A Primer on Endoscopic Electronic Medical Records

Ashish Atreja, M.D., M.P.H.,¹ Maged Rizk, M.D.,¹ and Brooke Gurland, M.D.¹

ABSTRACT

Endoscopic electronic medical record systems (EEMRs) are now increasingly utilized in many endoscopy centers. Modern EEMRs not only support endoscopy report generation, but often include features such as practice management tools, image and video clip management, inventory management, e-faxes to referring physicians, and database support to measure quality and patient outcomes. There are many existing software vendors offering EEMRs, and choosing a software vendor can be time consuming and confusing. The goal of this article is inform the readers about current functionalities available in modern EEMR and provide them with a framework necessary to find an EEMR that is best fit for their practice.

KEYWORDS: Medical records systems, computerized, endoscopy reporting, computerized endoscopic medical record (CEMR), electronic medical record system (EMR)

Objectives: On completion of this article, the reader should be able to list the functionalities available in a modern EEMR and describe the process of selecting EEMR for his or her practice.

Advances in computerized medical documentation, order entry, and storage of medical information have allowed many medical centers to include information from other clinical systems into electronic medical records (EMR). In its most simple form, EMR can be defined as computerization of health record content and associated processes. Ideally, all patient information from the various medical departments should be included in EMR.

Over the past two decades electronic medical record systems for endoscopy have developed. Endoscopic electronic medical record systems (EEMRs) or computerized endoscopic medical records (CEMRs) no longer create just reports, but often include additional features such as practice management tools, image and video clip storage, nursing documentation, and searchable

databases.¹ There are many existing software vendors offering EEMRs and choosing a software vendor can be time consuming and confusing. Our goal in this article is to provide the reader with the framework necessary to make an informed decision about selecting an EEMR.

FEATURES OF ENDOSCOPIC ELECTRONIC MEDICAL RECORDS

EEMRs consist of a computer workstation with minimum system requirements running software which are usually, but not necessarily, connected by a network to a main storage server.¹ The user interface has evolved over time from requiring mostly free text to current iterations that contain drop down menus, touch screen capabilities, and minimal free text. Software capabilities have also

¹Digestive Diseases Institute, Cleveland Clinic, Cleveland, Ohio.

Address for correspondence and reprint requests: Brooke Gurland, M.D., Cleveland Clinic Foundation, 9500 Euclid Ave., A30, Cleveland, OH 44195 (e-mail: gurlanb@ccf.org).

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evolved from simple documentation to include advanced database querying, patient scheduling, inventory tracking, billing, and communication with referring physicians through automated faxes or email. According to American Society of Gastrointestinal Endoscopy (ASGE) technical committee,² the common features available in most EEMRs are:

1. Patient scheduling
2. Patient monitoring: Vital signs, pulse oximetry, etc.
3. Procedural coding: Preprocedural diagnosis, current procedural terminology (CPT), and International Classification of Diseases (ICD)
4. Report generation: Endoscopic record with images
5. Pathology interface
6. Discharge planning
7. Correspondence with referring physicians
8. Automated or facilitated coding for billing
9. Quality assurance
10. Instrument tracking, usage, and maintenance
11. Inventory control for pharmaceuticals and supplies
12. Practice management
13. Clinical investigation and research
14. Completeness of documentation and risk management.

SELECTING THE RIGHT EEMR FOR YOUR PRACTICE

It is important to understand your needs prior to considering purchasing an EEMR. Free-standing ambulatory endoscopy centers will have different requirements than hospital-based or academic units. The number of endoscopy rooms, required workstations, procedural volume, and overall interests of the participating providers should be considered. Patient scheduling, interface with hospital EMR, nursing documentation, and voice recognition technology may be a priority to some users yet less important to others.¹⁻⁴ Centers interested in clinical research may look for a software product with a user-friendly search engine, which can query clinical parameters rather than just practice management data.

There are many specialty-specific EEMRs available in the market today. In addition, many generic EMRs have now started to support endoscopy documentation and provide modules for image capture; making the decision to choose the right solution even more complex. Following a logical and stepwise selection process such as the one detailed below will increase your chances of finding a solution that is right fit for your practice.⁵

Step 1: Define Your Goals

With so many fancy EEMRs in the market today, it is easy to get swayed by all the “bells and whistles” that

many vendors may show; and focus on value-driving features can get lost. Hence defining the precise goals from the very start is the most critical step in the selection process that can help you stay grounded in real needs. Once the goals are defined, it will guide the rest of the decision making, including devising the ranking criteria and finalizing the evaluation plan. Based on the needs assessment, you will find that the goals for implementation will vary based on your practice, research focus (academic versus private), ongoing or planned quality improvement initiative/s or desire to bring efficiency and effectiveness in endoscopy documentation and billing.

Step 2: Identify Your Decision Makers

The next step is to formulate an interdisciplinary team that will navigate through the selection process, finalize the EEMR choice and help implement the software. Although the choice for decision maker/s is pretty straightforward in solo or small private practice, it is not so easy in larger group practices or academic centers. In addition to the key decision maker(s) in a large group practice, the team should strive to include an information technology (IT) manager, nurse/nurse manager, physician champion, billing personnel, and other key stakeholders (such as quality manager, outcomes researcher, etc.) to help make an informed choice about EEMR and assess its impact on your practice. The ideal team is the one that has the right mix of personnel, is committed, and has full support from the department chairman or practice head so the members can put in many hours in research and administrative tasks required to select an EEMR.

Step 3: Explore All Options

It is important to first identify and include all appropriate vendors because it can be costly to learn later that one or more key vendors were missed. Table 1 lists common EEMRs available in the market today. In addition, your hospital EMRs may have the capability for endoscopic reporting, but the support for image management or inventory tracking may not always be optimal. ASGE technology status task force has compared the functionality of some common EEMR vendors.¹ Because many of the old features are regularly updated and new features added in latest versions of the software, a request for information (RFI) is often used to solicit information from vendors about their products and services.⁶ An RFI could be as informal as sending a letter or an e-mail, or making a telephone call to the vendors. Similarly, the response from the vendors to an RFI could be in the form of an e-mail, electronic file, or a packet of materials, along with a profile of the company, its history, and services. Once you receive responses from the vendors through an RFI, the next step is sending a more formal request for

Table 1 Common Endoscopic Electronic Medical Records (EEMRs) Available in the Market Today*

Product	Company	Web site
CORI	Clinical Outcomes Research Initiative Portland, OR	www.cori.org
Endosoft	UTECH Products, Inc., Schenectady, NY	www.endosoft.com
EndoPRO	Pentax Research, Montvale, NJ	www.pentaxmedical.com
Endoprose	Summit Imaging, Inc., Lee's Summit, MO	www.summitimaging.net
Endoworks	Olympus America, Inc., Center Valley, PA	www.endoworks.com
gCare	gMed, Inc., Weston, FL	www.gmed.com
GI-Trac	ASD/MediTrac, San Antonio, TX	www.gitrac.com
MD-Reports	Infinite Software Solutions, Inc., Staten Island, NY	http://www.md-reports.com
ProVation MD	ProVation Medical, Inc., Minneapolis, MN	www.provationmedical.com
Scribes	IBA Health Group, Sydney, Australia	http://www.isoftware.com

*In addition to above specialty EEMRs, some generic electronic medical records have components or modules that support endoscopic reporting.

proposal (RFP) to the selected vendors, asking them specifically as to how their company, products, and services can meet your practice's unique requirements. RFP is generally more structured and effort intensive process where you provide details about your practice, its requirements and priorities and ask vendors about a complete summary of related costs (hardware, software) and services (support, training, implementation, and consulting). Responding to a well-prepared RFP takes time and effort on the vendor's part, so invite only vendors you are seriously considering to participate. In general, IT departments are very familiar with RFI and RFP process and they can be an excellent resource for you. You can also find more details about the RFI/ RFO process online, and access templates made available by American Health Information Management Association (AHIMA).⁶

Step 4: Rank the Finalists

The vendors' responses to your RFP will allow you a side-by-side comparison of the EEMRs. Table 2 shows a comparison or rating matrix of EEMRs that you can modify based on your practice goals and priorities. Filling details from the RFP responses in this matrix can help you to stay objective and grounded while you narrow your choices to few vendors. When comparing different EEMRs, it is helpful to see not only the various features within an EEMR but also the vendor's track record as well as the total cost of ownership. The total cost of ownership includes hardware updates, yearly service contracts, and software installation. EEMRs are not plug and play software and they need to be configured to interface with the hospital EMR via health level 7 (HL7) messaging standards and these interfaces come with an additional fee. Inventory control, nursing modules, and software customizations may also be available but increase the price of the product. Backup of servers and future upgrades should also be factored into the total cost of ownership required to keep the EEMR safe and functioning properly.¹⁻⁴

Step 5: Arrange Live Demonstrations

Once you have narrowed your choice to a few vendors, you are ready to invest more time in learning about selected EEMRs in more depth. Make sure your entire team has the opportunity to attend live demonstrations of the products with a focus on your practice goals and priorities. Live demonstrations are also a great way to learn more about the company and its interest and commitment in supporting you. In addition to live demonstrations, you can ask vendors about installing a pilot version of the software in your workstation or allow you access to a remote installation of the software through secure connections such as Citrix. Nothing beats the hands-on experience you will get when you use the software on your own, as opposed to having someone else demonstrate the software to you. You can then use your team responses to live demonstrations and experience with pilot installation/s to further refine your content in comparison matrix (Table 2).

Step 6: Make Site Visits and Check References

Once you are able to attend the live demonstrations and had hands-on experience with the software in pilot installations, it may be prudent to call the references provided in the RFP and visit few sites that have already implemented the software you are highly considering to buy. Ideally, the site you visit should be similar to your site both in terms of size and practice type (private versus academic). This will allow you to have a realistic reflection on how the EEMR will affect your practice, once it is fully implemented.

Step 7: Choose the Vendor

Hopefully, there is a consensus in your team and you are now ready to choose the final vendor. If there is no clear-cut choice or there is divergence of opinion within your team, it may help to revisit your goals and rating form. Comparing the software with respect to features that meet your goals, vendor's track record and references,

Table 2 Comparison Matrix of Endoscopic Electronic Medical Records (EEMRs)***EEMR Ranking Criteria (0 = not present, 5 = best)****FEATURES****Report writing**

- Intuitive and consistent navigation
- Prebuilt content/templates for common procedures
- Accurate charting of advanced endoscopic procedures
- Automatic/facilitated coding
- Completeness of documentation for risk management

Image management

- Quality of still images, storage and retrieval
- Quality of video clips, storage and retrieval
- Remote access to images and video clips

Billing

- Automated/suggested code generation for billing
- Interface with hospital financial system
- Regular update of codes
- Ability to update incrementally and select multiple codes

Database

- Ability to track quality outcomes
- Ability to search key data fields for research
- Ability to make certain fields required and/or prevent free text

Interface

- Standard health level – 7 (HL7) messaging for all interfaces
- With electronic medical record or practice management solution
- With pathology
- With billing
- With picture archiving and communication system (PACS) or hospital document management system

Other features

- Patient scheduling, patient monitoring, instrument tracking, and inventory control, etc.

VENDOR DETAILS AND SUPPORT

- Years in business
- Number of practices using the product
- Success in similar organizations
- Financial stability of the company
- Quality of support and service (including software updates)

COST

- Software
- Hardware (workstations, database, and Web servers)
- Interface development
- Implementation and training cost
- Annual maintenance and licensing costs

*The exact priority for features is best decided by your practice. You may wish to rank each of these on a 0–5 basis.

and total cost of ownership cost may help you select the winner. Your IT manager can help you determine the total cost of ownership and do not be surprised if that costs come much higher than what you initially expected based on the RFP response. If you are still not sure about your final choice at this time, it may be worthwhile to

arrange another demonstration from the vendor or conduct a site visit to other practices using those EEMRs.

Step 8: Negotiate Contract

Before you sign the contract, make sure that the rest of the practice, and especially the key stakeholders, are with you. You can also invite the vendor to give another demo to the practice as a whole and address another round of questions.⁵ Involve a lawyer with experience in software contract (your IT manager will be able to recommend one) to help you through the contract process. With so many EEMRs, it's a buyer market and you should ensure that your needs with respect to customization, training, implementation, and ongoing support are clearly spelled out in the contract. Also, consider the possibility that the vendor can go out of business before you the contract expires, and it helps to clarify the obligations of the vendor in those circumstances, within the contract itself.

Step 9: Train and Implement

No matter how good an EEMR is, your practice will still need a good training and implementation plan before the EEMR go-live (date when EEMR starts being used in actual practice). Discussions with your vendor and IT manager can help you find the training method that may best suit your practice and will allow you or your IT manager to formulate a detailed implementation plan and go-live date. Implementation plan includes purchase of requisite hardware, installation of software, interface development with hospital EMR, customization of EEMR and end-user testing and training.

Step 10: Post Go-Live Evaluation and Optimization

The last and perhaps the most undervalued step in EEMR implementation is to evaluate whether the product really met your goals and expectations. Unmet needs should call for a detailed look at EEMR features, vendor support and gaps in your implementation plan and training. Many post go-live issues can be successfully resolved or reconciled if you and your vendor clearly discuss the problem and are willing to work on it together.

QUALITY INDICATORS FOR COLONOSCOPY AND ROLE OF EEMRS

Recently, there has been increased emphasis on documenting and improving quality for colonoscopy. The American Medical Association and National Committee for Quality Assurance released a Physician Performance Measurement Set with three main goals; first, to objectively measure whether there is an appropriate follow-up

interval for normal colonoscopy in average risk patients; second, to objectively measure whether there is appropriate surveillance colonoscopy interval in patients found to have polyps; third, to objectively measure comprehensive colonoscopy documentation.⁷ The American College of Gastroenterology and American Society for Gastrointestinal Endoscopy Taskforce on Quality in Endoscopy developed and published quality indicators for major endoscopic procedures.⁸ Quality indicators in colonoscopy include documentation of date of procedure, patient identification, endoscopists and assistants involved, relevant history and physical examination, informed consent, type of procedure, indication, type of instrument, medications, anatomic extent of examination, limitation of examination, tissue/fluid samples obtained, findings, diagnostic impressions, therapeutic interventions, complications, disposition, and recommendation for follow-up care. Though the above indicators are currently not enforced, it is conceivable that a smaller subset of the above quality indicators may ultimately be endorsed or enforced by pay-for-performance programs in the near future. EEMRs can facilitate accurate, complete, and timely collection of endoscopic quality indicators by including data that may be omitted in free text reports, hence saving precious time and effort.⁹ Other studies have shown that EEMRs are not necessarily more time-consuming than reporting with conventional methods and prove to be cost-effective once used more than 5 years.^{10,11} The utility of EEMRs are further increased in academic institutions where the structured data collected in EEMRs can facilitate outcomes research.¹² For example, members for the Clinical Outcomes Research Initiative (CORI; <http://www.cori.org>) have used endoscopy data for a variety of research purposes, including the study of endoscopic practice patterns, and the determination of procedural efficacy and intraprocedural complications.¹³ An increasing number of EMR vendors have started to include EEMR-like functions within their EMRs or are providing a tighter integration with existing EEMR systems that can facilitate links to other data of interest; and further enhance the value of EEMRs for quality improvement and research.^{12,14}

CONCLUSION

EEMRs have become an integral part of the daily operation of endoscopy units. New features can enhance efficiency as well as facilitate quality improvement and outcomes research initiatives. Not all EEMRs are the same and proprietary endoscopy reporting software dictates which functionality is available. Following a logical

and stepwise-selection process that includes a thorough assessment of features and cost estimates will increase the chances of finding the right EEMR for your practice.

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