# The Electronic Health Record "Toolbox"

By Michael A Krall, MD

## Introduction

The electronic health record is like a toolbox that clinicians can use to help manage their practice, take better care of their patients, and improve their documentation and efficiency. But to take full advantage of a toolbox, the carpenter must have familiarity and experience with all of its components, have a sense about which tool is optimal for a given job, and have the discipline to use that tool, even if at first it might seem difficult or cumbersome. When building a fine piece of furniture, or even a serviceable one, the initial investment made in "measuring twice and cutting once," or "letting the glue set," later yields great rewards in time, effort, and quality of the finished product. The same can be said when utilizing an electronic health record.

## Case Example

How can Kaiser Permanente (KP) HealthConnect help manage the difficult, multiple-problem patient more efficiently? Whether in primary or specialty care, there are patients with five to ten or more medical problems and ten or more medications. Many of those patients also have several allergies or intolerances and are as likely as other patients to have important social, family, medical, and surgical histories. What tools are available within KP HealthConnect to help a clinician organize, track, and manage these patients and their health data? What are some "best practices" in the use of these tools? What follows is one approach to these questions, written by an experienced KP HealthConnect (aka EpicCare) user, taking into consideration my own views and those of several other experienced users and trainers with whom I discussed this challenge. It may be possible to build a fine china cabinet using only one tool or only tools designed for other purposes, but to do so would be much more difficult, probably less fun and rewarding, and almost certainly less successful than using a well-stocked toolbox and using it well.

## The Problem List

In KP HealthConnect, the Problem List (Figure 1) is of paramount importance. The list is visible from several places within the application and can be fundamental to organizing, understanding, and managing patients and their problems. It is also a crucial tool to communicate necessary information to one's colleagues should they be called upon for consultation or treatment. However, maintaining the Problem List requires some effort and thoughtfulness as well as an understanding about what the Problem List is—and is not—designed to achieve within KP HealthConnect.

Essentially, the Problem List in KP HealthConnect is designed to be the repository of the patient's active, chronic, medical problems. Unlike the Problem Lists contained in some other electronic health records, here it is not a list of all the patient's Encounter Diagnoses. In KP HealthConnect, clinicians can easily add an Encounter or Visit Diagnosis to the Problem List, but this is done selectively. Used in this manner, the Problem List becomes an effective reminder and "action" list for use when the patient presents for a routine or acute visit. Conversely, it is very easy and efficient to add a chronic problem from the Problem List to the list of Visit Diagnoses. Moreover, when the Problem List is up to date and well organized it is easy for all to see what is being managed and what the treatment goals are (eg, control of blood pressure or LDL-C level). Treatment targets, dates of important studies or chart entries (eg, coronary angiograms, pain management contracts, or advance directives), or agreements (eg, narcotic limitations) can be specified in the comments and regularly updated. It is far more easy, efficient, and safe to cover for someone who manages patient Problem Lists in this manner.

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Problems can be sorted by priority to add further clarity to the List. When they become inactive, problems can be resolved, and doing so removes clutter from the computer display. Resolved problems can be viewed easily and reactivated if necessary. Most clinicians agree that acute, one-time, or time-limited problems clutter Problem Lists and are not helpful except in situations such as pregnancy or the serial management of a fracture (which might be maintained on the List until the episode of

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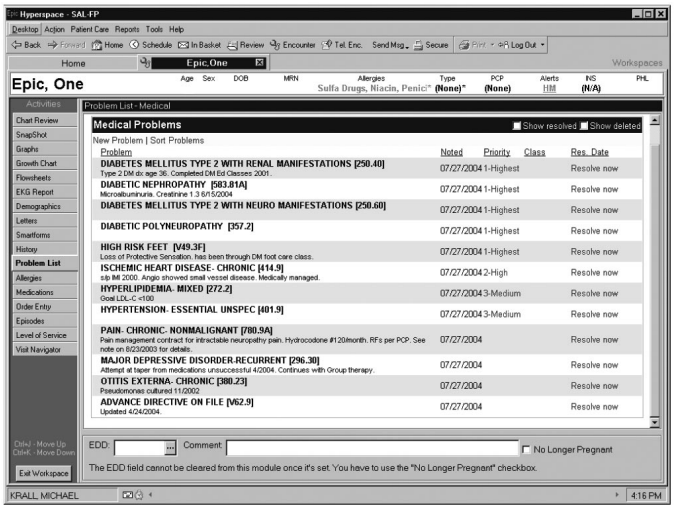

Figure 1. The Problem List.

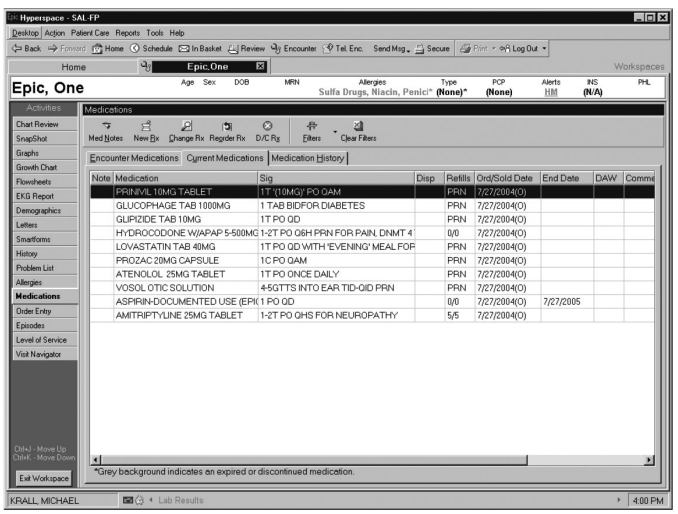

Figure 2. The Medication List.

care is over, at which time the problem can be resolved). In KP HealthConnect, problems are automatically ICD-9 coded and are reportable as discrete data. As shown in the illustration, however, there is ample room to add free text comments when desirable. It is important to note that there are sections within KP HealthConnect designed to store data, such as social and family history and current medications. Taking advantage of those fields (ie, instead of extensively recording such information on the Problem List) allows users to more efficiently reuse such data through charting links.

## The Medication List

An accurate, up-to-date Medication List (Figure 2) also is crucial when caring for the complex patient. Medication management is among the most complicated and important activities we do with our patients. To keep these lists accurate requires persistence and vigilance from all who interact with them. Complexity is introduced by the large number of pharmaceutical preparations that exist, their formulary and nonformulary status, medications filled both inside and outside KP, over-the-counter drugs, the special requirements of electronic pharmaceutical system interfaces, the frequent ambiguities in knowing which active prescriptions a patient is actually taking (or how they are taking them), to mention just some of the factors. Yet nowhere else does the effort expended to maintain the accuracy of a list, pay greater dividends. Clinician-patient decisions about medication effects, side effects, and dosage adjustments require reliable baseline information. Accurate drug-allergy and drug-drug interaction alerting and other automated decision support also depend on this list. To achieve a reliable Medication List, there is no substitute for reviewing and updating the Medication List at every visit. Updates in dosage and instructions must be recorded, even when such advice is given over the telephone or verbally and a new prescription is not issued. It is absolutely worth the effort for clinicians and teams to understand the difference between ordering, reordering, and changing prescriptions and using the correct workflow consistently. Similarly, it is important to understand the difference between a Current Medication (an active prescription in the pharmacy), an Encounter Medication (prescribed or changed in the current Encounter), and the Medication History (all medications, including discontinued and inactive ones, that have been prescribed). Well-designed, well-managed Preference Lists should help with prescribing complexity, but there are few shortcuts here. Your teams and work groups should decide how you will share the responsibility of maintaining the Medication List, and you must hold each other accountable. It is a safety and quality issue, as well as one of efficiency, and it will only be as successful as the effort made by every member of the clinical team.

## The Allergy List

In KP HealthConnect, the Allergy List (Figure 3) also contains coded data. Coded data are necessary to avoid ambiguity and for automated decision support and reporting purposes and thus become an important safety and quality matter. Technical and procedural issues surround Allergy List maintenance, and the list is best managed with a shared and coordinated approach. During the interregional collaborative design sessions, a recommendation was that the Allergy List be reviewed

and updated at each visit. KP HealthConnect provides tools to make this task easy. It requires literally a single click to confirm that allergies have been checked and verified as of today's date. Entering a specific reaction (eg, "hives" or "nausea and vomiting,") and the reaction type (eg, "Allergy" or "Intolerance") is of great help when evaluating the risk of subsequent reactions. It is straightforward to document this information in KP HealthConnect. Once this information is entered, it is prominently displayed in several locations within the application. The quality of Drug-Allergy alerting, including the frequency of false positive alerts, depends on ongoing attention to the Allergy List. When everyone does their part, the incremental maintenance effort is small.

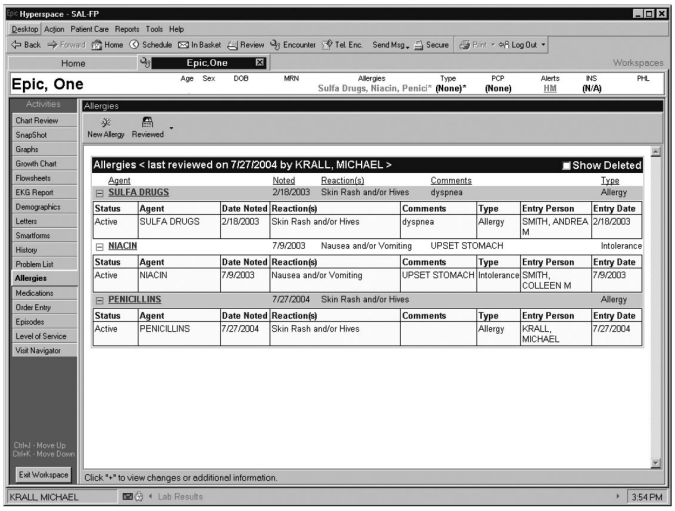


Figure 3. The Allergy List.

## The Histories Section

KP HealthConnect contains a comprehensive Histories module (Figure 4) that includes sections for Past Medical, Past Surgical, Family Medical, Family Status, Social and specific Specialty histories. Social History is further subdivided into "Substance and Sexuality," "Activities of Daily Living and other concerns," "Socioeconomic," and other free-text "Social Documentation" areas. Using these sections, it is possible to record and easily retrieve a rich record of relevant personal risk factors and modulating influences, including individual preferences. Outside of some workflows, it takes attention to complete and maintain the patient histories. These data are typically completed gradually over time, with more consideration given during health maintenance or comprehensive examinations or when specific histories are especially significant. Workgroups and clinical teams may develop effective strategies to encourage documentation of histories, by using (for example) patient-completed forms and ancillary staff entry with clinician review.

## The SnapShot

It should now be clear that there are many potential payoffs for actively completing and managing the KP HealthConnect record. Enabling automated decision support, in the case of medication and allergy lists, is one such benefit. Facilitating clinician information review and decision making by virtue of the enhanced and effective display of relevant data is another benefit. One example of where clinicians can take advantage of this activity is in the Patient SnapShot (Figure 5). With a single click, it is possible to get a comprehensive, high-level overview of the patient's active problems, medications, allergies, immunization history, due and overdue health maintenance plans, and selected elements of histories. This information flows to the SnapShot with no extra effort, but the data displayed here are only as accurate as the lists from which they are drawn. This fact may provide an additional incentive to do the upfront work necessary to reap this subsequent benefit. Clicking on a section within SnapShot yields a "drill down" into a configurable, detailed section report.

## SmartLinks

Yet another payoff of maintaining accurate lists is appreciated through the use of SmartLinks. SmartLinks are very similar to SmartPhrases. To display a short or

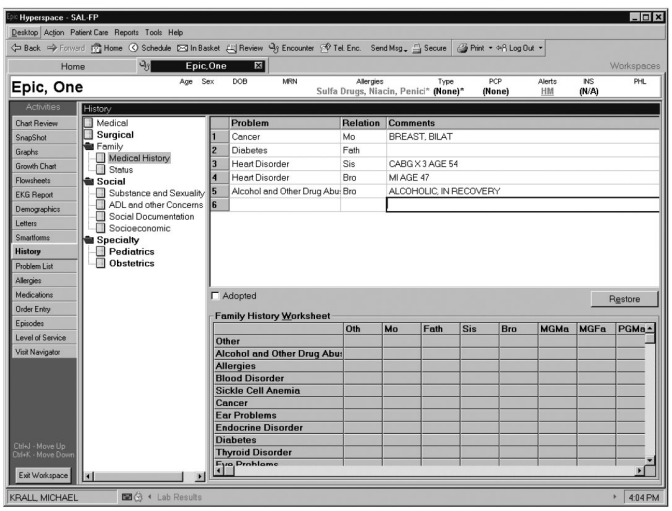


Figure 4. The Histories Section.

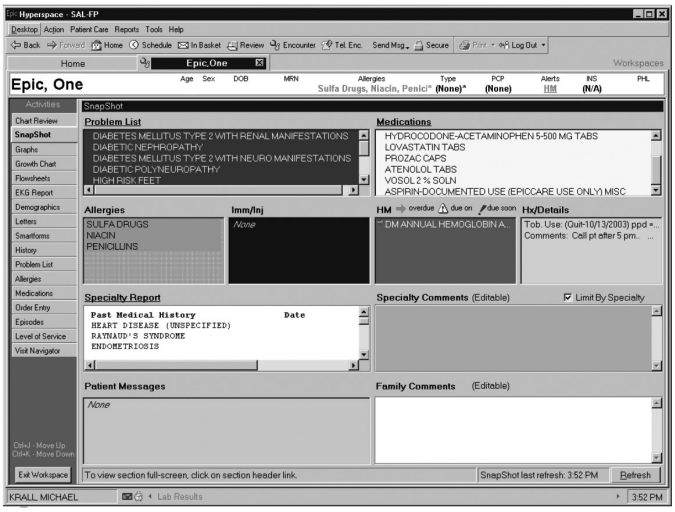

Figure 5. The SnapShot.

long string of "boilerplate text" when the phrase is invoked, a clinician types a period followed by the symbol for the phrase. For example, ".l" might expand into the phrase "left," and ".bp" might expand to "blood pressure." SmartPhrases will expand to the exact same text when used in any patient's chart. In contrast, SmartLinks differ in an important way: SmartLinks are connected (as their name implies) to specific information about the patient in whose record they are used. This connection can be as simple as a linkage to the age of a patient such that typing ".age" in the chart of an octogenarian will expand to "80 years," whereas the same link for an infant might return "8 days." SmartLinks are relevant here because they exist in very powerful fashion for the lists we have been discussing. There are links for ".prob," ".cmed," ".allerg," ".pmh," ".psh" and ".sochx," among others. As you would expect, invoking these in a patient's record, whether as part of charting, or writing a referral, a letter, or patient instructions, would return the patient-specific active Problem List, current Medication List, current Allergy List, Past Medical, Past Surgical, and Social Histories, respectively—assuming, of course, that someone has gone to the effort to populate and maintain these lists. Imagine the power of a comprehensive admission SmartPhrase ".admit" which embeds and draws from these and other SmartLinks, and can literally in a second assemble a comprehensive Admission History and Physical note. One of the times when I am most overwhelmed by and thankful for the power of KP HealthConnect is when I use ".admit." Being very familiar with available SmartLinks and SmartPhrases can markedly increase your charting efficiency.

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## SmartSets

A comprehensive introduction to SmartSets is beyond the scope of this article. Briefly, SmartSets are preassembled ordering and documenting tools designed to facilitate easy, efficient care of a specific condition or conditions or to perform the ordering and documenting associated with a procedure. When utilized, SmartSets may dramatically decrease the amount of "navigating" the clinician must do, and they can be a helpful reminder of the comprehensive management of the problem—from taking and documenting history and physical exam elements, to ordering lab, imaging, referrals, supplies, and patient education activities. SmartSets may not always be available for the problem your patient presents with, and they do seem to be most heavily used for patients who present for a single problem or procedure. However, an interregional group of adult primary care clinicians has developed a powerful SmartSet specifically designed to assist in management of complex adult patients with several common and important disease entities. In some circumstances, this tool may be just the right one for the job.

## Summary

I can't imagine that it will ever be easy to care for multiproblem, chronically ill patients; I suspect that such patients will always be a challenge. However, effective use of a system like KP HealthConnect can help us to be more organized and more focused in this care and can help us in the often very difficult, time-consuming task of reviewing the past status and preparing ourselves for the issues of today. With an up-to-date and managed Problem List, Medication List, and Histories section, we will be able to review in a short time what otherwise would require many minutes. Moreover, performing interim updates is simple and does not require starting from scratch, as often was the case with a paper record. Likewise, the use of SmartLinks will frequently streamline the documentation task. A SmartSet may bring all needed elements together into one easily used package. With KP HealthConnect, we have more electronic record tools, better adapted for specific functions, than ever before. With regular use of these tools, the result will be more time to spend on today's issues, including emotional needs, and on prevention, health maintenance, and chronic disease management. Achieving this goal will require dedication and ongoing effort but should yield a very satisfying and rewarding feeling not unlike that which a master carpenter might experience upon completing a fine china cabinet. ❖