



Advantages of a Palm OS PDA Medical Document Timer for Real- Time Point-of-Care Emergencies

The Problem: Providing Quick, Accurate, Real-Time, Portable Medical Documentation

Transporting the wounded presents many challenges for medics, emergency medical technicians (EMTs), paramedics, nurses, military personnel, physicians, pilots, and first-responders. Communicating and documenting the latest vitals, medications, and history of the injured can consume time on the ground and delay turnaround time to pick up more injured. Fast, accurate documentation and communication are critical to saving soldiers' lives. In trauma resuscitations, studies have found that patients died because data that would have helped medical personnel make correct decisions were missing or not captured from the documentation.¹

*Time is the currency
of medicine.*

Researchers and medical personnel have tried many methods to solve the problem of documenting codes and emergencies, everything from manual handwritten flowcharts, which are more prone to error, to high-tech streaming of electrical physiologic data, which requires a human to distill the critical information for correct decision making. Being able to document, transfer, and communicate medical information faster, more accurately, and more efficiently can save lives because time is the currency of medicine.

The Solution: CodeDoc®

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A new solution for emergency documentation is CodeDoc, a small (384K) yet powerful personal digital assistant (PDA) application for documenting codes in real time.

CodeDoc solves three major problems emergency personnel encounter in a code blue resuscitation:

1. *slow, error-ridden documentation.* For point-of-care emergency workers, CodeDoc provides a portable platform and easy interface for quick and accurate real-time data collection.
2. *difficulty filtering and synthesizing information.* For healthcare providers, CodeDoc summarizes and filters data to help with on-the-scene treatment decisions; and
3. *slow transfer of data to other healthcare providers.* For transfer personnel, CodeDoc quickly prints on a portable printer or transmits an accurate record to a desktop system.

CodeDoc Overview

CodeDoc is a document timer that runs on the Palm OS.

CodeDoc is a document timer that runs on the Palm OS[®] and time stamps entries as personnel document the events of a code blue. The program allows users to select and enter most standard data with just a few pen presses, while providing room for freeform entry of more unusual information. The record can then be printed with a portable printer or transferred to a desktop computer for the emergency personnel taking over patient care.

CodeDoc helps emergency workers provide quick and critical care to patients by:

- reducing documentation time;
- eliminating handwritten notes;
- automatically time stamping all orders and assessments;
- coupling patient care assessment time to medication administration;
- providing a documented list of patient medications with real-time total dose ready for printout any time;
- promoting critical documentation items on each screen to help assure key data are captured for decision support;
- building quality assurance for treatment and documentation by reminding the code team, medic, or healthcare provider to make timely assessments of the patient and alerting the team about possible medication administration;
- recreating the sequence of events in a time-stamped master log for review; and
- reducing transfer time of critical data either by direct printout to most infrared printers or by transfer using the HotSync[®] function to a Windows[®] desktop computer.

Background of Real-Time Documentation

Many methods have been tried in the field, but each has had a significant drawback.

For years, resuscitation researchers and emergency personnel have tried to find a good way to perform real-time documentation. A 1993 article, entitled "The Most Neglected Tool in EMS: The Clock," proposed developing "computerized timecards" that "medics punch to effect real-time data entry."²

Many methods have been tried in the field, such as cassette tape recording, bar coding, and various locally designed flow sheets for handwritten documentation, but each has had a significant drawback. At least two studies found that transcribing tape recordings was too labor intensive and provided no feedback on the scene.^{3,4} Handwritten documentation is prone to error; a study using bar codes during an arrest found the mean number of total errors per record for bar coding was 2.6 compared with 9.5 for handwritten charts.⁵ Although bar coding reduced error by capturing static events, it could not synchronize and integrate data into summaries to help emergency personnel make medical decisions. New continuous streaming electrical physiological data is fast, but a human still has to decide which data to capture to assist in making the best decision.

CodeDoc Pilot Study



With the advent of PDA use in medicine, the solution to real-time documentation was literally at hand. The PDA, or handheld mobile computer unit, is a mobile and flexible platform that can operate with batteries and be easily carried in a pocket or boot, or even sewn into a shirtsleeve. The CodeDoc application takes advantage of these features, enabling first-responders to document care, make decisions, and obtain quick updated orders or transfer documentation via the PDA's HotSync function.

A pilot study using CodeDoc showed major improvement in time and accuracy of documentation compared with handwritten reports. The study compared handwritten flow sheet reports with those produced by CodeDoc. The seven participating healthcare providers had more than 10 years of real rescue experience and received about 1.5 hours of instruction on each of the two documentation methods. A total of 28 code reports, 14 for Code A and 14 for Code B, were reviewed for time and omission errors.

The pilot study results showed that CodeDoc cut manual documentation time almost in half and reduced omission error by about 60%. In addition, the time trials found that participants could not manually summarize and filter data in their handwritten reports as well as CodeDoc could do it for them.⁶

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Among the various methods for documenting code blue emergencies, CodeDoc is unique in its ability to: 1) help a rescue worker collect pertinent data quickly, 2) summarize and filter data when needed on the scene, and 3) reduce transfer time of that data to another person for ongoing care of the patient. Because of this, CodeDoc can improve patient care and help save lives.

CodeDoc Features and Applications

The central feature of CodeDoc is a software invention called a DocuTimer[®], a tool that automatically time stamps entries so the user can focus on documenting the code blue rather than checking the clock to time data entries. The DocuTimer works seamlessly with CodeDoc's data entry interface to give the user real-time and elapsed time information on medications, assessments, and patient status.

CodeDoc provides before, during, and after support for code blues.

The CodeDoc software package includes the CodeDoc PDA application and a companion Windows desktop program. The companion program offers an updatable drug database and CodeViewer, an application that helps analyze data and produce reports for the permanent patient record.

CodeDoc is designed for medics and healthcare workers of all levels who encounter emergencies. Its powerful tools provide personnel with before, during, and after support for managing code blues.

Reports are a quick, easy, and accurate way to transfer pertinent information to other healthcare workers.

CodeDoc Increases Efficiency by:

- directly producing a printed report using a portable printer, thus eliminating dictation and typing time;
- automatically time stamping all documented orders and assessments in real time, which focuses the user on data-collecting rather than clock-watching;
- showing elapsed or real time using the 24-hour or 12-hour clock on every screen, which allows users to assess time without changing screens or performing time conversions or calculations;
- providing a number keypad on every screen that requires numeric data entry. The user can simply tap to add or remove a number, which saves time by eliminating Graffiti® writing or Palm keyboard use;
- printing or transferring reports within seconds to minutes for personnel taking over patient care. Reports range from a medication list with up-to-date doses in real time to a full report with real-time vitals, procedures, orders, assessments, results of interventions, outcome, and transfer information. These reports are a quick, easy, and accurate way to transfer pertinent information to other healthcare workers.

CodeDoc displays an onscreen alert when a patient needs to be reassessed.

CodeDoc Improves Medication Management by:

- allowing the medication list on the PDA to be created, updated, or customized by CodeDoc's desktop companion drug database. This editing ability helps users keep their procedures up to date with current medication standards;
- keeping track of each unique medication administration and calculating approximate total dose in real time based on documentation. CodeDoc displays an onscreen alert when a patient needs to be reassessed to help gauge the effectiveness of a medication. This track-and-alert system improves outcomes by helping the user make timely, appropriate assessments related to medication administration;
- providing a summary of how many unique medications have been ordered, when they've been administered, and what the current dose totals are, including continuous drips. These summaries save time and reduce errors in managing a patient's medications.

CodeDoc provides quick answers to many common questions.

CodeDoc Improves Medical Decision Support by:

- providing medication and documentation alerts, which brings dose timing and patient assessment closer together. This helps prevent healthcare provider oversight of key medication and patient assessments;
- keeping track of event sequence while the user documents, which helps bring needed information together for quick use in medical care and decision support during a code;
- providing quick answers to many common decision questions during codes, such as "How long has this cardiopulmonary arrest been going on?" or "Can we give another dose of epinephrine yet?" Being able to find answers quickly saves time and aids in making accurate decisions on the scene.

CodeDoc helps eliminate messy, confusing changes in a record.

CodeDoc Strengthens Quality Assurance by:

- providing timely reminders and documentation for nurses and medics to check patients routinely for vitals and reassessment times. Quality assurance is automatically built into the documentation;
- allowing users to make corrections in edit mode, which is time stamped in real time. This feature helps eliminates messy, confusing changes in a record;
- transferring all data to the desktop Windows companion, which has the CodeViewer and drug database. The CodeViewer is organized by date and time, and allows the user to edit and export the document into a text or word processing document. This companion software facilitates review and final editing of the report for the formal patient record;
- keeping track of basic outcomes (died, survived, and other) through CodeViewer and allowing users to view codes not yet transferred from the PDA. These features help users examine treatment sequences and patient outcomes of prior codes.

Most people are able to use CodeDoc after just two hours of practice.

CodeDoc Reduces Training Time by:

- arranging menus according to the standard ABC's of basic life support training—Airway, Breathing, Circulation, etc.—so navigation is easy. Most people are able to use CodeDoc after just two hours of practice.

CodeDoc Offers Quicker Access to Critical Data by:

- providing one-button access to medication and rhythm assessment screens, where users can find doses for adult, pediatric, and geriatric patients or management guidelines for a specific heart rhythm, respectively. Healthcare providers can gain quick access to changing drug and rhythm management protocols.

CodeDoc Enhances Training of ACLS, PALS, ATLS, BLS by:

- allowing a teacher, team member, or trainee to document megacode performance or code timing, and print it out for review. This feature helps evaluate decisions and training needs of various personnel.

Conclusion

CodeDoc automates processes and helps healthcare providers to focus on saving lives instead of watching the clock.

Field emergencies present medical personnel with unique challenges as they try to treat, document, and communicate a patient's condition. Error-prone documentation, difficulty summarizing critical data, and problems transferring information to others can sometimes lead to patient death. As technology changes, however, so do the possibilities for solving these critical patient care issues.

CodeDoc uses the now-ubiquitous handheld PDA, with its infrared print and transfer capabilities, as a platform for powerful documentation and treatment tools. With its DocuTimer, CodeViewer, easy interface, one-touch summary screens, and drug database, CodeDoc automates processes and helps healthcare providers to focus on saving lives instead of watching the clock.

Try a free demo
of CodeDoc at
www.md-software.com.

Free Demo

A demonstration version of CodeDoc is available for free download at the MD Software web site, www.md-software.com. The CodeDoc User's Manual is also online, which offers precise help and explains how to use the desktop companion CodeViewer and drug database. If you have questions about CodeDoc, please email: cathy@md-software.com or call: 352-468-2737 or 352-214-0152.

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