

EMR

for Hospital-based Oncology Programs

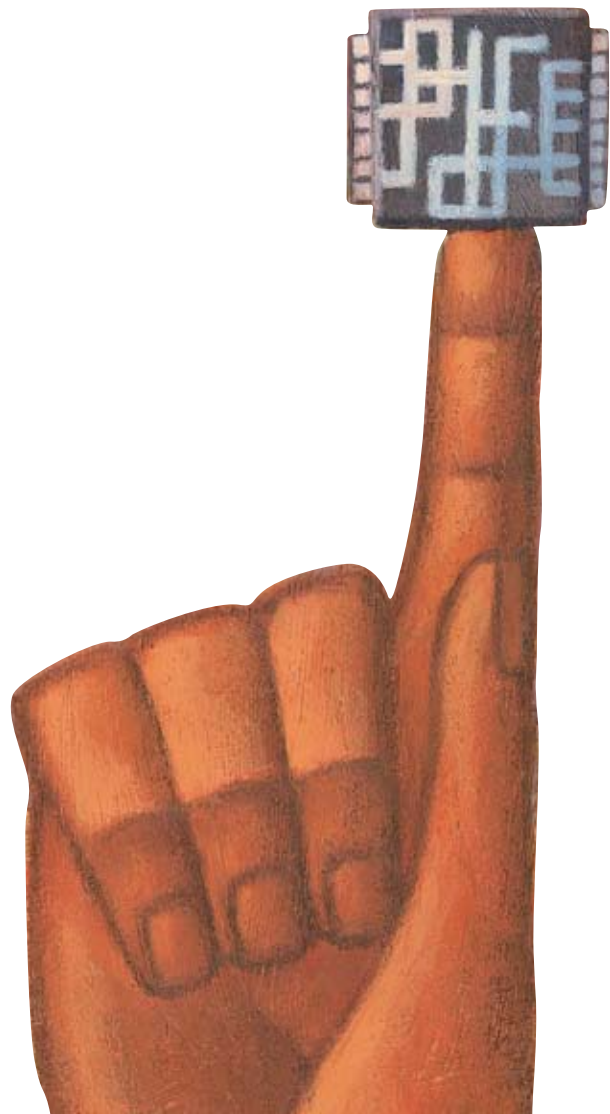
In July/August 2005, *Oncology Issues* featured a series of articles about electronic medical record (EMR) implementation in oncology practices. This issue of *Oncology Issues* features articles on EMR implementation in hospital-based cancer programs.

In a private physician office, the decision to implement EMR is made either by the physicians themselves, or by a clinic manager who has full physician support. In a hospital-based system, the implementation decision is often made by senior administration across a wide spectrum of services. It then becomes necessary to “earn” physician buy-in, which can lead to unique challenges for hospital-based cancer centers.

The decision to go forward with EMR adoption is often based on factors common to both physician practices and hospitals. These include tracking down paper records that are misplaced or difficult to access from remote or satellite locations, and the promise that EMR adoption offers for reducing the volume of paper and medical errors, and possibly improving clinical outcomes.

Selecting an EMR system for a hospital-based cancer center is a daunting task. Aside from the issues of capital and operating costs, the ideal system must meet the functional needs of the multidisciplinary cancer care team—medical oncologists, hematologists, radiation oncologists, surgeons, pharmacists, nurses, technicians, and administrative staff. Few systems can provide the breadth of functionality desired. Often, the cancer center must select multiple systems from multiple vendors, and attempt to “fit” the systems together. To eliminate redundant data entry by staff, the cancer center must stipulate that all vendors be able to exchange information through interfaces. Last but certainly not least, cancer center (or hospital) IT staff must have the skill sets to support the various technologies, the network, and all interfaces.

*Practical tips
and strategies
for hospitals*



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Consider the situation for hospital-based oncology programs that wish to purchase and use an EMR system. Likely, its hospital or integrated health system already has systems in place for patient registration, order entry, pharmacy, radiology, laboratory, medical records, and billing. The first step for hospitals that have already implemented a clinical information system will be to determine if it is even acceptable to have clinical documentation in more than one data repository. In other words, will it be in the hospital's best interests to invest in an oncology-specific EMR? To complicate matters even more, some integrated health systems may already have an EMR in place to address the general clinical documentation needs of outpatient services.

Identifying oncology-specific EMR products that meet oncology programs' surgical, radiation, and medical oncology needs is beyond the scope of this article; however, an extensive list of medical information technology systems and EMR vendors and products are available at the end of these articles. Software products selected should encompass eight core functions as outlined by the Institute of Medicine, including the capability to manage orders and administrative processes, to offer decision and patient support, and to communicate electronically and connect to other IT systems.

Making Your Case

Before a hospital-based oncology program can consider purchasing an oncology-specific EMR system, senior hospital management must buy into the idea. Cancer center staff must clearly outline the benefits to an oncology-specific EMR, as well as show how existing hospital systems are inadequate for oncology needs. If a case is made, hospital administration may provide funding for a new system or systems and add information systems resources to assist in the implementation and support of the EMR system thereafter.

There are many benefits to an oncology-specific EMR, including:

- Treatment plans that can help support standards of care and improve patient outcomes
- A streamlined workflow
- Improved access to patient information.

EMRs make it possible for cancer centers to create a library of treatment plans, including combination therapies that involve multiple oncology disciplines. These

treatment plans can then be used to develop standards of care, which can be evaluated retrospectively and refined as appropriate. The treatment plans can also reduce variation in patient outcomes and negative outcomes through the use of clinical decision support features (i.e., expert rules to alert the user to potential conflicts or alternatives).

An oncology-specific EMR can streamline workflow through the use of work queues, which work as follows. Once an initial assessment for a patient is completed, an entry could appear in the oncologist's work queue requiring the entry of a diagnosis code or the selection of a treatment plan. In fact, an oncology-specific EMR may actually assist in the coding process by recommending a diagnosis code based on documented information.

Perhaps an EMR's greatest potential benefit is improved access to patient information. Unlike paper medical records, EMRs are available to those with appropriate security access from the hospital, clinic, home, or on the road. Using an EMR system, a physician can obtain a longitudinal view of the patient's health, across all episodes. Furthermore, patient populations can be defined and used for retrospective reporting and research. Contrast this process with manually identifying patients for study, requesting medical record pulls, abstracting the relevant information by hand, and preparing reports. This entire process can be performed more quickly and accurately (provided the data is accurately captured) via electronic means.

Another important way to gain senior management buy-in for an oncology-specific EMR is to clearly show how certain aspects of outpatient services, especially for therapies requiring recurring visits, do not fit well with the hospital's existing information systems. For example, outpatient cancer centers do not have an associated bed or overnight stay component and may or may not have a hospital fee component. Instead, depending on payer requirements, some or all recurring visits to an outpatient cancer center must be grouped and billed under a single account.

Another important difference: care plans for inpatient visits end when the patient is discharged. For outpatient treatments—especially oncology treatments—the treatment plan and follow-up care lasts for months.

Coding requirements differ greatly between inpatient and outpatient care. Clinical documentation requirements for oncology patients will vary based on the selected treatment plan. Oncologists primarily work from a patient's flow sheet in the outpatient setting. Pharmacy orders (except for infusion orders) are generally

sent to retail pharmacists rather than the hospital's pharmacy department. The infusion orders may be processed and filled by pharmacy staff dedicated to the oncology program.

Finally, the specific clinical concerns of the oncology program may simply be beyond the capabilities of the hospital's information systems. An oncology-specific EMR can address these issues, including:

- Calculating the appropriate chemotherapy dose
- Tracking lifetime dosages of radiation and chemotherapy medications
- Keeping track of infusion preparation and administration
- Managing tumor staging
- Coordinating treatment protocols for combination therapies.

Oncology-specific EMRs will often have their own patient scheduling, order entry, clinical documentation, pharmacy functions, and billing components. If the hospital already has systems in place that take care of all or some of these functions, the hospital-based cancer center may choose not to implement certain elements in the oncology-specific EMR. In this scenario, the hospital-based information systems and the oncology-specific EMR must be set up to share data back and forth. Often this back-and-forth sharing of data requires specially developed interfaces.

Integrating Oncology-Specific EMR into an Existing Information System

Hospital-based cancer programs that already have a hospital-wide patient registration system will want to leverage existing systems to the extent possible in order to avoid creating additional work for their staff. At a basic level, patient demographic and insurance data will likely be provided from the hospital's registration system, and the oncology-specific EMR will need to use the hospital's assigned account number.

To avoid the use of multiple systems by nurses, clinicians, and other oncology staff, consider using the order entry module in the oncology-specific EMR. This means, however, that ancillary department systems (i.e., laboratory, radiology, pharmacy) will need to be able to accept orders from more than one information system.

Next, the hospital or health system must decide whether to 1) have the oncology-specific EMR calculate and trigger patient charges based on items charted and services ordered or completed, 2) have the ancillary information systems generate the charges, or 3) use some combination of these two options. Ultimately, the charges will go to the hospital's patient accounting system.

Other aspects of systems integration must also be addressed.

In oncology-specific EMRs, patient scheduling, tracking, and reminders are often tightly integrated with the treatment planning process. For example, if a patient becomes unstable due to a reaction to chemo-

Electronic medical records

In an attempt to develop consensus on a standard, industry-wide definition of an EMR, the Institute of Medicine (IOM) identified a set of eight core functions that an EMR software system should have:

1. Health information and data
2. Results management
3. Order management
4. Decision support
5. Electronic communication and connectivity
6. Patient support
7. Administrative processes
8. Reporting.

Source: Capabilities of an Electronic Health Record System. Letter Report. IOM, 2003.

therapy, the patient's treatment plan may need to be adjusted. With an integrated EMR, the change to the treatment plan will automatically reschedule future visits and reminders. If the hospital wants to enforce the use of a single, standard scheduling system in order to have all patient appointments in a single database, it will likely create additional work in oncology and dilute the benefits of integration.

Additional challenges may crop up related to the variety of cancer treatment options—patients may be treated surgically, with radiation, with chemotherapy, or some combination of the three. Ideally, the oncology-specific EMR would serve as a repository that includes, or at least supports, a tumor registry for *all* oncology patients. The challenge: most of the information systems for these various disciplines are distinct and not integrated. In other words, surgery, radiation, and medical oncology may all use different information systems. In this scenario, all of the different information systems will need to interface with the oncology-specific EMR. Surgery will need to communicate pre-operative, peri-operative, and post-operative documentation and radiation oncology will need to move treatment documentation into the oncology-specific EMR.

Of course, interfacing these different information systems with an oncology-specific EMR is not an easy task. How might these challenges best be addressed?

The IT Strategic Plan

Unfortunately, there is no single, correct answer for resolving these issues. Instead, each hospital or health system must address the challenges of systems functionality, integration, and support based on its unique situation, vision, and direction by developing a well-documented *IT strategic plan*.

The IT strategic plan supports the strategic business plan of the entire organization and provides a roadmap for moving from the current state to the desired, future state.



As a part of the planning process, the hospital or health system must consider numerous issues, including:

- The potential benefits of department-specific systems
- The financial resources required to acquire, implement, and support these information systems
- The capability of the software vendors to integrate overlapping and distinct functions between their systems
- The availability of skilled resources in the labor market.

Often, these issues will require a balancing act involving tradeoffs that may not satisfy all constituents.

Single Vs. Multiple Vendors

Hospitals and health systems looking to implement an oncology-specific EMR have numerous options, from a single vendor solution to a multiple product/multiple vendor combination.

In the single vendor solution, one clinical information system is implemented and all departments (medical oncology, surgery, radiation oncology) must use this system for clinical documentation needs. Most information systems permit department users to develop multiple forms of clinical documentation and multiple views of patient information, so these can be tailored to each department's needs. The end result is that all clinical documentation is stored in one data repository, where a complete clinical record for all patients' visits can be obtained from a single source.

In this scenario, the hospital's information systems department need only support one set of interfaces between the oncology-specific EMR, the revenue cycle, and the hospital's ancillary systems. Once built, the same interfaces will be used for all departments. The information systems skill sets required in this approach are limited to just the technologies associated with this one clinical information system.

On the negative side, the single vendor solution may not contain the unique functional capabilities identified previously. Some systems allow some modification or tailoring without reprogramming the system; however, creating multidisciplinary treatment plans, calculating lifetime chemotherapy doses, and incorporating radiation therapy documentation may be beyond the capabilities of a generic clinical oncology system. In addition, the resulting clinical repository will likely contain information on all patients, not just oncology patients, so this information must be filtered out during report writing or working with a tumor registry.

At the other end of the spectrum, a hospital or health system may select and implement information systems from multiple vendors in order to address unique departmental needs. So, for example, surgery documents care on its own system, radiation oncology documents treatment on a separate system, medical oncology uses a third system, and so on. These systems likely have different database engines and operating systems, which require additional skill sets in the information systems department. Each system will require its own registration, billing, and order entry interfaces. If a fourth system is used

as the clinical data repository, interfaces may need to be built from each of these systems to send clinical documentation to the repository.

Keep in mind: the vendors will charge extra for each interface and each interface involves two vendors for sending and receiving data. The more interfaces and the more complex the information system environment, the more resources required to support the interfaces and keep the systems synchronized. In short, the multiple product/multiple vendor solution involves more moving parts, which, in turn, means more time involved isolating and identifying the source of problems and devising ways to fix errors.

Bottom Line: Bottom Dollar

When budgeting for an oncology-specific EMR, consider that hospitals or health systems that select a single vendor solution pay for a clinical information system *once*—for all departments. Hospitals or health systems that opt to buy niche, department-based systems must invest significantly more money, both initially and ongoing. The capital expenditure for a full-featured oncology EMR can range from \$1 million to \$2 million or more, depending on the size of the health system, including software, hardware, interfaces, implementation fees, and out-of-pocket expenses.

In addition, the information systems department will likely need to devote at least one FTE to the implementation in order to test the interfaces. Using the industry average of 18 percent of the software license fee as an estimate for the annual software maintenance fee, the ongoing operating expense for software can exceed \$200,000 per year. Add to that the additional information systems resources to support the system and the total operating expense may hit \$300,000, including benefits.

Healthcare organizations that can afford this level of IT investment are typically academic medical centers and large health systems with comprehensive cancer centers. Traditionally, these organizations have taken a multiple vendor, best of breed approach to their information systems portfolio. Some of these healthcare organizations have begun to re-evaluate this approach, however, to rein in costs and reduce complexity in the information systems environment.

Still, hope is on the horizon for hospital-based cancer centers. For example, some mainstream clinical information system vendors (e.g., Eclipsys, Epic, Cerner) are developing oncology-specific functionality, integrated within their clinical data repository. This new level of competition bodes well for hospital-based oncology programs and will put pressure on niche oncology software vendors to demonstrate their added value. ☛

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