Communication from the ASGE Technology Committee

GUIDELINE

Endoscopic electronic medical record systems

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This document was reviewed and approved by the Governing Board of the American Society for Gastrointestinal Endoscopy.

The American Society for Gastrointestinal Endoscopy (ASGE) Technology Committee provides reviews of existing, new, or emerging endoscopic technologies that have an impact on the practice of GI endoscopy. Evidence-based methods are used, with a MEDLINE literature search to identify pertinent clinical studies on the topic and a MAUDE (Food and Drug Administration Center for Devices and Radiological Health) database search to identify the reported adverse events of a given technology. Both are supplemented by accessing the "related articles" feature of PubMed and by scrutinizing pertinent references cited by the identified studies. Controlled clinical trials are emphasized, but in many cases data from randomized controlled trials are lacking. In such cases, large case series, preliminary clinical studies, and expert opinions are used. Technical data are gathered from traditional and Web-based publications, proprietary publications, and informal communications with pertinent vendors.

Technology Status Evaluation Reports are drafted by 1 or 2 members of the ASGE Technology Committee, reviewed and edited by the committee as a whole, and approved by the Governing Board of the ASGE. When financial guidance is indicated, the most recent coding data and list prices at the time of publication are provided. For this review the MEDLINE database was searched through January 2015 for articles related to endoscopic electronic medical record systems by using the key words "endoscopic electronic medical record systems," "endoscopic reporting software," "endoscopic reporting systems," "practice management software," "electronic medical record," paired with "endoscopy," "endoscopy unit," "endoscopic imaging," "and quality reporting," Technology Status Evaluation Reports are scientific reviews provided solely for educational and informational purposes. Technology Status Evaluation Reports are not rules and should not be construed as establishing a legal standard of care or as encouraging, advocating, requiring, or discouraging any particular treatment or payment for such treatment.

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BACKGROUND

The capabilities of endoscopic electronic medical record (EEMR) systems have evolved greatly since they were initially created in the 1980s. Whereas early EEMR software was essentially limited to an endoscopy reporting system (ERS), allowing users to digitally compose an endoscopy report, current versions have evolved into sophisticated electronic medical record databases incorporating comprehensive electronic practice management (EPM) software. The Health Information Technology for Economic and Clinical Health Act was enacted as part of the American Recovery and Reinvestment Act of 2009. This was designed to promote the adoption and meaningful use of health information technology in the form of the electronic health record (EHR). Therefore, the integration of EEMR and EPM software with the EHR will be vital. The purpose of this review is to discuss the main features and benefits of current EEMRs and their associated EPM software as well as their ability to integrate with the EHR and/or be a stand-alone EHR.

TECHNOLOGY UNDER REVIEW

The central role of the EEMR system is the generation of the endoscopy procedure report. Previously published ASGE guidelines outline what information should be contained in the procedure report and are not reviewed in this document.[1-3] These systems comprise hardware, including image/video capture workstations, documentation workstations, and network servers, that have minimum system requirements based on the proprietary EEMR software (Table 1). Servers are computer systems, which are used as the central repository of data and various software applications that are shared by several workstations in a network. Workstations are generally connected in a

TABLE 1. EEMRs currently marketed in the United States

	CORI v4	EndoSoft	EndoPRO iQ, v4.6
Website	**www.cori.org**	**www.endosoft.com**	**www.pentaxmedical.com**
Company (location)	Clinical Outcomes Research Initiative (Portland, Ore)	EndoSoft LLC (Schenectady, NY)	Pentax Medical (Montvale, NJ)
Minimum server system requirements	Microsoft Server 2003, R2 GHz processor, 1 GB RAM, 30 GB hard drive	Microsoft Server 2008 R2, Intel Xeon 3.00 GHz processor, 32 GB RAM	Microsoft Server 2008 R2, Intel Quad Core 32 or 64 bit, 16 GB RAM
Minimum workstation requirements	Microsoft Windows XP, VISTA, 7	Microsoft Windows 7, Intel Core i5 3.00 GHz, 160 GB hard drive	Microsoft Windows 7, Quad Core Processor 2.8 GHz, 4 GB RAM, 80 GB hard drive
Cloud-based system option	N	Y	N
EHR	N	Y	N
Meaningful use (MU) certified	N	Y	N
Service contract (cost/yr/room; %of installation)	*	15-20%	15%
Software and installation (cost/room; USD)	*	10,500-11,500‡§	750-4000‡

EEMR, Endoscopic electronic medical record; *EHR*, electronic health record; *N*, No; *Y*, Yes.
*CORI is no longer funded by the National Institute of Diabetes and Digestive and Kidney Diseases and therefore is no longer available as an endoscopic reporting system for new users.
†Olympus will stop supporting the Endoworks product on March 31, 2018. Therefore, they are not selling any new installations of this product.
‡Pricing information is meant to serve as an estimate and is not meant to reflect actual quotes from any individual companies. Please contact individual vendors for actual pricing information.
§Includes first year of service contract built in to pricing.

network to a minimum of 1 main storage server along with a backup server. Several vendors offer cloud-based servers as well. The number of servers required varies, depending on the practice size, number of facilities, and whether the system is used to capture and archive video. All EEMR software programs commercially available in the United States are only compatible with Microsoft Windows (Redmond, Wash) operating systems. Most EEMRs have options to allow for remote access to the network via a personal desktop or laptop computer.

Endoscopic reporting systems

In the 1990s the ASGE, the European Society for Gastrointestinal Endoscopy, and the Japanese Society of Digestive Endoscopy formed a task force with the goal of devising a "minimal" list of terms that could be included within any computerized ERS used to record the indications, findings, and conclusions.[7] The incorporation of Minimal Standard Terminology (MST) for GI endoscopy, now in its third version, offers a template for data entry within the main descriptive sections of the endoscopy report and standardizes the descriptions of findings.[8] MST is the foundation for all ERS software; however, many vendors have expanded upon the MST database to include additional descriptors. The ERS software module within the EEMR is able to generate most of the endoscopic report with simple mouse click or keystroke input, using pull-down menus and checklists.[4-6] The eMerge Endo (Cincinnati, Ohio) software is unique in allowing voice-activated commands for note generation.

Most ERS software programs allow for the creation of customizable templates based on the user's practice, which allow for rapid procedure note generation. All ERS software programs allow for free text data entry options as well as free text editing of menu-driven entries, before finalizing the note. All available ERS software programs allow integration of most dictation software. EndoSoft (Schenectady, NY) offers optional built-in dictation software to complement the standard pull-down menu options. Importantly, free text entry by typing or dictation may negatively impact the efficiency and accuracy of subsequent database searches as well as the generation of Current Procedural Terminology and International Classification of Diseases (ICD) codes for billing purposes.

Once the procedure note has been created, all ERS software programs can automatically generate billing codes