



# Maximizing Return on Investment for Palm<sup>TM</sup> Handheld Computers in Healthcare

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## Introduction

Today's healthcare organizations must contend with a flood of new information on a daily basis. Medical records systems, elaborate billing systems, supply chain management applications, and other networked business process systems give healthcare providers, payers, and pharmaceutical companies a level of detail about their patients, partners, and employees that was unheard of until recently.

This blizzard of data can be both a blessing and a curse for healthcare organizations. Timely, well-managed information gives decision-makers the support they need to boost productivity, cut costs, and enhance the quality of patient care. On the other hand, fragmented or outdated information can threaten patient safety, increase risk, and reduce profitability.

With some creativity and the right technology, healthcare organizations can put information to work to improve profitability and maximize their return on investment. While each type of healthcare organization is distinct, all face relentless cost pressures. The key to saving money is finding a solution that can be tailored to meet the specific needs of each organization.

**Healthcare providers** must accommodate increasing patient loads and skyrocketing administrative expenses—without compromising the level of patient care they deliver. By giving healthcare professionals versatile, easy-to-use mobile solutions for information capture and database access, organizations can help them save time, cut costs and reduce errors—whether they're in their office, in the lab, or at a patient's bedside.

**Healthcare payers**, in contrast, use information for decision support and process improvement. Payers need solutions that can help them pull together information from their providers and patients, then put it to use in streamlining operations and controlling costs.

**Pharmaceutical companies** face their own unique challenges. These global organizations need tools to help mobile workers monitor and manage many aspects of a complex business, from research and development, to product manufacturing, sales and delivery, to customer relationship management.

To improve their bottom line, all of these healthcare organizations need solutions that let them collect and process information quickly, accurately, and inexpensively. The solution must be mobile, enabling them to exchange data where it's most needed: whether it's a doctor's office, an emergency room, a claims processing office, or a delivery truck. And the solution must be easy to learn and use, fitting smoothly into a healthcare professional's routine with minimal training.



## Maximizing Return on Investment for Palm™ Handheld Computers in Healthcare

Palm™ handheld solutions are designed to close the information gap between people and network information systems. Together with innovative third-party applications, Palm handheld solutions tackle a wide variety of tasks, from enhancing personal productivity to improving strategic reporting for global organizations. Palm solutions deliver a substantial return on investment by helping healthcare organizations take control of their information management.

### Healthcare Providers

Operating on the front lines of healthcare delivery, healthcare providers contend with new cost pressures and productivity issues every day. Escalating patient loads, increasing paperwork, and more complex billing systems all leave physicians with less time to care for patients. Inefficient information management can quickly translate into increased costs and lost revenues for healthcare providers. Healthcare providers need powerful tools to help them focus on caring for patients, without getting mired in paperwork.

**Saving time**—Whether they're at a patient's bedside or preparing a report on a consultation, healthcare professionals are always on the move, accessing and updating medical information. To keep productivity at its peak, providers need a mobile, flexible solution that lets medical professionals exchange data quickly, accurately and intuitively, wherever they are.

**Improving processes**—Whether they're maintaining equipment or managing patient billing records, healthcare providers have their hands full. Even small process delays amplify quickly as they ripple throughout an organization. Providers need solutions that not only integrate with existing workflow processes, but make them more agile, cost-effective, and efficient.

Palm handhelds deliver the flexibility and convenience that healthcare providers need to streamline processes, cut costs, and save time on day-to-day tasks. A wide array of sophisticated third-party applications are available designed specifically to help healthcare providers maintain accurate records, reduce medical errors, and increase the quality of patient care.

### Streamlining Patient Records Systems

Palm solutions extend enterprise applications beyond the desktop PC into the pocket of the healthcare delivery professional, bringing critical information to the point of care.

Baptist Health, Arkansas' largest healthcare facility, keeps patient information for its five hospitals in a set of databases. In the past, accessing patient records was cumbersome and time-consuming. Doctors and nurses had to find an available PC, log into the system, search for patient information, then print it out for review.

Now, thanks to the Palm handheld solution, physicians can access the information they need on their own in seconds. Using the MData Enterprise System developed by MercuryMD, healthcare professionals can view accurate clinical information right on their handheld devices, including up-to-date patient census lists, demographics, laboratory results, diagnostic reports, medication lists, and reports. The application ties directly into the Baptist Health patient records database, and synchronization stations are located throughout the hospital, enabling doctors to update their handhelds at the touch of a button.

The system saves doctors 30 to 60 minutes a day, freeing them up to spend more time caring for patients. What's more, physicians can now access records on their own, instead of relying on nurses and administrators to track down information. This translates into big savings for Baptist Health.

"If I can get a doctor to be more self-sufficient, he or she will use fewer of my resources," says David House, CIO for Baptist Health. He estimates that the timesaving achieved with the Palm solution equals that of about 11 full-time employees.

Baptist Health expects to save \$550,000 in its first year deployment of the mobile patient data delivery solution, mainly by redeploying physician support staff to other areas of the hospital.

## Making Billing More Efficient

The intuitive Palm™ user interface makes data entry easy, a tremendous improvement over tedious, inaccurate paper records systems. Healthcare professionals can change and update database records with just a few strokes of a stylus.

For example, North Shore-Long Island Jewish (LIJ) Health System is the third-largest nonprofit health system in the U.S., serving an area of more than seven million people. Yet despite its size, North Shore-LIJ still relied on a manual, paper-based process for capturing patient billing information.

When physicians made their rounds, they hand wrote a patient's name and identification on an index card, along with diagnosis codes. At the end of the day, they handed the cards to the billing department, which manually input them into a database. The cumbersome billing system was inefficient, error-prone and costly. About 20 percent of the index cards never made it into the system, which meant that the hospital was unable to bill for those patient charges.

In the spring of 2000, North Shore-LIJ deployed a solution based on Palm handhelds to electronically capture patient billing information. The handhelds are running the ChargeKeeper billing and compliance application from Massachusetts' PatientKeeper, Corporation, and are synchronized with the hospital patient database. Each day, physicians pick up a Palm handheld which they use to call up patient information and select diagnosis codes from a pick list. At the end of the day, they return their handheld to its cradle and press the "Synchronize" button to automatically upload records into the hospital's back-end database.

The Palm solution captured 10 percent more inpatient charges, and streamlined billing processes to save an average of eight days' processing time. The result was a 490 percent return on investment, including deployment and support costs.

## A Portable Library of Patient Resources

Physicians are always on the move. Whether they're picking up a lab report, consulting with colleagues, or performing research, doctors need an information resource that goes where they go. Palm wireless handhelds support fast, secure connectivity wherever it's needed, enabling healthcare professionals to make the most of their time.

Mobile connectivity plays a key role at Los Angeles' Cedars-Sinai Medical Center, a non-profit corporation that includes an 800-bed medical center, specialty clinics, and many other facilities. The Center needed a solution that would enable its mobile physicians to exchange patient data, lab results, surgical reports and other data anywhere at the facility.

Cedars-Sinai developed a solution that combined the Palm™ VII handheld wireless handheld, intranet access, and an Oracle database solution. Using their handheld devices, healthcare providers anywhere on the campus enjoy convenient, untethered access to physician directories, paging and wireless email, confidential patient information, and ordering from the medical library. Access to these resources is secure, to protect sensitive medical information. The innovative Palm solution frees physicians to spend more time on patient care, rather than sitting at a PC to access patient records and resources. And the versatile Palm operating system was easy for developers to work with.

"The strength of the Palm OS® development tools allowed us to quickly and easily deploy our existing Web-based applications on the Palm handhelds in just a matter of days," says Dr. Ray Duncan, Director of Technology and Architecture for Enterprise Information Services at Cedars-Sinai Health System.

## Reducing Paperwork in the Field

Home healthcare providers know all too well that paperwork can be a nightmare. Just one home healthcare case takes an average of 18 hours to document. With convenient, portable Palm handheld solutions, cumbersome forms can yield to improved productivity and healthcare delivery.

One non-profit organization making the most of Palm solutions is the Visiting Nurses Association Home Health Systems (VNAHHS), based in Santa Ana, California. Its clinicians make five to seven home visits per day, and each visit generates at least three forms.



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Jeneane Brian, CEO of VNAHHS, wanted to reduce the amount of time spent on paperwork, improve information resources for mobile nurses, and make collecting and distributing information to management and clinicians in the field more efficient. Brian equipped her staff with Palm handhelds and an application she developed called FreeForms.

FreeForms lets home healthcare providers capture patient data on their handhelds using simple forms, check boxes, and drop-down lists. It also provides access to patient and medical reference information wherever the caregiver goes—at home, in the office, or at the patient's side. At the beginning and end of their shift, clinicians synchronize their Palm handhelds with the VNAHHS' central database using their PC or wireless modem, to keep patient data up to date at all times.

The return has been impressive: a 50 percent reduction in paperwork, reporting turnaround time cut in half, and an 80 percent reduction in paper costs.

### Fast, Accurate Ambulance Tracking

Despite their reputation for fast response, emergency workers contend with much of the same time-consuming paperwork as other healthcare professionals. For example, Medic 9 Paramedic Service, Inc. offers emergency care throughout eastern Pennsylvania, via its two ambulances. When one ambulance is dispatched, the other must leave its station to provide backup. In the past, tracking ambulance activity and destinations created stacks of handwritten documentation, which had to be typed into a database. Medic 9 needed a handheld solution that would let staff to fill out and submit these "trip sheets" wherever they were.

Using an application called RemStat running on Palm handhelds, ambulance drivers can fill out detailed records for each call they take, including location, demographic information, and data about the patient's illness or injury. The new system is faster and more accurate.

"With RemStat we can complete 80 to 85 percent of our trip sheets on site and then sync it to the desktop once we return to the station," says John Kostenbader, a paramedic at Medic 9. "So we don't have backlogs of trip sheets that need to be done, don't have to do data entry of old trips, and don't have to remember things after the fact. And we can even edit the report later at a desktop PC."

### Improving Emergency Response

A rapid response is critical in healthcare emergencies. Doctors in the E.R. need a snapshot of a patient's condition to make the right treatment decision. With Palm handhelds, emergency workers can gather and deliver vital patient data in seconds.

Emergency teams in Danville, Pennsylvania, including Danville Ambulance, Alpha Community Ambulance Services, Inc. and Life Flight helicopters are using Palm handhelds to enhance patient care in life-or-death emergencies. Using a pilot application running on the Palm handheld, paramedics can efficiently collect patient data at the scene of an accident or illness and quickly get that information to hospital emergency departments.

The software, developed by Med-Media, Inc., displays a small diagram of the human body on the Palm handheld's screen to speed up information entry about the type and location of a victim's injuries. Ambulance personnel tap on the figure to quickly record information, then select the type of injury from a drop-down list. Vital signs, including blood pressure, pulse, and EKG can also be entered using sliding scales and drop-down lists on the handheld.

Paramedics can transfer this information to a hospital emergency room right from the scene via wireless-cellular modem. Or, they beam the information from the Palm to a hospital printer using infrared technology.

Eddie Crow, ARL associate research engineer and project team manager, says the system can improve patient care and response time. "The overall emergency services response to a vehicle crash and accident victim is improved with the use of this new technology through accurate and complete health status information sent to the emergency department physician."

## Time-Saving Maintenance Management

Physicians depend on medical equipment to support them in their day-to-day work. A faulty MRI machine or lab instrument can reduce productivity or even jeopardize patient health. Portable and compatible Palm™ solutions let organizations accurately gather maintenance data from every part of a healthcare facility, then roll it into a database at the touch of a “Synchronize” button.

One facility leveraging such a Palm solution is Virginia's Centra Health, Inc. which consists of two hospitals, Virginia Baptist and Lynchburg General, along with nursing homes and other facilities. Its clinical engineering department must maintain 12,000 complex medical devices within the organization.

To replace its antiquated system of handwritten notes for tracking maintenance requests, Centra Health deployed a mobile solution developed by Palm partner, Sussex Systems, Inc. Palm handhelds are stationed at PCs throughout the hospitals, where staff can submit work requests to a central database. Each day, technicians pick up and synchronize a Palm handheld to download their requests, then use the handheld to track their tasks. At the end of their shift, they synchronize again to transfer updated work order information back to the main database. Since 1998, tens of thousands of transactions have been processed successfully.

“The system has met my objectives with a seven percent productivity improvement, 10 percent increase in documented procedures and daily savings in technician time through electronic recall of the data,” says Ben Clark, Director of Clinical Engineering at Centra. “The paper shuffle is ending on equipment maintenance, thanks to this solution.”

## Healthcare Payers

Healthcare payer organizations must collect and manage huge amounts of information, as they interact with providers and members. New advances in medical technology, changes in benefit plans, and fine-tuning treatment procedures are just a few of the issues management and staff must deal with every day.

**Enhancing decision support**—The mountain of information that healthcare payers face can actually make decisions and strategic planning more difficult, increasing the potential for waste and reducing administrative oversight. Payers need solutions that let management, staff and physicians take command of large amounts of data, and use it to make hard choices.

Using intelligent Palm handheld solutions, healthcare payers can make information work for them rather than against them, streamlining business processes, improving information flow to decision makers, and reducing costs.

## Safer, More Accurate Prescriptions

With thousands of types of drugs on the market, physicians must exercise more caution than ever when prescribing medication. Palm handhelds' ability to store and intelligently present large amounts of information makes it a valuable resource for physicians who must keep track of medication for hundreds of patients.

One organization putting the solution to good use is General Motors, the largest private purchaser of healthcare in the U.S., covering 1.2 million people. To improve the quality and cost effectiveness of healthcare for its enrollees, GM has deployed new patient record and prescription solutions based on the Palm platform.

Previously, GM depended on a handwritten medical records and prescription system, which was vulnerable to costly mistakes. Now, using an electronic prescription writing solution developed by MedicaLogic, physicians can quickly access current reference information for thousands of drugs from their Palm handheld. The MedicaLogic Prescriber software alerts doctors about drug interactions, and can prompt them to use medically equivalent, lower cost, or generic drug alternatives to comply with a health plan's requirements.

The new Palm solution can not only save money on medication, but also improve patient care. A Harvard study revealed that prescription drug errors decline by 55 percent when doctors use electronic prescription systems.

“Providing doctors with information at their fingertips helps our employees and retirees to receive appropriate care, for example, the right prescription drug at the right dose—whether that's at the hospital bedside or in the doctor's office,” says Tom Weatherup, GM's Director of E-Health Care Implementation.



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### Reducing Worker's Compensation Costs

Developing and refining work processes is among the toughest tasks administrators face. For organizations with thousands of employees, simply collecting all the information needed to make decisions about process improvement can be daunting. Pocket-sized Palm™ handhelds give healthcare organizations the ability to collect and synthesize information from many different locations quickly and accurately.

Kaiser Permanente is the nation's largest not-for-profit integrated healthcare system, serving eight million members in nine states. With worker's compensation costs reaching unprecedented levels, injury reduction has become a top priority for Kaiser. A review of injuries showed that patient transferring and handling injuries account for many worker's compensation costs.

To reduce these injuries, Kaiser set up an injury prevention task force, which tracked details about patient lifts. However, documenting these activities on paper was costly, and left Kaiser's "Lift Team" less time for patient care.

Today, Kaiser's Lift Team uses Palm handhelds to quickly and accurately collect patient information using pull-down menus to track "Lift Log" data. At the end of each shift, Palm HotSync® technology automatically transfers data from the Palm handheld to the Microsoft Access database on a desktop PC in the Kaiser office. The medical center is saving \$200 per week in data entry and using the patient handling information to reduce employee injuries.

### Pharmaceutical Companies

Pharmaceutical companies are typically large—often global—organizations that contend with a unique set of information needs. Decision makers at these organizations must collect and evaluate information from customers, inventory and manufacturing, their own sales force, and many others.

**Optimizing sales productivity**—The sales force is the key point of customer contact for most pharmaceutical companies. The ability of sales people to recognize and respond to customer needs, and communicate those needs to management, can make have a direct impact on the company's bottom line. Pharmaceutical companies need solutions that enable sales people to be at their most productive in any setting.

**Enhancing research and development**—More than most industries, innovation can mean all the difference in success or failure for a pharmaceutical company. To power their research and development programs, these companies need the ability to gather and consolidate information quickly and accurately.

**Streamlining inventory and delivery**—Product distribution has an obvious and immediate effect on any company's profitability. Pharmaceutical companies need real-time access to delivery data to ensure customer satisfaction, and to make strategic decisions about inventory management.

A number of innovative applications enable Palm handhelds to interface with pharmaceutical companies' diverse information systems, making it easy to extend a fast, accurate information-gathering solution out to employees, partners and customers.

### Improved Customer Management

Pharmaceutical companies depend on their sales force to present themselves to customers. Armed with a Palm handheld, sales people can record notes about a customer during a meeting and forward them directly to management.

Bayer Consumer Care is one of the world's leading suppliers of over-the-counter medication. Its Polish subsidiary has a field sales force of 21 people. In the past, Bayer depended on a paper-based system to collect market and customer records from this team. Bayer chose a solution based on the Palm platform to power a mobile, electronic, point-of-contact system that could streamline reporting and offer faster access to current information.

Bayer's sales force use their Palm handhelds to collect customer information during each visit, then synchronize and upload the data to the company's central database for management to review and use. The sales team also maintains appointment lists and contact databases on the Palm, which gives them all the customer information they need at their fingertips. During appointments, they can access a customer's notes and order history, or take orders and check stock.

"Since we implemented this solution, the productivity of our sales force has improved by more than 20 percent, because we have been able to eliminate the time-consuming process of re-entering data and consolidating reports," says Slawek Klimontowicz, the group's OTC Sales Manager.



### Efficient, More Accurate Patient Trials

Drug companies spend millions of dollars in research and development to get a drug to market. Using error-prone, paper-based systems for clinical patient trials can multiply these costs. The intuitive, easy-to-use Palm interface simplifies patient information collection for more accurate and cost-efficient results.

One developer taking advantage of this opportunity is CRF Box, an application developer for the pharmaceutical industry. The company has developed a handheld solution that helps its customers speed data collection and streamline the drug development process.

Clinical trial patients are issued Palm™ m125 handhelds pre-loaded with the CRF Box application, and receive training on how to keep a diary of their health information throughout the trials. The handhelds remind patients when to make entries, and track patient activities.

“Many patients participating in clinical trials are elderly or disabled,” said Jaakko Ollila, Vice President of Business Development at CRF Box. “The simplicity of Palm handhelds makes it easier to teach patients and investigators how to use them.”

To meet FDA regulations, patient entries are stored permanently after the trials are complete. CRF Box customers have enjoyed a cost savings of 35 percent over paper-based data capture methods, and reported a 90 percent improvement in the quality and accuracy of patient information.

### Building a Better Delivery System

With their ability to smoothly interface with even the largest enterprise data systems, Palm solutions are a key tool for managing inventory and delivery processes. McKesson Corporation, the world's largest healthcare and supply management information technology company, delivers more than 25,000 orders each day. Although its order accuracy exceeds 99 percent, even a few delivery mistakes can expose McKesson to expensive disputes and potential litigation.

To improve service and reduce these costs, McKesson needed an easy, accurate way for drivers to ensure that deliveries match orders. The solution had to track data input from points of delivery all over the country, and automatically load it into the company's central order and distribution system. It also had to be affordable, not only for its own drivers, but for McKesson's many courier company drivers as well.

Their solution is simple to use. Drivers load manifest information from the company's order distribution system onto the handhelds using Ethernet cradles at distribution centers. As they drive their delivery route, they use the handheld to scan each package as it comes off the truck and to electronically capture customer signatures. At the end of a shift, the drivers upload delivery information and signatures from their handhelds to the Web server.

The Palm solution has resulted in a 50 percent reduction in legal claims, a 30 percent reduction in delivery claims, and an estimated 10 percent reduction in customer ordering errors.

### Conclusion

Flexible, convenient Palm solutions enable healthcare organizations to take charge of information to improve productivity, streamline processes, and reduce overall costs.

Healthcare providers can use handheld solutions to save time on day-to-day tasks and make communication more efficient, making physicians, staff and management more productive. Health payers appreciate the Palm's ability to help them make sense of information from many different sources, enabling them to make money-saving decisions. And pharmaceutical organizations can use Palm solutions to power their sales, R&D, and distribution processes.

Palm mobile healthcare solutions integrate into existing corporate information systems with minimal disruption. Handheld applications from Palm partners are easy to learn and use, increasing solution adoption rates, and many organizations experience immediate increases in productivity. Handheld computing solutions from Palm and its solution provider partners help organizations in all branches of the healthcare industry increase operational efficiency, reduce errors, and enhance information management for improved profitability and competitiveness.

# Maximizing Return on Investment for Palm™ Handheld Computers in Healthcare

## APPLICATIONS TABLE:

	Patient records	Billing	Wireless	Home healthcare	Emergency Services	Maintenance	Prescriptions	Sales	Drug trial	Delivery/ Inventory
Baptist Health	•									
Kaiser Permanente	•									
Novant Health	•									
Miami Children's Hospital	•									
INO Therapeutics		•								
North Shore-LIJ		•								
Cedars Sinai			•							
Visiting Nurses Assoc. Home Health Systems				•						
RehabCare Group				•						
Danville, Pennsylvania Emergency Organization					•					
Medic 9 Paramedic Service, Inc.					•					
Centra Health, Inc.						•				
General Motors							•			
Bayer Consumer Care								•		
CRF Box									•	
Invivo									•	
PHT Corp.									•	
McKesson Corporation										•



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