



How will an ECG management system with electronic storage and recall benefit my facility?

ECG management has been available in the industry for over twenty-five years. Until now it has been both expensive and limited to certain acquisition devices. ECG management is often requested in a budget and denied funding because it does not generate revenue. Implementing ECG management does, however, generate significant clinical benefits for patients and dramatic cost savings for your facility.

Patients receive better care when ECG management is coordinated between departments in the hospital. ECG management streamlines procedures in the Operating Room and Cardiology Department, but its life-saving benefits are most profound in the Emergency Department.

Financial benefits include saving *at least* \$6.00 per exam for resting ECG tests. ECG management eliminates the costs of all those “chart pulls” that consume staff time and facility materials.

Clinical benefits of electronic ECG management—patient care and administrative

Emergency Department

Lifesaving benefits of ECG management begin in the Emergency Department (“ED”). The standard of care for patients presenting with cardiac symptoms is to, among other things, compare the current ECG to the previous ECG. ECG-retrieval delays compromise patient treatment. Those delays become longer on weekends and holidays. Electronic ECG management allows retrieval in seconds in the ED any day of the week.

ECG management that connects emergency vehicles with the cath lab offers even greater benefits. A Duke University study reported in eWeek (22 March 2006) described a 50% reduction in the time to a percutaneous coronary intervention (“PCI”) for patients with an acute myocardial infarction compared with the national average. The national average for PCI is 100 minutes; the American College of Cardiology and the American Heart Association recommend 90 minutes maximum; Duke researchers reported 50 minutes from the time of patient pick-up to PCI. They achieved this dramatic, life-saving improvement by transmitting ECGs from the ambulance to a wireless, hand-held device used by cardiologists. Electronic ECG management is the plumbing that made the 50% reduction possible.

ECG management can also facilitate quality-management programs for the ED. Many hospitals have implemented a tracking system containing a separate log for patients “whose initial treatment plan later resulted in the need for modification based upon significant variation in the final interpretation of . . . cardiographic . . . findings.” Epiphany’s ECG management system automatically captures all interpretive findings and changes on a patient’s ECG. See Healthcare Facilities Accreditation Program Standard 20.00.10.

Cardiology Department

Most Cardiology Departments have a policy that requires unconfirmed ECGs to be read within twenty-four hours. Most struggle to comply with this policy in a paper-based environment. ECG management supports and simplifies compliance with the policy because it allows managers to easily audit the status of unconfirmed ECGs and allows ECG over-readers to conveniently access and confirm ECGs from anywhere in the hospital and, with proper network access, from their offices or homes.

Operating Room

Pre-operative guidelines require that an anesthesiologist review the patient’s previous ECGs that are up to one-year old. ECG management provides this data to the anesthesiologist in seconds. See University Hospitals of Cleveland, Case Western Reserve University, <http://uhcanesthesia.com/Guidelines/dialysis-guidelines/view>.

Financial benefits from ECG management

Electronic ECG management streamlines delivery of cardiac care in all units and dramatically reduces costs. To demonstrate the financial benefits of ECG management, the costs of managing an ECG paper record were compared to other paper records in clinical practice. The analysis is based upon published, statistical analyses from clinical practices and in the industry. See Appendix A for a complete list of sources.

Labor costs for managing paper records range from \$3.00 to \$14.00. In addition to labor costs, the analysis found another \$3.00 per paper record in material costs, including folders, dividers, filing cabinets, on-site space, off-site space, etc. It is fair to say, therefore, that the minimum cost of any paper-chart pull is \$6.00. To calculate the savings possible when implementing an ECG management system, multiply the number of annual ECG exams by \$6.00. These cost savings do not include additional clinical benefits described below.

As a caveat, it should be stated clearly that none of the articles in the survey discussed paper-based ECGs specifically. All, however, summarized benefits resulting from digital document management over paper-based management. ECG paper records are treated the same as other paper documents in a clinical environment. The cost savings associated with the electronically stored, clinical documents apply to ECG records.

Bottom-line results: An electronic ECG management system will save at least \$6.00 per ECG record, including resting ECG, stress, Holter, etc.

Institutional Savings

To quantify a clinical facility's savings from using electronic ECG management, simply add the annual volume of all the modalities that are compatible with the ECG management system and multiply by \$6.00. These modalities typically include resting ECG, stress, and Holter only. With Epiphany's ECG management system, these modalities also include event monitoring, pacemaker follow-up, pulmonary function testing, ambulatory blood pressure, etc. Following are examples of cost savings at three different-sized hospitals.

Size	# ECGs	# Stress	# Holter	# Other	Cost Savings/year
128 beds	11,000/year	1,000/year	250/year		\$73,500
235 beds	19,500/year	1,800/year	750/year	PFT 1,500/year	\$141,300
321 beds	36,500/year	2,500/year	1,000/year		\$240,000

Other benefits

Finally, consider the other benefits from an electronic ECG management system, generally characterized as more efficient allocation of staff resources. ECG management:

- Eliminates traditional scanning methods that result in low-resolution ECGs and tedious, manual patient indexing;
- Eliminates transcription errors;
- Eliminates transcription costs;
- Eliminates faxing of records to remote sites;
- Reduces telephone calls for remote-party record requests; and
- Increases billing accuracy if a billing module is in place

Conclusion

ECG management provides significant clinical benefits and financial savings.

ECG management supports the standard of care in the Emergency Department, Cardiology Department, and the Operating Room. Life-saving benefits are most profound in the ED.

Although ECG management does not generate revenues, electronic ECG management will save a clinical facility at least \$6.00 per ECG paper record. Modalities exported into ECG management systems transcend resting ECG and include stress, Holter, event monitoring, pacemaker follow-up, pulmonary functions testing, etc. Calculating the

annual savings is a simple matter of multiplying the annual volume of the compatible ECG modalities by \$6.00.

The clinical benefits together with the financial benefits make electronic ECG management a cost-justified investment for any facility. These clinical benefits and financial benefits have been recognized by larger hospitals for the last twenty-five years and are now available to every hospital in the country.

Appendix A

Methodology to determine the cost of chart pulls

In an effort to find objective statistics regarding the costs of pulling a patient's chart, we used Google with the search terms "cost of chart pulls." Reviewing the first fifty responses, we found the enclosed, relevant items.

- Allscripts, Benefits of Document Imaging, web site (adding up material costs on paper charts to \$3.00).
- California Center for Long Term Care Integration, Cost Savings Research Grid—Information Technology (articulating additional benefits that include improved turn-around times from 25 to 64%, improved billing accuracy, decreased telephone calls discussing paper charts by 75%, and enhanced workflow and efficiency).
- Jeffrey D. Cooper, MD, FAAP, Application for the Davies Recognition Program Independent Primary Care Practices (estimating that paper records cost \$15.00 to create, store, and maintain).
- John Fontanesi, PhD, A Business Case for Electronic Immunization Registries, University of California, San Diego, CA (stating that the cost for chart pulls ranges between \$8.00 and \$14.00).
- Marshfield Clinic, Healthcare Clinic Saves Money and Improves Quality of Care with Tablet PC Solution (finding that the total cost of pulling a patient's chart is \$4.50).
- MedcomSoft, Costs of Charts and Chart Pulls, web site (stating that each chart pull and re-filing costs \$3.00).
- MedicaLogic, Ambulatory EMR—Establishing a Business Case, White Paper (noting that the supplies used in paper charts, including folders, dividers, and filing cabinets, cost an average of \$3.00 per chart).
- Misys, Misys EMR ROI Calculator, web site (citing The American Journal of Medicine, April 1, 2003, finding the cost of pulling and re-filing charts at \$5.00).
- Samuel J. Wang, MD, PhD et al., A Cost-Benefit Analysis of Electronic Medical Records in Primary Care, The American Journal of Medicine, April 1, 2003, Brigham and Women's Hospital, Harvard Medical School (analyzing the time and cost of pulling and re-filing paper charts at \$5.00).