Title

Leveraging technology to improve wound care delivery and care transitions

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Authors

Kirkland-Kyhn, Holly
Howell, Melania
Senestraro, Jesse
et al.

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Safety Solutions Wound Care

Leveraging technology to improve wound care delivery and care transitions

By Holly Kirkland-Kyhn, PhD, FNP, GNP, CWCN, FAANP; Melania Howell, DNP, RN, AGCNS-BC, CWOCN, DAPWCA; Jesse Senestraro, MBA, BSN, RN, CCRN-CMC; and Sarah Walsh, MBA, BSN, RN, CNML

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Healthcare providers' interaction with electronic medical records (EMRs) is complicated and can be either a "love-hate" or "ball-and-chain" relationship. Regardless, the technology is here to stay. EMRs have improved communication, documentation, and complex care planning to reliably provide safe, quality care by increasing an organization's operational efficiency.[1] Hospital-based nurses are the healthcare team members who often have the initial and most frequent patient encounters within these dynamic care systems. As a result, nursing documentation in the EMR about a patient's condition and their response to interventions and care plans, especially during transitions of care when the patient moves between departments or undergoes an admission or discharge from the facility, is paramount to patient safety.[2,3]

A team working in a 620-bed academic medical center that's part of an integrated health system

located in urban Northern California undertook the task of improving wound care delivery and transitions of care by leveraging the facility's EMR.

Background

The team started by conducting a study to understand clinical nurses' documentation workflow. The results revealed an opportunity to improve the nursing workflow through streamlining EMR documentation. The precise amount of time nurses spend on documentation was mined and measured utilizing code previously designed to track physicians' EMR usage and efficiency. Fifty-one acute care nurses consented to have their documentation data collected over six shifts, which spanned 12 hours. On average, the nurses spent 4.7 hours ± 1.3 hours documenting in the EMR per shift.[4,5] These data revealed that a significant portion of the study group spent more than half of their shift exclusively documenting in the EMR.

Additionally, the study detected that nurses had to document nonpatient care related information by completing incident reports. These reports are a quality improvement mechanism designed to identify system or risk issues, which can help guide organizations to improve processes.[6] Incident report completion and investigation requires highly skilled analysis involving multiple steps and numerous departments. It was discovered that it took 15 to 17 minutes of bedside nursing time to complete an incident report.[4,5] Once completed by the nurse, the unit's manager spent 15 minutes reviewing the report, performing a documentation review, and responding to the incident.[4,5] The incident report then went to the quality and safety nurse and the category manager for that incident. These highly skilled clinicians (nurses, pharmacists, or physicians) also spent 15 minutes responding to the same report addressed by the unit manager whose team completed it.[4,5] Inefficient nonpatient care documentation and processes negatively impact nurses' ability to deliver personalized patient care and engage in effective time management.[7,8]

Of particular interest for this project was the number of completed incident reports on all patients with wounds present on admission, regardless of etiology. Another consideration was that the present on admission report didn't provide valid or reliable information to assess and guide care needs for patients with pressure injuries on admission.[7,8] It was also determined that the facility's team couldn't accurately differentiate community-acquired pressure injuries (CAPIs) from hospital-acquired pressure injuries (HAPIs). To solve this problem, the team recognized the need to build a best-practice alert within the EMR.

Based on the information gathered, the team examined process or workflow improvement strategies to reduce clinical nurses' data entry time by:

- eliminating the incident report for present on admission wounds
- improving validity and reliability of documentation of present on admission wounds
- improving staging and anatomical documentation of present on admission pressure injuries
- differentiating CAPIs from HAPIs
- creating a database of multivisit patients (MVPs) for prompt identification of the highest healthcare utilizers and implementation of personalized care plans
- capturing the last wound note electronically for transitions of care. (See *Figure 1.*)

Methods

Eligible participants in this quality improvement intervention included all patients admitted through the facility's ED or to any inpatient nursing unit. These patients had a primary wound diagnosis. Additional patients may have had a primary medical diagnosis, such as congestive heart failure, but the admitting nurse discovered a wound while conducting a physical assessment. Other participants included inpatients whose wounds were found 24 hours following admission.

The wound team manager spearheaded an effort to expand the capabilities of the facility's EMR by equipping nursing units with handheld EMR devices and extending EMR and mobile device capabilities through add-on applications. The expanded operability enables and empowers the admitting nurse to photograph all wounds on admission and upload the photos directly into the patient's EMR. These photos are available in real-time and instantly accessible to all care team members, family members for teaching, and wound experts to validate pressure injury staging. The EMR prompts and links the clinician through the process of correctly noting the wound's anatomical location,

etiology, and accurate staging. Additionally, the EMR requires the assessor to document whether the wound was present on admission, further enabling the wound team to differentiate CAPIs from HAPIs.

Within the EMR, a best-practice alert asks, "Is this pressure injury present on admission?" If a wound is identified as being present on admission, incident report completion is eliminated. The EMR prompts the admitting nurse through the steps needed to determine if a wound is a pressure injury and stage it accurately. The system includes a link that asks, "Need help staging?" Once opened, the prompt provides pressure injury staging definitions with photographs. Further, the EMR generates automated daily reports by pulling data from the system's present on admission and staging elements. Additionally, data analysis can be performed that shows the prevalence of CAPIs admitted to the facility.

Another new feature is the ability for the discharging nurse to include the wound care team's last note entered, along with an AARP QR code for education, optimizing the potential to improve health outcomes.[9] The automated wound note capture is included in the after-hospital

Figure 1: Concept map of improved workflow

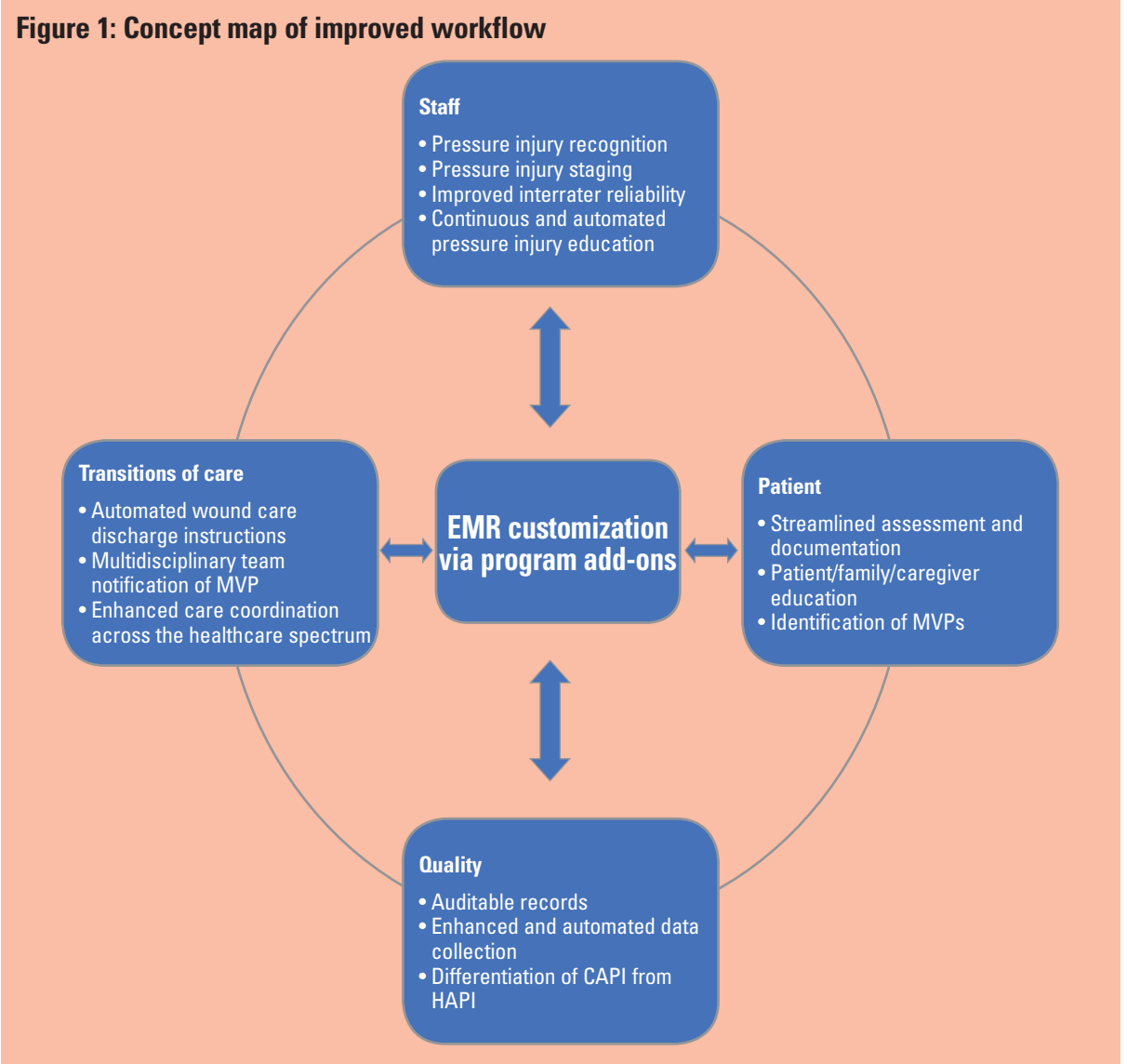

Table 1: Impact of workflow streamlining on key processes

Present on admission workflow	Before	After
Total nursing hours spent on incident reports for present on admission wounds	2,000+ hours per year	0 hours (no need to report)
Percent of pressure injuries staged once identified as being present on admission	30%	95%
Percent of photos taken on admission for present on admission wound validation	No photos	84% to 95%
Identification of MVPs	Not identified	210 patients in current database

summary, complete with photos and any supplies needed. It's expected that this feature will improve communication during transitions of care and reduce 30-day readmissions and ED visits.

Results

Before streamlining the workflow, clinical nurses in the ED alone spent 19.26 hours per week completing incident reports on all present on admission wounds. Using the EMR's handheld device and expanded add-on applications to photograph wounds present on admission improved the team's ability to differentiate pressure injuries from other wound etiologies, enabling clinical nurses to accurately identify and stage CAPIs. Differentiating CAPIs from HAPIs and other wound etiologies became more comprehensive, reliable, and auditable. This improvement in workflow eliminated the need to complete incident reports for present on admission wounds, which resulted in saving over 2,000 nursing hours per year. (See *Table 1*.)

Wound photography on admission, which now occurs 84% to 95% of the time, helped improve compliance for answering whether a wound was present on admission from 30% to 95%. And an unexpected outcome was that nurses completed incident reports for HAPIs with more accuracy in staging due to having more time and the ability to easily photograph the wounds.

The new process also enabled the wound and multidisciplinary team to identify MVPs with frequent admissions (four or more per year) and ED visits (10 or more per year) as established by the facility. Upon streamlining the process, 210 frequent wound care patients were identified, allowing for establishment of an MVP database.

Discussion

Healthcare organizations are making strides toward improving patient care outcomes while decreasing costs. However, healthcare systems are complex and dynamic, which increases the risk of medical errors and scant or inadequate documentation. Institutions are searching for strategies that will reduce sentinel or near-miss events, making them high-reliability organizations.[10] Accomplishing this task requires processes that promote efficient workflows.[11] EMRs have the potential to support clinicians' ability to accurately assess the patient, document findings, and trigger care plans. This can improve the timeliness of care delivery, accuracy of diagnosis, and multidisciplinary team involvement. These factors can significantly enhance patient care, reduce healthcare costs, and increase staff satisfaction.[12] Yet, hospital EMR systems are notoriously difficult to change. The streamlined workflow discussed in this article took 2 years to enact as convincing data were collected and reported.

This quality improvement project maximized the potential of the facility's EMR. First, the team utilized the EMR's add-on applications to accurately capture present on admission wounds and assist the clinician with a proper diagnosis. This triggered the admitting team's ability to efficiently identify and manage wounds that were present on admission, improving risk mitigation through proper documentation. Streamlining the present on admission workflow enabled the facility to realize a cost savings of over 2,000 nursing hours per year. Eradicating unnecessary incident reports for present on admission wounds saved team members' valuable time. The facility's ability to differentiate CAPIs from HAPIs was also improved. As a result, the facility was able to

automate some data collection for its quarterly National Database of Nursing Quality Indicators® surveys, improving the accuracy of the statistics and identifying where to focus education for pressure injury prevention.[13]

The multidisciplinary team's ability to curate an MVP database has significant implications as well. High utilizers of ED care are at increased risk for adverse outcomes, such as medical errors and frequent rehospitalizations.[14,15] Also, MVPs usually have numerous social determinants of health that need addressing.[15] As a result, a multipronged approach to address the complex needs of MVPs is warranted.[15] Organizations can successfully reduce ED visits and rehospitalizations by utilizing a multidisciplinary team comprised of case managers, medical social workers, physicians, nurses, and psychologists and including a link to community resources.[16] The streamlined workflow identified 210 patients who have the potential to benefit from a multifaceted healthcare plan.

Toward high reliability

Leveraging the EMR to improve and streamline workflows and processes can help facilities make more efficient and cost-effective use of scarce healthcare resources and move closer to becoming high-reliability organizations while improving patient outcomes, reducing costs, and increasing staff satisfaction. NM

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Holly Kirkland-Kyhn is adjunct clinical faculty, advanced nursing practice, at the Betty Irene Moore School of Nursing and Johns Hopkins University School of Nursing and director of wound care at UC Davis Medical Center in Sacramento, Calif. Melania Howell is a certified wound ostomy continence specialist in Northern California. Jesse Senestraro is a clinical nurse in the cardiac ICU at UC Davis Medical Center in Sacramento, Calif. Sarah Walsh is an assistant clinical director and nurse manager of the ED at Kaiser Permanente in Southern California.

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