

# Improving Nursing Care Quality and Safety through Electronic Medical Record Performance Management Pat Schaffer, RN, MSN; Ed Mendez, RN, MPH; Lynn Daum, BSN RN-BC; James Healy, BS



#### Purpose:

To monitor and improve the quality and safety of nursing care in a free standing pediatric academic medical center through implementation of a new electronic medical record (EMR) system that replaced existing electronic and paper nursing care documentation processes.

## Strategy and Implementation:

Nursing leaders identified key practice metrics that reflected nursing sensitive areas of quality & safe care. There was urgency to evaluate impact of new nursing documentation work flows & new EMR functionality (e.g. critical care area moving from paper to electronic documentation & best practice alerts to cue nurses to act on assessments). A report was developed in Excel and distributed to all nursing leaders weekly. It helped identify opportunities for improvement & inform data driven action planning for quality & safety issues. It included color cues indicating level of meeting goals. Departments could view their performance compared to others & house wide results. The report was enhanced to include run charts & weekly medians. Two months later a unit comparison by cluster (MedSurg, Critical Care, Psych) report was shared to help areas choose two metrics for active improvement. Failures were analyzed by area using detail data that was provided by analysts that informed who, what, & why documentation was noncompliant. This process supported the evolution of optimal metrics, enhancements of the EMR, and more informative report displays.

#### Metric Evolution:

Some metrics were only designed to monitor Epic® implementation, while others were intended to review quality on an ongoing basis. Over the past year, a portion of Quality Improvement department staff's time was spent in developing reports which were used as a source for scoring metrics. The 4 staff roles included: 1) nurse content experts that know the right thing to measure; 2) system analysts including nurse informaticist to define data and processing needs; 3) EMR system report writers to extract data, and 4) programmers to review compliance and score metrics. In addition to list below, 11 other metrics are under development.

Metric Number	Metric	First Date Used	Last date used	Current status
14	# of medications administered greater then 30 minutes after a scheduled administration time with no valid reason	January	March	Replaced by #56 below
12	# of patients without a pain reassessment within 1 hour of the documentation of a pain intervention	January	June	Replaced by #28 below
7	# of patients with a PPOC not having their PPOC updated within the last 24 hrs	February	August	Discontinued after conclusion report did not provide enough information and did not support desired practice.
16	# of Med Administrations where Patient Not Scanned	January	August	Discontinued, detail not needed
18	# of Med Administrations where Medication Not Scanned	January	August	Discontinued, detail not needed
19	# of Med Administrations where Neither Medication Nor Patient Scanned	January	August	Discontinued, detail not needed
22	# of Med Administrations where Patient Scanned (Numerator)	January	August	Discontinued, detail not needed
23	# of Med Administrations where Med Label Scanned (Numerator)	January	August	Discontinued, detail not needed
24	# of Med Administrations (Denominator)	January	August	Discontinued, detail not needed
3	# of IV Medications NOT linked to a line	January	June	Discontinued, goals met
13	# of patients that have at least one medication administration not given and no documented reason for not giving	January	June	Discontinued, goals met
9	# of patients having a Skin alert and yet do NOT have a Skin Risk plan of care updated within the last 24 hrs	February	June	Discontinued, goals met
4	# of patients lacking a DAY shift hand-off (PPOC, Infusions, Orders are checked)	January	May	Replaced by Metric #29
5	# of patients lacking a NOC shift hand-off (PPOC, Infusions, Orders are checked)	January	May	Replaced by Metric #30
6	% of patients who have been admitted greater than 24 hours who have a PPOC by any discipline.	January		In use
10	# of patients that lack a pain assessment during the 1st 4 hours of admission	January		In use
11	# of times any patient went more than 8 hours without a pain assessment	January		in use
15	% of Total Med Administrations where patients were scanned before giving med	January		In use
17	% of Total Med Administrations where Meds were scanned before being giving	January		In use
34	% of Both Patient and Medication Scanned	January		In use
8	# of patients having a Fall Risk alert and yet do NOT have a Fall Risk plan of care updated within the last 24 hrs	February		In use
27	% of Pysis Overrides Resolved	April		In use
29	% of patients with a DAY shift hand-off	May		In use
30	% of patients with a NOC shift hand-off	May		In use
28	% of timely pain reassessments after medication given	May		In use
31	Number of "Wrong Medication" or "Discontinued/Expired Order" or "Wrong Patient's Order" or "Unexpected Errors" Alarts per 1,000 Administration (Near Missea)	June		In use
39	% of Total Med Administrations where Meds were scanned before being given - ADJUSTED	August		In use
35	% of PPOCs reviewed during last 12 hour Day shift	September		In use
36	% of PPOCs reviewed during last 12 hour Night shift	September		In use
56	% of medication administrations given on time (within 30 minutes)	September		In use
58	% of Focused PPOC reviews that are complete on all components reviewed	October		In use
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## **Display Evolution:**

Microsoft Excel has been retained as a presentation mechanism due to it's flexibility, comprehensive display options, and ability to allow simple interactivity with end-users.

End users initially created graphs using multiple pull-down menus (1/12/10), but now need only push a blue graph button (2/25/10).

Consistent with institutional methods, a view (2/1/10) was added to show weekly medians.

Special reports produced for leadership (2/17/10, 3/25/10) were helpful to leadership, but time-consuming to produce as shown. House-wide and nursing cluster scores were added later to the Epic® report (not shown).

Detail data reports (added 3/7/10) were sent to unit leadership to provide information for individual improvement efforts. These reports provide data to analyze why the documentation was non-compliant, yet many times this required an education session on how to interpret the raw data.

"Metrics at a Glance" micrographs were added (6/27/10) as quick reference for the visually-oriented.

## **Evolution of Data Processing:**

Data sources for metrics have always come from reports exported from the EMR. At the outset of Epic® -implementation, reports were moved to Excel for all processing. Shortly after implementation, reports were loaded to Microsoft Access, and from there exported to Excel, resulting in immediate reduction in staff time from 42 hours to 8 hours per week to produce reports. Access supports automation of all data processing steps from data acquisition, data scrubbing, metric scoring, data exports for Excel reports.

The Access database core tables are the Metric (defines the metrics) and Metric Score (Fields: score, numerator, denominator, unit, date, etc). These simple formats allow additional metrics (not shown) to be appended easily, creating a central metric score repository that was used to fulfill many reporting requirements.

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#### **Evaluation:**

The table in the lower left corner of the poster, three metrics were discontinued early as there had been significant improvement: IV meds linked to a line, meds given as ordered, and appropriate & timely initiation of skin plan of care.

The table directly below shows the metric names, a statement of significance, and an outcome statement describing the practical impact on care.

Paired t-tests were performed for any metrics where 30 days of data were available for both Jan-Feb and Oct-Nov 2010. Of these, 5 improved, 1 had no significant change, and 2 got worse. The absence of improvement in those 2 metrics may be related to a lack of real time charting.

The graph shows the pre-and post-scores, which are the average daily score for units during the periods. Solid lines are percentages of compliance (higher is better), dashed lines are counts of failure (lower is better).

Number	Metric with significance statement	Significance	Outcome Statements for 30 Day Period
	# of Admission Histories NOT completed (blank or	Yes	247 more patients with Admission Histories
1	pending)	Improved	completed
		Yes	
4	# of patients lacking a DAY shift hand-off	Improved	396 more day shift hand-offs complete
- 6	# of patients lacking a NOC shift hand-off	Na	no significant difference
	% of patients who have been admitted greater than 24	Yes	More patients with PPOC in place 24 hours
6	hours who have a PPOC by any discipline	Improved	after admission.
	# of patients having a Fall Risk alert and yet do NOT		
	have a Fall Risk plan of care updated within the last 24	Yes	More patients with Fall Risk plan in place who
0	hrs	Improved	need it.
	# of patients that lack a pain assessment during the	Yes	Fewer patients had pain assessments during
10	1st 4 hours of admission	Worsened	first 4 hours (admission check)
	# of times any patient went more than 8 hours without	Yes	Fewer patients had pain assessments during
11	a pain assessment	Worsened	first 8 hours (shift check)
			14851 more Med Administrations where Patie
		Yes	ID and Medication were scanned before giving
- 34	% of Both Patient and Medication Scanned	Improved	med



Implications for Practice: Improvements in nursing documentation practices & optimization of the EMR were achieved through these data driven strategies. Disseminating results via Shared Governance Councils to staff, supported measurable increases in compliance with practice standards that impact patient care quality & safety.