Chapter Seven

Problem Lists, Results Management, and Trending

Learning Outcomes

After completing this chapter, you should be able to:

◆ Understand and use Patient Management
◆ Understand and use Problem Lists
◆ Cite information from previous visits in a new encounter
◆ View pending orders
◆ Review lab test results
◆ Create a graph of lab results
◆ Create a graph of vital signs in the chart

Important Information about the Exercises in This Chapter

The exercises thus far have permitted you to skip setting the encounter date and time. In the next few chapters, you will work with patients’ complete medical history using information from several previous encounters. In certain exercises it will be necessary to match the encounter date and time exactly as instructed in step 2 of the exercise in order to maintain the correct chronology of data in the exercise. If you need to review how to set the date and time when creating a new encounter, see Chapter 3, Guided Exercise 13.

Longitudinal Patient Records to Manage Patients’ Health

In this chapter we shift from inpatient to outpatient facilities. In medical offices the electronic health record is a longitudinal record encompassing numerous encounters over an extended period of time. In contrast, inpatient records
typically concern a particular inpatient stay or episode of care. In addition to the traditional medical office, hospitals are increasingly operating specialty clinics focusing on problematic diagnoses—for example diabetes, asthma or hypertension.

In a medical office or outpatient clinic, patients are frequently seen by nurse practitioners instead of physicians. In this chapter we use the term clinician or provider to represent equally a nurse practitioner or doctor.

Providers in a specialty clinic or primary care practice come to know their regular patients, helping to monitor and hopefully improve the patient’s health. To do so, the clinician must review the records from the patient’s past visits and recheck previous problems on every new encounter.

Providers also must keep track of what medications the patient is currently taking, which tests have results, and any other orders that have been issued. A clinician will always check the medications list before writing a new prescription, as well as to renew any that were about to expire.

In a world of paper charts, this is done by flipping through the papers in the chart and reviewing the previous notes. In some offices, current medications and current problems are copied by hand to a list in the front of the paper chart. In other cases, the clinician simply remembers them while skimming the chart, keeping a mental list as he or she reads the chart.

In a codified electronic chart, the software itself can dynamically locate the necessary information and organize it for quick review. Additionally, the clinician can note the items reviewed, make updates to the problems, and then record them in the current encounter. The clinician does not have to search for findings in the system because the findings are already identified in the previous encounter notes.

The Student Edition software includes a Patient Management feature that will allow you to explore some of these concepts. Although commercial EHR vendors use national standard nomenclatures such as Medcin, they differentiate their software with unique visual styles. Software you will use in a clinic or medical office will have concepts and features for Patient Management similar to the Student Edition, but the presentation of the information is likely to have a different appearance.

**Understanding Problem Lists**

Clinicians of all levels are trained to work with Problem Lists and depend on the information contained in the problem lists when providing care. Furthermore, maintaining a Problem List is a requirement for accreditation by organizations such as the Joint Commission (JCAHO).

Problem Lists are used to track both acute and chronic conditions related to the care of the patient. Clinic staff should be able to easily see the active problems for a patient and view the history of problems. Although chronic diseases that are poorly controlled or malignancies take precedence in clinical decision making over mild conditions that are not life threatening, the idea of
Chapter 7  Problem Lists, Results Management, and Trending

263

a Problem List is to make sure everyone who touches the patient knows what conditions are present.

The relationship between diagnoses and problems is very close. In most EHR software, they are synonymous. Most clinical information recorded in the chart will be related to one or more problems. However, the concept of a primary diagnosis used for billing does not apply to a Problem List.

The concept of a “problem-oriented” view is to organize entries in a patient record by problem. The Problem List provides an up-to-date list of the diagnoses and conditions that affect that particular patient’s care. Typically, it links the data from all encounters, orders, and prescriptions to the respective problem. This problem-oriented view allows the clinician to quickly see the patient’s problems and what has been done thus far.

Problem Lists usually have an onset date, indicate Chronic or Acute, and show whether or not the problem is active. Problems are removed from the list or set inactive once the patient is “cured” or the problem is “resolved.” Some problems have a natural period of time in which they normally resolve themselves. These problems are called Acute Self-Limiting.

In some systems, Problem Lists can include findings that are not disease related but are, rather, wellness conditions. Wellness conditions are based on the age and sex of the patient and used in health maintenance and preventative screening programs to keep healthy patients healthy. Both disease conditions and wellness conditions have activities that are typically performed for patients with that condition, including:

◆ an annual EKG for a person with congestive heart failure
◆ a quarterly blood sugar test for a patient with diabetes
◆ a mammogram for a healthy woman over 35
◆ immunizations for a healthy infant

These recommendations can be driven by the data in the Problem List. An example of a health maintenance preventive screening program was discussed in Chapter 2.

In many EHR systems, a problem is added to the Problem List either manually or automatically from the assessment in the encounter note. Some clinicians prefer to add the problems manually so that diagnoses for “possible” and “rule-out” conditions do not appear on the Problem List until the diagnosis is confirmed. Manually adding a problem to the Problem List is especially useful when the problem is being treated by a specialist at another office, but the clinician wants to remain aware of the condition. It is also possible to manually add findings to the Problem List that would normally be in other sections of the narrative, such as Past Medical History or Symptoms.

Guided Exercise 44: Exploring Patient Management

The Patient Management tab in the Student Edition software is used to manage a patient’s problems over time. It presents a clinical summary view of the patient’s
previous visits. The view presents historical data that is obtained from findings recorded in past encounters. The view can be updated from the current encounter or, conversely, the encounter note for the current visit can be created using data from Patient Management.

In this exercise you are going to start a new encounter but the system will automatically retrieve and display information from previous encounters. For the first exercise, you are just going to become familiar with the Patient Management features of the software. In the subsequent exercise you will learn to cite information from previous encounters into the current encounter note.

Case Study
Juan Garcia, an outpatient who has been treated, previously, is returning for a follow-up visit.

Step 1
If you have not already done so, start the Student Edition software.

Click Select on the Menu bar, and then click Patient.

In the Patient Selection window, locate and click on Juan Garcia, as shown in Figure 7-1.

Figure 7-1 Selecting Juan Garcia from the Patient Selection window.

Make certain you set the date and time correctly for this exercise. If you need help, review Chapter 3, Guided Exercise 13.

Step 2
Click Select on the Menu bar, and then click New Encounter.

Select the date May 21, 2012, the time 9:00 AM, and the reason Office Visit.

Compare your screen to Figure 7-2. Make certain the date and time match before clicking on the OK button.

Step 3
Enter the Chief complaint by locating the button in the Toolbar labeled “Chief” and clicking on it.

In the dialog window, type “Knee injury follow-up.”

Figure 7-2 New encounter for an office visit, May 21, 2012 9:00 AM.
Compare your screen to Figure 7-3 before clicking on the button labeled “Close the note form.”

**Step 4**

Locate and click on the tab labeled “Manage” at the bottom of your screen. It is circled in red in Figure 7-4.

Compare your screen to Figure 7-4. The Medcin Nomenclature normally displayed in the left pane of your screen has been replaced by an information window displaying information from previous encounters.

When you are on the Manage tab, the Toolbar (at the top of the screen) has some additional buttons.

Locate and click on the button in the Toolbar labeled “Details.” This action allows you to see more of Patient Management by hiding the Entry Details section at the bottom of the screen. The Entry Details section can be restored when it is hidden by clicking the Details button again.

Look at the left pane of your screen. Note that the pane contains nine tabs:

- Problems (The Patient Management feature opens on the Problem List tab.)
- Care Plan
- Medications
- Vaccines
- Allergies
In the following steps, you will examine each tab.

**Step 5**

The Manage tab opens on the Problem List tab (circled in red in Figure 7-5). The Problem List includes a view of both active and inactive problems, as well as nursing assessments. This example has two active problems.

Compare your screen to Figure 7-5. Within the Problem List, there are three columns: Tests, Medications, and Procedures/Other. The most recent active findings (from the Tx and Rx sections of previous encounters) are listed in these columns for each problem.

If tests have been ordered, they appear in the first column. If a test has results, the name of the test is displayed in bold. Any medications prescribed for the problem appear in the second column. The last column lists any other orders or procedures from past encounters related to this problem.

The clinician also can focus on a particular problem by closing the others. A small plus or small minus sign next to a problem description allows you to open and close the details of the problem in the same way you expand or contract the tree structure when browsing the Nomenclature List. You will work more with the Problem List in the next exercise.

**Step 6**

Locate and click on the tab labeled “Care Plan” in the information pane on the left of your screen.

The Care Plan tab displays each problem, followed by the date of each encounter that the patient was seen for that problem. Small plus signs next to the encounter allow you to expand the encounter to display the Care Plan for that date.

Click on the plus sign beside each encounter date. Compare your screen with Figure 7-6.

Findings from the Plan section of the encounter note are displayed beneath the encounter date; however, findings from any group can be manually added to the Care Plan.

**Step 7**

Locate and click on the tab labeled “Medications” in the information pane on the left of your screen. Compare your screen to Figure 7-7.
The Medications tab provides a traditional medications list. Although the two previous tabs (Problem and Care Plan) listed the medications ordered for each problem, the Medications tab displays all medications ordered by any clinician in the practice as well as those reported by the patient.

**Step 8**
Locate and click on the tab labeled “Vaccines” in the information pane on the left of your screen. Compare your screen to Figure 7-8.

The tab displays the patient’s history of vaccines. Note that vaccines also appear in the Medications list; these are not duplicate findings. The software deliberately shows vaccines in both lists.

**Step 9**
Locate and click on the tab labeled “Allergies” in the information pane on the left of your screen. Compare your screen to Figure 7-9.

The tab displays any allergy information from any of the patient encounters. In this case, the pertinent fact is that the patient reported “No allergies.”

Before writing a prescription, a provider would check both the Medications and Allergies tabs. Most electronic prescription systems also check allergy data automatically at the time the prescription is written. Drug utilization review was discussed in Chapter 2 and Chapter 6.

**Step 10**
Locate and click on the tab labeled “Med/Surg” in the information pane on the left of your screen. Compare your screen to Figure 7-10. Note that the tabs in the left pane are arranged in two rows; when you click any tab in the upper row, the entire row moves down. The tab for the data currently displayed in the left pane is always in the (bottom) row of tabs closest to the grid.

“Med/Surg” stands for Medical and Surgical History and displays all findings that have been recorded in the Past History section of previous encounters. The date column displays the date the finding was recorded.
Step 11
Locate and click on the tab labeled “Family History” in the information pane on the left of your screen. Compare your screen to Figure 7-11.

The tab displays all findings that have been recorded in the Family History section of previous encounters. The date column displays the date that the finding was recorded.

Step 12
Locate and click on the tab labeled “Social History” in the information pane on the left of your screen. Compare your screen to Figure 7-12.

The tab displays all findings that have been recorded in the Social History section of previous encounters. The date column displays the date that the finding was recorded.

Step 13
Locate and click on the tab labeled “Vitals” in the information pane on the left of your screen. Compare your screen to Figure 7-13.

The tab displays the Vital Signs findings that have been recorded in multiple encounters.

Step 14
In each of the tabs the data can be sorted. This is done by clicking on the labels over the columns of data. For example:

Locate and click on the column labeled “Temp” within the Vitals tab. Compare the Vitals tab on your screen with Figure 7-14. You will notice that the rows of vital signs data changed places and the date that Juan had a temperature of 101°F is now the top row. When sorting, the entire row stays together. To restore the Vitals tab to its original order, click on the column labeled “Date.”
This example used the Vitals tab, but the data in any tab of Patient Management can be sorted by clicking on the column labels.

*If there is not enough class time remaining to complete the next exercise, you may stop at this point. You do not need to print the encounter.*

**Citing Previous Visits from Problem Lists**

Patient Management is an excellent tool for reviewing information from the patient’s previous encounters without having to open and read each one individually. Presenting the information in a “problem-oriented” view and having the previous findings at hand enables the clinician to quickly record the reexamination of each area examined during the previous visits. Patient Management is much more than just a review tool; it also is a very efficient method of documenting a follow-up exam.

In an EHR, citing from a previous encounter note means to bring a finding into the current encounter, usually as a follow-up to a previous visit.

### Guided Exercise 45: Following Up on a Problem

You will recall from a previous chapter that the mouse typically has at least two buttons, a left button and a right button. In this exercise, when instructed, you are going to be using the right button on the mouse as well as the left button.

**Case Study**

Juan Garcia has returned for a follow-up on his previous knee injury. Using Patient Management, you will see how easy it is to document this type of visit.

**Step 1**

If you are continuing from the previous exercise, proceed to step 4. Otherwise, start the Student Edition software.

From the Select Menu, click Patient, and from the Patient Selector window select **Juan Garcia** (see Figure 7-1).

**Step 2**

From the Select Menu, click New Encounter. Use the date **May 21, 2012, the time 9:00 AM**, and the reason **Office Visit**.

Make certain the date and time match before clicking on the OK button (see Figure 7-2).

**Step 3**

Enter the Chief complaint by locating the button in the Toolbar labeled “Chief” and clicking on it.
In the dialog window, type “**Knee injury follow-up**.”

When it is correct, click on the button labeled “Close the note form” (see Figure 7-3).

![Figure 7-15 Vital Signs form for Juan Garcia.](image)

**Step 4**

Enter Juan Garcia’s vital signs using the Vitals Form in the corresponding fields as follows:

- Temperature: 97
- Respiration: 17
- Pulse: 68
- BP: 120/86
- Height: 68
- Weight: 149

When you have finished, compare your screen to Figure 7-15. If it is correct, click on the tab labeled Manage at the bottom of the window. (If you have difficulty locating Manage, refer to Figure 7-4.)

**Step 5**

Verify that you are on the Manage tab.

If the information pane on the left of your screen is not already displaying the Problem List, click on the tab labeled “Problem List” (circled in red in Figure 7-5).
If the Entry Details section is currently covering the bottom of your screen, locate the button labeled “Details” in the Toolbar at the top of your screen and click it until the Entry Details section is hidden.

Position the mouse pointer over the first problem, “Sprained anterior cruciate ligament of the knee,” and click the Right button on your mouse. A drop-down list will be displayed, as shown in Figure 7-16.

If the drop-down list does not match the list shown in Figure 7-16, your mouse was not positioned correctly on the problem description. Reposition your mouse and click the Right mouse button again.

Without clicking on any of the options, study the options on the drop-down list. Most of these options are used to cite updated findings into the new encounter. Do not select any option until directed to do so. The following is a brief explanation of each option in the drop-down list:

**Edit Problem Note:** Allows you to edit a free-text note that is attached to the problem.

The next 11 options are used to record the status of the problem. Selecting any of the following items from the drop-down list will add a new finding to today’s encounter. The finding will have a status set with one of the following:

- **Expanding**
- **Failing to Change as Expected**
- **Improving**
- **Inadequately Controlled**
Mildly Exacerbated
Resolved
Resolving
Severely Exacerbated
Unchanged
Well Controlled
Worsening

The remaining options allow the clinician to take multiple actions quickly. They are as follows:

**Clear This Problem:** Clears all test orders, discontinues medications related to the problem, clears therapy orders, and sets the problem as inactive.

**Quick H&P:** This option invokes a data entry window that lists symptoms, history, and physical findings as they appeared in the most recent encounter for this problem. The clinician can quickly review the last History and Physical (H&P) taken for this problem and update the new encounter with any findings in the Quick H&P window. The Quick H&P window will be shown in the next step.

**Order a Test:** This option is provided to allow the clinician to order a new test for this problem. When the option is selected, the right pane will temporarily display a list of tests you would normally see in Tx tab. When the Tx list is displayed, you can order directly from the list in the right pane.

**Order a Medication:** This option is provided to allow the clinician to order a new medication for this problem. When the option is selected, the right pane will temporarily display the Rx list of medications. When the Rx list is displayed, you can order directly from the list in the right pane. If the drug selected requires a prescription, the prescription writer will be invoked automatically.

**Order a Therapy:** This option is provided to allow the clinician to quickly order any type of therapy other than medications. As with the previous two options, a list of therapies will temporarily display in the right pane. You can order directly from the displayed list.

**Ignore Action:** This option cancels the drop-down list without recording anything. You also can cancel the drop-down list by clicking anywhere else on the screen.

**Step 6**

Locate and click on the Quick H&P option in the drop-down list (shown highlighted in Figure 7-16). The Quick History and Physical window will be invoked.

Compare your screen to Figure 7-17. The window displays findings from the previous exam for this condition.

Using the findings in the list, the clinician can be certain to update anything that was observed in the previous visit. Items that have already been entered in today’s encounter appear on the Quick H&P list in gray. Examples in this exercise include Chief complaint and Vital Signs.
The patient reports that his knee is better. Locate and click on the following findings (you will need to scroll the window to get them all):

- (blue button) Left knee joint pain
- (blue button) Left knee joint swelling
- (blue button) Taking antibiotics
- (blue button) Localized swelling of the left knee
- (blue button) Warmth of the left knee
- (blue button) Pain was elicited by motion of the left knee

Important—do not click every finding that is listed. Click only those indicated above.

**Step 7**

Compare your screen to Figure 7-18. Scroll the window and verify that you have selected only the items listed in step 6. If you find an error, click on the button labeled “Cancel,” and repeat steps 5 and 6.

When all the findings have been selected correctly, click on the button labeled “Post To Encounter.”
Step 8
The findings you selected in the Quick H&P window should now be displayed in the patient encounter note (as shown in the right pane of Figure 7-19).

The problem is resolved. To indicate this in today’s encounter note, position the mouse over the first problem, “Sprained anterior cruciate ligament of the right knee,” and click the Right button on your mouse. Again the drop-down list will be displayed, as shown in Figure 7-19.

Locate and click on the option labeled “Resolved.” The window shown in Figure 7-20 will be invoked.

Step 9
When a problem is resolved, there are certain actions the clinician may want to take: canceling previous orders, discontinuing any medications, or setting the problem as inactive. The Resolved option invokes a window of all active orders related to the problem and sets appropriate default actions.

A check box next to each item indicates that you wish to take the action indicated. A drop-down list of possible actions is available for each order, as shown in Figure 7-20. You can use the list to select a different action or you can indicate that no action is to be taken by unchecking the box.

Do not make any changes to the default list. When you have reviewed the list, locate and click the button labeled “Take All Actions That Are Checked.”

Step 10
The knee problem in the left pane has moved to the section labeled “Inactive Problems.” If it is not currently displayed, locate and click the small plus sign next to “Inactive Problems.”
Compare your screen with Figure 7-21. Note in the right pane that the previous therapy orders have been canceled.

**Step 11**

The Problem List also listed a second problem, acute sinusitis, for which the patient was recently treated. The patient reports that his sinusitis has cleared up and that he has finished the prescribed course of antibiotics. Using what you have learned in the previous steps, resolve the acute sinusitis problem.
Position your mouse pointer on the active problem, “Acute sinusitis.” Click the Right button on the mouse and select Resolved from the options on the drop-down list. The action confirmation list window (shown in Figure 7-22) will be invoked.

**Step 12**

Because the patient has reported taking all the amoxicillin, there is no reason to discontinue the order. Locate and click on the down arrow next to “Cancel” and select “Clear This Therapy” from the drop-down list as shown in Figure 7-22.

Click on the button labeled “Take All Actions That Are Checked.”

When you have completed this step, you will notice that both problems are now in the inactive problem list.

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**Alert**

**Do not close or exit the encounter until you have a printed copy in your hand. You will lose your work if you exit before printing.**

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**Figure 7-23** Check mark next to Problem List in Print Data window.

**Step 13**

Remain on the Manage tab. Click on the Print button on the Toolbar at the top of your screen to invoke the Print Data window.

Be certain there is a check mark in the box next to “Current Encounter” and also put a check mark in the box next to “Problem List” as shown in Figure 7-23.
Click on the appropriate button to either print or export a file, as directed by your instructor.

Juan Garcia

Student: your name or id here
Patient: Juan Garcia: M: 7/31/1984: 5/21/2012 09:00AM

Chief complaint
The Chief Complaint is: Knee injury follow-up.

History of present illness
Juan Garcia is a 27 year old male.
He reported: No left knee joint pain and no left knee joint swelling.

Past medical/surgical history
Reported History:
Medical: A recent URI.
Medications: Not taking antibiotics.
Physical Trauma: Trauma to the knee due to twisting.

Physical findings

Vital Signs:

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral temperature</td>
<td>97 F</td>
<td>97.6 - 99.6</td>
</tr>
<tr>
<td>RR</td>
<td>17 breaths/min</td>
<td>18 - 26</td>
</tr>
<tr>
<td>PR</td>
<td>68 bpm</td>
<td>50 - 100</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>120/86 mmHg</td>
<td>100-120/60-80</td>
</tr>
<tr>
<td>Weight</td>
<td>149 lbs</td>
<td>125 - 225</td>
</tr>
<tr>
<td>Height</td>
<td>68 in</td>
<td>65.35 - 74.02</td>
</tr>
</tbody>
</table>

Ears:
General/bilateral:
* Ears: normal.

Nose:
General/bilateral:

Sinus Tenderness:
* Tenderness of sinuses.

Pharynx:
* Normal.

Lymph Nodes:
* Normal.

Lungs:
* Normal.

Musculoskeletal System:
Knee:
Left Knee:
* Examined. * No localized swelling. * No warmth. * Motion was normal.
* No pain was elicited by motion.

Neurological:
Motor (Motor Strength):
* No weakness of the left knee was observed.

Assessment
* Acute sinusitis which is resolved
* Sprained anterior cruciate ligament of the left knee which is resolved

Therapy
* Order cancelled for cool mist vaporizer.
* Order cancelled for reduced physical activity.
* Order cancelled for acetaminophen.
* Order cancelled for ice.
* Order cancelled for Ace bandage.

Allergies
No allergies.

Figure 7-24a Printed encounter note for Juan Garcia (page 1 of 2).
Compare your printout or file output to Figures 7-24a and 7-24b. If it is correct, hand it in to your instructor. If there are any differences, review the previous steps in the exercise and find your error.

### Orders and Results Management

You will recall from Chapter 1 that Results Management was one of the eight criteria for an EHR in the IOM report. Orders are tracked in an EHR from the moment they are entered in the system. In Chapter 6 we discussed one of the benefits of CPOE systems is that they keep track of what has been ordered for each patient. Benefits of CPOE order tracking include:

- Preventing lost orders.
- Preventing duplicate orders.
- Detecting when a patient sent to an outside lab has failed to show up.

Benefits of results tracking include:

- Notifying the provider as soon as “preliminary” results are available.
- Notifying the provider anytime results status are updated to “final” or “corrected.”
- Keeping track of which results need to be reviewed by the clinician.

As you will see in subsequent exercises, the benefits of having test results available to the provider during the patient encounter include the ability to graph or “trend” the results. Another benefit is the ability to review results online and to quickly order subsequent or additional tests when it is warranted.

The Student Edition software does not contain an electronic laboratory order and result system. It would be inappropriate to order tests from a classroom.

<table>
<thead>
<tr>
<th>Problem List</th>
<th>Tests</th>
<th>Medications</th>
<th>Procedures/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inactive Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprained anterior cruciate ligament of the left knee which is resolved</td>
<td>Order cancelled for acetaminophen 5/21/2012</td>
<td>Order cancelled for reduced physical activity 5/21/2012</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Order cancelled for ice 5/21/2012</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Order cancelled for Ace bandage 5/21/2012</td>
<td></td>
</tr>
<tr>
<td>Acute sinusitis which is resolved</td>
<td>A sinus culture for bacteria was positive 5/7/2012</td>
<td>Order cancelled for cool mist vaporizer 5/21/2012</td>
<td></td>
</tr>
</tbody>
</table>
Because the Student Edition does not contain the electronic lab interface, the following two exercises have been created solely to demonstrate how useful it is to have lab data at hand while seeing the patient. The features you will find in commercial EHR software automate the lab order/result workflow differently and more elegantly than these simple exercises.

**Guided Exercise 46: Viewing Pending Orders and Lab Results**

**Case Study**

In Guided Exercise 42 this patient’s mother reported the possible exposure to lead-based paints while remodeling their older home. You will recall her treatment plan recommended screening other family members. The clinician has since ordered tests for her son Stanley and he has already visited the lab before his appointment. Today is his office visit for examination and to review the test results.

**Step 1**

If you have not already done so, start the Student Edition software.

Click Select on the Menu bar, and then click Patient.

In the Patient Selection window, locate and click on **Stanley Zabroski** as shown in Figure 7-25.

![Figure 7-25 Selecting Stanley Zabroski from the Patient Selection Window.](image)

**Alert**

Make certain you set the date and time correctly for this exercise. If you need help, review Chapter 3, Guided Exercise 13.

**Step 2**

Click Select on the Menu bar, and then click New Encounter.

Select the date **May 22, 2012**, the time **4:00 PM**, and the reason **Office Visit**.

Compare your screen to Figure 7-26. Make certain the date and time match before clicking on the OK button.

![Figure 7-26 New encounter for an office visit, May 22, 2012 4:00 PM.](image)
Step 3
Enter the Chief complaint by locating the button in the toolbar labeled “Chief” and clicking on it.

In the dialog window that will open, type “Rule out lead poisoning.”

Compare your screen to Figure 7-27 before clicking on the button labeled “Close the note form.”

Step 4
Enter the patient’s Vital Signs using the Vitals Form. Vital Signs for Stanley Zabroski are as follows:

- Temperature: 98.6
- Respiration: 20
- Pulse: 76
- BP: 120/80
- Height: 73
- Weight: 155

When you have finished, compare your screen to Figure 7-28. If it is correct, click on the tab labeled Encounter at the bottom of the window.
Step 5
Click on the Dx Tab.

Click on the button labeled “Search” on the Toolbar near the top of the screen. (The Search button icon resembles a small pair of binoculars.) The Search String window will be invoked.

Enter the search string “Lead poisoning” and click on the button labeled “Search” in the window, as shown in Figure 7-29.

Step 6
Click on the Dx tab.

Locate and highlight the finding “POISONING HEAVY METALS LEAD.”

Click on the List Size button until the list size is 1.

Compare your screen to Figure 7-30, and then click on the button labeled “Prompt” on the Toolbar near the top of the screen.

Step 7
Click on the Sx tab.

Verify that List Size is set to 1.

Click on the button labeled “ROS” on the Toolbar near the top of the screen.
Click on the button labeled “Negs” (Auto Negative) on the Toolbar near the top of the screen.

Compare your screen to Figure 7-31.

Figure 7-31 Symptoms for Heavy Metal Poisoning Lead.

Figure 7-32 History for Heavy Metal Poisoning Lead.
Step 8
Click on the Hx tab. Locate and click on the following finding:

- (red button) house has peeling paint which is lead based

Compare your screen to Figure 7-32.

![Figure 7-32 Physical Exam for Heavy Metal Poisoning Lead.](image)

Step 9
Click on the Px tab. Locate and click on the following finding:

- (blue button) Gums gingival line

Compare your screen to Figure 7-33.

Step 10
As discussed at the beginning of the exercise, the patient has had several lab tests performed before the office visit. The results were within normal limits. The clinician will review results of the tests and document them in the encounter note.

Click on the Tx tab. Locate and click on the following finding:

- (blue button) CBC with differential
- (blue button) Serum Lead Level
- (blue button) Urine Lead, 24 hr
Compare your screen to Figure 7-34. If it is correct, click on the tab labeled "Manage" at the bottom of the window.

Figure 7-35 Patient Management—Pending Orders window.
Step 11

Your screen should display the Problem List. If the information pane on the left of your screen is not already displaying the Problem List, click on the tab labeled “Problem List.”

If the Entry Details pane is covering part of your list, locate and click on the button labeled “Details” in the Toolbar at the top of your screen.

Knowing which orders are still pending results is especially useful in offices in which multiple clinicians share patients, because it prevents duplicate orders. A nurse practitioner can see what orders are outstanding on a patient, including those ordered by another provider.

Click Select on the Menu bar, and then click **Pending Orders**. A window of pending orders will be displayed.

Compare the window in your screen labeled “Pending Orders for Stanley Zabroski” to Figure 7-35. This window contains a list of tests that have been ordered but for which results have not yet been entered.

Close the window by clicking on the Cancel button. Note: If you click OK by mistake, you will invoke a results entry window. Simply click the Cancel button in that window, and proceed to the next step.

![Figure 7-36 Right-click menu: “Shows Results” invokes window of ordered CBC results.](image)

Step 12

From the Manage tab, you also can see the results of any tests that have been entered. As we discussed earlier, EHR systems can receive results from the lab electronically and merge them directly into the patient’s chart. Typically, the ordering provider is notified that results are ready for review.
Look at the Problem List in the left pane of your screen, under the test column.

Test names that are in bold type in the list indicate those that have results in the system.

Position the mouse over the test labeled “Ordered CBC” and click the Right button on your mouse. A drop-down list will be displayed.

If the drop-down list does not match the list shown in Figure 7-36, your mouse was not positioned correctly on the test. Reposition your mouse and click the right mouse button again.

Locate the option to Show Results and click the left mouse button. A window displaying the “Results for Ordered CBC” will be displayed, as shown in Figure 7-36.

The clinician can review the actual test results. Click the Cancel button to close the results window.

**Step 13**

You will recall that tests displayed in the Pending Orders window (shown in Figure 7-35) did not yet have results. This fact can be easily noted in the encounter note using Patient Management.

Position the mouse over the test labeled “Ordered Basic Metabolic Panel” and click the Right button on your mouse. A drop-down list will be displayed. Without clicking on any of the options, look at the list that is displayed. In addition to the “Show Results” option, used in the previous step, the drop-down list options include the ability to reorder a test, order additional follow-up tests, or enter the status of a test into the current encounter.

Locate and highlight the option “Results Pending” in the drop-down list (as shown in Figure 7-37) and click the left mouse button. This will record a finding into the exam narrative that the test results are pending.

**Step 14**

Locate and click on the Encounter tab at the bottom of your screen.

Click on the Dx tab (which has now returned to the full list of findings).

Again, click on the Search button in the Toolbar at the top of your screen.

The Search String window will be invoked and should still contain the words “lead poisoning.” If it does not, type them again.

Click on the button in the window labeled “Search.” (If you need help, refer to Figure 7-29.)
When the list of diagnoses is displayed, locate and highlight the finding “POISONING HEAVY METALS LEAD.” (If you need help, refer to Figure 7-30.)

In the Entry Details section at the bottom of your screen, locate the Status Field and click on the down arrow button in it.

Scroll the drop-down list that is displayed to locate and click on “ruled out” as shown in Figure 7-38.

**Alert**

Do not close or exit the encounter until you have a printed copy in your hand. You will lose your work if you exit before printing.

**Step 15**

Click on the Print button on the Toolbar at the top of your screen to invoke the Print Data window.

Be certain there is a check mark in the box next to “Current Encounter” and then click on the appropriate button to either print or export a file, as directed by your instructor.
Compare your printout or file output to Figure 7-39. If it is correct, hand it in to your instructor. If there are any differences, review the previous steps in the exercise and find your error.
By Henry Palmer, M.D.

Henry Palmer, M.D., specializes in internal medicine and is affiliated with Rush University Medical Center.

I am a physician practicing at two locations, neither of which is where my EHR computer is located. I have computers in the exam rooms and I am documenting with the patients, but the data is going over the Internet into the servers in real time.

Rush University Medical Center, like other large institutions, had many different computer systems in its departments. Trying to unite all these legacy systems was very difficult, but the center wanted to be able to access all the information relatively easily from one system. Rush has a CDR, or clinical data repository, which stores the data from various legacy systems. For example, the clinical notes section includes all of the radiology, ultrasound, stress testing, cardiology, and operative reports; these are transcribed reports, all text based.

Lab results, however, come in as data. The results are imported automatically. You can set how far back in time you want to default your view of them. This is very handy because you are able to see the trends. You can also graph it. You can rearrange the view to see your results horizontally or vertically.

The CDR has demographic information for the patient, of course, and helpful information about admission and discharge. Let us say I want to look at the admission from two months ago. I can highlight it and find out who the providers were for that admission, the insurance information for that admission, as well as the diagnosis.

Rush also has an order entry system. When I sign in, it automatically shows if I have a patient who is in the hospital. This is handy, particularly in the case of primary care physicians, because sometimes your patients get admitted without your knowledge. A patient may get admitted into the surgical service and you might never be called.

The order entry screen first shows if there are any orders approaching expiration. It also asks me to authenticate any verbal orders I had given over the phone, but had not yet countersigned.

I can pull up a patient and view results through the order system. I can look at results in different ways—results for the last five days, all the results since admission, or just the ones that were critical. I can see details about particular results, the normal ranges, and some additional information about how to interpret those results.

When I write a medication order, it goes electronically to the pharmacy. The order system will also provide alerts to drug interactions or areas of concern the hospital has identified with the drug. When ordering potassium, for example, the system would advise me that it should only be given in a certain quantity if the patient is on certain medications that tend to increase potassium levels anyway.

It is easy to order labs by just clicking one box. I can also order a consult. CPOE works. It is not perfect, but in a large institution like this it has to work or it would not be used.

Our PAC system eliminates the need to have to go down to radiology to see x-rays. On the average workstation I can view the images of the patients’ x-rays with reasonable definition. If I want really fine detail, I can go to any of the high-definition monitors that are scattered around the hospital. I can also display the radiologist’s report. Reading the report will guide me toward the areas of concern.

Additionally, we use an electronic signature program for signing off on charts. Basically this brings up the document, allowing me to edit it and finalize my signature. I can also indicate which doctors I want to receive copies of my document. The system will then automatically fax them to the doctors involved with the patient care.
Decision support includes access to the Rush medical library from inside our system. I enter my search term and it will retrieve an index of the article. I can go directly to what I want to read, for example, the treatment or the diagnostic approach to the disease.

One of the challenges as a primary care physician is that my patients search the Internet. They will often come in with research in hand and ask some very cogent questions. I think the downside can be that people assume because they have read it on the Internet that it applies to them or that they know what to do with the information—and that is not always the case.

The biggest problem I see in health information technology today is the segregation of records, particularly between inpatient and outpatient systems. When patients are admitted, their outpatient records are not there. Synchronizing those, I think, would be a big step forward and also eliminate redundancy in testing.

Trending

One important service that clinicians want to perform for their patients is “trending,” which is comparing the change of certain test components or measurements over a period of time. In Chapter 1 the IOM identified this as one of the functional benefits derived from an EHR.

In a paper chart, the trend is observed by paging through past tests, locating the desired component on each report, and making a mental comparison. However, when the lab results or other measurements are stored as data in the EHR, the computer can instantly find all instances of any component the clinician wishes to compare.

Additionally, with computerized data, graphs and charts can be easily created for any finding that has numerical results. This provides the clinician with a quick picture of the changes over time. Not only are graphs useful to the clinician, but they also provide an excellent means of clarification when counseling patients or for patient education.

Using Graphs to View Trends of Lab Results

Chapter 2 discussed the advantages of EHR records with codified results as opposed to EHR records that are scanned images of printed reports. Nowhere is that more evident than with lab result reports.

An EHR system can graph any component of a lab test that has numerical values. However, to create a meaningful graph, the test must have been performed multiple times.

Guided Exercise 47: Graphing Lab Results

In the next exercise you will learn to graph a specific lab test by locating it using the search tool. You will also learn to retrieve an existing encounter.

Case Study

Guy Daniels has been seen at the clinic for several years. He has hypertension, Type II diabetes, and a weight problem. He is scheduled for a clinic visit tomorrow and his pre-visit lab work has been received from the lab. You have been asked to generate two graphs to be used for patient education.
Step 1
If you have not already done so, start the Student Edition software.

Click Select on the Menu bar, and then click Patient.

In the Patient Selection window, locate and click on Guy Daniels, as shown in Figure 7-40.

Step 2
In this exercise you will use a new feature you have not used before; you are going to retrieve and work with an encounter already in progress.

Click Select on the Menu bar, and then click Existing Encounter.

A small window of previous encounters will be displayed.

Compare your screen to the window in the center of Figure 7-41.

Position your mouse pointer on the first encounter in the list, dated 5/23/2012 1:35 PM (as shown in Figure 7-41) and click on it.

Because this is the first time that you have retrieved an existing encounter, take a moment to look at the encounter note in the right pane of your screen. This encounter is simply the result record of a number of tests that were ordered before Mr. Daniel’s scheduled visit. It is not uncommon for patients to have lab work done ahead of their clinic visit so that the results will be ready when the doctor or nurse practitioner sees them. While having his blood drawn, Mr. Daniels felt faint, so the nurse took his blood pressure and recorded it in the chart.
Step 3
Click on the Tx Tab.

Click on the button labeled “Search” on the Toolbar near the top of the screen. The Search String window will be invoked.

Type the search string “Creatinine” and click on the button in the window labeled “Search” as shown in Figure 7-42.
Step 4
Your left pane should automatically be on the Tx tab.

Locate and highlight the finding of Serum Creatinine (as shown in Figure 7-43).

Click Graph on the Menu bar, and then click “Current Finding” from the drop-down list

The Medcin Graph window will be invoked.

![Graph of Guy Daniel’s serum creatinine.]

Step 5
The software will find and graph Mr. Daniel’s creatinine over the last four tests. Compare your screen to Figure 7-44.

This example shows the increase in creatinine level. Similar graphs could have been created for any of the lab results that have numeric values for their results.

Step 6
The Graph window has two buttons in the upper left corner that are identical in appearance and purpose to the corresponding buttons on the Student Edition Toolbar. The first button is Exit, which closes the graph window. The second button is the Print button, which prints your graph.
Locate and click on the Print button (circled in Figure 7-45) in the upper left corner of the graph window to invoke the Print Data window.

In the left column of the Print Data window where you normally see a check box for Current Encounter, you will see a check box with the name of the graph. Click your mouse in the check box next to Serum Creatinine and then click on the appropriate button to either print or export a file, as directed by your instructor.

When your graph has printed successfully, click on the Exit button in the window displaying the Serum Creatinine graph.

Do not close or exit the Student Edition software until you have completed the next exercise.

Guided Exercise 48: Graphing Vital Signs in the Chart

As previously stated, any finding with a numeric value can be graphed. For example, vital signs are recorded at every encounter. A chart of the patient’s blood pressure and weight measurements could be used for patient education and might stimulate the patient to keep his own chart at home.

Step 7

In the right pane, the encounter note, locate and click on the vital sign Blood Pressure as shown in Figure 7-46.
Step 8
Click the word “Graph” on the Menu bar, and then click “Current Finding” on the list of menu options, as you did in the previous exercise.

Step 9
The software will find and graph Guy’s blood pressure over the last four visits. Compare your screen to Figure 7-47. The blue line is his systolic blood pressure.
readings and the green line is his diastolic readings, as noted in the graph legend, SBP and DPB, respectively.

Locate and click on the Print button in the upper left corner of the graph window to invoke the Print Data window, as you did in the previous exercise.

Be certain there is a check in the box next to Blood Pressure and then click on the appropriate button to either print or export a file, as directed by your instructor.

When your graph has printed successfully, click on the exit button in the window displaying the graph.

**Step 10**

For some vital signs it is not necessary to locate the finding to generate a graph. Several popular measurements are always available for graphing. In this example the nurse wants to print a graph of the patient’s weight to use for weight counseling.

Click the word “Graph” on the Menu bar, and then click “Weight” on the list of menu options (as shown in Figure 7-48).
Step 11

Compare your screen to Figure 7-49.

A graph of the patient’s weight measurements from previous visits is instantly displayed. You do not have to select a finding or even load an existing encounter. The graph menu allows the clinician to instantly create graphs of several key measurements without having to locate a specific finding.

Step 12

Locate and click on the Print button in the upper left corner of the graph window to invoke the Print Data window.

Locate the check box for Weight, in the left column and click on it.

Locate and click on the appropriate button to either print or export a file, as directed by your instructor. When your graph has printed successfully, click on the exit button in the window displaying the Weight graph.

Hand your graphs in to your instructor.

Visual Aides to Engage Patients in Their Own Healthcare

Patients must become involved in their own healthcare to effectively manage and prevent diseases. A chart of the patient’s weight measurements and graphs of key indicators such as cholesterol and blood glucose levels can be effective visual aides for patient education and may help to stimulate compliance with health regimens.

Critical Thinking Exercise 49: Graphing Total Cholesterol and Weight

Case Study

The clinic has been helping Sally Sutherland monitor her cholesterol by testing her at each annual exam. In this exercise, you are going to create a graph of Sally’s total cholesterol and her weight. You will not enter any new data.

Step 1

If you are continuing from the previous exercise, proceed to select the patient, otherwise start the Student Edition software.

Click Select on the Menu bar, and then click Patient.

In the Patient Selection window, locate and click on Sally Sutherland.

You do not have to set the date or time.

Step 2

Click the word “Graph” on the Menu bar, and then click “Weight” on the list of menu options.

Step 3

Locate and click on the Print button in the upper left corner of the graph window to invoke the Print Data window.
Locate the check box for Weight in the left column and click on it.

Locate and click on the appropriate button to either print or export a file, as directed by your instructor. When your graph has printed successfully, click on the exit button in the window displaying the Weight graph.

Click on the Exit button in the window displaying the weight graph.

**Step 4**
Locate and click the button labeled “Search” on the Toolbar to invoke the Search String window. Type the words “**Total Cholesterol**” in the Search String window and click on the Search button.

**Step 5**
Verify you are on the Tx tab.

Locate and highlight the finding of Total Cholesterol.

Click Graph on the Menu bar, and then click “Current Finding” from the drop-down list.

The Graph window will be invoked, displaying a graph of Sally’s Total Cholesterol test results over the last four years.

**Step 6**
Locate and click on the Print button in the upper left corner of the graph window to invoke the Print Data window.

Locate the check box for Total Cholesterol in the left column and click on it.

Locate and click on the appropriate button to either print or export a file, as directed by your instructor. When your graph has printed successfully, click on the Exit button in the window displaying the Total Cholesterol graph.

Hand your graphs in to your instructor.

**Chapter Seven Summary**

This chapter explored the Patient Management feature to demonstrate the way an EHR can organize information from past encounters. Patient Management has the following tabs:

**Problems**—Problem lists and problem-oriented views of the chart organize the data by problem and encounter date.

Problem lists provide an up-to-date list of the diagnoses and conditions that affect that particular patient’s care. Problem lists track both acute and chronic conditions. Problems are removed from the list or set inactive once the patient is “cured” or the problem is “resolved.” Problems that normally resolve themselves over a short period of time are called “Acute Self-Limiting.” The status of the problem is updated at each visit.
The following are typical of the types of status assigned to active problems:

- Resolved
- Resolving
- Improving
- Well controlled
- Unchanged
- Inadequately controlled
- Mildly exacerbated
- Failing to change as expected
- Expanding
- Worsening
- Severely exacerbated

**Care Plan**—Provides a quick review of the plan from each previous encounter. It is organized by problem and encounter date for which the patient was seen for that problem. Clicking on the encounter reveals the findings recorded in the plan for that visit.

**Medications**—Keeps track of what medications the patient is currently taking. The Medications list is always reviewed before writing new prescriptions.

**Vaccines**—Lists the patient’s immunizations that have been administered at the clinic.

**Allergies**—Lists food, drug, and other allergies the patient may have. This information is reviewed before writing a prescription.

**Past Medical/Surgical History**—Lists past history items recorded in the EHR during all previous encounters.

**Family History**—Lists family history items recorded in the EHR during all previous encounters.

**Social History**—Lists social and behavioral history items recorded in the EHR during all previous encounters.

**Vitals**—Displays key vital signs taken on previous visits in a column format.

Clicking the mouse on the label of a column within any tab of Patient Management will sort the rows in the tab by the values in the column that was clicked.

The Patient Management feature allows information from previous encounters to be updated and cited in the current encounter.

**Citing** means to bring a finding from a previous encounter note into the current encounter. Tests can be ordered, reordered, or the results can be viewed. Prescriptions can be renewed or discontinued as well. In this chapter you also learned how to view pending orders and lab results.

You also learned to view pending lab orders. All lab orders have a status; these include:

- Pending—Sent but have no results.
- Preliminary—Results provide an early indication of the test but awaiting verification.
Final—Results have been verified and are ready for review.
Corrected—A change occurred as a result of repeat verification.

The ability for the clinician to see what tests are pending helps prevent duplicate orders.

The ability to graph weight, height, and test results can provide an excellent means of clarification when counseling patients or for the clinician to observe trends in the patient’s condition.

Any finding with a numerical value can be graphed. Several standard graphs—for example, height and weight—can be generated without locating the specific finding, simply by selecting them from the Graph menu.

As you continue through the course, you can refer to the Guided Exercises in this chapter when you need to remember how to perform a particular task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Exercise</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to use Patient Management</td>
<td>44</td>
<td>263</td>
</tr>
<tr>
<td>How to use problem lists and cite findings</td>
<td>45</td>
<td>269</td>
</tr>
<tr>
<td>Viewing pending orders and lab results</td>
<td>46</td>
<td>279</td>
</tr>
<tr>
<td>How to graph lab results or any current finding</td>
<td>47</td>
<td>290</td>
</tr>
<tr>
<td>How to print a graph</td>
<td>47</td>
<td>293</td>
</tr>
<tr>
<td>How to graph weight or height</td>
<td>48</td>
<td>294</td>
</tr>
</tbody>
</table>

**Testing Your Knowledge of Chapter 7**

1. What is a Problem List?
2. What is the idea of a Problem List?
3. Name at least two reasons why clinicians use a Problem List.
4. What is a reason that a “wellness” condition would appear on a Problem List?
5. Where does the data that appears in the Manage tab come from?
6. What does it mean to cite a finding?
7. Define trending of lab values.
8. Describe how to graph a patient’s weight.
9. What type of lab results can be graphed?
10. What is a pending order?
11. List the steps you would take to graph a lab value.
12. What type of data is on the Care Plan tab?
13. How do you sort the data display on the Vitals Signs tab?
14. How do you set a problem as inactive?
15. You should have produced two narrative documents of patient encounters, and five graphs. If you have not already done so, hand these in to your instructor with this test. The printed encounter notes and graphs will count as a portion of your grade.