

Technical White paper

Healthy, wealthy and wise

Real-time intelligence helps match beds and patients—for better care, for more people, at less cost.



CentralLogic⁺



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Better patient flow, better patient experience

Hospitals are recognizing that better patient flow management improves quality of care, resource utilization, and cost-efficiency.

The 2012 Patient Flow Challenges Assessment survey conducted by American Hospital Association (AHA) Solutions and Hospitals in Pursuit of Excellence (HPOE) finds hospitals investing in patient flow improvement initiatives that span process, staffing, and systems—and reporting positive results from their efforts.¹ According to Tony Burke, CEO of AHA Solutions, “Patient flow directly impacts a health care facility’s overall performance and can also play a strong role in patient satisfaction.”²

Fixed beds, moving patients

Patient flow management starts with the earliest point in patient transport—whether a patient comes in through, ER, OR, Dialysis, or another health system—through the patient’s discharge, whether to another care facility or their own home. A hospital’s ability to manage patient flow depends on its ability to balance both “demand” (patient needs) and “supply” (finite physical and human care resources).

At the core of patient flow is bed management, or capacity management. Patient transfer, for example, is operationally inseparable from capacity management, because proper patient placement depends on what beds are available. Gaps, delays, or mistakes in placing patients in the right bed, with the right level of care, can have serious negative clinical, operational, and financial impacts.

Making the best use of existing hospital resources is critical in light of economic uncertainties coupled with the anticipated growth in demand from an aging population and the newly insured under healthcare reform.

Even a small improvement in efficiency in patient placement and flow can have significant impact. For example, reducing average length-of-stay by just four hours in a 275-bed hospital is the equivalent to increasing the facility’s physical capacity by 10 beds.³

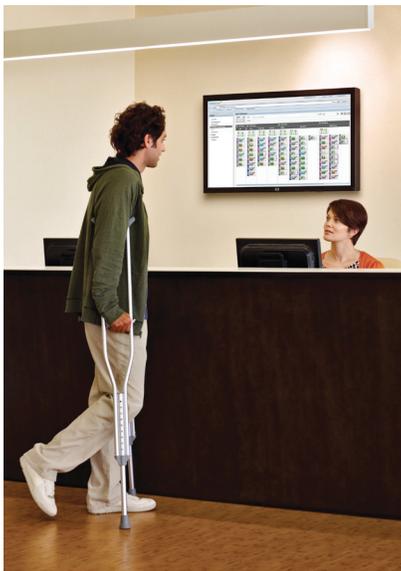
1 Source AHA Solutions and Hospitals in Pursuit of Excellence (HPOE). “Results and Report of the 2012 Patient Flow Challenges Assessment: Hospitals Consider Patient Flow Essential to Care and Competitiveness.” 2012

2 Source AHA Solutions press release, January 26, 2012. <http://www.aha-solutions.org/press/01.26.12-pfca-report-launch.shtml?source=prindex>

3 Source CSC calculation based on CDC data on U.S. averages for inpatient care (non-Federal short-stay hospitals) <http://www.cdc.gov>

Urgency and quality of care

Capacity management is much more than just the timely allocation and provisioning of physical beds. Urgency and quality of care requires that patients be matched with the right bed—with the right level of nursing care and access to the right specialists, diagnostics and treatments—as quickly as possible.



The timeliness of definitive care is the most critical—and complex—aspect of patient placement, directly impacting the quality of care and patient experience. According to State-led initiatives like the nurse-to-patient ratios mandate initiated in 1999 in California, critical care beds in the ICU and “step-down” units require a 1:1 nurse/patient ratio, while standard care is 1:3, and general medical and surgical units only require a 1:5 ratio.⁴

If no suitable bed is available—or the transfer center is unable to see that such a bed is available—an admitted patient may need to be placed in another, less suitable area of the hospital, and subjected to multiple moves. For example, an oncology patient may first be transferred to a bed in the pediatric surgery ward, or vice versa. In a worst case scenario, admission may be delayed and critically ill patients are boarded in an emergency department or hallway until a bed opens with the proper level of care.

Getting patients into the right bed, the first time, improves health outcomes and patient experience, and reduces overall length of stay. The ability to make fast, informed decisions about patient placement—from transfer, admission, and internal transport, to discharge—is an important factor in achieving many hospital objectives, including higher Hospital Consumer Assessment of Healthcare Providers Systems (HCAHPS) survey ratings, reducing unnecessary re-admissions, and making the most efficient use of all health system resources.

Financial and regulatory drivers

Proper and efficient patient placement also contributes to lower costs for patients, payors, and hospitals. Medicare, Medicaid, and private insurers closely monitor “right patient status” as designated by the patient’s physician and compare “intensity of service” and “severity of order” to define reimbursable patient stay. If, for example, a patient comes to the ER with abdominal pain, it could be appendicitis, but initial lab work and symptoms are not definitive. The insurer will typically pay the full cost of overnight observation. However, if the patient is unnecessarily admitted the next day due to inappropriate communications to the care team to ascertain status, the insurer may not pay the full cost, leaving the hospital to absorb the difference.

Healthcare reform will increasingly tie reimbursement to hospital quality of care metrics such as HCAHPS and other still-to-be defined efficiency measures. Beginning October 2012, hospitals faced maximum financial penalties of up to 1% of Medicare/Medicaid reimbursement for excessive readmission of patients in less than 30 days. In 2014, the maximum financial penalties double to 2% of Medicare/Medicaid reimbursement.⁵

The financial benefits of being able to quickly, efficiently place patients in the right bed the first time are compelling. They include:

- **Added capacity**—Without physically expanding, through more efficient utilization and faster turnover of existing capacity and less “bed hiding” from delayed updating of availability
- **Increased revenue**—By providing care for more patients, without adding resources
- **Reduced costs**—By optimizing use of hospital resources and proactively managing length-of-stay
- **Improved staff productivity**—By cutting the time teams (transport, emergency, transfer, nursing, EVS) spend looking for data and minimizing “work queuing”
- **Improved patient health and satisfaction**—By reducing wait times and timeliness of definitive care
- **Shorter length-of-stay / Fewer readmissions**—Through right level of care and coordinated discharge processes

4 Source Health Affairs September 2002 vol. 21 no. 5 53-64: <http://content.healthaffairs.org/content/21/5/53.long>

5 Source <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>

Better communication and coordination

To achieve the full clinical, operational, and financial benefits of better, faster patient placement, hospitals must be willing to address significant challenges—chiefly, the conundrum of how to improve communication and coordination among extremely busy professionals engaged in different, but critical tasks. Indeed, 60.9 percent of the hospital leaders surveyed for the Patient Flow Challenges Assessment report, identified poor communications as the root cause of poor patient flow.⁶

A number of factors contribute to the sharing of timely and accurate information required for fast, smart bed management decisions and efficiencies. These include:

- Constant changes in bed and patient status
- Separate admission processes and systems in different departments (e.g., emergency, cardiology, pediatrics, obstetrics)
- Manual data entry and reconciliation, decreasing staff productivity and increasing risk of errors
- Multiple, incompatible sources and versions of information on bed status and patient needs in multiple, incompatible data formats (e.g. paper, whiteboard, Excel files, ADT, Electronic Medical Records (EMRs), patient transfer and EVS worklists)
- Difficulty of inputting and accessing information at the point of patient care
- Need for strict security and privacy in compliance with HIPAA and other regulations and policies to protect access to, and update of, patient information
- No ability to capture and analyze or review data to measure performance/quality, identify trends or target areas for improvement

Symptoms of poor patient flow

A quick check to determine flow issues would be to ascertain if any of these circumstances are recurring:

- Holding patients overnight in the ER who need to be admitted
- Full recovery room (PACU) results in delayed OR procedures
- Turning patients away due to inefficient inpatient capacity management

From bed management—to patient placement

Traditionally, “bed management” solutions for managing information and communications have focused on turning over physical beds as quickly as possible, primarily by helping Environmental Services (EVS) teams schedule and report on room cleaning, with little matching of patient needs and levels of care and services.

Such solutions, whether internally developed or purchased from a vendor, have typically only exacerbated communication, complexity, and cost issues by adding to:

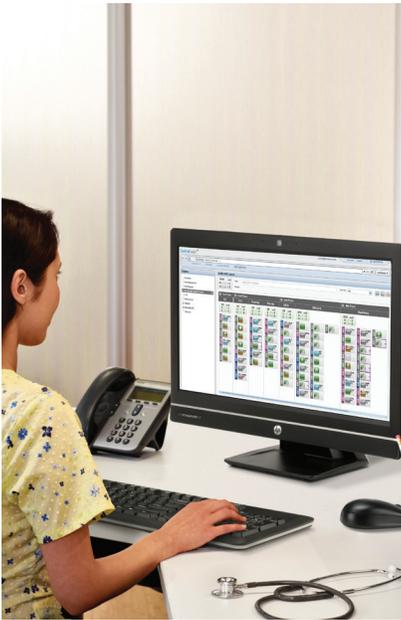
- The number of incompatible systems
- The amount of data created
- The number of places data is stored
- IT maintenance expenses
- Staff training requirements

The promise of all-digital technology

Today, advances in digital technology enable a new approach: patient-centered placement. In this setting, resources are organized around patient needs and all teams (transport, ER, ADT, clinicians, EVS) share real-time visibility into the patient’s needs and status through technology.

Recent advances in processors, touch-enabled devices, and Web-connected application technologies make it increasingly practical for hospitals to implement end-to-end digital solutions that provide everyone on the patient care team with the real-time, “at-their-fingertips” information they need to make patient placement decisions.

6 Source AHA Solutions and HPOE. “Results and Report of the 2012 Patient Flow Challenges Assessment: Hospitals Consider Patient Flow Essential to Care and Competitiveness.”



New capabilities include:

- Secure, web-connected access to actionable real-time information by authorized users across all departments and functions
- User-friendly electronic whiteboards, digital displays, and mobile devices that enable staff to quickly and easily access and input information anywhere
- Integrated worklist and workflow automation, with hospital-defined standards and rules written into the software, including checks and balances and escalation alerts
- Consumer-oriented hardware and software innovation and integration, from the processor chipset to intuitive touchscreen interfaces, that significantly reduce cost and minimize the need for administration, maintenance, training and support
- Data capture, analysis, and reporting tools to identify trends and pinpoint opportunities for improvement

Transforming the hub of patient flow

Like air traffic controllers, triage nurses must make patient placement decisions based on complex, interdependent factors that change minute-by-minute. The unpredictability of emergency admissions can quickly turn an efficient system with a high occupancy rate into a crisis situation. Bottlenecks, delays, or mistakes anywhere in the system of care can cause a serious backup—and even mean the difference between life and death.

Before

Until recently, the triage nurses responsible for providing the clinical oversight and making patient placement decisions in a large hospital were forced to depend on multiple manual tools and techniques to find, coordinate, and update the information required to make good decisions quickly. Information sources include:

- Handwritten status updates on the whiteboards near patient beds, or manual data entry into Microsoft® Excel worksheets at nurses' stations
- Multiple phone calls and face-to-face meetings each day with nursing staff in different departments to review status and attempt to sync up information
- Gleaning relevant information from an ADT (admissions/discharge/transfer) system, designed not for patient placement, but for billing

Despite the best efforts of everyone involved, information was never up-to-date and the process was very labor-intensive and inefficient.

Now

By moving to an integrated, all-digital capacity management system with real-time visibility, triage nurses can benefit from capabilities, such as:

- Automatic capture and analysis of data
- At-a-glance dashboard views of performance metrics, with drill-down to details
- Real-time email alerts when hospital-defined-parameters are exceeded
- Regular, automatically generated reports
- Report wizards to create customized, on-demand reports
- Snapshot views by units, floors, and the entire hospital system
- Secure access to real-time dashboards and data via a standard web browser

Informing management decisions

When it comes to seeing the big picture in patient placement, whether to address immediate issues or make the right long-term investments, hospital executives have long been limited by a lack of access to timely information, historical information, and analysis tools.

Before

Gaining access to patient transfer and bed management information typically meant hiring an outside consultant or adding to the burden of already-busy professionals to collect and enter information into Microsoft® Excel spreadsheets. Management-by-walking-around was another option. Unfortunately, problems with patient placement and capacity management typically only became evident during a crisis, such a bed shortage or ER boarding.

Now

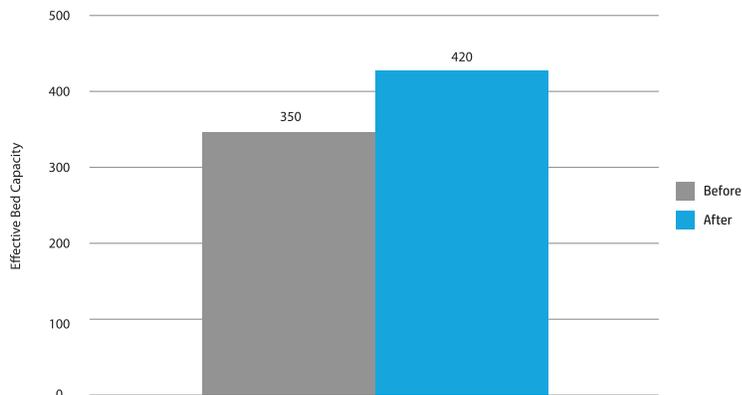
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The numbers tell the story

Redesigning processes, centralizing patient placement and introducing technologies are estimated by industry experts to help hospitals increase their effective bed capacity by 5 to 20 percent. For each bed added, it's easy to see how a comprehensive bed management solution can help generate untapped revenue.⁷

Illustration of capacity before and after a workflow redesign



7 Source Using Tracking Tools to Improve Patient Flow in Hospitals, April 2011: <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/U/PDF%20UsingPatientTrackingToolsInHospitals.pdf>



Real-time visibility and workflow considerations

Moving forward to realize the benefits of real-time data visibility and workflow automation, hospitals and health systems need to evaluate not just technology, but its impact on different teams and patient placement and bed management processes.

The creation of a steering committee to identify and engage stakeholders, devise and gain consensus on a strategy, and plan implementation is a good first step. Many hospitals have created new departments or designated permanent committees focused on patient flow improvement.

The following are important considerations in developing a successful real-time patient placement strategy, solution, and implementation plan:

- **Process improvement and workflow automation**

Workflow automation begs the question of what workflows are to be automated, considering how processes might be improved. It doesn't make sense to select tools that force your organization into models that don't fit. Customizable predefined workflows provide a starting point, along with the flexibility to adapt easily to team- or hospital-defined requirements. Rules-based engines can help guide staff through the customization of existing workflows or development of workflows that match specific operations.

- **User adoption**

User adoption starts with the aforementioned involvement of a broad set of stakeholders in upfront design and definition. Representatives from critical functions, such as, Triage, Transfer Center, Nursing, EVS, Transport, Maintenance, and Hospital Executives must actively participate throughout definition, planning, and implementation to make sure tools support the processes and provide the information and functions they need. Friendly, intuitive interfaces, such as consumer-style, touch-enabled interfaces, go a long way in speeding adoption by making tools simple to use and learn.

- **IT integration**

Ask IT to review infrastructure requirements, implementation, and ongoing maintenance and support needs. Seek their help evaluating the comparative value of different product features, such as configurable rules engines and report wizards that can reduce end-user reliance on IT services. Have them rate tools on the basis of their ease of integration and interoperation with other hospital applications (e.g., patient transfer, clinical, ADT, EMR), as well as off-the-shelf applications for email, web browser access, and so on.

- **Financial justification / ROI**

Investment in new real-time patient placement systems should be weighed against the costs of existing manual systems. Examples include overhead, when clinical nurses must manually go through the hospital to identify patient status and find and alert physicians as the deadlines for critical decisions, such as discharge, approach. More "hidden" but potentially even more serious costs include: the negative impacts of the existing system on quality of care, patient experience, and risks to data security, patient privacy, and regulatory compliance.

Do no harm: Best practice patient placement principles

To keep patients safe and provide quality care, emergency medical staff, nurses, and physicians all learn the 5 'Rights' of Giving Medications (Right Patient, Right Medication, Right Time, Right Dose, Right Route) as part of their training.

The patient flow team at a large New England tertiary-care hospital has adapted these guiding principles in 5 'Rights' of Patient Placement:

1. Right Level of Care
2. Right Service
3. Right Nursing Unit
4. Right Bed
5. Right Time

Ready-to-go real-time patient flow—from the leaders in healthcare technology

Together, Intel, HP, and Central Logic offer integrated, easy-to-use solutions that reduce the time, cost, and complexity of implementing end-to-end digital patient flow.

The real-time capacity management solution combines:

Central Logic Core™ bed management software

Intuitive, web-enabled, Core software provides secure, real-time communication, tracking, and updating of patient and bed status to optimize quality of care and experience. Features include:

- Multiple views of/and access to actionable data—authorized users simply click on a room or patient to change a status or make a request
- Seamless integration with Central Logic ForeFront, the industry's most popular patient transfer software
- Easy integration with other hospital systems, such as ADT and EMR
- Customizable automated workflow templates and rules-based engine
- Real-time dashboards and reports
- Integrated worklists for nursing, transport, transfer, EVS and maintenance with automatic prioritization based on urgency of care and location
- Predictive reasoning to help optimize capacity utilization and forecast when beds will become available
- Assisted matching of patient needs to hospital-defined bed attributes

HP TouchSmart Elite All-in-One PCs, HP Workstations, HP Business PCs, HP EliteBook Tablet PCs, and HP Interactive Digital Signage Displays

Central Logic software on HP systems makes it easy for authorized personnel to securely access and update patient and bed information on the spot. For example:

- HP TouchSmart 8300 All-in-One PC featuring Intel® Core™ vPro™ processors with 23 inch diagonal touchscreen monitor offer a compact, ergonomic workstation at the nurses' station
- Powerful HP Z600 Workstations featuring Intel® Xeon™ processors provide backend virtualization and redundancy
- HP ElitePad tablets enable nurses, Environmental Services (EVS), and Transport teams to access and enter the latest information where they work as they check on patients, clean rooms, transfer patients
- HP Digital Signage Displays with integrated multi-touch screen technology replace antiquated whiteboards to provide up-to-the-minute views of the facility, units, bed status, assigned staff, and patient status

3rd-generation Intel® Core™ vPro™ processor technology

HP healthcare systems take advantage of advanced Intel processor technology innovations, which build security, self-maintenance, data encryption, and other functionality into the chipset and other system hardware, where they are less vulnerable to hackers, computer viruses, computer worms, and other threats. For example:

- During deployment, security credentials, keys, and other critical information are stored in protected memory (not on the hard disk drive)—and erased when no longer needed
- 3rd-generation Intel® Core™ processors with vPro™ technology⁸ support encrypted communication while roaming
- Multi-layered, hardware-assisted monitoring, security, management, reliability, and maintenance capabilities make it easier for a sys-admin to monitor, maintain, secure, and service systems



8 Source Some functionality of this technology, such as Intel® Active management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future “virtual appliances” applications for Intel vPro technology is dependent on 3rd party software providers. Microsoft Windows required.”

Getting started

Integrated bed management solutions leveraging technologies from HP, Intel and Central Logic can help your organization optimize resources by providing real-time data visibility and customized, automated bed management workflows. Better communications benefit providers, physicians, nurses, other staff, patients, and their families.

Financing

HP Financial Services can help you to begin to take advantage of end-to-end digital bed management in your hospital today—with minimal impact to cash flow. HP financing specialists take a lifecycle approach that helps you to consider not just initial purchase, but total cost-of-ownership to develop financing that makes sense for your organization.

Consulting

Central Logic consultants and authorized HP Health Specialist partners with extensive expertise in digital patient flow solutions will work with your staff to integrate with existing workflows and provide onsite training.

Learn more

About HP

As a trusted supplier of information technology solutions to hospitals, clinics, and medical practices around the world, HP is uniquely equipped to support end-to-end patient flow solutions in major medical centers, community hospitals, and small care centers. The HP Healthcare Alliance program combines offerings from independent software vendors with hardware from HP to deliver integrated, tailored, and tested solutions that work.

Learn more about HP Healthcare solutions at:

hp.com/go/healthcare

About Central Logic

Central Logic is the healthcare industry's leading provider of innovative patient flow software and consultative expertise. Since 2005, the company's solutions have transformed patient transfer processes for some of the United States' most respected medical systems and hospitals. Central Logic works collaboratively with physicians, administrators, and staff to design and deliver patient flow solutions that increase patient throughput while conserving internal resources.

Learn about Central Logic patient flow solutions at:

centrallogic.com/solutions

About Intel

Where information and care meet: HP solutions powered by the Intel® vPro processor family deliver smart, long-lasting performance. Advanced and Industry standard technologies from Intel help enable coordinated, customized care by contributing to the creation of an interoperable health IT infrastructure.

Learn about Intel and healthcare at:

intel.com/about/companyinfo/healthcare/index.htm

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