Why Clinical Mobility is Vital to the Transformation of Healthcare

IMPROVING PATIENT CARE DELIVERY, QUALITY AND COST

Consistently delivering safe and cost-effective patient care is a challenging task, but essential for the success of all healthcare organisations. Decision making happens in time-sensitive, pressurised-environments. In many instances, clinicians do not have all the patient health and clinical decision support information readily available when and where it is needed.

Recognising the critical role that information plays in patient care delivery, healthcare organisations throughout the world are increasingly investing in digital technologies to improve the accuracy, immediacy and accessibility of their patient health information. Strategic investments in Electronic Health Records (EHR), Internet of Things (IoT), smart medical devices, artificial intelligence and predictive-data analytics are empowering clinicians and elevating the quality of patient care. Despite impressive advancements, workflow operational barriers remain stubbornly in place and too frequently interfere with the clinician and patient interaction.

This white paper examines the role of Clinical Mobility in the transformation of healthcare and explores the types of workflow barriers; the impact that they have on clinician-patient interactions; and the potential causality relationship between workflow barriers and combined caregiver-patient satisfaction levels. It also presents Clinical Mobility utilisation as a strategy to alleviate workflow barriers, and as an emerging discipline within healthcare systems.

Ultimately, this paper helps answer the question of why Clinical Mobility is strategically important to all healthcare provider stakeholders. The goal is to provide vision and inspiration on how advanced technologies, when properly coordinated, can help extend patient centricity and care delivery excellence.

Clinical Mobility is the use of mobile devices, such as handheld mobile computers, tablets and mobile printers, by physicians, nurses and other healthcare professionals at the point-of-care.

A CHANGING WORLD

Hospital clinicians operate in a work environment that is very different from just a few short years ago. Acuity levels are higher, length of stays shorter, documentation requirements greater, and technology ecosystems more complex. Collectively, these factors result in increased work, intensified pressure and higher levels of stress for hospital caregivers. It is more critical than ever before to simplify the patient care delivery process and to break down the work flow barriers that impede clinician-patient interactions.

In the last two years, more data was created than in the previous 5,000 years of humanity.

Less than 0.5% of that data is analysed for operational decision making.[1]

Workflow Barriers

Healthcare workflows are multi-dimensional, complex, fast-paced, overlapping, and often unpredictable. These characteristics create high levels of variance and contribute to inefficiencies in patient care delivery. For purposes of this discussion, we've divided workflow barriers into three distinct categories: patient health information data, staff communications and situational awareness. The cumulative impact of these workflow barriers is formidable and disruptive to clinician-patient interactions.

Patient Health Information Data

Within the fast-paced healthcare work environment, it is often difficult for clinicians to access the right type of data in real time. Challenges often occur, including:

- The information does not exist in electronic or digital format.

- Information is available but is not disseminated in a real-time manner, therefore diminishing the value of the information.

- There is seemingly too much information available and locating the relevant information is difficult.

When clinicians leave the patient's bedside to receive updates from the care team, access lab results, review doctor's orders or medication changes, care can be compromised. Clinicians must be able to access, locate and retrieve the specific data that they are looking for in a convenient, user-friendly and timely manner that maximises time with the patient.

[1]Harris, R. (2016, December 23). More data will be created in 2017 than the previous 5,000 years of humanity. *App Developer Magazine*. Springfield, MO, United States.

Staff Communications

Within the hospital environment, it is often difficult for team members to have seamless, non-intrusive and reliable communications with each other. Caregivers commonly struggle to identify which co-workers are on shift, locate them and communicate securely. Often, communication modalities and tools are not compatible and prevent needed interactions from occurring. Even in well-coordinated situations, physical infrastructure can impede effective communication delivery, resulting in poor quality voice transmissions during mobile phone calls and in the unreliable delivery of text messages. Streamlining communications is essential to reducing workflows and improving patient care.

NURSE MANAGERS IDENTIFY OPPORTUNITIES FOR IMPROVED COMMUNICATION[2]

1 Nurse-to-physician communication

2 Nurse-to-nurse communication

3 Nurse call and patient monitoring alerts to mobile devices

4 Clinical decision support (real-time information)

Situational Awareness

Patient health conditions, the physical environment of care and clinical support functions frequently and unpredictably change. Changing conditions may be time-related and result in a late procedure start time or delayed patient care activity. A changing situation may be attributable to the readiness and availability of medical assets causing the clinician to adjust patient care administration unexpectedly. In other instances, the changing status is patient-related. When the care delivery team is unaware of changing conditions, blind spots occur and can result in compromised patient care delivery.

SMART DEVICES REQUIRE MANAGEMENT[3]

On average, patients are monitored by three to six devices.

[2] Zebra Technologies. (2017). 2022 Hospital Vision Study. Lincolnshire, IL, United States.
[3] White, J. (2016, August 9 2016). The connected hospital: Wireless technology shapes the future of healthcare. *Becker's Health IT & CIO Review.* (M. Gamble, Ed.) Chicago, IL, USA.

NURSES: A DAY IN THE LIFE

As the largest employee group inside a hospital, nurses are especially important and perform critical roles as caregivers, communicators, teachers, patient advocates and decision makers. For nurses, the vocational mission of treating, helping and healing sick patients is increasingly at risk of becoming marginalised due to the modern-day care coordination and workflow document requirements placed upon them.

18%
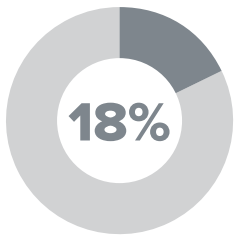
Only 18% of nurses' time is spent with patients for assessment and treatment.

According to a recent article, nurses spend a mere 18 percent of their time with patients for assessment and treatment. The remaining 82 percent is spent away from the point-of-care walking from patient's rooms to nurses' and storage stations, retrieving medications, supplies and recording information into the EHR system.[4]

In a similar study, researchers examined the patient-care workflows of medical-surgical nurses across 36 hospitals and once again revealed that nurses spend the minority of their time on patient care activities.[5]

Worker Retention
Nurse retention rates across all hospitals are cause for concern. A recent industry study reported that 43 percent of newly licenced nurses working in hospital settings leave their jobs within three years of employment. Nurse workforce turnover undermines patient care delivery quality and costs a hospital on average between $5.2 million and $8.1 million annually.[6]

Hospital-Acquired Infections
There is a direct relationship between nurse staffing levels, burnout and healthcare-associated infections. For every 10 percent increase in the number of high-burnout nurses, one additional catheter infections and two surgical site infections occurred per 1,000 patients.[7]

ALL IN A DAY'S WORK

In a single shift, nurses complete at least one function every 1 to 1 ½ minutes and perform as many as 2,061 tasks to provide treatment and clinical documentation for their patients.[8]

[4] Pierson, J. (2015, March 18). Point-of-Care Workstations Contribute to Improved Nursing Workflows. (J. Kovacs Silvis, Ed.) *Healthcare Design.*
[5] Hendrich, A., Chow, P. M., Skierczynski, B. A., & Zhenqiang, L. (2008, 12(3)). A 36-Hospital Time and Motion Study: How Do Medical-Surgical Nurses Spend Their Time? *The Permanente Journal, 12(3),* pp. 25-34.
[6] NSI Nursing Solutions, Inc. (2016, March). *2016 National Healthcare Retention & RN Staffing Report.* Retrieved from NSI Nursing Solutions.
[7] Cimiotti, J. P., Aiken, L. H., Sloane, M. D., & Wu, S. E. (2012, August). Nurse staffing, burnout, and health care—associated infection. *American Journal of Infection Control*, pp. 486-490.
[8] Ibid, *Healthcare Design.*

THE CASE FOR CLINICAL MOBILITY

Challenging healthcare workflows place undue burdens on caregivers and negatively impact the level of interaction between clinicians and patients. As a result, patient care delivery can suffer. Clinical Mobility can help elevate patient care, empower clinicians and enhance workflows.

Clinical Mobility is the use of mobile devices, such as handheld mobile computers, tablets and mobile printers, by physicians, nurses and other healthcare professionals at the point-of-care. Clinical Mobility workforce solutions have had an under-appreciated value in the past and offer a surprisingly high ability to positively transform patient care delivery within a hospital.

This perspective is more fully understood when one considers that a single handheld device is both a fully functioning, high-powered mobile computer and simultaneously a multi-dimensional clinician workflow tool that automates and executes critical workflow tasks such as barcode scanning, medical image capture, secure text messaging and mobile voice communications.
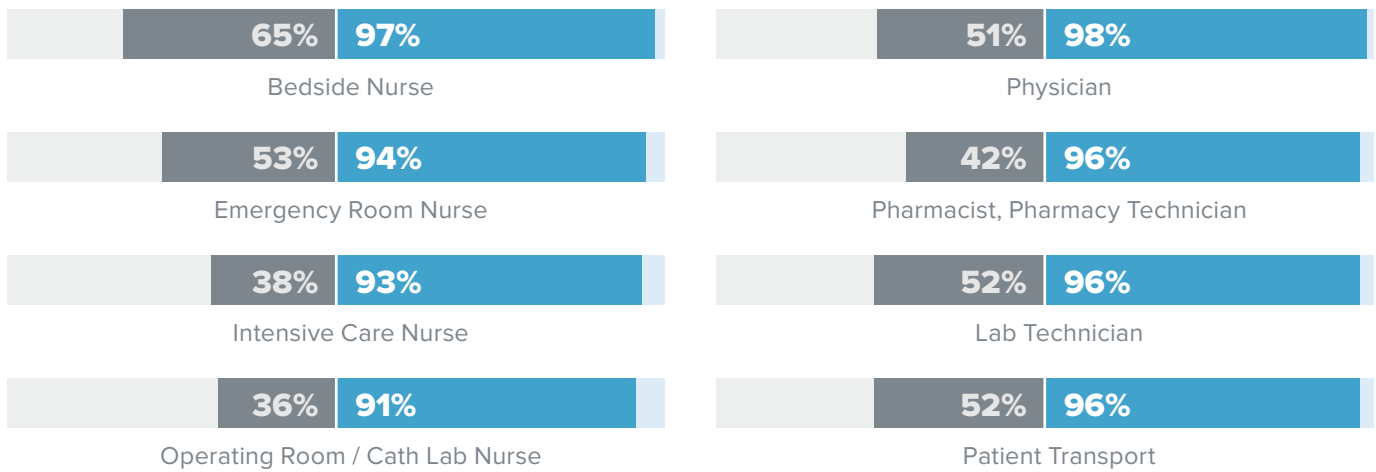
With appropriate ecosystem coordination, Clinical Mobility solutions not only unify disparate clinician work tools, but more importantly, disparate patient health information sources as well. By combining and integrating Internet of Things medical devices, health information software systems, and co-worker communications, Clinical Mobility solutions can help usher in a new era of smarter, dynamic, and more flexible patient care delivery processes. Higher quality, lower cost delivery and patient care centricity are the promises of this system and will be powered by:

• Strengthened clinical integration amongst all functional teams and disciplines.

• Elevated patient care delivery coordination.

• Improved visibility to changing circumstances and deteriorating patient conditions.

• Greater staff productivity and hospital operational efficiency.

• Increased clinician-patient interaction time.

ADOPTION TRENDS

Clinical Mobility adoption rates are increasing exponentially in both the number of hospital employee users and in the intensity of use. In a recent global study, over 1,500 respondents were surveyed on their current and future practice of Clinical Mobility.[9] The results depict a future healthcare delivery system where mobile device usage is widespread throughout the hospital and well-coordinated across both clinical and support-services employee groups. By 2022, global mobile device usage is expected to exceed 95 percent by nurses, physicians and pharmacists.

MOBILE DEVICE USAGE IS EXPECTED TO INCREASE DRAMATICALLY — 2017 | 2022

	2017	2022
Bedside Nurse	65%	97%
Emergency Room Nurse	53%	94%
Intensive Care Nurse	38%	93%
Operating Room / Cath Lab Nurse	36%	91%
Physician	51%	98%
Pharmacist, Pharmacy Technician	42%	96%
Lab Technician	52%	96%
Patient Transport	52%	96%

REPORTED BY IT EXECUTIVES

Bottom-Line Results

Clinical Mobility helps improve the patient care delivery process. When implemented effectively, hospital employees cite reduction in costs, enhanced patient safety, and quality improvements. The development of an enterprise-wide Clinical Mobility solution is important for the future success of healthcare organisations.

CURRENT IMPACT OF MOBILE TECHNOLOGY[10]

COST REDUCTION
55%
Of hospitals cite reduced cost of patient care

QUALITY IMPROVEMENT
72%
Of hospitals highlight improved quality of patient care

ENHANCED PATIENT SAFETY
61%
Of nurses report reduced medication administration errors

[9] Zebra Technologies. (2017). 2022 Hospital Vision Study. Lincolnshire, IL, United States.
[10] Ibid, Zebra Technologies.

AN INTEGRATED ECOSYSTEM OF HEALTHCARE TECHNOLOGIES

Clinical Mobility solutions, when implemented effectively, integrate with health information software systems and IoT medical devices. As clinicians adjust to the robust capabilities of the solution, the mobile device becomes increasingly more central to the way in which patient care is administered. Let's consider three application categories: communication and collaboration, data management and workflow efficiency.

COMMUNICATION AND COLLABORATION	DATA MANAGEMENT	WORKFLOW MANAGEMENT

• VoIP Reliable Voice Communication
• Secure Text Messaging
• Digital Image Capture and Delivery
• Telemedicine
	• Data Capture
	  – Patient Identification
	  – Barcode Medication Administration
	  – Specimen and Tissue Labelling
	  – Inventory Management
	• Data Retrieval
	  – Medical and Drug Database Reference
	  – Patient Records
	  – Lab Diagnostics
	  – Radiology
	  – Patient Vital Signs
		• Nurse Call Alerts
		• Biomedical Device Alarms
		• EMR Text-Based Notifications
		• Work Rule and User Group Routing
		• Employee Locationing

Communication and Collaboration

A properly integrated enterprise-wide Clinical Mobility solution enables healthcare team members to communicate seamlessly with each other in a unified and diverse manner; have high-quality voice communications; transmit and receive secure text messages; send patient care related digital camera photos; and conduct telehealth video conferences.

Data Management

The demands and complexity of the patient care delivery environment require pinpoint precision when matching patients to records, medications, specimens and medical assets. Through advanced mobile device data capture tools, workflow steps can be automated and preventible medical errors reduced. Best in class Clinical Mobility solutions also make clinical decision support data readily available to the clinicians in real time and directly at the point of patient care.

Workflow Efficiency

Healthcare professionals have the complex task of managing multiple patients and situations simultaneously. A high performing Clinical Mobility implementation helps improve workflow efficiency, reduces unnecessary alerts, call alarms and notifications. Integrating algorithm-driven alert and alarm management software capabilities directly into the clinician's mobile device helps reduce unnecessary and disruptive interruptions and helps the clinician focus their attention on the most critical patients with the highest prioritised activities.

THE FUTURE OF HEALTHCARE

The purpose of a health system organisation is to treat sick patients and to restore and manage patient health and wellness within their given community. While most healthcare providers are well equipped to fulfill this purpose; it is becoming exceedingly difficult for many to do this cost-effectively and sustainably within today's economic environment.

Healthcare organisation success and survival depend on the quality of their patient care workflow. Patient workflow variance is the enemy for healthcare provider organisations and is a root-cause contributor to higher operating costs, higher employee job dissatisfaction levels and lower standards of care delivery.

The future healthcare delivery landscape will require leading institutions to become technology organisations who embrace Clinical Mobility and redefine core capabilities. Removing the disruptive and chronic workflow barriers that wedge between clinician and patient interactions is ultimately a people, process and technology equation. Achieving a harmonious balance amongst these factors is critical to the long-term success of all hospitals.

Tomorrow's leading health system organisations will competitively differentiate themselves through continuously benefitting and reenforcing a loop of tension-free patient care delivery workflows, satisfied employee team members and enhanced patient experiences. The development of an enterprise-wide and holistically integrated Clinical Mobility solution is essential for hospital executives to create and a necessary component for the future success of their organisation.

ABOUT THIS PAPER

The insights and information shared in this paper are the result of a long-standing collaboration with Zebra Technologies' Healthcare Advisory Council. The council is focussed on shaping the future of technology usage in hospitals. Membership is made up of technology, clinical and executive advisors from across the healthcare spectrum with representatives from neonatology, clinical informatics, nursing and information technology. This paper was driven in large measure by the Industry Education Committee whose concentration is on the development and dissemination of healthcare education and best practices information to healthcare organisations around the world.
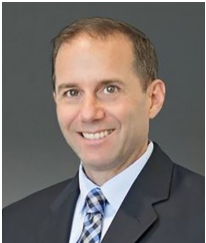
Chris Sullivan
Global Healthcare Practice Lead
Chairman, Healthcare Advisory Council
Zebra Technologies

For more information on how Clinical Mobility can help transform healthcare, please visit www.zebra.com/healthcare

ᘔ. ZEBRA

NA and Corporate Headquarters
+1 800 423 0442
inquiry4@zebra.com

Asia-Pacific Headquarters
+65 6858 0722
contact.apac@zebra.com

EMEA Headquarters
zebra.com/locations
contact.emea@zebra.com

Latin America Headquarters
+1 847 955 2283
la.contactme@zebra.com