Medical University of South Carolina (MUSC) Value Institute
Evidence-Based Practice Summary
Developed through the EBP for Health Care Professionals Course

Improving collaborative communication in the Pediatric ICU

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ASK THE QUESTION

Clinical Question: For patients and families of patients in pediatric intensive care, what is the effect of a visible care plan on accuracy of collaborative communication?

Objective: To critically review the evidence related to the utilization of visible care plan documentation tools to improve patient and patient families’ views of collaborative communication

Background: In the PCICU we perform multidisciplinary rounds and use a single sheet paper rounding tool. Despite these efforts we still see patients and families get mixed messages about their plan of care from different care team members. When searching the literature I found that two main tools are used in pediatric hospital settings to improve communication. One is a white board in patient’s room that is used for care plan documentation and the other is a rounding tool similar to what we already use. I also found one new study, that took place in a pediatric cardiac unit, that utilized a white board as a rounding tool that had excellent success at improving team communication.

SEARCH FOR EVIDENCE

Databases searched: PubMed, Scopus

Search strategy:
(Intensive Care OR ICU OR Critical Care) AND (Interprofessional OR Interdisciplinary OR Multidisciplinary OR Rounds) AND (Communication OR Satisfaction) AND (Goals OR Care Plan)
(Intensive Care OR ICU OR Critical Care) AND (Interprofessional OR Interdisciplinary OR Multidisciplinary OR Rounds) AND (Communication OR Satisfaction) AND (Goals OR Care Plan) AND (Professional-Family Relations) based on professional-family relation being a mesh term is many of my articles

(Intensive Care OR ICU OR Critical Care) AND (Interprofessional OR Interdisciplinary OR Multidisciplinary OR Rounds) AND (Communication OR Satisfaction) AND (Goals OR Care Plan) AND (Goal Sheet OR Rounding Sheet OR Communication Sheet)

Filters/limits (publication date, age, etc.): none

CRITICALLY ANALYZE THE EVIDENCE

When searching the literature for tools to improve the accuracy of multidisciplinary team communication, I found two strategies are most often used. One is a paper rounding tool used to document goals of care during team rounds and the other is a white board in patient rooms used for several things including documenting goals of care. Because of these distinct ideas, I divided my evidence into two tables: Evidence Table 1 details studies utilizing a daily goals sheet or rounding tool and Evidence Table 2 details studies utilized a patient white board. Interestingly, I found a single study (Justice et al., 2016) that utilized a combined whiteboard and patient goal sheet (or rounding tool).

The studies evaluating the rounding tool found: 1) Use of a rounding sheet increased understanding and agreement of patient goals of care among care team members 2) Use of a rounding sheet increased comfort of discussing goals of care with patients and patient families. The studies evaluating the use of patient whiteboards found: 1) Use of a whiteboards increased patient satisfaction with communication 2) Use of a whiteboard could improve communication. The combined study (Justice et al., 2016) had great results showing that: Use of a visible rounding tool and visual display of goals of care in patient room improved understanding and agreement of patient goals of care among team members and improved patient family satisfaction.

Evidence Table 1: Patient Goal sheets

<table>
<thead>
<tr>
<th>Author/Date/ Journal</th>
<th>Purpose of Study</th>
<th>Study Design</th>
<th>Sample and Setting</th>
<th>Outcomes</th>
<th>Design Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agarwal et al, 2008, Journal of Critical Care</td>
<td>To determine if a pediatric intensive care unit (PICU) goal sheet would improve communication</td>
<td>prospective cohort study</td>
<td>Nurses and residents in the 12 bed PICU at Lucille Packard Children’s Hospital Pre and Post intervention questionnaire assessed nurse and resident understanding of daily patient care goals</td>
<td>During 2 week pre-intervention survey a total of 419 questionnaires (overall return rate of 68%) were returned (229 from nurses and 187 from residents and 3 with no occupation listed)</td>
<td>Study Limitations = None Non-Experimental/Observational Studies (case-control, cohort, cross sectional,</td>
</tr>
</tbody>
</table>
Patient goal sheet implemented for all PICU patients for 16 weeks.  

Primary outcome measured was understanding of patient care goals for the day via the question “How well do you understand the goals of care/what needs to be accomplished for this patient today?” Questions evaluated using a 5-point Likert scale. Secondary outcomes included 1) the comfort in explaining patient care goals by nurses and resident physicians (evaluated using a 5-point Likert scale) and 2) number of goals (out of 3) subjects were able to list for each patient under their care

Survey a total of 387 questionnaires (overall return rate of 65%) were returned (174 from nurses and 213 from residents)

Both nurses and resident physicians had a better understanding of daily patient goals after intervention nurses = 4.2 pre compared to 4.5 post (on 5-point Likert scale) residents = 4.0 pre compared to 4.7 post (on a 5 point Likert scale) (P<.001)

Both nurses and resident physicians had increased comfort in explaining care goals nurses= pre 4.1 compared to post 4.3 (on a 5 point Likert scale) and residents 3.9 pre compared to 4.7 post (on a 5-point Likert scale) (p<.001)

Insufficient sample size
Sample not representative of patients in the population as a whole
Variables (confounders, exposures, predictors) were not described
Outcome criteria not objective or were not applied in blind fashion
Insufficient follow-up, if applicable
For prognostic study, sample not defined at common point in course of disease/condition
For diagnostic study, gold standard not applied to all patients
For diagnostic study, no independent, blind comparison between

<p>| © Value Institute, 2017 |
| Quality Management/Library, Medical University of South Carolina |</p>
<table>
<thead>
<tr>
<th>Ainsworth et al., 2013, Journal of Critical Care</th>
<th>Performance improvement project</th>
<th>20 bed surgical ICU</th>
<th>Alignment of daily patient care goals between HCT members was low overall and did not improve after implementing a DCC. There was a decrease in goal alignment after implementation of the DCC. Four of these trends were statistically significant: the critical care attending to the bedside nurse (alignment before 55%; alignment after 38%) (P = .02) and vice-versa (alignment before 52%; alignment after 36% (P = .03), the bedside nurse to the on-call resident (alignment before 55%; alignment after 38%) and vice-versa (alignment before 56%; alignment after 40% (P = .05). The relationships between the primary surgical team and the ICU team members all showed mild trends toward improved goal alignment.</th>
<th>Study Limitations = None Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey) Insufficient sample size Sample not representative of patients in the population as a whole Variables (confounders, exposures, predictors) were not described Outcome criteria not objective or were not applied in blind fashion Insufficient follow-up, if applicable For prognostic study, sample not defined at common point in course of drug) Increase Quality Rating if: Large Effect Level of evidence for studies as a whole: High Moderate Low Very Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>To test the hypothesis that implementation of a daily goals Door Communication Card (DCC) would improve goal alignment between members of the health care team (HCT)</td>
<td>5 weeks of random baseline surveys performed to establish goal alignment pre intervention. Surveys given to HCT member following multidisciplinary rounds (MDR) and asked HCT members to “list and rank today’s major goals” for each of their patients. Major goals were defined as “the most important objectives/tasks to accomplish” for a given patient on the day of inquiry. HCT members surveyed each instance included the critical care attending, bedside nurse, on-call ICU resident, and the primary surgical chief resident. Surveys assessed by 3 reviewers for goal alignment. If HCT members shared a goal it was considered aligned. If the goal was not shared, it was considered “non-aligned”. Alignment was assessed from the dominant-to subordinate member of the relationship (first listed to second listed member) using the chi-square test. 12 possible inter-provider relationships studied. Surveys conducted on a random day (Mon-Fri) where days were identified by a web based random number generator. DCC implemented for 1 month. Any HCT member could utilize card, but card “officially” updated during MDR</td>
<td></td>
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</tbody>
</table>
| Centofanti et al., 2014, Critical Care Medicine. | To understand the perspectives and attitudes of ICU clinicians about use of a daily goals checklist (DGC) on rounds | Prospective cohort | Surveys given to same HCT members after 1 month implementation | Three main themes were identified from the interviews and focus groups: impact on communication (systematic approach to rounds, facilitates multidisciplinary input into care plans, and serves as a central data repository), impact on patient care (decreases chance or errors, promotes recovery), and impact on education (introduces trainees to “an approach” to complex critically ill patients and prompts teaching topics). | Study Limitations = None Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey) □ Insufficient sample size □ Sample not representative of patients in the population as a whole □ Variables (confounders, exposures, predictors) were not described □ Outcome criteria not objective or were not objectively measured.

15 bed medical/surgical ICU daily goals checklist (DGC) was introduced in February 2010
Semi structured individual and focus group Interviews were conducted with 56 clinicians. Purposeful sampling was utilized: (registered nurses [RNs] and RTs) who worked both day and night shifts with at least 1 year of DGC experience, complete sampling (intensivists, pharmacists, physiotherapists [PTs], dietician), and convenience sampling (fellows and residents attending four academic half-days). Fellows and residents were invited in-person and others via e-mail
Interviews followed a guide and were digitally recorded and transcribed.

Interviews were digitally recorded and transcribed. Transcripts were analyzed using conventional qualitative content analysis, whereby codes are derived
directly from the data rather than using preconceived categories
- used N’Vivo (version 10.0; QSR International, Melbourne, Australia)

No invited respondents declined. Of 56 clinicians, there were 20 nurses, five RTs, three PTs, two pharmacists, one dietitian, 14 residents, five fellows, and six intensivists.

| Narasimhan et al., 2006, American Journal of Critical Care | Evaluate the effect of a standardized worksheet on physicians and Quality improvement project | 16 bed Medical ICU at Beth Israel Memorial Hospital daily goals worksheet implemented | Nursing and Physician understanding of the goals for the day improved significantly after 6 weeks: nurses’ scores increased from 3.9 (SD1.02) before goal worksheet and 4.8 not applied in blind fashion
☐ Insufficient follow-up, if applicable
☐ For prognostic study, sample not defined at common point in course of disease/condition
☐ For diagnostic study, gold standard not applied to all patients
☐ For diagnostic study, no independent, blind comparison between index test and gold standard
Psychometric Studies (validation study)
☐ Instrument was not clearly described
☐ Protocol for administration and scoring was not standardized
☐ Data were not collected on a representative sample

Study Limitations = None
Non-Experimental/Observational Studies (case-
| Nurses perceptions of their understandings of goals of care and on patients length of stay in an intensive care unit | All attending, residents, interns, and nurses assigned to ICU from Jan-March given questionnaire to assess satisfaction with communication before worksheet introduced and same questionnaire plus additional questionnaire after worksheet introduced (6 weeks, and 9 months after introduction). Responses were scored on a 5-point scale (1=understand noting, 5= completely understand) | (SD0.39) after goal worksheet. (P = .001) and physicians scores increased from 4.6 (SD0.67) before to 4.9 (SD0.32) (P = .03). Scores remained high 9 months later in both groups: 4.4 (SD 0.51) for nurses and 4.6 (SD 0.61) for physicians. Both physicians and nurses also reported significant improvement in communication with each other: nurses’ scores improved from 3.6 (SD 0.87) to 4.3 (SD 0.87) (P=.03), and physicians’ scores improved from 3.4 (SD 0.90) to 4.7 (SD 0.48) (P = .01). Communication scores remained high 9 months after the worksheet was implemented (4.2 for nurses and 4.4 for physicians) | Control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey | Insufficient sample size | Sample not representative of patients in the population as a whole | Variables (confounders, exposures, predictors) were not described | Outcome criteria not objective or were not applied in blind fashion | Insufficient follow-up, if applicable | For prognostic study, sample not defined at common point in course of disease/condition | For diagnostic study, gold standard not applied to all patients | For diagnostic study, no |
| Phipps et al., 2007, Intensive and Critical Care Nursing | To assess the impact of the implementation of a daily goals sheet upon nursing perception of communication in an academic, tertiary care pediatric intensive care unit (PICU). | Prospective, longitudinal, before-and-after intervention surveys | 12 bed medical/surgical PICU Team consists of Nurse, APN, resident, attending Daily goals tool implementation for 12 months Pre and post intervention 6-question survey available to 40 (pre) and 42 (post) nurses. First 4 questions related to nurse’s perception of team communication (1. Understand goals at end of rounds 2. Report received is thorough and accurate 3. Staff works as a team 4. Medical care is attending directed and I am comfortable with decisions) and were graded on a scale from 1 to 4 (never, rarely, sometimes, always). Question 5 not graded and 6 open ended. | 26/40 (65%) of the initial survey were returned along with 22/42 (52%) of the secondary survey All questions demonstrated an improvement in communication following implementation of the goals sheet. In comparing the before and after responses to the first three questions question #3 (”Overall, I think the PICU staff works as a team”) showed statistically significant improvement (P=0.05) For the 4th question (I trust that the medical care is attending directed) improvement reached statistical significance for surgical service #3 (p = 0.04). | Study Limitations = 

- Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey) 
- Insufficient sample size 
- Sample not representative of patients in the population as a whole 
- Variables (confounders, exposures, predictors) were not described 
- Outcome criteria not objective or were not applied in blind fashion 
- Insufficient follow-up, if applicable 
- For prognostic study, sample not applicable |

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<table>
<thead>
<tr>
<th>Pronovost et al., 2003, Journal of Critical Care</th>
<th>The purpose of this study was to evaluate and improve the effectiveness of communication during patient care rounds in the intensive care unit (ICU) using a daily goals form.</th>
<th>prospective cohort study</th>
<th>16 bed surgical oncology ICU</th>
<th>During the first 2 weeks of the study less than 10% of residents and nurses understood the daily goals of therapy and the daily tasks to be completed. After implementing the goals form, the percent of residents and nurses who understood the daily goals increased to over 95%.</th>
<th>defined at common point in course of disease/condition</th>
<th>For diagnostic study, gold standard not applied to all patients</th>
<th>For diagnostic study, no independent, blind comparison between index test and gold standard</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Survey given to ICU resident on call and patient primary nurse after rounds to evaluate understanding of goals of therapy. Questions asked were 1) how well do you understand the goals of care for this patient today? 2) How well do you understand what work needs to be accomplished to get this patient to the next level of care. Responses utilized a 5-point Likert scale Outcome measure was % of nurses and residents per week who responded with a score of 4 (mostly understand) or 5 (completely understand). Each day the resident and nurse of 2 patients were surveyed. A random number table was used to select 2 ICU beds per day for 8 weeks. After two weeks, a daily goals form was implemented.</td>
<td></td>
<td></td>
<td></td>
<td>Study Limitations = None</td>
<td>Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)</td>
<td>Insufficient sample size</td>
</tr>
</tbody>
</table>
Rehder et al., 2012, Pediatric Critical Care Medicine

To improve communication during daily rounds using sequential interventions

Prospective cohort study

The Duke PICU consists of a 16-bed unit that cares for critically ill pediatric patients of all medical and non-cardiac surgical specialties, including those requiring extracorporeal life support.

The study population included the PICU rounding team: the patient’s bedside nurse, the PICU charge nurse, a pediatric respiratory therapist (RT), a pediatric critical care attending physician, a pediatric critical care fellow, and four residents (either pediatric, combined medicine-pediatric, team agreement with the attending physician’s stated daily goals increased from 56.9% at baseline to 82.7% (p < 0.0001). Mean agreement increased for each provider category: 65.2% to 88.8% for fellows (p < 0.0001), 55.0% to 83.8% for residents (p < 0.0001), and 54.1% to 77.4% for nurses (p < 0.0001).

Study Limitations = None

Non-Experimental/Observational Studies (case-control, cohort, cross-sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)

Insufficient sample size
A single Clinical Nurse Specialist (CNS) not directly involved in rounds or in patient care observed daily round. Following rounds the CNS provided a goal checklist (designed for this study and not previously used) for randomly selected 8 patients (selected by software-generated random number list 1-16) to key members of the patient’s team: the attending physician, on-call fellow, on-call resident, and the patient’s primary bedside nurse. Checklist contained 57 common daily goals identified during pilot data collection. Each provider independently completed the checklist by selecting up to 4 goals with the option of free-texting any goals not listed on the checklist.

After collection of 4 weeks of baseline data, three sequential interventions were made over the 9 month study period with each intervention spaced at least 8 weeks apart: 1) a new resident daily progress note format 2) a performance improvement “dashboard” and 3) use of a bedside whiteboard to document daily goals at the end of rounds.

Using the attending physician as the gold standard, individual goal agreement was calculated from the checklist.

☐ Sample not representative of patients in the population as a whole
☐ Variables (confounders, exposures, predictors) were not described
☒ Outcome criteria not objective or were not applied in blind fashion
☒ Insufficient follow-up, if applicable
☐ For prognostic study, sample not defined at common point in course of disease/condition
☐ For diagnostic study, gold standard not applied to all patients
☐ For diagnostic study, no independent, blind comparison between index test and gold standard
| Justice et al., 2016, Pediatric Critical Care Medicine | To improve communication during daily cardiac ICU multidisciplinary rounds. | Quality improvement | A 25 bed cardiac ICU (CICU) at Cincinnati Children’s Hospital Medical Center conducted a quality improvement project.

This improvement initiative is the direct comparison of perceived daily goals for the bedside nurse, nurse practitioner (NP) or fellow provider, and attending physician, in order to determine actual understanding. Parent satisfaction was used to evaluate the impact of more uniform team communication on family satisfaction.

An Improving Rounds Task Force was assembled to evaluate multidisciplinary rounds and implement interventions to improve communication effectiveness.

This quality improvement project was guided by the improvement science model, which focuses on organizational improvement through development of a Key Driver Diagram, which includes a global aim, specific, measurable, attainable, realistic, and time bound.

At baseline, the percent agreement for patient goals was a mean of 62%. After initial implementation of the daily goal write-down and read-back process, which was written on paper by the bedside nurse, the REACT survey revealed no improvement. The intervention was altered, and goals were written on whiteboards for visual display during rounds, but the percent agreement remained unchanged. The intervention was again altered, and the bedside nurse wrote down the goals on a whiteboard displayed outside the patient room. The goals were read back by the nurse, and the team participated in a focused discussion about the goals. The percent agreement improved with repeat testing, and this improvement was sustained with a new mean of 87.6%. In addition, improvement was noted in the percent of matching responses by question and the number of matching responses per patient.

Family survey results improved for |

Study Limitations =

- None
- Non-Experimental/Observational Studies (case-control, cohort, cross-sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)
- Insufficient sample size
- Sample not representative of patients in the population as a whole
- Variables (confounders, exposures, predictors) were not described
- Outcome criteria not objective or were not applied in blind
(SMART) aim, key drivers, and interventions. In the improvement science model, interventions are tested using the Plan-Do-Study-Act (PDSA) method, whereby interventions can be discarded, altered, or adopted based on testing results.

To evaluate the effectiveness of communication during rounds, a Rounds Effectiveness Assessment and Communication Tool (REACT) was developed. The tool format and content were adapted from the Patient Knowledge Assessment Tool, which was previously developed and validated. Categories for the REACT survey were altered to match the system-based format of ICU rounds and the patient daily goal sheet completed during rounds.

The bedside nurse, NP or fellow, and attending physician completed surveys at the end of each patient’s rounding event, and respondents selected plans or interventions that were pertinent for the day. Those responses were then compared to determine the percent agreement between providers each day. Those responses were then compared to determine the percent agreement between providers each day. Because of the surprisingly low-percent agreement at baseline, the team focused on a SMART aim of increasing percent agreement of understanding by implementing a patient daily goal write-down and read-back process.

<table>
<thead>
<tr>
<th>fashion</th>
<th>Insufficient follow-up, if applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>For prognostic study, sample not defined at common point in course of disease/condition</td>
<td></td>
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<tr>
<td>For diagnostic study, gold standard not applied to all patients</td>
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<tr>
<td>For diagnostic study, no independent, blind comparison between index test and gold standard</td>
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</tbody>
</table>

Every question, and the overall mean score improved from 4.6 to 5.7 of 6. Furthermore, parent selection of the best possible score was 19% at baseline and 75% after implementation of daily goals visual display.

Insufficient follow-up, if applicable

For prognostic study, sample not defined at common point in course of disease/condition

For diagnostic study, gold standard not applied to all patients

For diagnostic study, no independent, blind comparison between index test and gold standard
The daily goal write-down and read-back process was developed through testing and evaluation (using REACT surveys) of multiple interventions over a year (daily communication sheet visualized by nurse, mobile white board outside patient room visualized by entire rounding team, whiteboard outside patient room with focused discussion on patient goals at end of rounds, and smaller laminated “goals” whiteboard sheet visible to all in rounds (sheet attaches to white board in patients room) used for focused discussion.

A 6-question parent satisfaction survey was developed to assess the impact of more uniform team communication on parent satisfaction. It was based on the previously validated EMPATHIC 30 questionnaire. Questions were adapted to include wording specific to patient daily goals. Parents were asked to evaluate the clarity of communication they received regarding daily goals for their child and their perception of whether the team was working together to accomplish the stated goals.
### Evidence Table 2: Whiteboards

<table>
<thead>
<tr>
<th>Author/Date/ Journal</th>
<th>Purpose of Study</th>
<th>Study Design</th>
<th>Sample and Setting</th>
<th>Outcomes</th>
<th>Design Limitations</th>
</tr>
</thead>
</table>
| Sehgal et al., 2010, Journal of Hospital Medicine | publish literature guiding the most effective uses of whiteboards, or describing their impact on communication, teamwork, or patient satisfaction and care. | Cross sectional survey | anonymously surveyed bedside nurses from 3 inpatient medical units, internal medicine house staff, and faculty from the Division of Hospital Medicine at the University of California, San Francisco (UCSF) A Likert scale was used to measure frequency of use, usefulness, and attitudes toward patient whiteboards. An open-ended question for “additional comments” was also asked. Survey responses were collected from 104 nurses (81% response rate) 118 internal medicine house staff (74% response rate) and 31 hospitalists (86% response rate) | All respondents agreed that whiteboard use could improve teamwork and communication as well as patient care. Nurses rated have a “goal for the day” on the white board as more useful than did either house staff or attending’s | Study Limitations = None Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey) Insufficient sample size Sample not representative of patients in the population as a whole Variables (confounders, exposures, predictors) were not described Outcome criteria not objective or were not applied in blind fashion Insufficient follow-up, if applicable For prognostic

Based on the GRADE CRITERIA for rating a body of evidence (See Appendix A for more info)

Lower Quality Rating if:

- Studies inconsistent (When there are differences in the direction of the effect, populations, interventions or outcomes between studies)
- Studies are indirect (Your PICO question is quite different from the available evidence in regard to population, intervention, comparison, or outcome)
- Studies are imprecise (When studies include few
<table>
<thead>
<tr>
<th>Study Limitations</th>
<th>Increase Quality Rating if:</th>
<th>Level of evidence for studies as a whole:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Limitations = None</td>
<td>Large Effect</td>
<td>High</td>
</tr>
<tr>
<td>Non-Experimental/Observational Studies (case-control, cohort, cross-sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)</td>
<td>Insufficient sample size</td>
<td>Moderate</td>
</tr>
<tr>
<td>Insufficient sample size</td>
<td>Sample not representative of patients in the population as a whole</td>
<td>Low</td>
</tr>
<tr>
<td>Insufficient sample size</td>
<td>Variables (confounders, exposures, predictors) were not studied</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

Tan et al., 2017, Postgrad Medical Journal

To measure the impact in improving patients’ understanding of and satisfaction with care; understand barriers for their use by physicians and how these could be overcome; and explore their impact on staff and patients’ families

Quality Improvement

4 inpatient medical units at Stanford university were interviewed over a 3 week period

Two of the surveyed units had whiteboards managed by bedside nurses and resource nurses. The other two units did not have whiteboards in patient rooms, however, the same medicine teams and same set of nurses cared for the patients.

The nurses were encouraged to fill out the whiteboard during rounds so that the patients and physicians were all present.

The residents were trained as to what to look for on whiteboards and to correct any wrong information. To be included in the project, patients had to be between the ages of 18 and 91, on a general medicine team, with a study, sample not defined at common point in course of disease/condition

For diagnostic study, gold standard not applied to all patients

For diagnostic study, no independent, blind comparison between index test and gold standard

There were 63 inpatients on units with whiteboards, and 58 inpatients on units without whiteboards during this study. On units with whiteboards, surveys were received from 56 patients and on units without, 48 surveys were received.

On units where whiteboards were used patients were significantly more likely to know their physician’s name (p≤0.001) and understand the goals for their admission (p≤0.0016) than patients on other wards without whiteboards

Patients on the wards with whiteboards were also more satisfied with their treatment at Stanford (p≤0.0242), which remained statistically significant after MANOVA analysis

All of the 40 persons in the study, sample not defined at common point in course of disease/condition

For diagnostic study, gold standard not applied to all patients

For diagnostic study, no independent, blind comparison between index test and gold standard

Study Limitations = None

Increase Quality Rating if:

Large Effect

Level of evidence for studies as a whole:

High

Moderate

Low

Very Low
<table>
<thead>
<tr>
<th>Description</th>
<th>Outcome Criteria</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-surgical admission to one of our four study units, and with a minimum length of stay of 3 days. Patients were exempt if they had a reason they could not read the board because they would not truly reflect the impact of the board.</td>
<td>- Outcome criteria not objective or were not applied in blind fashion</td>
<td>- Insufficient follow-up, if applicable</td>
</tr>
<tr>
<td>Patients were interviewed with a questionnaire using information from Stanford’s quality improvement team about aspects of care they found to be important to patients. The principle investigator administered questionnaire with no other providers or staff in the room. Questionnaire examined patient’s knowledge of 1) primary attending physician 2) reason for admission 3) plan of care 4) approximate discharge date. Patients indicated how strongly they agreed with statements about their care using a 5-point Likert scale.</td>
<td>- For prognostic study, sample not defined at common point in course of disease/condition</td>
<td>- For diagnostic study, gold standard not applied to all patients</td>
</tr>
<tr>
<td>Patient responses from both groups were collected as integers and a rank sum test for each of the found patient interview questions was performed. The mean score from patients on units with whiteboards was compared against the mean score from patients on units without whiteboards. A MANOVA test was fun on the four outcomes because the rank sum test foes not account for variance and because of the left-skewness. To ensure study was adequately powered, a post hoc power</td>
<td>- For diagnostic study, no independent, blind comparison between index test and gold standard</td>
<td></td>
</tr>
<tr>
<td>convenience sample found the whiteboards to be helpful.</td>
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</tr>
</tbody>
</table>
| Singh et al., 2011, American Journal of Medical Quality | To examine if the use of whiteboards improve communication with inpatients | Prospective cohort | Whiteboards placed in each patient room on the 4 general medical wards at a 430-bed urban academic medical center in the Midwestern United States. White boards not placed on the 7 surgical wards to create a natural control group.  
Press Ganey survey mailed to random subset of patients discharged from all wards (approximately 37% of patients per ward).  
Response rate to survey was approximately 28%.  
Patients rated satisfaction on a 5-point Likert-type scale and score was multiplied by a factor of 20 to convert to a 0-100 numerical score.  
An unadjusted mean score and standard deviation with the total number of responses was collated by ward. | Patient satisfaction scores with communication improved significantly after placement of white boards.  
The mean patient satisfaction scores with nurse communication increased by 6.4 points (P < .001), satisfaction with physician communication increased by 4.0 points (P = .04), and satisfaction with involvement of patients in decisions regarding their own care increased by 6.3 points (P = .002).  
There was no significant change in patient satisfaction with communication for patients discharged from the surgical ward. | Study Limitations =  
None  
Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)  
✗ Insufficient sample size  
✗ Sample not representative of patients in the population as a whole  
✗ Variables (confounders, exposures, predictors) were not described  
□ Outcome criteria |
Responses to 3 questions pertaining to communication with doctors, nurses, and involvement of patients in decisions about their own care were examined.

Patient satisfaction scores with communication were compared before and after placement of whiteboards. Comparisons were conducted for all 4 medical wards combined and for all 7 surgical wards combined.

T tests used to compare scores for 6 month time period prior to placement (Jan-June 2006) and 6-month period after placement (Jan-June 2007).

Rehder et al., 2012, Pediatric Critical Care Medicine
To improve communication during daily rounds using sequential interventions
Prospective cohort study

The Duke PICU consists of a 16-bed unit that cares for critically ill pediatric patients of all medical and non-cardiac surgical specialties, including those requiring extracorporeal life support.

The study population included the PICU rounding team: the patient’s bedside nurse, the PICU charge nurse, a pediatric respiratory therapist (RT), a pediatric critical care attending physician, a pediatric critical care fellow, and four residents (either pediatric, combined medicine-pediatric, emergency medicine, or anesthesia).

Team agreement with the attending physician’s stated daily goals increased from 56.9% at baseline to 82.7% (p < 0.0001). Mean agreement increased for each provider category: 65.2% to 88.8% for fellows (p < 0.0001), 55.0% to 83.8% for residents (p < 0.0001), and 54.1% to 77.4% for nurses (p < 0.0001).

Study Limitations = None
Non-Experimental/Observational Studies (case-control, cohort, cross sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)
Insufficient sample size
Sample not representative of
A single Clinical Nurse Specialist (CNS) not directly involved in rounds or in patient care observed daily round. Following rounds the CNS provided a goal checklist (designed for this study and not previously used) for randomly selected 8 patients (selected by software-generated random number list 1-16) to key members of the patient’s team: the attending physician, on-call fellow, on-call resident, and the patient’s primary bedside nurse. Checklist contained 57 common daily goals identified during pilot data collection. Each provider independently completed the checklist by selecting up to 4 goals with the option of free-texting any goals not listed on the checklist.

After collection of 4 weeks of baseline data, three sequential interventions were made over the 9 month study period with each intervention spaced at least 8 weeks apart: 1) a new resident daily progress note format 2) a performance improvement “dashboard” and 3) use of a bedside whiteboard to document daily goals at the end of rounds.

Using the attending physician as the gold standard, individual goal agreement was calculated from the checklist as the percentage of the attending physicians stated daily goals patients in the population as a whole

- Variables (confounders, exposures, predictors) were not described
- Outcome criteria not objective or were not applied in blind fashion
- Insufficient follow-up, if applicable
- For prognostic study, sample not defined at common point in course of disease/condition
- For diagnostic study, gold standard not applied to all patients
- For diagnostic study, no independent, blind comparison between index test and gold standard
| Justice et al., 2016, Pediatric Critical Care Medicine | To improve communication during daily cardiac ICU multidisciplinary rounds. | Quality improvement | A 25 bed cardiac ICU (CICU) at Cincinnati Children’s Hospital Medical Center conducted a quality improvement project.

This improvement initiative is the direct comparison of perceived daily goals for the bedside nurse, nurse practitioner (NP) or fellow provider, and attending physician, in order to determine actual understanding. Parent satisfaction was used to evaluate the impact of more uniform team communication on family satisfaction.

An Improving Rounds Task Force was assembled to evaluate multidisciplinary rounds and implement interventions to improve communication effectiveness.

This quality improvement project was guided by the improvement science model, which focuses on organizational improvement through development of a Key Driver Diagram, which includes a global aim, specific, measurable, attainable, realistic, and time bound (SMART) aim, key drivers, and interventions. In the improvement

At baseline, the percent agreement for patient goals was a mean of 62%. After initial implementation of the daily goal write-down and read-back process, which was written on paper by the bedside nurse, the REACT survey revealed no improvement. The intervention was altered, and goals were written on whiteboards for visual display during rounds, but the percent agreement remained unchanged. The intervention was again altered, and the bedside nurse wrote down the goals on a whiteboard displayed outside the patient room. The goals were read back by the nurse, and the team participated in a focused discussion about the goals. The percent agreement improved with repeat testing, and this improvement was sustained with a new mean of 87.6%.

In addition, improvement was noted in the percent of matching responses by question and the number of matching responses per patient.

Family survey results improved for every question, and the overall mean score improved from 4.6 to 5.7 of 6. |

Study Limitations =

- None
- Non-Experimental/Observational Studies (case-control, cohort, cross-sectional, longitudinal, descriptive, epidemiologic, case study/series, QI, survey)
- Insufficient sample size
- Sample not representative of patients in the population as a whole
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- Insufficient
science model, interventions are tested using the Plan-Do-Study-Act (PDSA) method, whereby interventions can be discarded, altered, or adopted based on testing results.

To evaluate the effectiveness of communication during rounds, a Rounds Effectiveness Assessment and Communication Tool (REACT) was developed. The tool format and content were adapted from the Patient Knowledge Assessment Tool, which was previously developed and validated. Categories for the REACT survey were altered to match the system-based format of ICU rounds and the patient daily goal sheet completed during rounds.

The bedside nurse, NP or fellow, and attending physician completed surveys at the end of each patient’s rounding event, and respondents selected plans or interventions that were pertinent for the day. Those responses were then compared to determine the percent agreement between providers each day. Because of the surprisingly low percent agreement at baseline, the team focused on a SMART aim of increasing percent agreement of understanding by implementing a patient daily goal write-down and read-back process.

The daily goal write-down and read-back process was developed through

Furthermore, parent selection of the best possible score was 19% at baseline and 75% after implementation of daily goals visual display.

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follow-up, if applicable
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☐ For diagnostic study, no independent, blind comparison between index test and gold standard
testing and evaluation (using REACT surveys) of multiple interventions over a year (daily communication sheet visualized by nurse, mobile white board outside patient room visualized by entire rounding team, whiteboard outside patient room with focused discussion on patient goals at end of rounds, and smaller laminated “goals” whiteboard sheet visible to all in rounds (sheet attaches to white board in patients room) used for focused discussion.

A 6-question parent satisfaction survey was developed to assess the impact of more uniform team communication on parent satisfaction. It was based on the previously validated EMPATHIC 30 questionnaire. Questions were adapted to include wording specific to patient daily goals. Parents were asked to evaluate the clarity of communication they received regarding daily goals for their child and their perception of whether the team was working together to accomplish the stated goals.

APPLY THE EVIDENCE

Practice Recommendation(s): I recommend that we follow the suggestions from the study and utilize a white board-type rounding tool that is kept in a patient and patient family accessible area in the patient’s room. I think this will improve the accuracy of team communication and therefore decrease the occurrence of mixed messages getting to families.

Strength of Recommendation: Strong
Quality of Evidence: Low
EVALUATE THE EVIDENCE

Outcome & Process Measures: SMART Goals

S=specific – Improve collaborative communication in order to decrease occurrence of patient and patient families getting mixed messages about care plans.

M= measurable – Survey/Questionnaire (to be developed) regarding communication accuracy. Survey/questionnaire to multidisciplinary team members and patient and patient families prior to intervention, after 3, 6, and 12 months of implementation. Survey/Questionnaire more frequently if implementation done in stages. (Survey 2-3 months after each stage implemented and then 3, 6, 12 months after entire implementation complete).

A= attainable – I cannot achieve this by myself. I will need help from my fellow UBC members to engage nursing and support staff and physician cooperation, but they have all been receptive to the idea up to this point.

R= realistic - Unit very open to quality improvement and is currently striving to be more family centered.

T= timely – approximately 12-18 months
<table>
<thead>
<tr>
<th>Implementation Plan</th>
<th>Who</th>
<th>Resources</th>
<th>When</th>
<th>Deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder agreement and plan development</td>
<td>Myself</td>
<td>presentation</td>
<td>2017</td>
<td>Plan implementation</td>
</tr>
<tr>
<td>Funding for whiteboard</td>
<td>myself</td>
<td>ERHF</td>
<td>2017</td>
<td>Whiteboard</td>
</tr>
<tr>
<td>Purchase whiteboard</td>
<td>Myself and admin</td>
<td>ERHF</td>
<td>2017</td>
<td>Whiteboard</td>
</tr>
<tr>
<td>Install whiteboard</td>
<td>maintenance</td>
<td>maintenance</td>
<td>2017</td>
<td>Usable whiteboard – “family and patient information area”</td>
</tr>
<tr>
<td>Laminate rounding tools</td>
<td>Myself and admin</td>
<td>Laminating sheets (we already have these)</td>
<td>2017</td>
<td>Rounding tool – more family friendly and visible to all team members</td>
</tr>
<tr>
<td>Develop survey/questionnaire</td>
<td>Myself, UBC team</td>
<td>staff</td>
<td>2017</td>
<td>Evaluate current collaborative communication and determine specific areas where improvement needed</td>
</tr>
<tr>
<td>Education on why change</td>
<td>Myself, UBC team</td>
<td>staff</td>
<td>2017</td>
<td>Consistent messages for patients and families</td>
</tr>
<tr>
<td>Education on changes to be made</td>
<td>Myself, UBC team</td>
<td>staff</td>
<td>2017</td>
<td>Consistent messages for patients and families</td>
</tr>
<tr>
<td>reeducation</td>
<td>Myself, UBC team</td>
<td>staff</td>
<td>2017-2018</td>
<td>Consistent messages for patients and families</td>
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</table>
REFERENCES


Appendix A: GRADE criteria for rating a body of evidence on an intervention
Developed by the GRADE Working Group

**Grades and interpretations:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Further research is very unlikely to change our confidence in the estimate of effect.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.</td>
</tr>
<tr>
<td>Low</td>
<td>Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.</td>
</tr>
<tr>
<td>Very low</td>
<td>Any estimate of effect is very uncertain.</td>
</tr>
</tbody>
</table>

**Type of evidence and starting level**

<table>
<thead>
<tr>
<th>Evidence Type</th>
<th>Starting Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized trial</td>
<td>High</td>
</tr>
<tr>
<td>Observational study</td>
<td>Low</td>
</tr>
<tr>
<td>Any other evidence</td>
<td>Very low</td>
</tr>
</tbody>
</table>

**Criteria for increasing or decreasing level**

**Reductions**
- Study quality has serious (–1) or very serious (–2) problems
- Important inconsistency in evidence (–1)
- Directness is somewhat (–1) or seriously (–2) uncertain
- Sparse or imprecise data (–1)
- Reporting bias highly probable (–1)

**Increases**
- Evidence of association† strong (+1) or very strong (+2)
- Dose-response gradient evident (+1)
- All plausible confounders would reduce the effect (+1)

†Strong association defined as significant relative risk (factor of 2) based on consistent evidence from two or more studies with no plausible confounders. Very strong association defined as significant relative risk (factor of 5) based on direct evidence with no threats to validity.