

Engaging Frontline Nurses in Building an Electronic Workload Acuity Tool

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Nursing leadership and nursing informaticists engaged bedside nurses in the design, build, and evaluation of the Nursing Workload Acuity tool, which produced a robust evaluation process and seamless implementation of an acuity tool embedded in the electronic health record. The tool uses existing data elements from the electronic health record that are mapped to rules to produce a dynamic score. Bedside nurses evaluated content, points, and scoring, which confirmed the acuity tool included necessary elements and matched nursing perception of workload greater than 90% consistently.

The nursing leadership team in partnership with the nursing informatics team at a large academic medical center engaged the bedside nurses in the design, build, and evaluation of the Nursing Workload Acuity (NWA) tool embedded in the electronic health record (EHR). The tool produces an objective and dynamic score for each patient that updates with each entry in the patient's chart. The project, designed to decrease the burden of documentation for nurses, heavily engaged clinical nurses in the development of the necessary algorithms for automation. The tool is now utilized across 3 hospitals in the health system for all inpatients and excludes the emergency room, perioperative, and labor and delivery departments.

Measuring nursing workload acuity in the acute care setting is required by law in California. The need for objective NWA information is well established in the literature to ensure equitable distribution of nursing resources. Hoogendoorn et al.¹ proposed that it is more important to focus on nursing workload than the nurse-to-patient ratio. Perceived high workload is associated with nurse burnout and job dissatisfaction, and if left unaddressed, can significantly impact stability in nursing teams. When a mismatch exists between the nursing perception and the data provided by objective nursing tools, confidence in the acuity measurement is reduced.²

Implementing a new workload acuity tool that pulls from existing information in the patient's chart has several implications for nursing documentation in the EHR. Nursing leaders and informaticists recognized the vital need for clinical nursing input, participation, and feedback. Harper and Utley³ state that simply implementing a new system will not mean that the new

technology is accepted and used by an organization's employees. A successful technology implementation and adoption strategy cannot assume end users or employees will easily adopt new technology. Evidence from research shows that "teamwork within the organization and the trust of the employees are most important in gaining widespread acceptance of the new information technology (IT) tools"³

Technology in health care is expanding at a rapid pace and clinical nurse participation has become imperative to help shape the future of technology in health care. When nurses are not able to contribute to technology innovation, development, and implementation, the new technical solutions may be implemented in the clinical practice setting, but will encounter avoidable problems.⁴ "As health care delivery becomes more technocentric, an urgent need exists to ensure everyone actually benefits in this digital transformation. Nurses will be essential in monitoring

KEY POINTS

- **Participation, feedback, and support from clinical nurses is essential for the successful development of a nursing workload acuity tool.**
- **Nursing leaders contributed to the project success by encouraging and facilitating clinical nurse involvement.**
- **Nursing involvement in the evaluation of the tool led to high confidence in the accuracy and overall adoption of the tool.**

the progression of the touted promises in digital health.”⁴

METHODS

The design of the NWA tool utilizes existing data elements within the EHR, such as orders, medications, nursing documentation, admission, transfer, and discharge events. The tool consists of many rules and algorithms that are mapped to flowsheets, orders, medication administration, and patient movement. Each rule has point values to produce a total dynamic score for every patient. The score updates in real time when changes are entered into the EHR. Engaging clinical nurses early in the discovery and planning phases allowed the organization to maintain the current acuity tool while establishing the NWA instrument. This approach created the opportunity for a side-by-side comparison of the 2 instruments, which offered clinical nurses the opportunity to evaluate workflow and the weighting of each metric.

Additional guiding principles for the project included avoiding the introduction of practice changes for clinical nurses while maintaining current workflows and documentation standards.

Previously, the organization utilized a manual entry acuity tool based entirely on the nurse’s perception; this approach produced subjective data. The tool did not integrate into any of the nursing documentation workflows. Additionally, it did not allow for fluctuations during the shift based on patient needs. As a result, it did not accurately project workload needs for future shifts.

At the beginning of the project, nurse informaticists, nurse leaders, and clinical nurses reviewed the scoring rules within the tool and mapped each rule to current documentation flowsheets. Clinical nurses identified additional areas of focus to include in the NWA tool as well as some items that could be excluded based on their expertise.

After completion of the mapping, the team developed a robust evaluation process to ensure the accuracy of the points per rule and total score for each patient. Key stakeholders included clinical nurses, charge nurses, unit acuity champions, nursing educators, clinical nurse specialists, unit leaders, and nurse informaticists. Scores were displayed in common nursing workflows so nurses could readily view the source of points for each patient and identify gaps in the initial build.

Evaluation Phase I

The implementation team led a 2-phase evaluation process with the clinical nurses. The first phase consisted of a gap analysis to ensure the NWA tool captured all necessary elements of the nursing workload and identified any omissions in mapping. The

team developed an electronic survey for evaluation and easy data collection and review. Nurses were asked to identify the top 3 categories taking up most of their time for each patient and the current score value from the NWA tool in the EHR for comparison. In addition, nurses rated the overall care needs for their patients as routine, moderate, or high level of nursing care as defined within the survey. Nurses could add free text comments and relative information for each question as needed. Each inpatient nursing department completed a minimum of 10 surveys per shift for 7 days. Many nurses chose to complete surveys for all patients to ensure that the data represented every service line.

The nurse informaticists reviewed all surveys from Phase I and focused on identifying any mismatch between nurse perception and the NWA score to evaluate the source of the discrepancy. Free text comments from the nurses proved useful, providing information to clarify the mismatch or include a potential solution to a gap identified for that patient. Key stakeholders reviewed themes identified from the Phase I surveys. Robust discussion produced recommendations for solutions to address all gaps identified. Two rounds of the Phase I evaluation were completed for the medical-surgical units, intensive care unit (ICU), pediatric, and pediatric and neonatal ICU units to confirm the effectiveness of the recommended changes to the tool.

Evaluation Phase II

During phase two, the team confirmed that the score produced by the tool aligned with the nurses’ perception of the workload. Every bedside nurse and charge completed a survey every shift for 7 days. Nurses completed the surveys between 2:30 a.m./p.m. and 3:30 a.m./p.m. to coincide with the timing of when charge nurses begin to prepare staffing for the upcoming shift. The survey asked bedside nurses to rank their patient assignment from heaviest to lightest workload and identify the overall care needs for their patients as routine, moderate, or high level of nursing care as defined within the survey. Charge nurses identified 2 patients on their unit for each category of routine, moderate, and high level of nursing care. The ICU charge nurse survey identified patients who could be paired as well as patients who were or were likely to be downgraded. The nurses entered the total score from the NWA tool into the survey for each patient.

Again, the nurse informaticists reviewed the results of the Phase II surveys to evaluate whether the NWA score matched the individual bedside nurse’s ranking of their patient assignment. The nurse informaticists also compared the bedside nurses’ data to the charge nurses’ data identifying patients with routine, moderate, and high levels of nursing care.

Table 1. Phase I Surveys Completed by Bedside Nurses

	Phase I <i>n</i>
<i>Med-surg</i>	3695
<i>ICU</i>	1166
<i>Pediatrics</i>	792
<i>PICU/INICU</i>	804
<i>Perinatal</i>	112
<i>Neuropsychiatric</i>	378
<i>Total surveys</i>	6947

Daily huddles held during the survey weeks answered questions, clarified processes, and identified issues. Huddles included all nursing leaders and bedside nurses, and many clinical staff attended. Town hall meetings shared the results and recommendations for optimization after the completion of surveys for each area.

RESULTS

The team received a total of 6947 surveys during the Phase I evaluation. [Table 1](#) reflects the breakdown for individual service lines. In Phase II, 1854 nurses submitted surveys ranking their assignments and comparing their perception to the NWA score ([Table 2](#)). Nurses' perception of workload acuity and the NWA scores averaged a 91% overall alignment. The most common cause of an identified mismatch resulted from omission of nursing documentation, which if included, would have impacted the NWA score and matched the perception of the nurse.

Table 2. Phase II–Nurse Perception Evaluation Survey Results

	Phase II <i>n</i>	Perception/Points Match
<i>Med-surg</i>	851	83%
<i>ICU</i>	292	86%
<i>Pediatrics</i>	118	92%
<i>PICU/INICU</i>	202	94%
<i>Perinatal</i>	251	90%
<i>Neuropsychiatric</i>	140	98%
<i>Total</i>	1854	91%

DISCUSSION

Nurses quickly identified that there was no place in the EHR to document the time spent with patients and families for psychosocial support or coordination of care. The addition of a new flowsheet row with definitions and scoring for routine, moderate, high, and very high frequency patient care needs provided a consistent place to document the time that nurses spent with patients and/or families providing psychosocial support or managing and coordinating care needs. As a practice change, the new psychosocial row was the most common documentation omission. Moving forward, when a mismatch was identified, documentation in this area would have corrected the mismatch.

Of note, the charge nurses' perception of the workload acuity matched the bedside nurses. Phase II surveys provided evidence of consistently balanced assignments in all nursing areas. Charge nurses rarely assigned multiple high acuity patients to the same nurse.

Nurses expressed appreciation for reducing their acuity documentation with the implementation of the NWA tool. The NWA tool produced a dynamic score making the manual assessment no longer necessary. In addition, the NWA did not require any change to the nurses' workflow.

CONCLUSION/IMPLICATIONS FOR NURSING PRACTICE

Participation, feedback, and support from clinical nurses are essential for the successful development of a NWA tool. Nursing leaders encouraged and facilitated the involvement of clinical nurses by ensuring they could attend meetings and include their expertise. Nurses expressed high confidence in the accuracy of the process and the result due to their involvement in the development and evaluation of the tool. As new technological innovations continue to be introduced in nursing, ensuring the participation and representation of clinical nurses facilitates meaningful and successful outcomes.

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