



PatientKeeper Benefits Summary

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A Physician's Perspective

With the accumulating imperatives upon us as clinicians to practice cost-effectively, and mounting pressures felt at individual, organizational and national levels, it is all too easy to feel that a physician's primary purpose – safely and compassionately caring for the individual before us – is being overlooked. Numerous strategies exist to incorporate different approaches of varied proven efficacy to achieve higher value care, and yet we are often left feeling overwhelmed by the choices before us, with little positive impact realized. Our role as physicians in changing the vision of healthcare delivery is crucial, and yet needs to be balanced against our first mandate of superlative care for patients.

PatientKeeper is sensitive to the enormity of the physician's task, and our products reflect that. The need for accurate, legible orders is achieved through CPOE, with a positive trickle down to the individual patient care interaction by decreasing the need for clarification calls and pages, and thereby improving the speed of order fulfillment. CPOE speaks to the call for a greater focus on patient safety by reducing medication errors, and providing point of care decision support through best practice adherence. Immediate cost improvement through a reduction in duplicate orders and medication errors is achieved by CPOE as well.

But not all CPOE systems are created equal, and the need to improve medication ordering cannot be done without recognizing the impact on the physician. At PatientKeeper, we believe CPOE is a tool for the physician that must conform to the way the physician is already practicing and wants to practice. It must be intuitive and easy to use, and must always leave us truly knowing we are delivering care better. Physician satisfaction is already challenged by the numerous demands on our time. PatientKeeper knows this and aims to cultivate not just satisfaction but enjoyment, and the peace of mind that comes from knowing you are part of the process of delivering better care.

Erin Jospe, MD
Chief Medical Officer, PatientKeeper Inc.

PatientKeeper Impact Summary

Benefits	Constituent			Impact	
	Physician	IT	Executive	Patient Safety	Financial
Physician Efficiency and Quality of Life	✓		✓	✓	✓
Physician Affinity	✓	✓	✓	✓	✓
Nursing Productivity	✓		✓	✓	✓
Hybrid Environment and Avoidable Errors	✓		✓	✓	✓
Reduction of Duplicate Tests	✓		✓	✓	✓
Formulary Compliance	✓		✓	✓	✓
Implementation Cost		✓			✓

Feature/Functionality	Constituent			Impact	
	Physician	IT	Executive	Patient Safety	Financial
Simplified Single Sign-On	✓	✓		✓	✓
Secure, Native Mobile Platform	✓	✓		✓	
Integrated Workflow	✓	✓		✓	
Remote Access	✓	✓	✓	✓	✓
Stable Software Environment	✓	✓	✓		✓
Data Repository and Historical Data Loader	✓	✓			
Downtime	✓	✓		✓	✓
HIS Integration	✓	✓			✓
Electronic Charge Capture	✓		✓		✓

PatientKeeper Benefits

Physician Efficiency and Quality of Life

Perhaps now more than ever, time is a precious resource for physicians, making physician efficiency of the utmost importance. When workflow can be improved to eliminate unnecessary steps, the time saved can add up quickly. Just one hour saved per day equals 240 hours saved per physician per year.

There are numerous examples of poorly-designed and implemented systems costing physicians time or causing them to avoid adoption altogether – perhaps none more studied or challenging than Computerized Physician Order Entry (CPOE). While the benefits of CPOE from a patient safety and order processing perspective are well-documented, the real and perceived negative impact of physician efficiency continues to result in relatively poor and/or shallow adoption¹. A CPOE system that adds just 5 min/patient/day to a physician’s order workflow, for example, results in 1hr 15min – 1hr 50min per day of additional time (assuming 15 – 20 patient encounters per day for a hospitalist) spent on data entry rather than on time that could be spent seeing more patients, completing other important work, or simply contribute toward a better quality of life. It’s no wonder physicians have yet to (voluntarily) embrace CPOE in sufficiently large numbers.

Here are just a few ways in which PatientKeeper helps physicians save that precious time:

- Eliminating inefficient, manual gathering and aggregating patient data from multiple systems into a single, physician-centric application,
- Supporting physicians’ complete workflow with anytime, anywhere access via zero-footprint web browser, Smartphone and tablets (eliminates chart chase),
- Integrating disparate, ancillary systems to provide access with a single username and password (e.g., view an MRI, EKG, etc. directly from a patient’s test result),
- Supporting one-click/tap actions from a single screen, (e.g., order a medication with a single-click vs. manually entering the entire sig),
- Providing a unique, *physician* environment that supports their clinical vocabulary rather than requiring them to learn the “language” of the lab, pharmacy and other ancillary systems,
- Leveraging data across the entire workflow preventing re-entry and re-dictation (e.g., automatically display lab and test results, vitals in a progress note), and
- Requiring as little as 15 minutes to learn how to use PatientKeeper rather than spending hours/several days locked in a training room in front of a terminal.

Saving physicians’ time allows them to practice more efficiently, provide safer care and spend more time with their patients, and ultimately contributes to a better quality of professional life.

¹ Effects of Computerized Provider Order Entry (CPOE) System on Medication Orders at a Community Hospital and University Hospital. AMIA Annual Symposium Proceedings Archive. 2007: 796-800

Physician Affinity

PatientKeeper solutions can create a competitive advantage with regard to physician recruitment and retention which ultimately leads to increased hospital admissions. Physicians prefer to provide care at facilities that make them more efficient and effective – an attractive benefit of PatientKeeper’s solutions. Having easy access to information allows physicians to spend more time with the patients, enhancing patient care and service. PatientKeeper solutions streamline physicians’ workflow by giving them anytime, anywhere access to clinical data.

Nursing Productivity

Physician adoption of clinical systems reduces administrative work for nurses, who spend a significant portion of their time helping physicians to find and/or enter data. The difficulty that physicians experience in finding patient information can quickly translate to time spent by nurses helping them find that information. Physicians frustrated with a hard-to-use, legacy HIS applications and strapped for time often turn to their nursing colleagues to log into that system, locate the correct patient, collate the necessary information and print it out for them. This represents an unnecessary administrative burden for nurses and an inefficient patient care process for physicians.

Five Common Nursing Administrative Tasks:

- Locating patient charts
- Tracking down recent test results
- Transcribing physicians’ instructions onto order sheets
- Transcribing physicians’ instructions into computer systems
- Finding the appropriate pre-printed forms for physicians

Nurses also realize significant workflow benefits when a well-designed inpatient CPOE system is implemented at a hospital. Consider for starters how much time nurses spend “deciphering” physicians’ handwritten orders. The fundamental premise (and benefit) of CPOE is that physicians enter their medication, lab, and test orders directly into a computer, eliminating handwriting as a variable – and, therefore, the need for a nurse to spend time translating a doctor’s illegible chicken-scratch into English.

Then there’s the familiar, wildly inefficient telephone orders process. When doctors phone in an order from off-premises to a nurse at the hospital, it sets in motion a series of steps that collectively take a lot of time (for the nurse *and* the physician), and that are prone to misunderstanding and error. Instead, if the physician were to enter the order into a CPOE system using their Smartphone or tablet, from wherever they may be, the nursing workflow is streamlined dramatically, and the opportunity for error is minimized.

CPOE does not completely remove nurses from the patient orders workflow, of course, nor should it. Consistent verbal communication between physicians and nurses will always be one of the greatest guarantors of patient safety, when it comes to orders and every aspect of inpatient care. But clearly

CPOE offers nurses a lot of workflow benefits, so nurses should be actively involved in advocating for and evaluating their hospital's CPOE solution.

Forcing nurses to deal with hybrid order workflows until such time that virtually all orders are entered is inefficient with a potential impact on patient safety.

The Cost of a Hybrid Environment and Avoidable Errors

Maintaining a hybrid environment (both paper and electronic workflows) among physicians creates additional costs and patient safety concerns. This is often the case in hospitals where the goal is to merely demonstrate Meaningful Use rather than implementing a fully-electronic environment (60% of orders electronic means 40%+ are still paper-based). Forcing only employed physicians or hospitalists to use CPOE while allowing other physicians to continue with manual/paper ordering requires ancillary departments to support dual workflows – this is inefficient and increases the probability of error. Even worse, an individual patient could be under the care of multiple physicians, some of whom are entering orders electronically and some of whom are entering them on paper.

With streamlined access to drug information and clinical decision support tools, PatientKeeper helps physicians provide more informed care of their patients. Better patient care can reduce costs in a variety of ways, most especially through the reduction of Adverse Drug Events (ADEs). PatientKeeper provides drug-drug, drug-allergy and duplicate drug decision support in addition to efficient, integrated medication reconciliation, helping physicians manage medications at the point of care.

Reduction of Duplicate Tests

PatientKeeper makes it easy to find patient and clinical information from multiple systems and data sources. Decreasing duplicate test ordering is one of the most compelling and well-studied benefits associated with an application that's easy for physicians to use and that provides a consolidated view of a patient's clinical record across multiple applications and settings. Additional clinical benefits that are harder to quantify but no less significant include:

- An increased ability to make expeditious clinical decisions when information is more readily available to physicians in a format that's conducive to how they typically need to view it –even during instances when the organization's core clinical information system is down
- A decrease between the time tests are ordered and when they are available to physicians – and in some cases, the potential to discharge patients sooner than might have been possible otherwise
- An increase in physicians' ability to communicate and share clinical information with each other

Formulary Compliance

Real-time access to the hospital's formulary is necessary to facilitate compliance and ultimately decrease cost. With the frequency with which formularies are updated, and the variability between different facilities' formularies, staying current with the recommended interchanges is challenging and

time consuming. Reports generated on prescribing habits over time don't speak to the need to make those pharmaceutical changes as the opportunity arises.

PatientKeeper's CPOE is designed such that formulary-recommended therapeutic equivalents are shown to the clinician when the medication is searched for, or the order is entered. There is no additional need to consult a hospital's formulary reference, and current therapeutic equivalents are presented for consideration. In this way, the clinician's time can be focused on considering changes for formulary compliance only for the particular medication in question rather than needing to repeatedly search each medication to ensure it remains on the formulary. Formulary updates are assessed for daily, keeping the formulary information current for the clinician. PatientKeeper can also configure CPOE to limit medications to display only those within the formulary, or can offer free text fields for non-formulary medications. Opportunity to explain the reason for any override is also provided in a streamlined manner for ease of entry.

By providing formulary information in this manner, PatientKeeper fosters formulary compliance as well as the freedom to prescribe as needed for the individual patient as dictated by the clinician's judgment.

Implementation Cost

Implementing PatientKeeper's CPOE takes less time with less initial and ongoing cost. Utilizing PatientKeeper's Order History Analyzer (OHA) results in *much* faster implementation at a *significantly* lower work effort.

Without the OHA, hospitals will spend up to and often more than 1-year of a pharmacist's time manually keying in order strings. And these order strings would generally be global in nature, based on overall pharmacy distribution/stock counts, rather than on actual, physician-specific order history.

The OHA speeds and enhances physician adoption because each physician sees what he/she is used to seeing, literally on Day 1. When placing their very first medication order, each physician will see their most common order strings, allowing them to place medication orders *with a single click* rather than having to click/select the medication, form, dose, route, frequency, etc. In addition, the OHA allows us to automatically generate physician-specific favorites – also based on their actual order history (rather than a global list for an entire department of physicians who may not utilize the same list of common orders).

PatientKeeper Feature/Functionality

Simplified Single Sign-On

As hospitals migrate more patient information online, physicians are required to access a growing number of clinical applications – each requiring its own username and password. Physician tolerance for logging into each system every time they need to access patient information and their ability to even remember all of these passwords (without writing them down and compromising system security) rapidly decreases as more systems are added. In addition, patient safety can be compromised when physicians have to re-enter patient demographics to get to the right patient and data, adding an extra

step that introduces opportunity for error. On the other hand, installing robust single sign-on applications is a more expensive solution.

PatientKeeper provides a single application that links to other systems, providing physicians with access ALL clinical data through a single username and password. In addition to authenticating the physician's credentials, PatientKeeper passes patient context to the external system, allowing the physician to automatically and rapidly locate the right patient and the right information (e.g., lab test, study, image, etc.) with a single click. As a result, hospitals can forgo the expensive security infrastructure that would have otherwise been required to make the sign-on process easier for its physicians, saving both implementation and ongoing costs.

Native, Secure Mobile Platform

Physicians have demonstrated a willingness and interest in adopting mobile technology that outpaces the general public. A primary driver for this adoption is the mobile nature of a physician's typical day and workflow. They are often responsible for patients in multiple locations (within and outside of the hospital), and as a result, or often not in the presence of the patient's chart and/or hospital's HIS. This is a common cause of verbal orders.

No other vendor supports a physician's mobile workflow through a secure, native, mobile application like PatientKeeper. PatientKeeper's mobile platform is a huge physician satisfier that will distinguish a hospital in a competitive physician market. In addition, PatientKeeper's mobile solution allows physicians to access AND act on data. Physicians need to be able to act on it immediately - whether entering orders, entering charges, or some other common workflow – physicians require support for more than just viewing results. They are less keen to view results on their mobile device only to have to search for an open computer/terminal to enter orders, document care, etc.

Integrated Workflow

A significant barrier to physician adoption of IT is the way in which traditional systems treat physician workflow as a fragmented, linear set of "steps" that occurs at a specific point in a patient encounter in a predictable order. Whether it's CPOE that is separate from medication reconciliation, problem list management that is separate from CPOE or documentation that is separate from clinical results, standalone applications merely add to the inefficiencies inherent in traditional systems and act as a significant barrier to adoption.

PatientKeeper delivers an integrated suite of physician workflow applications that speed adoption, improve efficiency, and ultimately satisfy physicians. PatientKeeper's physician workflow tools allow users to share data between "modules" and move back and forth between them – definitely not just linear. For example, when writing the assessment and plan section of a note a physician selects a problem from the displayed problem list, or even adds a new one, indicates the assessment, including potentially updating the problem list and then includes the plan, which may include including existing orders or even adding new orders, all done from within the note itself.

Remote Access

With physicians becoming more mobile, residing and practicing in suburban and rural areas, and following patients in multiple inpatient settings, hospitals are increasingly obligated to provide remote access to their core applications. Given its web-based architecture, physicians working remotely can securely sign in to the PatientKeeper Portal from any computer and access information from multiple hospital systems from within a single portal application. This reduces the costly training and support that would be required if a hospital were to provide access to each system individually through tools such as Citrix. A hospital supporting 100 physicians who require remote access would need to invest at least \$100,000 to install a remote access network, plus any additional money to support and maintain the system every year. Utilizing a zero-footprint browser, PatientKeeper does not require an expensive (to purchase, maintain and use) Citrix environment.

Stable (Physician) Software Environment

PatientKeeper offers a stable software environment for your physicians as you upgrade underlying HIS and ancillary systems over time. Physicians will be trained on and use PatientKeeper regardless of if or when a hospital upgrades or even migrates to another system altogether. This is less disruptive for physicians as they will only have to learn one system and will maintain a single, efficient workflow regardless of other core and ancillary system changes going on around them.

Data Repository and Historical Data Loader

One of the challenges if not outright barriers to upgrading or migrating to another HIS is the potential for loss of invaluable historical data. Hospitals are left with two undesirable options: 1) “transfer” data from the old system to paper records before decommission or 2) maintain access to the “old” system even after the new system is live.

The first option is fraught with problems, chief among them market’s overwhelming move toward digital records and their associated benefits. The second option adds yet another system (that is presumably sub-par given its replacement) for providers to access and manually aggregate longitudinal data in order to generate a complete patient medical record.

PatientKeeper’s Historical Data Loader preserves your historical MEDITECH data and integrates it with current, ‘live’ data that physicians access from within a single, unified system.

Downtime

PatientKeeper’s downtime solution ensures that you reduce the negative operational and financial effects of planned and unplanned downtime, including:

- No access to historical data such as lab results, which may result in poor or incomplete medical decisions
- Medication errors due to lack of access to MAR system
- Physician frustration with data access delays

- Physician loss of confidence in and adoption of technology/computer systems
- Loss of productivity as physicians and nurses are forced to search for charts, call the lab for data, and have radiology results printed so that x-rays may be reviewed
- Time spent to re-enter and reconcile data entered into the system once uptime returns

PatientKeeper's downtime solution includes a repository that stores a complete history of all patient information, which provides a true longitudinal patient record. The history is purged or archived according to client-defined parameters. The repository is completely independent of your hospital information system - users can access patient records via mobile device or web browser even when the core hospital information system is down. Data in the repository is as current as the last feeds received, and PatientKeeper can even notify users when the core system is back up.

Using the downtime solution, physicians can continue to access data in order to safely care for their patients and nurses can continue to collect information – such as vitals, I/Os and pain assessments - that can be synchronized once the system is up again. This time savings adds up into a significant cost savings as well - the cumulative cost of downtime can be steep. According to a study reported by *Healthcare Informatics*, the annual cost of a 1% downtime (less than two hours per week) in a 500-bed hospital is \$1.4 million².

HIS Integration

Integrating disparate healthcare applications always ends up being more difficult and expensive than expected. For organizations hosting multiple vendor systems that seek to present a single unified patient record to physicians, it's not unusual to spend \$20,000 to build *each* interface. PatientKeeper leverages a direct integration or Web services approach for several of the leading hospital IT vendors (including GE Centricity Business, MEDITECH and Cerner) that can reduce the separate, point-to-point interface costs organizations would otherwise incur attempting to achieve seamless integration on their own.

Electronic Charge Capture

Manual, paper-based charge processes - with multiple hand-offs and points of failure - cost practices many thousands and in some cases millions of dollars each year. Physicians must spend an inordinate amount of time reconciling encounter forms and index cards with multiple patient lists in order to submit charges in an accurate, compliant, and timely fashion. With ICD-10 requirements, it will only get worse without an automated billing process that fits your physicians' existing workflow. Electronic charge capture allows providers to virtually eliminate lost charges, reduce charge lag time, and eliminate rework while improving communication between physicians, billers and coders.

² System Uptime Study for the Healthcare Industry. Anderson, M.R. *Healthcare Informatics*. 2003.