

# **Chart Audits: The how's and why's**

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## Overview

### **This module will cover:**

- **Definition of audit**
- **Purposes of an audit**
- **How to conduct an audit**

Objectives: Upon completion of this module, the learner will be able to:

1. State the definition and purposes of a medical records audit.
2. List the necessary steps in designing and conducting a chart audit for Quality Improvement.
3. Design a chart audit for a quality measure, including:
  - topic selection,
  - identification of a clearly defined performance measure,
  - identification of target population and sample size
  - design of data collection methods and tools, and
  - identification of appropriate benchmarks.
4. Perform a chart audit and report results in a format useable for quality improvement efforts.

## Definition

**A chart audit is an examination of medical records, electronic and/or hard copy, to measure some component of performance**

A chart audit is an examination of medical records, to determine what is done, and see if it can be done better. There are countless numbers of performance components that can be measured in a chart audit. Examples include:

- adherence to clinical protocols,
- patient adherence with medication regimens,
- provider compliance with coding and documentation requirements.

Chart audits can also involve a review of the prevalence of symptoms and disease. Clearly, you can conduct a chart audit on virtually any aspect of medicine and medical care. The important point is that the data you are reviewing should be accurate and must be available in the chart. It is also important to note that a chart audit will involve reviewing data that may be deemed confidential; therefore, it is necessary to consult the appropriate institutional guidelines prior to reviewing charts.

## Purposes of Chart Audits

**The ultimate goal of non-financial chart audits is quality improvement**

Quality improvement initiatives, such as chart audits, may be defined as small-scale cycles of interventions that are linked to assessment, with the goal of improving the process, outcome, and efficiency of complex systems of health care. It is important to note that chart audits are not done to root out bad quality but rather to rate quality. Acting on the findings of an audit is discussed in the 'Analyzing Data' portion of this module.

A chart audit for quality improvement measures how often and how well something is being done (or not done). For example, a chart audit may involve reviewing a pediatric practice's charts to see how often the chicken pox vaccine is offered, given, or declined. If the audit determines that the vaccine is not being offered or given as recommended, then there is room for improvement. The same practice could review the panels of individual providers within the group, to see if they differ in performance on this measure.

A chart audit is one of several tools available for quality improvement. Other examples include patient surveys, discharge summary reviews, and employee feedback.

## Purposes of Chart Audits

**A chart audit may also be the basis of elaborate research**

Medical records are a rich source of data for research. The research application of an audit can be clinical (such as reviewing the prevalence of blindness in diabetic and non-diabetic patients) or operational (such as reviewing the hospital length of stay for appendectomies performed on Monday vs. Friday).

Even when the initial purpose of the audit is for research, the ultimate application of the research is for quality improvement.

# How to Conduct an Audit

## Conducting an effective chart audit requires careful planning

A well thought-out plan is essential to carrying out a chart audit that will yield useable data. The first questions to consider are:

- What is the topic/focus of the audit?  
(e.g. breast disease)
- Is the topic/focus too narrow or broad?  
(e.g. monthly self-breast exam vs. breast cancer overall)
- Is there a measure for the topic/focus?  
(e.g. self-reported rate of performing self-breast exam)
- Is this measure available in the medical record?  
(e.g. recorded by physician in Review of Systems)
- Has this been measured before?  
If “yes”, then a benchmark or standard exists;  
if “no”, then a standard for comparison may not exist.

Chart auditing is an iterative process-- do not be discouraged if the answers to some of the questions above change several times before being finalized.

It is always a good idea to inform your medical records manager when you are conducting a chart audit. The records manager can help locate the appropriate charts, arrange an ideal time to review charts, and can assist with issues related to confidentiality.

# How to Conduct a Chart Audit

**There are eight steps to follow**

Although the chart audit process is not always necessarily linear, this list represents the general steps involved.

1. Select a topic
2. Identify measures
3. Identify patient population
4. Determine sample size
5. Create audit tools
6. Collect data
7. Summarize results
8. Analyze and apply results

We will discuss each step in turn.

## 1. Select a Topic

- **The topic may be mandated**
- **If not, pick an area of interest or perceived need**

This module is designed for the novice individual who has a choice in their audit topic. When designing your audit, pick an issue that interests you personally. You will find that you are more able to recognize nuances in your study when you have personal interest in the topic.

It is also important that your topic be an area of interest to the practice. Choose something that is viewed as important, perhaps a problem or an aspect of care that the providers feel needs improvement. You want to make sure your findings will be of interest to the group when your work is done!

Occasionally chart audits will be mandated by external bodies. A common example is insurance company reviews for HEDIS measures. When externally mandated, the auditing process can be very complex and involve many individuals with extensive experience in reviewing charts.

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For more information on HEDIS, see [www.ncqa.org/Programs/HEDIS](http://www.ncqa.org/Programs/HEDIS).

# Example

## Topic:

## Breast cancer screening

As we go through the 8 steps, we'll show an example of a potential audit process.

### 1. Select a topic

Suppose your practice decides it wants to measure how well it's doing on meeting recommendations for preventive care measures. Since the insurance carriers in the area are focusing heavily on women's health right now, the group decides it would like to look at screening for breast cancer (mammography).



## 2. Identify Measure(s)

- **There are countless measures in any given topic area.**
- **Clearly define the one(s) you will assess.**
- **Try to predict questions that will arise, and answer them.**

Once a topic has been selected, you need to define exactly what you will measure. Criteria need to be outlined precisely, with specific guidelines as to what should be counted as a “yes” (criteria met), and what should be counted as a “no” (not met).

For example, if you decided to review the rate at which foot exams were performed on diabetics in the last year, you would need to decide what qualifies as an adequate foot exam. Is it monofilament testing for protective sensation? Visual inspection? Palpation of pulses? Many would say all 3 are necessary for a complete foot exam. If only 2 of the 3 have been done, how will you count that?

## Do Your Homework

- **Literature search**
- **Pilot audit**



Often it is worthwhile to conduct a literature review to help in defining measures--ones that have been used successfully in the past will have fewer “bugs” to deal with as you go. HEDIS measures, for example, are defined in exquisite detail (probably more than you would be able to follow in a completely manual audit). Literature review will also provide benchmarks for comparison. You may want to first learn what benchmarks exist and how other audits were conducted before initiating your own.

If you are starting from scratch, a pilot audit can be very helpful. Just going through a few records will help to identify potential problems or questions that need to be clarified before starting your full audit.

## Example

### Measure:

### Mammography rates

## 2. Identify your measure(s)

For your audit on breast cancer screening, exactly what do you want to measure?

Possibilities include:

A. Time since last mammogram (months)

This provides the most information, but is more complex for analysis.

B. Mammogram completed within last year (yes/no)

If you want to assess performance relative to guidelines, then measure compliance with the guidelines. But what is the correct time period? If annual mammograms are the recommendation, should 13 months between studies be counted as not in compliance (especially since most insurance will not pay for screening mammograms separated by less than 365 days)? For this reason, HEDIS measures for at least one mammogram completed within the past 24 months.

C. Recommendation for mammogram documented within last year (yes/no)

Do you want to measure only whether the study was done, or whether it was recommended/ordered by the provider? Should providers be held accountable when patients decline to have the test?

For our example, we'll look at a combination of B and C.

### 3. Identify patient population

#### Who is the target population for your measure?

In order to determine which records to review, you need to define the population you wish to assess. Characteristics to consider may include age, gender, disease status, treatment status, etc.

In many cases, the topic itself will help to define this. If you want to look at cervical cancer screening rates, the population has to be limited to women. You may wish to exclude those who have had hysterectomies.

Many audits require specific inclusion or exclusion criteria. For the audit on diabetic foot exams mentioned earlier, you might have:

inclusion criteria:

- diagnosis of diabetes
- age 18 or above

exclusion criteria:

- double amputee

## Example

- **Patient population = women ages 52 – 69**

**Inclusion criteria?**

**Exclusion criteria?**

Continuing our example audit:

### **3. Identify patient population**

Since mammography is clearly recommended for women ages 52 - 69, and somewhat controversial for younger and older women, it's a good idea to limit your audit to the population in which the guideline is generally accepted.

## Population selection

- **Inclusion**

**Female**

**52-69 years old by specific date**

- **Exclusion**

- **Status-post bilateral mastectomy**

One might also consider including a personal history of breast cancer as an exclusion, as the screening guidelines are not intended to apply to women with known disease. However those women should be receiving mammograms on a regular basis if there is breast tissue remaining, so you might choose not to exclude them.

## 4. Define sample size

- **Will all charts be reviewed, or a subset?**
- **If a subset, how many?**

It is relatively rare to do a manual audit on all charts meeting your inclusion criteria--it's usually too many to feasibly complete. That's where sampling comes in.

Choosing a sample size is critical. If the sample is too small, the random variability will be too large, and the results will not be useable.

## Estimating Sample Size

**There are four steps in determining a sample size**

Calculating the sample size for a chart review follows selected steps adapted from statistical techniques used in determining the sample size for descriptive studies with dichotomous variables. Descriptive studies make statistical inferences about the total population such as describing the average and percentage. Dichotomous variables describe the measure in two distinct outcomes – either with the characteristic or without. The steps are:

## Step 1

- **Expected proportion**

50% or less

> 50%

- **Characteristic**

- **Sample**

– without characteristic

1. Estimate the expected proportion within the population that will have the measure of interest. If you have a benchmark from literature or prior studies, you can use that. Otherwise consult with colleagues or experts in the field to determine an estimate.

The tables to be used in Step 4 require this proportion to be 50% or less. If over 50% of the population is expected to have the characteristic, then base your sample size calculation on the proportion without the characteristic.

## Step 2

- **Specify confidence interval**  
**Margin of error**

2. Specify the width of the confidence interval (CI) you wish to use. All empirical estimates, based on a sample, have a certain degree of uncertainty associated with them. It is necessary, therefore, to specify the confidence interval (CI), i.e. the desired total width of confidence interval (W) [e.g. 79.5 to 80.5 mm Hg, as  $W=1$ ]. The CI can be thought of as summarizing the "margin of error", since it gives a range of values that we are confident contains the true value - essentially the simple estimate "plus or minus" a bit.

## Step 3

- **Set Confidence Level**

**Precision or level of uncertainty**

3. Set the confidence level. This is a measure of the precision or level of uncertainty. Typically a 95% CI is constructed, meaning that we are 95% certain that the interval includes the true value. This is arbitrary, however, and other levels of confidence can be used to construct different CIs.

A narrow confidence interval (say 79.5 to 80.5 mm Hg) with a high confidence level (99%) is more likely to include the true population value than a narrower interval and lower level.

## Step 4

- **Use the appropriate table to estimate sample size.**

**Sample size for a descriptive study of a dichotomous variable**  
95% confidence level

Width of confidence interval	0.10	0.15	0.20	0.25	0.30
<b>Expected proportion (P)</b>					
<b>0.10</b>	139				
<b>0.15</b>	196	88			
<b>0.20</b>	246	110	62		
<b>0.25</b>	289	128	73	47	
<b>0.30</b>	323	144	81	52	36
<b>0.40</b>	369	164	93	60	41
<b>0.50</b>	384	171	96	62	43

For our example audit on breast cancer screening:

**4. Define sample size**

The HEDIS Breast Cancer Screening rate estimates the percentage of women aged 52 – 69 years enrolled in a health plan who had a mammogram during the 2000 measurement year was 74.5%. This makes the expected proportion of those without screening = 25.5%

The confidence interval or the "level of uncertainty" is set at .15 (plus or minus 7.5%).

The confidence level is set at 95%.

This means that we want to be 95% confident that the result falls between 67 and 82 %.

Using Table the table above, read down the left column of figures for the expected proportion without the characteristic (.25). Next, read across to the chosen confidence interval (.15). Then follow the column down. The number shown (128) is the required sample size. (For more information, see [http://www.bath.ac.uk/med-sci/rdsu/hints\\_quantstuds.htm](http://www.bath.ac.uk/med-sci/rdsu/hints_quantstuds.htm) .)

## 5. Design Audit Tools

- **Tool for individual chart reviews**
- **Summary tool**

To complete your chart audit, you will need instruments on which to record your findings. How they are structured and the details they include will impact upon the analysis you can do, and the eventual usability of your findings.

There are many ways to document findings. It can be done on paper or electronically. Since charts are being reviewed independently, data should be collected in a format that keeps all individual data separate but allows for easy compiling.

A separate sheet of paper pre-printed with key points/questions will help with paper data collecting and another sheet that summarizes your findings is also helpful. A spreadsheet format is ideal for electronic record keeping. Many chart audits will involve the calculation of a rate, percentage, mean, or other statistical measurement. A spreadsheet format will allow for calculating many different measurements.

The following pages give examples of 3 common audit materials:

- audit guidelines or instructions
- audit tool
- summary form

## Example

- **Guidelines for breast screening audit**

Sample audit guidelines:

### **Background**

The US Preventive Services Task Force recommends that women aged 50 – 69 receive routine mammograms every 1 – 2 years. The provided patient list has been generated by CRMS (Clinical Resource Management System) a retrospective data analysis tool, and includes those women who have not received mammograms. This audit is designed to determine additional information concerning this group of patients including verification of their ages, and reasons for not obtaining screening services. The patient list includes women aged 52 – 69 as of Dec. 31, 2001 who were active patients in this practice.

### **Instructions for Conducting Audit**

Randomly select 128 patients from the provided list. You may choose the first 128 or begin from the last name and select backwards. If a selected patient does not meet the age criteria, select another so that the completed total is 128. Using Browser and/or hard copy medical records, complete the audit tool. Once you have completed audit of 128 records meeting the inclusion criteria, complete the audit summary:

Clear and specific instructions are important for consistency when more than one person is performing the chart reviews.

## Example

### Breast cancer screening audit tool

Sample audit tool:

Date of Review \_\_\_\_\_

Patient ID \_\_\_\_\_

Auditor \_\_\_\_\_

Inclusion criterion:

Patient age between 52 – 69 as of 12/31/01

Y N

*If no, this file is ineligible for this audit*

Mammography verification (check one):

- Patient received mammogram at Duke
- Patient received mammogram elsewhere
- No documentation of mammogram

If patient did not receive mammogram (check one):

- Patient declined
- Mammogram ordered, not completed
- No documentation of discussion of mammography
- Other, please specify \_\_\_\_\_

## Example

### Breast cancer screening audit summary

Sample summary form:

Date: \_\_\_\_\_

Auditor: \_\_\_\_\_

1. Total # charts reviewed: \_\_\_\_\_

2. # Patients included in audit : 128

3. Number out of 128 who:

- Received mammogram at Duke: \_\_\_\_\_
- Received mammogram elsewhere: \_\_\_\_\_
- Had no documentation of mammogram: \_\_\_\_\_

4. Number of patients with documentation of:

- Patient declined mammography: \_\_\_\_\_
- Mammogram ordered, not completed: \_\_\_\_\_

5. Number of patients with no documentation of discussion of  
mammography: \_\_\_\_\_

6. Number of patients with other reasons for not receiving screening:  
\_\_\_\_\_

List reasons:

- 1.
- 2.
- 3.

## 6. Collect Data

- **Review the defined number of records**
- **Record findings for each**

Select the date for collecting data and coordinate the specifics (date, time and number of charts to be pulled) with the medical records staff Director.

Review each chart to determine if the individual meets the selection criteria (eg correct age, gender, etc.)

Complete one audit tool for each individual you include in the sample.

## 6. Collect data

- **Data sheets done**

### **6. Collect Data**

For our example audit on breast cancer screening, we would now review 128 charts and fill out the audit tool for each one.

## 7. Summarize results

**Present figures that will be useful in addressing the clinical concerns**

Summarizing the data is a little more complex than just counting up all the data sheets. You must consider how the data will be used, and make sure the information is presented in a way it will be useable.

### EXAMPLE:

An audit was done to measure compliance with the guideline that all asthmatics stage 2 or higher should be on anti-inflammatory medication. Of the 50 records reviewed,

40% of the patients were stage 2 or higher  
40% were on anti-inflammatory medication.

How do you interpret that result?

You can't. The patients on medication could theoretically all be patients with stage 1 disease. You need to know not the number out of 50 that were on anti-inflammatories, but the number out of the 20 (40%) that were stage 2 or higher.

<b>Breast Cancer Audit</b>	
Total charts reviewed	150
Patients included	128
Duke Mammogram	50
Outside Mammogram	41
No Mammogram	37
Documentation	
Declined mammogram	6
Ordered but not done	4
No Documentation of Discussion	27
Other (Left practice)	1

Hypothetical audit results

Let's return to our hypothetical mammogram audit.

Look at the results as documented on this slide.

## Example

- **Interpretation of breast CA screening results**

Returning to our breast screening example, we see from the audit results that a total of 71% of our sample received mammograms. This figure is only slightly less than the national HEDIS rate of 74%. The proportion receiving mammograms at Duke was only marginally greater than the 32% that received screenings elsewhere. 29% had no documentation of having had mammogram services. Of the 27 who had no documentation of mammogram, only 10 records showed documentation of discussion with the provider.

## 8. Analyze and apply results

### Compare your findings with standards and benchmarks

Once you have compiled your data you can compare it to benchmarks. There are many different benchmarks depending on your topic and the performance measure you calculated.

For example, if you calculated the number of ER visits per patient made by patients in a Family Medicine group, you could compare this to other Family Medicine groups, a local Internal Medicine group, all physicians in the city, etc. How you interpret the comparison should be influenced by the differences between your study and the benchmarking studies/populations.

In some cases, benchmarks are not readily available. You may want to reformulate your study to be comparable to available measures (here is where the early planning is important!). If the measure truly is something of importance to the group, you may wish to set a goal based on what the group feels is appropriate and reasonable.

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**Q:** When benchmarks don't exist, the audit is of little value. (true or false)

**A:** False. Although benchmarks are helpful, the findings of an audit can also be used for internal comparison across time. Trend analysis is sometimes even more helpful than a single snapshot.

# Analysis

- **Drill down**

The above analysis shows that, for the women who had not had a mammogram, the vast majority of the records had no documentation of discussion of the issue.

The challenge is now to “drill down” to figure out why.

Was the issue discussed but not documented?

Did the patients not want to discuss the issue?

Or was it simply overlooked?

Telephone contact with the 27 identified patients might help to clarify this, so that an appropriate intervention can be designed.

## Using Results for Quality Improvement

- **Initial measure or baseline**
- **Root cause analysis**
- **Develop intervention**
- **Execute and evaluate**

The results of your audit are a key step in the Quality Improvement cycle.

In the FADE model, we've just completed the "**Analyze**" step (**initial measure or baseline**). If you've identified an area with room for improvement, a drill-down or **root cause analysis** may be in order to find out where the defect is -- what's causing the performance to be less than optimal.

The next step is to **Develop** an intervention to correct the "defect". What can be done to make things better? Be sure to involve all the stakeholders in the design process -- it will make your product better, and reduce resistance later.

Once you've implemented your intervention (**Execute**), you will want to repeat your audit (**Evaluate**), to measure the effect of the changes you've made. While you may want to "tweak" your audit to look at some more details, try to keep the second review as close to the original study design as possible, so the results will be comparable.

## **Summary**

### **A chart audit**

**Is a systematic review that...**

**Measures performance and...**

**Improves quality.**