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# Data collected by the electronic health record is insufficient for estimating nursing costs: An observational study on acute care inpatient nursing units

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ABSTRACT

Introduction As the electronic health record becomes more sophisticated, commensurate advances in cost accounting have risen as a top priority for hospital leaders. This study explored: 1) the average time to complete common nursing tasks documented in the electronic health record, 2) nursing-related tasks that remain undocumented, 3) the association between observation data and actual nursing documentation, and 4) considerations for model development and report design to be used for activity based cost accounting in nursing.

Methods This was an observational study completed on acute care inpatient nursing units at a large academic medical center. During a five-week period, 63 nurses from 25 units were observed for over 250 h.

Results Nearly 60% of the observed nursing activities did not fit into categories readily available in, and easily abstracted from, the electronic health record. The undocumented activities accounted for over half of the observation tasks and equated to nearly 130 h, in which over 40 h were spent on the activity of documentation/charting itself. Furthermore, nearly 36 h were spent on communication, followed by 13.5 h on monitoring/surveillance, two critical tasks in nursing which cannot be overlooked.

Conclusions Using the electronic health record for cost accounting in nursing is a novel approach. In addition to the electronic health record, supplementary sources of data must be included to accurately capture nursing work and associated costs. Findings and lessons learned from this study will be used to guide future work and develop a model that determines the cost of nursing care and improved value in hospitalized patients.



## What is already known about the topic?

- Nursing hours per patient day (HPPD) and skill mix have long been the gold standard in providing metrics for nurse costing. Sometimes a delicate subject, studies suggest that increased staffing levels (HPPD) contribute to decreased complications, and ultimately less cost (Li et al., 2011).
- With a formidable agenda, innovative approaches to cost effectiveness in nursing are in their infancy (Spetz, 2005).
- Welton and Harper (2015) suggested a value-based model for nursing care; however, many details, such as nursing documentation, require refinement at the organizational level.

## What this paper adds

- The most critical finding in this study was the number of nursing tasks that are not documented in the electronic health record.
- It is prudent to say that additional documentation is not the answer; therefore, healthcare leaders doing this work must clearly outline what can, and what cannot, be captured and used for cost accounting.

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- In addition to the electronic health record, supplementary sources of data must be included to accurately capture nursing work and associated costs.

## 1. Introduction

### 1.1. Background and rationale

Nursing hours per patient day (HPPD) and skill mix have long been the gold standard in providing metrics for nurse costing. At times a delicate subject, studies have suggested that increased staffing levels are associated with decreased complications and less cost (Li et al., 2011). Nurses represent the largest component of the health care team and perform critical tasks like patient assessment and surveillance (Institute of Medicine, 2004; Newbold, 2008). Nursing practice drives value as nurses have a direct and intimate influence on the quality, safety, and costs of care (Pappas and Welton, 2015). If nursing value is defined as the function of outcomes divided by costs, there is a need to better define the measures and analytics for patient-level costs and outcomes of nursing care (Pappas and Welton, 2015). The complex relationship between nursing activity and costs surely has an impact on the value of care; however, with a daunting agenda, innovative approaches to cost effectiveness in nursing are in their infancy (Spetz, 2005).

Efforts utilizing the electronic health record to measure the value of nursing have been limited. Welton and Harper (2015) present a value-based data model for nursing; however, many details, such as the use of nursing documentation, require refinement at the organizational level. To accurately measure value, cost must be measured at the patient level (Kaplan and Porter, 2011). In nursing, cost depends on how much time is used in the care of the patient (Kaplan and Porter, 2011). The idea of nursing activity per patient day has also been introduced but not widely disseminated (deJong et al., 2009). Self-reported time studies and work observations have been conducted to identify the duration of standard tasks (Trotter et al., 2009). Additionally, the complexities of multitasking and interruptions in the healthcare environment have been explored (Walter et al., 2017; Westbrook and Ampt, 2009). It's no surprise that advances in the electronic health record have provoked the use of documentation to improve cost accounting systems; however, no one method in healthcare has proven to 'get it right'.

### 1.2. Local problem

Organizational leaders were interested in using advanced decision support, and derive the value of care, by integrating costs, outcomes, and revenue to drive quality improvement and change management activities. Inpatient nursing care is one of the key drivers of cost associated in hospitalized patients. With advancements in health information technology, there is growing interest in utilizing nursing documentation, from the electronic health record, to calculate activity based costing in nursing.

As part of a large cost accounting initiative undertaken by the organization, nursing was asked to provide data necessary to calculate the cost of nursing care, including the length of time it takes to complete common nursing tasks documented in the electronic health record and the number of times each task was performed. Although additional work is necessary, the findings from this study provided insight for decision making and ongoing work that is generalizable to other institutions.

### 1.3. Objectives

The objectives of this study were to: 1) Assign average times to common nursing tasks documented in the electronic health record; 2) Identify nursing-related tasks that remain undocumented and consider alternate methods of accounting for them; 3) Explore the association between observation data and actual nursing documentation; and 4) Develop a 'proof of concept' report to be used for cost accounting.

## 2. Methods

In 2017, a workflow time study, using observations, was conducted at a large, level-I, academic health care center located in the mid-west (average daily census 920, 31 acute care inpatient nursing units). A sample of 63 nurses from 25 different acute care inpatient nursing units representing the 6 central staffing 'clusters' volunteered and were selected to participate. Since workload in each 'cluster' is similar, the number of observations in each area was carefully calculated to obtain average times that could be generalized throughout the organization.

Observation were conducted by trained students in the healthcare field. Observation sessions were distributed between units and time of day. Although observation times ranged from 0647 to 2200 and represented all days of the week, time blocks were largely driven by convenience. Participants were shadowed by an observer continuously during each observation session ranging from two to four hours in duration. During the sessions, the observer recorded time-stamped information about each activity. Several sessions were piloted by the primary researcher prior to the study. Observation details were handwritten on the data collection tool in real time and were later entered electronically by the observer. Each task was coded by documentation category, and later reviewed by the primary researcher for accuracy and assigned a sub-category for further exploration. Frequencies and descriptive statistics were completed and used to guide exploration of each category in more detail. During a period of 5 weeks, 63 nurses, from 25 units (44, were observed for a total of 252 h and 13 min.

## 3. Results

A total of 2890 distinct, descriptive tasks were recorded with time stamps totaling 221 h and 21 min. Nearly 60% (N = 1763) of the observed nursing tasks did not fit into a category readily available as a flowsheet row and easily abstracted from the electronic health record. Commonly documented tasks included medication administration (14.6%) and assessments (10.7%), followed by lines, drains, and airway (LDA) care (5.2%), orders (2.6%), activities of daily living (ADL) (4.6%), and admissions, discharges, and transfers (3.6%) (Fig. 1).

The average amount of time it took to complete any one task was less than five minutes. By category, wounds, burns, incisions, and orthotics took the longest amount of time per task (7:48), but it was also one of the least observed (0.5%, N = 15). Descriptive statistics for each category are displayed in Table 1.

### 3.1. Undocumented / poorly documented nursing work

One of the most critical findings was the number of tasks marked as 'other' during the observations. These 'other' tasks were activities completed by the nurse, but remained undocumented or poorly documented, at best. Since the primary objective of cost accounting is to use nursing documentation from the electronic health record, it is critical to highlight this concern. In our study, we observed the following nursing tasks that were not well reflected in the documentation categories: the act of documentation/charting itself (29.3%); communication with patients, family, nursing staff, and other healthcare providers (28.1%); monitoring and surveillance (17.7%), non-nursing tasks, such as cleaning

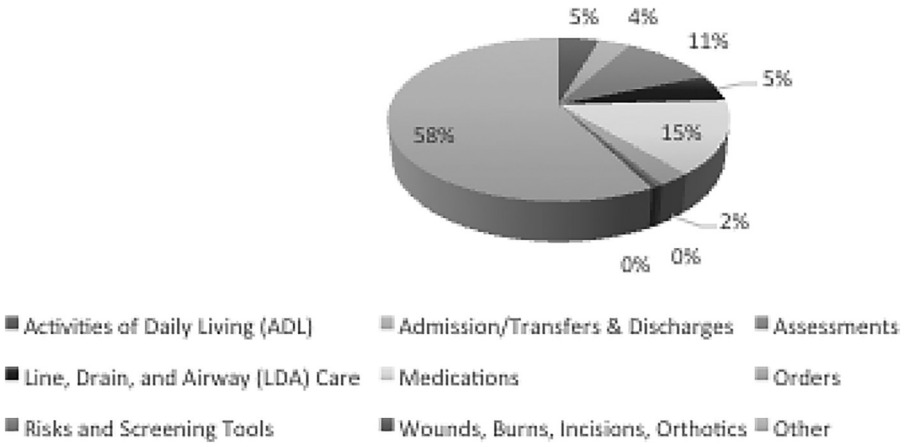


**Fig. 1.** Frequency of tasks observed by category.

**Table 1**
Time (in minutes) by category.

| Category | N | Mean | Median | SD | Min | Max |
|---|---|---|---|---|---|---|
| Activities of Daily Living (ADL) | 141 | 04:58 | 03:00 | 05:19 | 00:00 | 32:00 |
| Admission/Transfers & Discharges | 111 | 05:49 | 04:59 | 05:00 | 00:00 | 29:00 |
| Assessments | 325 | 03:47 | 02:00 | 04:45 | 00:00 | 40:00 |
| Line, Drain, and Airway (LDA) Care | 159 | 03:55 | 03:00 | 03:33 | 00:00 | 20:00 |
| Medications | 444 | 04:11 | 03:00 | 03:22 | 00:59 | 24:00 |
| Orders | 80 | 03:26 | 02:00 | 03:50 | 00:59 | 26:00 |
| Risks and Screening Tools | 16 | 03:37 | 01:29 | 01:29 | 00:00 | 23:00 |
| Wounds, Burns, Incisions, Orthotics | 15 | 07:48 | 03:59 | 10:14 | 01:00 | 34:00 |
| Other | 1599 | 04:47 | 03:00 | 06:23 | 00:00 | 67:59 |
| Total | 2890 | 04:36 | 03:00 | 00:05 | 00:00 | 67:59 |

(12.8%); breaks (7.6%), and administrative duties, such as email, education, and quality improvement activities (4.5%) (Fig. 2).

Not only did these tasks account for over half of the observation count, they equated to 127 h and 32 min, in which over 40 of those hours were spent on documentation/charting. Nearly 36 h were spent on communication, followed by 13.5 h of monitoring/surveillance, two critical tasks of nursing which cannot go unnoticed (Table 2).

For purposes of this study, documentation included the physical act of documenting patient care in the medical record. Monitoring and surveillance included checking on the patient, performing hourly rounds, self-education (e.g., the nurse checking orders, labs, medications), and answering call lights, alarms, and pages. Specific communication patterns were noted and included: 1) patient / family communication / education; 2) nursing communication (between other nurses, assistive personnel, and the unit clerk); 3) huddle, care rounds, and unit report 4) communication with a provider (e.g., physician, pharmacist, physical therapist); and 5) teamwork.

Specific 'non-nursing' tasks included a variety of things such as: cleaning, changing linen, looking for supplies, and retrieving necessities for the patient. These were things that nurses often do; however, do not require a professional skill set. 'Breaks' consisted of non-patient care activities and included meals, rest, and personal time. Administrative time, which accounted for merely 6 h and 20 min (2.9%) of the overall time, included tasks like reading and responding to email, charge nurse duties, quality improvement activities, and educating students.

### 3.2. Time study: average times

One of the main goals of the observations was to assign average times to tasks documented in the medical record. Documented

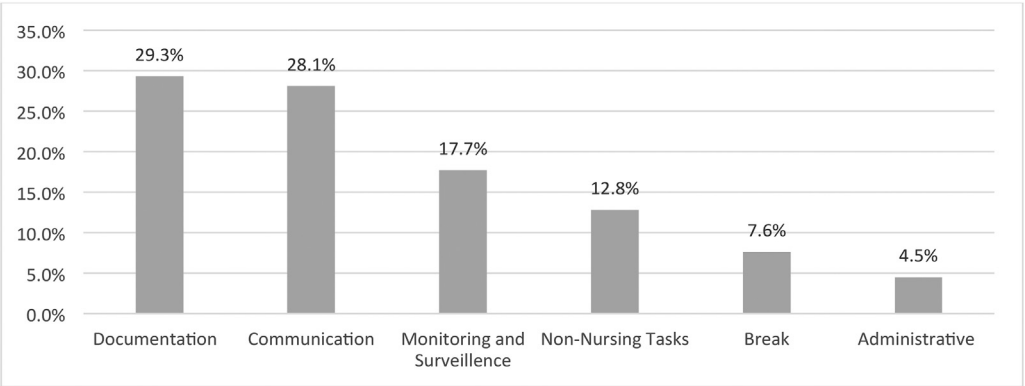


**Fig. 2.** Poorly documented nursing work.

**Table 2**
Time (in minutes) by 'other' category.

| Sub-Category | N | Sum | Mean | Median | SD | Min | Max |
|---|---|---|---|---|---|---|---|
| Documentation | 468 | 40h18m | 05:10 | 03:00 | 07:10 | 00:00 | 67:59 |
| Communication | 456 | 35h47m | 04:43 | 03:00 | 05:10 | 00:00 | 41:00 |
| Monitoring and Surveillance | 288 | 13h31m | 02:53 | 02:00 | 02:59 | 00:00 | 22:00 |
| Non-Nursing Tasks | 205 | 12h36m | 03:41 | 02:00 | 05:02 | 00:00 | 41:00 |
| Break | 107 | 19h | 10:40 | 05:00 | 11:39 | 00:59 | 54:59 |
| Administrative | 73 | 6h20m | 04:53 | 03:00 | 04:57 | 00:59 | 24:00 |
| Total | 1597 | 127h32m | 04:47 | 03:00 | 06:23 | 00:00 | 67:59 |

nursing tasks varied widely (0–40 min) (Fig. 3); however, mean times were used for a number of tasks and associated business rules were created (Table 3). Based on the work presented, suggested data sources and weights were recommended, but require additional discussion among the business owners (Table 4).

### 3.3. The relationship between observation and documentation

Table 5 displays a comparison between the activity being observed and the nursing documentation during the same time frame. Documentation is expected to be retroactive, grouped, and is sometimes missed. For example, the observer notes that the nurse assisted the patient with hygiene care around 0900; yet, it is not reflected in the documentation regardless of the fact that there is a dedicated flowsheet row. The nurse also performed a lab draw that is reflected in the 'Labs' section of 'Chart Review', but not indicated in a flowsheet row.

One strength of the electronic health record is that you can clearly see when the nurse was 'charting'. In the example above (Table 5), we can see that the nurse was charting around 0900 and the vital signs, oxygen therapy, cardiac monitoring status, heparin infusion, etc. were documented at that time. Without information from the Omnicell, our medication dispensing system, we do not capture medication preparation; however, we can see documentation of medication administration in the medication administration record. Nonetheless, these limitations of documentation should be noted.

### 3.4. Report: proof of concept

It was considerably more challenging than expected to accurately capture nursing workload via the electronic health record. In theory, we would be able to abstract nursing tasks, by patient, unit, and role, for an episode of care and assign average estimated times by task. Although nurses and report writers from health information technology continue this work, several barriers exist, including rule development, mapping requirements, and resources.

A major challenge that must be overcome is the consideration of documented and undocumented work. We suggest using login information to capture documentation time and time spent in the chart on monitoring and surveillance. Data from pages and calls should also be considered. Table 6 highlights data sources needed to supplement nursing documentation. Furthermore, when considering the amount of time spent on documentation, our organization should consider the burden and the opportunities for decreasing it.

## 4. Discussion

### 4.1. Key results

The most critical finding in this study was the number of nursing tasks that are not documented in the electronic health record. This presents several challenges when trying to use documentation for activities such as cost accounting, especially when the time spent documenting already consumes much time in the day. It is prudent to say that additional documentation is not the answer; therefore, healthcare leaders doing this work must clearly outline what can, and what cannot, be captured and used for cost accounting in the electronic health record.

Furthermore, although advancements in the electronic health record presents us with opportunities to model cost by activities, there may be potential downsides to pursuing rigorous time

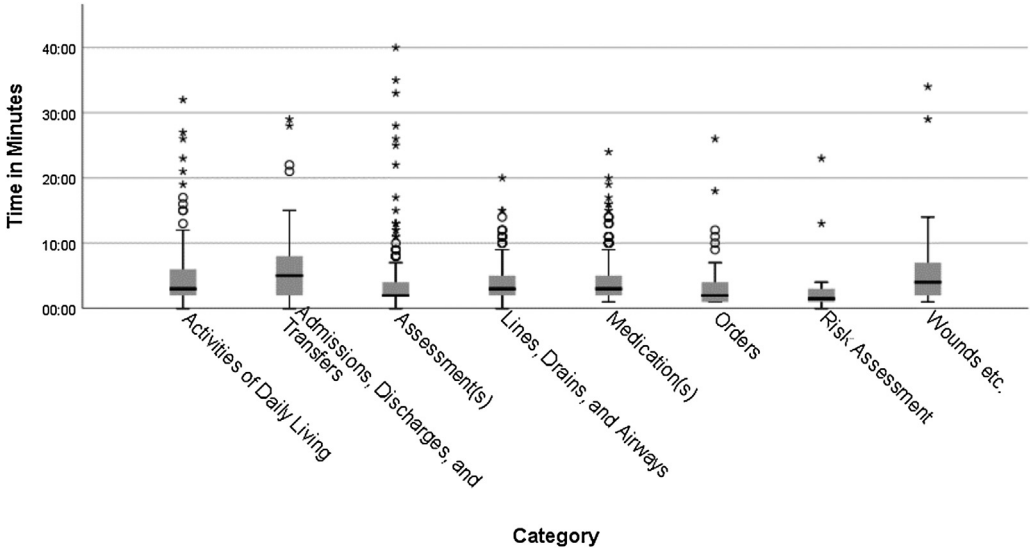


**Fig. 3.** Variation of time spent completing documented tasks.

**Table 3**
Average time (in minutes) to complete common nursing tasks.

| Activity | Time in min (SD) | Type* | Weight |
|---|---|---|---|
| **Assessments** | | | |
| Head to Toe Assessment | 5 (6.5) | 1 | |
| Focused Assessment | 2.5 (2.5) | 1 | |
| Cardiac Monitoring- Rhythm strip interpretation | 2.5 (2) | 1 | |
| Glucose Test | 2 (1) | 1 | |
| Height / Weight Assessment | 2 (0) | 1 | |
| Lines / Drains Assessment | 3.5 (2.5) | 1 | |
| Pain Assessment | 2.5 (0) | 1 | |
| Safety Screening | 4 (0.5) | 1 | |
| Vital Signs | 4 (5) | 1 | |
| *Monitoring and Surveillance* | 3 (3) | 2 | 0.11 |
| **Interventions** | | | |
| Admission Activities | 6 (4) | 4 | |
| Airway: Suction | 4 (3) | 1 | |
| Basic Intake/Output | 3 (3.5) | 1 | |
| Bladder Scan | 6 (0) | 1 | |
| Blood Draws/Lab Collection | 3.5 (3.5) | 1 | |
| Blood Product Administration | 4.5 (3.5) | 1 | |
| Coping / Cognitive Interventions | 7 (8.5) | 1 | |
| Discharge Activities | 6.5 (5.5) | 4 | |
| Elimination Assistance | 7 (7) | 1 | |
| Feeding Assistance | 6 (7) | 1 | |
| Hygiene Assistance / Care | 4 (3.5) | 1 | |
| Lines / Drains Change / Adjustment | 4 (3) | 1 | |
| Lines / Drains Insertion | 7 (3) | 1 | |
| Lines / Drains Removal | 3 (2) | 1 | |
| Mobility Assistance | 5 (5) | 1 | |
| Moderate Sedation | 13 (10) | 1 | |
| Post Mortem Care | 26 (0) | 4 | |
| Repositioning | 3.5 (4) | 1 | |
| Respiratory Intervention (e.g., O2, CPAP) | 4 (3.5) | 1 | |
| SCDs /orthotics / compression stockings on/off | 2.5 (2) | 1 | |
| Suture Removal | 14 (0) | 1 | |
| Wound Care | 6.5 (9.5) | 1 | |
| **Medications** | | | |
| Administration of Injection / IVP / Flush Medication | 6.5 (3.5) | 1 | |
| Administration of IV Fluid/Medication | 9 (0) | 1 | |
| Administration of NG, G-Tube, etc. Medication administration | 6 (3.5) | 1 | |
| Administration of Rectal / Vaginal Medication | 7.5 (5.5) | 1 | |
| Administration of Topical Medication | 10 (3) | 1 | |
| Administration of Eye / Ear / Nose Medication | 2.5 (0) | 1 | |
| Administration of Oral Medication | 4.5 (2.5) | 1 | |
| Gather/Obtaining/Prepping Medications | 3.5 (3) | 5 | |
| **Other** | | | |
| *Administrative (e.g. competencies)* | 5 (5) | 3 | 0.03 |
| *Break* | 11.5 (11.5) | 3 | 0.05 |
| Communication with health care team | 4.5 (5) | 2 | 0.16 |
| *Documentation* | 5 (7) | 2 | 0.17 |
| *Non-Nursing Tasks (e.g. Making bed, cleaning, etc.)* | 3.5 (5) | 3 | 0.08 |

*Type

| | |
|---|---|
| 1 | task |
| 2 | weighted by documentation freq |
| 3 | proxy by day or unit |
| 4 | proxy time by order/activity by day |
| 5 | by med administration pass |

accounting in nursing. Performance measurement often drives behavior, and using an approach like this, once discovered, may change documentation practices. For example, if time is associated with certain documentation, we may see documentation increasing in areas that are being measured and decreasing in others. Although something we may not initially take into account, this is definitely something that must be considered.

### 4.2. Data sources

Based on the work presented (Table 4), several business decisions must be made and may require additional testing and refinement. As technology continues to advance, documentation and surveillance may be trackable within the electronic health record. Communication efforts may also be better documented with improvements in human factors and usability of the care plan and educational activities within the electronic health record. Lastly, some items, such as breaks, can be pre-defined.

Due to the limitations of our current documentation system, we chose to assign 'types' to our source data, as shown in Table 3. Type 1 data is information that can be directly counted from the medical record. For example, the patient had 3 bladder scans in a 24-hour period of time, and it is documented 3 times. Type 2, which included activities like documentation and monitoring / surveillance, are relative to the total amount of documentation. It is reasonable to assume the nurse likely spent more time documenting on the patient with more documentation, and it is also likely that more monitoring and communication was necessary. Type 3 is an assigned value by day and includes activities in which time is estimated (e.g., breaks, precautions). Type 4 is a proxy measure by orders or activities that take a significant amount of time; however, are not well documented as one activity in the medical record (e.g., admission, discharge, restraints). Lastly, type 5 was assigned to the gathering and preparing of medication administration which will be applied once per medication administration pass, in which a 'batch' of medication were administered within five minutes, and may also be captured better using a different data source, such as the that recorded by the medication dispensing system and/or entry into the medication room. It must be noted that additional rules were developed to indicate which flowsheet rows are equivalent to each activity and how many must be included for activities like the head to toe assessment.

### 4.3. Summary

Using documentation from the electronic health record is a novel approach to activity-based costing in nursing; however, we must be mindful that less than half of what nurses do is currently captured by the electronic health record. As suggested in this study, nurses are spending a significant amount of time documenting the care they provide. We must carefully evaluate the risks and benefits of added documentation, and seek to understand how to account for work that does not require documentation. Additionally, our profession should explore and consider alternatives to lessen the burden of documentation and ensure a timely, accurate, and complete record that accurately reflects the care provided.

Communication in healthcare is of utmost importance, and often times remains undocumented. In this study, we observed several different types of communication, all which are likely to be critical to patient care. Likewise, nurses provide a critical role in patient monitoring and surveillance, and are often the first line of defense between the patient and the care in which they receive. This is another area that is not captured well within the documentation and may include the nurse reviewing the patient's medications or planning the day around tasks. Additionally, about 5% of observed nursing time (10 h, 40 min) was spent doing none-nursing tasks. Similarly, about 8.5% of the time, the nurse was not performing productive work.

**Table 4**
Suggested data sources and estimated weights.

| Activity | Data Source | Estimated Weight |
|---|---|---|
| ***Activities of Daily Living*** | Flowsheets | .40 |
| ***Admission/Transfers & Discharges*** | ADT Events | |
| ***Assessments*** | Flowsheets | |
| ***Lines, Drains, & Airway Care*** | Flowsheets | |
| ***Medications*** | Medication Administration Record | |
| ***Blood Transfusion*** | Flowsheets | |
| ***Labs*** | Labs | |
| ***Glucose*** | Labs | |
| ***Risks & Screening Tools*** | Flowsheets | |
| ***Wounds, Burns, Incisions, Orthotics*** | Flowsheets | |
| ***Documentation*** | Tracking Data | .17 |
| ***Communication*** | TBD | .16 |
| ***Monitoring & Surveillance*** | Tracking Data | .11 |
| ***Non-Nursing Tasks*** | Pre-defined | .08 |
| ***Breaks*** | Pre-defined | .05 |

## 5. Limitations and lessons learned

Several limitations were noted. Observations were not completed during the night shift. Many activities took less than one minute; yet, our level of analysis was minutes, not seconds. It was often difficult for the observers to differentiate assessments of body systems (e.g., auscultation of the heart, lungs, and bowel sounds, vital signs). Observers most often stated 'assessment' for a variety of different activities. This is an area of interest that likely requires greater attention; however, although the assessments ranged from 0 to 40 minutes, they only made up 10% of the total time spent observing. Another limitation to this study and the differentiating activity times, is that nursing work is often grouped. In a matter of minutes, the nurse may flush an IV, change the dressing, and administer medication. These tasks separately take just seconds. Lastly, documentation in the electronic health record can be redundant. For example, emptying a urinary catheter and assessment of urine and output is conceivable one observed task; yet, it may be documented in lines, urine assessment, and output. If using documentation for workload acuity and cost accounting, situations like these need to be carefully planned out.

**Table 6**
Additional data sources.

| Data Type | |
|---|---|
| Nursing Documentation | Patient care reflected in documentation |
| Documentation Times | Actual time spent documenting |
| Time logged in to patient chart | Monitoring and surveillance |
| Medication dispensing system | Medication preparation |
| Calls, Pages, Alarms | Communication, monitoring, and surveillance |
| Labs | Obtained by nursing |
| Patient Education | Care plan education |

On a positive note, our observation sessions were very well received by leadership and frontline nurses in our organization. The use of student observers provided a uniquely positive experience for both the observers and the nurses. The students enjoyed seeing and recording the different activities completed by nurses and exploring areas they may want to work in. Likewise, the nurses were empowered to explain, and think aloud, their regular activities to the students.

### 5.1. Interpretation

As stated throughout, in addition to nursing documentation, supplementary sources of data (e.g., time spent logged in to the chart or medication dispensing system, documenting, paging, responding to alarms) are necessary to accurately capture nursing

**Table 5**
Comparison of observed activity and nursing documentation of one patient.

| Observation Activity | Start Time | End Time | Flowsheet Row | Documentation Time |
|---|---|---|---|---|
| Charting | 8:54:00 AM | 9:02:00 AM | Vital Signs | 9:00:00 AM |
| Helping patient clean up | 9:02:00 AM | 9:06:00 AM | oxygen therapy | 9:00:00 AM |
| Charting | 9:06:00 AM | 9:07:00 AM | cardiac monitor status | 9:00:00 AM |
| Helping patient brush teeth | 9:07:00 AM | 9:09:00 AM | Heparin infusion | 9:00:00 AM |
| Lab Draw | 9:09:00 AM | 9:11:00 AM | Nitroglycerin | 9:00:00 AM |
| Charting | 9:11:00 AM | 9:12:00 AM | LR IV | 9:00:00 AM |
| Checking chest tube | 9:12:00 AM | 9:13:00 AM | enteral tube volume | 9:00:00 AM |
| Charting | 9:13:00 AM | 9:14:00 AM | enteral tube volume | 9:00:00 AM |
| Sending labs | 9:14:00 AM | 9:15:00 AM | Pain assess | 9:00:00 AM |
| Changing out suction | 9:15:00 AM | 9:18:00 AM | Pain assess | 9:26:00 AM |
| Changing linens | 9:18:00 AM | 9:23:00 AM | Vital Signs | 10:00:00 AM |
| Omnicell | 9:23:00 AM | 9:25:00 AM | oxygen therapy | 10:00:00 AM |
| Medication given in NG | 9:26:00 AM | 9:30:00 AM | art line | 10:00:00 AM |
| Medication adjustment | 10:10:00 AM | 10:12:00 AM | cardiac monitor status | 10:00:00 AM |
| Charting | 10:12:00 AM | 10:15:00 AM | Heparin infusion | 10:00:00 AM |
| Talking with care team | 10:17:00 AM | 10:27:00 AM | Nitroglycerin | 10:00:00 AM |
| Checking orders | 10:28:00 AM | 10:29:00 AM | LR IV | 10:00:00 AM |
| Omnicell | 10:29:00 AM | 10:30:00 AM | enteral tube volume | 10:00:00 AM |
| Medication Given IV | 10:30:00 AM | 10:37:00 AM | Pain assess | 10:00:00 AM |
| Charting/ Talking with patient | 10:30:00 AM | 10:43:00 AM | Nitroglycerin | 10:33:00 AM |
| Emptying Foley | 10:37:00 AM | 10:39:00 AM | enteral tube volume | 10:33:00 AM |
| Omnicell | 10:43:00 AM | 10:46:00 AM | Heparin infusion | 10:42:00 AM |
| Medication given in NG | 10:46:00 AM | 10:48:00 AM | Pain assess | 10:47:00 AM |
| Emptying Foley | 11:18:00 AM | 11:20:00 AM | Vital Signs | 11:00:00 AM |
| Charting | 11:22:00 AM | 11:25:00 AM | oxygen therapy | 11:00:00 AM |
| Charting | 11:29:00 AM | 11:33:00 AM | art line | 11:00:00 AM |
| Intake and output | 12:14:00 PM | 12:17:00 PM | cardiac monitor status | 11:00:00 AM |
| Charting | 12:17:00 PM | 12:19:00 PM | Heparin infusion | 11:00:00 AM |
| Checking NG residual/ Flushing NG | 12:19:00 PM | 12:21:00 PM | Nitroglycerin | 11:00:00 AM |
| Charting | 12:22:00 PM | 12:27:00 PM | LR IV | 11:00:00 AM |

workload and the associated costs. Estimated times for common nursing tasks should be used when available. If the organizational goal is to utilize nursing documentation to accurately reflect workload and cost, significant changes may be required.

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## Ethical considerations

This study was approved exempt by the Institutional Review Board (IRB).

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