

UNIVERSITY OF CALIFORNIA IRVINE

Implementation of an Electronic Handoff Report: A Quality Improvement Project

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Angelica Kaisa Ahonen

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Abstract: Critical information such as a patient's vital signs, neurological status, and level of care is exchanged between registered nurses during a patient handoff report. It is imperative that the communication between registered nurses (RN) is accurate, specific, relevant, and timely. When the care of a patient is transferred from one healthcare provider to another, the patient may experience potential risk because of communication failure. The purpose of this doctoral project was to evaluate patient and nursing satisfaction with patient handoffs between the Emergency Department (ED) and Medical Telemetry unit. The aim of the proposed process was to have a concise communication tool. The use of this electronic handoff tool promotes relevant and timely communication. The project product is an electronic handoff tool that is consistent, safe, and efficient.

The project was framed in the Iowa Model of evidence-based practice. An inter-professional team was created consisting of frontline nurses, educators, administrators, and technicians. The team met to identify practice issues surrounding the current handoff process. The focus group met over a four month period. During these meetings, the ED to floor handoff report was developed

The handoff report is part of the Electronic Health Records (EHR) operating system of Sunrise, Allscript Corp., Chicago, Illinois (Vawdrey et al., 2013). This EHR system is used at the University California Irvine (UCI). Conducted by the medical telemetry nurse manager and the emergency department nurse supervisor, in-service education was administered to all ED RNs and Medical Telemetry RNs on the new electronic handoff process.

A three-month pilot took place. Data collection began once the electronic handoff report pilot was implemented. The parameters analyzed were: (1) Nursing Satisfaction Survey; (2) Press Ganey Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Patient Satisfaction-Overall Recommend and Nursing Communication mean scores; (3) Emergency Department pre and post pilot Diversion times.

Statistically significant changes in nursing satisfaction survey scores were observed for both the efficiency of handoffs and overall satisfaction, $p < .001$. Approximately 3/4 of the participants rated the Electronic Handoff Trial positively (Excellent, Very Good, or Good) while 1/4 of the participants rated it negatively (Fair to Poor). Patient satisfaction HCAHPS survey results observed at post-test demonstrate statistically significant improvements in ratings of both nurses overall and likelihood to recommend, $p < .05$. A 10% increase in patient satisfaction was achieved after the implementation of the report.

As a result of positive feedback from the use of the ED to floor handoff report, the handoff process was expanded to all units within the hospital. More data will need to be collected by nursing leaders to determine if the ED to floor handoff report will demonstrate an improvement in patient safety, ambulance diversion times, and emergency department throughput.

Implementation of an Electronic Handoff Report: A Quality Improvement Project Executive Summary

Angelica Kaisa Ahonen, DNP, RN, CMSRN, NE-BC

Background

Critical information such as vital signs, neurological status and level of care is exchanged between RNs during a handoff report. Communication between healthcare providers must be accurate, specific, relevant and timely (Welsh, Flanagan, & Ebright, 2010). When care of a patient is transferred from one provider to another, the patient may experience potential risk because of communication failure (Flanagan, Patterson, Frankel, & Doebbeling, 2009)

Problem Statement

A team of UCI nurses held a focus group and determined that there was a lack of a standardized handoff process. Handoff reports are often too long and usually contain irrelevant information such as questions not applicable to the current plan of care. Existing process of report via telephone call causes unnecessary wait time. Emergency Department (ED) RNs have to make multiple attempts to receiving RN because they are unable to give report at first attempt. Current handoff causes considerable delays of patient transfer from one unit to the other. Delays cause dissatisfaction for both patient and nurses and loss of revenue through ambulance diversion.

Methods

Purpose: To evaluate patient and nursing satisfaction.

Aim: To have a concise communication tool.

Methodology: A Quality Improvement project. The Iowa Model of Evidenced Based Practice was used.

Design: A non-experimental pre and posttest design.

Sample and Setting: 152 RN's who work in the ED and Medical Telemetry unit in a non-profit, university teaching hospital in a large urban area. A three-month pilot took place between the ED and Medical Telemetry unit.

Instruments: (1) Nursing Satisfaction Survey Monkey results; (2) Press Ganey Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Patient Satisfaction-Overall Recommend and Nursing Communication mean scores; (3) Emergency Department pre and post pilot Diversion times.

Data Analysis and Reporting:

A non-parametric Mann-Whitney U tests and Sample T-tests were used to compare the pre and post implementation data of the Quality Improvement project. SPSS version 22 was used for this analysis.

Results

Years of experience: Years of experience were collected from participating RN's and examined by setting (Emergency Room vs. Medical Telemetry)
Summary of participating RNs' experience (n = 152)

| Years of Experience | Frequency (Valid %) | |
|---------------------|---------------------|-----------------------|
| | Emergency Room RNs | Medical Telemetry RNs |
| 0-5 | 52 (49.5%) | 7 (14.9%) |
| 6-10 | 21 (20.0%) | 17 (36.2%) |
| 11-15 | 15 (14.3%) | 13 (27.7%) |
| 16-20 | 6 (5.7%) | 8 (17.0%) |
| 21-25 | 6 (5.7%) | 1 (2.1%) |
| > 25 | 5 (4.8%) | 1 (2.1%) |

Nursing satisfaction survey results: Statistically significant changes in nursing satisfaction survey scores were observed for both the efficiency of handoffs and overall satisfaction, $p < .001$. Approximately $\frac{3}{4}$ of the participants rated the Electronic Handoff Trial positively (**Excellent, Very Good, or Good**) while $\frac{1}{4}$ of the participants rated it negatively (**Fair to Poor**).

Summary of Mann-Whitney U Tests (n = 426)

| | Median Score | | U | z | p |
|-----------------------------------------------|--------------|------|----------|-------|--------|
| | Pre | Post | | | |
| Ability to communicate information at handoff | 5.0 | 5.0 | 12650.00 | -0.81 | .42 |
| Adequate information at handoff | 4.0 | 4.0 | 12356.00 | -1.07 | .28 |
| Use of standardized reporting system | 5.0 | 5.0 | 12948.50 | -0.41 | .69 |
| Time efficiency of handoffs | 4.0 | 5.0 | 8602.00 | -5.05 | < .001 |
| Satisfaction with handoffs | 4.0 | 5.0 | 9653.00 | -3.93 | < .001 |

Emergent themes regarding participants' positive and negative experience with the Electronic Handoff Trial (n = 105)

| | Theme | Exemplar Quote* |
|----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Positive | Efficiency | Saves time on lengthy phone reports. It helps to be able to look over report before patient arrives and a call back number for verbal questions. Awesome! Helps minimize delays, cannot wait for whole hospital to adapt new process. |
| | Accuracy | Information is concise and accurate with the important data needed. Important information such as pain meds and vital signs are carried over easily. Really like having the name and direct call back number of the RN in the Emergency Department. |
| | Convenience | Love it! All documents are easily transferred and clearly visible. The electronic handoff report makes it very easy to give report. There is no waiting time for the nurse to call. |

| | | |
|----------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Timeliness | Saves time, improves throughput, and reduces down time. The electronic handoff report makes it quick to deliver a handoff without delaying patient wait times in the ED, crucial to preventing diversion. |
| | Challenge of Transitions | People might have a hard time adjusting to this, but all new things takes time to get <accustomed> to, just like when charting became electronic. Please do not discontinue something so effective especially if all the other nurses on different units haven't had a chance to try this out yet. |
| Negative | Incomplete | Not tons of information provided on form. Some of the assessment information was marked with dashes and not aware that the double dashed meant "not applicable." |
| | Technological Challenges | Limitations with current software. Looking forward to transitioning to a newer Electronic Health Record. |
| | Length of Report | Template of Electronic Handoff report becomes longer than one page when the ED nurses include all of the history and physical. Not necessary to include this information since we can look it up. |

* Bolding added by the author for emphasis

Patient satisfaction survey results: Patient satisfaction HCAHPS survey results observed at post-test demonstrate statistically significant improvements in ratings of both nurses overall and likelihood to recommend, $p < .05$. A ten-percent increase in patient satisfaction was achieved after the implementation of the pilot.

Summary of Independent Samples T-test Comparisons of Patient Satisfaction (n = 123)

| | M (SD) | | t | df | p |
|--------------------|----------------|-----------------|-------|-------|-----|
| | Pretest (2015) | Posttest (2016) | | | |
| Nurses | 76.8 (29.6) | 83.7 (22.9) | -1.94 | 198.8 | .05 |
| Recommend Hospital | 70.3 (36.7) | 80.3 (34.1) | -2.02 | 199.8 | .05 |

ED diversion times: No statistically significant changes in diversion times from pre-implementation to post-implementation were observed.

Summary of Independent Samples T-test Comparisons of Diversion Time (n = 114-519)

| | M (SD) | | T | df | p |
|-------------|----------------|-----------------|-------|--------|-----|
| | Pretest (2015) | Posttest (2016) | | | |
| ED | 101.17 (32.38) | 97.50 (37.54) | 1.03 | 333.3* | .31 |
| Trauma | 58.31 (59.51) | 74.07 (87.27) | 1.07 | 72.9* | .29 |
| ED + Trauma | 91.52 (43.83) | 92.53 (52.80) | -0.24 | 517 | .81 |

* The assumption of equality of variances was violated, so df were adjusted to compensate

Conclusion

The results of this pilot indicated overall positive results in nursing and patient satisfaction. The outcomes of the data analysis were applied, and it was determined that the electronic handoff report should be implemented between the Emergency Department and all remaining Inpatient units within the institution. Although ambulance diversion times did not show a significant timing improvement, further data gathering is suggested in order to determine if an electronic handoff report could benefit the throughput process. Incident reports related to patient safety were not presented during this Quality Initiative project. Future studies are needed to confirm if an electronic handoff report may improve quality and patient safety.

Recommendations

1. Request support from executive leadership for the transition of the ED to IP handoff report into EPIC
2. Prospective pilots should be considered in order to evaluate the impact of the newly implemented electronic handoff on diversion rates, throughput times and patient safety.
3. Continue to monitor improvements in patient and nursing satisfaction.

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Implementation of an Electronic Handoff Report: A Quality Improvement Project

Angelica Kaisa Ahonen, DNP, RN, CMSRN, NE-BC; Angela Hudson, PhD, RN; and Gail Washington, DNS, RN

Background

- Critical information such as vital signs, neurological status and level of care is exchanged between RNs during a handoff report
- Communication between healthcare providers must be accurate, specific, relevant and timely
- When care of a patient is transferred from one provider to another, the patient may experience potential risk because of communication failure



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Problem Statement

- Focus group reported that handoff reports are often too long
- Emergency Department (ED) RNs have to make multiple attempts to give handoff
- Current handoff causes delays of patient transfer
- Delays cause dissatisfaction for both patient and nurses
- Delays results in the loss of revenue through ambulance diversion

Purpose

- To evaluate patient and nursing satisfaction
- Aim is a concise communication tool to promote accurate, relevant, and timely communication between the ED and medical telemetry unit

Methods

Design: A non-experimental pre and posttest design

Theoretical Framework: The IOWA model of evidence based practice

Sample and Setting: 152 RN's who work in the ED and Medical Telemetry unit in a non-profit, university teaching hospital in a large urban area. A three-month pilot took place between the ED and Medical Telemetry unit

Instruments: (1) Nursing Satisfaction Survey Monkey results; (2) Press Ganey Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Patient Satisfaction-Overall Recommend and Nursing Communication mean scores; (3) Emergency Department pre and post pilot Diversion times

Data Analysis and Reporting: A non-parametric Mann-Whitney U tests and Sample T-tests were used to compare the pre and post implementation data of the Quality Improvement project. SPSS version 22 was used for this analysis

Process: ED RN completes handoff. Notifies inpatient RN to review and call within 15 mins.

Sample Handoff Report

ED To Floor Report Date: 08/26/2016 16:39 [SAMPLE REPORT]

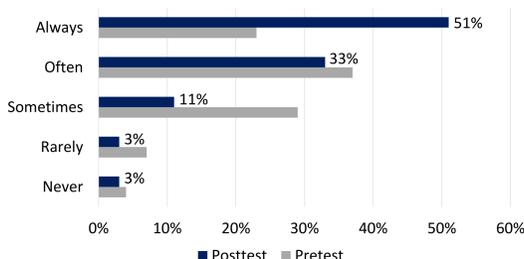
DOE, JANE [2345678] 68 y F (mm/dd/yy) 72.7kg CODE STATUS:DNAR* 8/25/16 (2d)

| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Patient Information T3BD12 Telemetry-Med/Surg Angelica RN call if you have questions, ext: 456-5533 Chief Complaint low back and abd pain/unable to eat or drink X 2days Admitting Diagnosis PAIN Allergies Plastic tape Rash Advance Directive Status Yes Fall Risk Score 4 (3 or more may be at high risk for falls) Cervical Precautions -- (double slash = assessment not applicable) Suicide Risk -- Behavioral Risk -- Restraints -- Legal Hold -- Sitter -- Preferred Language English Patient Belongings Belongings Form Completed: Yes Patient Property Number: -- Background Past History Liver CA Chemo DM Screening for violence -- Accompanied By Family | Infection Control Cough/Respiratory symptoms Breathing/Cough: Normal breathing effort R/O influenza -- Vital Signs T: 36.9° T _{max} : 37.1° @ 26 Aug 11:05 HR: 69 (65 - 78) BP: 102/46 (102/41 - 126/86) RR: 18 (16 - 20) SpO ₂ : 96% (90 - 96) ICP Monitoring Device: -- Location: -- ICP (mm Hg): -- CPP (mm Hg): -- CIWA Score: -- RASS Score: (0) Alert and calm Pain Management Pain Score (numeric): 8 Interventions: pain medications; Dilaudid/Zofran Pain Assessment Abdominal pain PCA Orders HYDROMORPHONE PCA IntraVenous [Last dose: 0.1 mL / hour @ 08-26 10:21] Pain Meds HYDROMORPHONE Injection [Last dose: 1 mg @ 08-26 07:31] | Medications IV Peripheral IV #1 Site of insertion: left antecubital 20 G IV Medicated drips NS @ 75ml/hr Anti-infectives -- Blood Administration 1u PRBC [08-26-16 @ 10:30] Tests/Results Blood glucose Results (mg/dL): -- Interventions: none Hemocue Results (mg/dL): -- CT/Radiology CT Abdomen [08-25-16] Procedures Procedures Procedure List: -- Body Part/Laterality: -- Dialysis (from MD order) -- | Physical Assessment Neuro Mental Status (Adult): Awake; Alert GCS Adult: 15 Cardiac Heart Rhythm: NSR Capillary Refill: Less than 2 seconds Radial Pulse Left: Normal Radial Pulse Right: Normal Pedal Pulse Left: Normal Pedal Pulse Right: Normal Skin: Normal Temp; Warm; Jaundiced Respiratory Airway: Patent Breathing/Cough: Normal breathing effort Breath Sounds Left: Clear on the left Breath Sounds Right: Clear on the right GI Nausea GU GU Assessment: Foley 16 Fr (inserted 08-26-16) Musculoskeletal Gait: Unsteady = Fall Precautions Weight Bearing: -- Pelvis: -- Deformity: -- Circulation/Sensation/Movement: -- Skin Integrity/Impairments Skin intact Remarks: -- Wound Appearance: -- Wound Type: -- Wound Location: -- |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

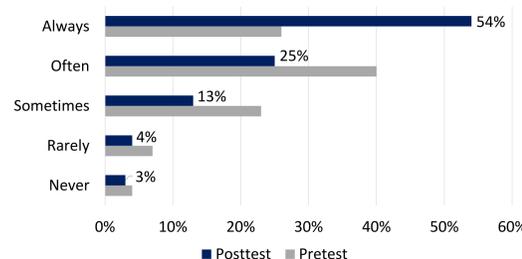
[adapted from New York Presbyterian Hospital original handoff document]

Results: Nursing Satisfaction

“The current process for giving/receiving a handoff report is time efficient”



“The current process for giving/receiving a handoff report is satisfying”



Years of RN Experience

Summary of participating RNs' experience (n = 152)

| Years of Experience | Frequency (Valid %) | |
|---------------------|---------------------|-----------------------|
| | Emergency Room RNs | Medical Telemetry RNs |
| 0-5 | 52 (49.5%) | 7 (14.9%) |
| 6-10 | 21 (20.0%) | 17 (36.2%) |
| 11-15 | 15 (14.3%) | 13 (27.7%) |
| 16-20 | 6 (5.7%) | 8 (17.0%) |
| 21-25 | 6 (5.7%) | 1 (2.1%) |
| > 25 | 5 (4.8%) | 1 (2.1%) |

A Chi-Square Test of Independence revealed a statistically significant association between years of experience and setting ($\chi^2(5) = 22.56, p < .001$)

Patient Satisfaction

Summary of Independent Samples T-test Comparisons of Patient Satisfaction (n = 123)

| | M (SD) | | t | df | p |
|--------------------|----------------|-----------------|-------|-------|-----|
| | Pretest (2015) | Posttest (2016) | | | |
| Nurses | 76.8 (29.6) | 83.7 (22.9) | -1.94 | 198.8 | .05 |
| Recommend Hospital | 70.3 (36.7) | 80.3 (34.1) | -2.02 | 199.8 | .05 |

A ten-percent increase in patient satisfaction was achieved after the implementation of the pilot, $p < .05$

Discussion

- Concise tool to give report
- Information transmitted in the electronic handoff report includes:
 - ✓ What brought the patient to the hospital
 - ✓ Past medical history
 - ✓ Latest pain score and dosage given
 - ✓ Symptoms requiring isolation
 - ✓ Physical assessment

Conclusion

- Results indicated overall positive results in nursing and patient satisfaction
- Recommendation to implement electronic handoff report to all units
- Further data suggested to determine if an electronic handoff report could benefit patient throughput
- Future studies are needed to confirm if an electronic handoff report may improve patient safety