all information included to substantiate the billing for the services?

These types of audits should focus on an individual practitioner/staff member to ensure that corrective actions will lead to improvement. When analyzing the audit results, determine why the practitioner is amending or not completing records; this information will help you identify appropriate improvement strategies.

## Test Result Tracking and Referral Tracking

### *Test Result Tracking*

Your practice should have a well-articulated procedure for tracking patients' lab, radiology, and other test results. Many EHR systems can automate this procedure, improving both timeliness and completeness of the function.

Make sure providers and staff in your practice are consistently using the EHR system to track test results. The automated functions built into the system should not be circumvented – e.g., do not use a paper tickler system as a workaround. These functions are included in the EHR to help minimize the risks associated with lost or overlooked results.

You may find it helpful to have your system generate a daily task list that flags certain situations that could lead to risk exposure. Circumstances that should be flagged include:

- Tests ordered, but no results received
- Test results received, but not viewed by the healthcare provider
- Test results viewed by the healthcare provider, but not communicated to the patient

Routinely running reports to identify overlooked test results is critical, even if test results are included on your daily task list. Failure to address test results is a frequent underlying cause of the top allegation in medical malpractice claims – failure to diagnose. By using your EHR system to better track and manage tests, your practice can aim to ensure that no results go missing or unnoticed.

### *Referral Tracking*

Although it might not be necessary to track all routine referrals, you should be able to identify patients whose medical histories and current medical conditions require close follow-up. If you provide accurate and thorough documentation in your EHR system, it should be able to create a report that lists all patients requiring close follow-up.

Auditing referral tracking reports closely will provide you with the information that you need to ensure appropriate follow-up is completed in a timely manner.

## **Reports**

EHR systems have the capacity to generate a range of reports that will help your practice audit the effectiveness and efficiency of its processes. Work with your EHR vendor to automate as many audit reports as possible. Working with your vendor early in the selection and implementation process is beneficial, because custom report templates will often cost more after the system has been installed.



The ideal audit report is one that you can run directly from your system. Sometimes a certain amount of manual calculation or counting of the data is necessary to get the information that you need to measure performance. Again, work with your vendor to obtain the most refined reports possible from your system so that quality measures can be calculated accurately.

If you can generate system reports without difficulty, your practice might run 100 percent of all occurrences for the measure that you are auditing. However, if you have to conduct a portion of the review manually, sampling is acceptable. As a general rule, sample sizes for populations – which are defined as the number of patients, cases, or events – should fall into the following ranges:

- Population = <30: Measure 100 percent of the population.
- Population = 30-100: Sample size should be at least 30 cases.
- Population = 101-500: Sample size should be at least 50 cases.
- Population = >500: Sample size should be at least 70 cases.

Initially, your practice should plan to run reports to calculate its aggregate results. It is always best to first review the usefulness and integrity of reports at a system level before proceeding with practitioner-specific reporting.

Ultimately, sharing practitioner-specific reports with each practitioner in a confidential and professional manner will support positive change in your practice and may have significant influence on your results.

## Audit Document

The audit document should contain space for documenting the following items (consider a spreadsheet format with columns and rows):

- The measure (e.g., “test results tracking”)
- The definition of the measure (e.g., “tests ordered, results received, results placed in correct patient’s record in a timely fashion, and critical test results flagged for immediate review”)

- The goal (e.g., “minimize risks to patients associated with missed or unaddressed test results”)
- Target compliance percentage (e.g., “100 percent”)

## Closing the Loop

Conducting audits and running reports from your EHR system is not enough to say you have a QI program in your practice setting. You also must “close the loop” by analyzing the results, communicating with the team, and developing and implementing corrective actions.

## Analyzing Results

Conducting ongoing analysis of both the audit framework and the results themselves is critical. Involving all team members in the analysis will significantly contribute to future improvements.

Displaying results in easy-to-understand graphs is extremely helpful, not only for the analysis but also for use in the communication process. Your EHR system may include some graphic reporting capabilities.

Questions to ask when reviewing your results include:

- Are we getting better or are we getting worse?
- Can we see the effect of our latest action step(s)?
- Where are we compared with our established target?

Remember, audits are a way to detect failures or identify successes depending on the measure you are auditing.

## Communicating With the Team

Once you’ve analyzed the audit data, you will need to communicate the results in a positive manner to those in your practice. This communication can take various forms. For example, you might choose to present aggregate results in a staff meeting and provide individual results during periodic performance reviews.

## Developing and Implementing Corrective Actions

Once you've analyzed and communicated audit results, the next step is to develop and implement corrective action plans based on an understanding of the root cause of the problem. This process should involve identifying best practices to use as benchmarks for data comparison.

Planning and implementing corrective actions require involvement and commitment from your entire team. After the corrective actions have been implemented, continue to audit the measure to ensure changes are applied consistently and to see whether improvement occurs.

## Confidentiality and Privacy

All providers and staff in your practice should be aware of and understand their responsibility for protecting patients' health information and respecting patients' privacy. The practice's confidentiality and privacy policies apply to all QI and auditing activities, including the generation of reports.

## Conclusion

When used appropriately, an EHR system is an excellent tool for risk mitigation, quality checking, and long-term QI monitoring. The activities of identifying areas for improvement, designing efficient audits, aggregating and analyzing data, communicating results, taking action based on the findings, and monitoring for long-term improvement are critical to delivering quality patient care, preventing errors, and minimizing risk within your healthcare practice.

Although EHR systems can assist with QI efforts, mere use of these technologies does not equate to improvement. Rather “using health IT for QI requires purposeful and thoughtful planning, effort, and allocation of resources, all of which entail significant costs . . . in terms of capital, clinician and staff training, and time.”<sup>3</sup>

However, benefits in QI initiatives can be significant. These efforts can ultimately improve patient outcomes, increase patient satisfaction, reduce the risk of errors, and potentially reduce liability exposure.

## Resources

- [Agency for Healthcare Research and Quality: Using Health Information Technology to Support Quality Improvement in Primary Care](#)
- [The Office of the National Coordinator for Health Information Technology: Capturing High Quality Electronic Health Records Data to Support Performance Improvement](#)
- [The Office of the National Coordinator for Health Information Technology: Health IT Playbook](#)
- [The Office of the National Coordinator for Health Information Technology: How Will Adopting Electronic Health Records Improve My Ability to Care for Patients?](#)
- [U.S. Department of Health and Human Services, Health Resources and Services Administration: Managing Data for Performance Improvement](#)

## Endnotes

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<sup>1</sup> CRICO Strategies. (2017, September 12). CBS educational webinar: EHR-related risks.

<sup>2</sup> Higgins, T. C., Crosson, J., Peikes, D., McNellis, R., Genevro, J., & Meyers, D. (2015, March). *Using health information technology to support quality improvement in primary care* (AHRQ Publication No. 15-0031-EF). Rockville, MD: Agency for Healthcare Research and Quality.

<sup>3</sup> Ibid.



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