

Twice-Daily Huddles Improves Collaborative Problem Solving in the Respiratory Care Department

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BACKGROUND: Lean Six Sigma processes are used in health care systems to increase safety and efficiency. Daily huddles, one tool of the Lean Six Sigma process, have been used to increase patient safety, facilitate efficiency in problem solving, promote optimal patient outcomes, and reduce poor communication. Huddle utilization by respiratory care departments has not been previously reported. We describe our process of implementing daily huddles and the impact on departmental problem solving. **METHOD:** A descriptive study of a quality improvement intervention and a retrospective study of prospectively collected data were performed. The respiratory care department was trained in the utilization of a daily huddle process to resolve issues and identify process improvement opportunities. Huddles were performed at the beginning of each shift. Process improvement opportunities were raised by the respiratory therapy staff using the following categories: Safety/Service, Methods, Equipment, Supplies, and Associates. Opportunities were placed within 3 categories; quick hits (resolution in 1–3 d), complex problems (resolution in 3–7 d), and projects (resolution in > 7 d). All opportunities included a problem statement, an immediate countermeasure, a problem leader, and a due date. Items requiring interdisciplinary support were escalated to the organizational patient care services huddle. We evaluated the number and nature of process improvement opportunities raised in huddles from January 1 through December 31, 2018, to better understand the impact of daily huddles. **RESULTS:** A total of 366 process improvement opportunities were raised during huddles. Of those, 245 (67%) were quick hits, 77 (21%) were complex, and 44 (12%) were projects. Resolution of 174 (47.5%) opportunities was completed using only the resources of the respiratory care department, and 157 (43%) were resolved with additional interdisciplinary involvement. A small portion 35 (9.5%) of opportunities required escalation to the organizational multidisciplinary huddle for resolution. All process improvement opportunities were resolved at the end of the study period (mean \pm SD of 30.5 \pm 7.7 per month). **CONCLUSIONS:** Twice-daily huddles implemented by our respiratory care department allowed for identification and timely resolution of process improvement opportunities. *Key words:* process improvement; huddles; problem solving; respiratory care; Lean processes; communication; efficiency; transparency. [Respir Care 0;0(0):1–●. © 0 Daedalus Enterprises]

Introduction

Lean Six Sigma processes are used in health care systems to increase safety and efficiency.^{1,2} Lean Six Sigma is a process that relies on a collaborative team approach focused on removing waste and variation from processes and improving performance. A variety of tools are included in Lean Six Sigma methodology, including gemba walks, A3's, and daily huddles.³ A huddle is a process in which leadership and direct reports or care

providers meet in front of a process improvement white board. Huddles are short (< 15 min) and allow attendees to work from a visual of organizational metrics. The daily huddle is a time for leaders and staff to raise problems and suggest ideas, and the time limit ensures that huddles are not a place of problem solving or lengthy conversation. In health care, the concept of huddles has been used to increase patient safety and facilitate efficiency in problem solving. Huddles within health care first emerged as patient-safety enhancements. Expanding on that, shift and

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department huddles can help promote optimal patient outcomes and reduce poor communication between leaders and staff.^{4,5}

Lean Six Sigma processes were embraced by our organization, and huddles were initiated on a trial basis with a select group of senior leadership and their associated departments in 2014. Empirically, huddles were felt to result in improvement in overall communication and were expanded to all clinical departments. Our respiratory care department implemented twice-daily shift huddles in 2015 and became proficient in the process in 2017. To our knowledge, adaptation of daily huddles by respiratory care department has not been described previously. In this report, we summarize our process of attaining huddle proficiency. In addition, we evaluated the number and nature of the process improvement opportunities that emerged from huddles after proficiency had been attained to better understand the impact of this program. We hypothesized that the majority of process improvement opportunities raised in huddles would be resolved within 7 d.

Methods

This study was approved by the Nemours institutional review board, and was performed at a 200-bed, quaternary, free-standing children's hospital (Level 1 trauma center, Level 4 neonatal ICU). Starting in 2015, our institutional continuous improvement department aided in the initial set-up of huddle boards, education, and auditing of the huddle process. The respiratory care department leadership team and staff were trained in the utilization of a Lean Six Sigma huddle process to identify process improvement opportunities and to follow these opportunities to resolution. Training included a review of scientific methodology and principles, observation of huddles, and "in the moment

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Ms Burr has disclosed a relationship with Hill-Rom. The remaining authors have disclosed no conflicts of interest.

Ms Burr presented a version of this paper at the AARC International Congress held November 9–12, 2019, in New Orleans, Louisiana.

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DOI: 10.4187/respcare.07717

QUICK LOOK

Current knowledge

Organizational huddles are a way for health care providers to share identified improvement opportunities prior to embarking on patient care for their shift. Organizational huddles promote an environment of open communication where patient safety is paramount. Huddles can also enhance transparency related to problems, immediate countermeasures, and resolutions.

What this paper contributes to our knowledge

By utilizing huddles, our respiratory care department addressed both quick and complex problems in a timely fashion. The huddle process studied provided staff and leaders with a conduit to improve their work environment. This can improved communication, transparency, and the throughput of problem resolution.

feedback" as a huddle leader. Table 1 depicts an outline of the huddle discussion for the huddle leader.

All respiratory therapists, ancillary staff, and leadership personnel of the respiratory care department assigned to day and night shifts reported to the department at change of shift (ie, twice daily at 06:45 and 18:45) for participation in the huddle. Huddles were performed prior to respiratory therapists being dispatched to their assigned clinical areas. Only the oncoming shift attended the huddle so that the outgoing shift could provide uninterrupted patient care during this time. The following categories were used to organize issues on the huddle board: Safety and Service, Methods, Equipment, Supplies, and Associates. When discussing each category, items on the board with due dates were reported on and removed first. After due items were removed, the respiratory therapists were given the opportunity to raise new opportunities in each category. Opportunities were then placed within 3 categories: quick hits (anticipated resolution in 1–3 d), complex problems (anticipated resolution in 3–7 d), and projects (anticipated resolution in > 7 d). All opportunities included a problem statement, an immediate countermeasure, a problem leader, and a due date on the huddle board for transparency. Items requiring interdisciplinary support without immediate patient or staff safety impact were handled through email or direct communication with ancillary departments. Items requiring interdisciplinary support with a safety or service impact were escalated to the organizational patient care services huddle that occurs once daily (Monday through Friday) in our facility. On weekends, the huddle leader escalated to the respiratory care manager on call, who is able to escalate to the patient

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Table 1. Outline of Huddle Process for the Huddle Leader

Speaker	What to Say
Huddle Leader	Greeting: Today we are adequately staffed with the following transports, procedure, etc., occurring.
Huddle Leader or Metric Owner	Review Metrics: Today we had zero issues with no orders. Does anyone have any barriers to obtaining orders? (This can change daily/weekly/monthly.)
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on any safety/service barriers due today.
Huddle Leader	What new safety/service barriers do we have today?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on method items due today.
Huddle Leader	What new method barriers do we have today?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on any equipment items due today.
Huddle Leader	What new equipment barriers do we have today?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on any supply items due today.
Huddle Leader	What new supply barriers do we have today?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on any associate items due today.
Huddle Leader	What new associate barriers do we have today?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader or Item Owner	Report out on complex problems or projects due today.
Huddle Leader	Does anyone have any cost-saving ideas?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader	What employee recognition or great catches do we have?
Huddle Attendees	Allow for responses from attendees.
Huddle Leader	Adjourn.

care services executive team member on call, if needed. Overall, the problem leader is responsible for rallying needed stakeholders and developing a solution prior to the due date. The problem leader has the ability to extend the problem due date or change problem type (quick, complex, project) as needed until the problem is resolved.

After problem resolution, items were placed on a separate FYI board on the day of resolution. This board held each item in an announcement fashion for 1 week. After 1 week, items from the FYI board were placed into an Excel spreadsheet, and resolved items were forwarded via daily email to respiratory care department staff to ensure that all staff received the outcome of the process improvement opportunity. All posted and emailed items from huddles were documented and reported after removal of protected health information.

Auditing of the huddle process was initiated at the time of implementation. Table 2 depicts the huddle audit-scoring tool developed by our institutional continuous improvement department and used to score the huddle for competency and to provide the leader with feedback. The huddle audit includes 25 YES/NO questions in 4 different levels. Level 1 questions were related to huddle readiness. Level 2 questions were related to problem solving. Level 3 questions

were related to countermeasure implementation. Level 4 questions were related to associate engagement. Mastery includes selection of YES in all elements of Level 1, Level 2, and Level 3, as well as scoring YES in a majority of Level 4 questions. Huddle auditors gave immediate feedback to the huddle leader after the huddle on audit results and areas for improvement.

Continuous audits determined that mastery in the huddle process was achieved by the end of 2017. After proficiency in the huddle process was consistently demonstrated, we wanted to further evaluate the impact of the huddle process on the number and nature of the process improvement opportunities encountered in the respiratory care department. The respiratory care department huddle excel spreadsheet containing all resolved process improvement opportunities was retrospectively reviewed for the time period January 1, 2018, to December 31, 2018. The number and type of process improvement opportunities, problem leaders, due dates (to determine timeliness of resolution), immediate countermeasures, resolutions, involvement of other departments, and the number of opportunities escalated to the patient care services huddle were evaluated. Descriptive statistics were performed, with improvement opportunity data reported as proportions.

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Table 2. Nemours Continuous Improvement Department Huddle Audit Scoring Tool

Huddle Audit			
Department:		Auditor:	
Huddle Leader:		Date/Time:	
		Observing a HUDDLE	
		Yes	No
LEVEL 1 – READINESS	1	Did the huddle start on time and end within 15 min?	
	2	Is there associate, physician, and leadership representation?	
	3	Did the facilitator ask for Methods, Equipment, Supplies, and Associates problems individually?	
	4	Did the facilitator use prompting questions and/or a script to help surface readiness problems?	
	5	Is EVERY problem surfaced captured on the visibility board?	
	6	Are the problems described from the patient or business impact?	
	7	Are countermeasures, owners, and dates established for each readiness problem?	
	8	Are dates being kept current?	
	9	Are the escalation guidelines for Quick Hits and Complex Problems being met and captured on the visibility board?	
LEVEL 2 – TRUE NORTH PROBLEM SOLVING	10	Is the problem solving kept to a minimum during the huddle?	
	11	Are True North metrics up to date?	
	12	Did the facilitator ask for problems and barriers rated to a red True North metric?	
	13	Were there problems and barriers captured for a red True North metric from the patient perspective?	
LEVEL 3 – COUNTERMEASURE IMPLEMENTATION	14	Are there countermeasures, owners, and dates established for each True North problem?	
	15	Is there evidence of experimentation with improvements? Countermeasure implementation?	
	16	Is there evidence of reliable methods being developed for process improvements or countermeasures?	
	17	Is there evidence of education on new processes?	
LEVEL 4 – ASSOCIATE ENGAGEMENT	18	Is there evidence of process audits?	
	19	Is there evidence of data collection and/or use of frequency trackers?	
	20	Is there evidence of control charts and/or run charts being used?	
	21	Are at least half of the countermeasures owned by associates (not the area leader)?	
	22	Is there a distribution of countermeasure ownership (more than 2–3 people)?	
	23	Is there evidence of problem-solving worksheets?	
	24	Are there problems other than readiness and True North noted?	
	25	Did the facilitator recognize the associates who raised problems or proposed countermeasures in a positive way?	

TOTAL: Yes (1 point), No (0 points).

Results

During the study period, twice-daily huddles were completed every day. During these 730 huddles, 366 process improvement opportunities were raised (0.5 opportunities per huddle). All opportunities were resolved by the end of the study period. On a monthly basis, a mean \pm SD of 30.5 ± 7.7 opportunities were resolved, with the fewest in December (13) and the most in August (45). Opportunities were categorized as 245 (67%) quick hits, 77 (21%) complex problems, and 44 (12%) projects. Resolution of 174 (47.5%) opportunities was completed using only the resources within the respiratory care department, while 157 (43%) were resolved with additional interdisciplinary involvement. A small portion of opportunities (35, 9.5%) required escalation to the organizational multidisciplinary huddle for resolution. Table 3 lists examples of issues that were addressed using the huddle process within our respiratory care department.

Discussion

In this study, we demonstrate that daily huddles can be successfully adapted by a respiratory care department as part of a quality improvement program. This quality improvement program allowed for the identification of process improvement opportunities on average of once per day, with 88% of opportunities resolved within 1 week and 90.5% of opportunities managed with the resources of the respiratory care department and its multidisciplinary colleagues.

Lean business strategies (also known as Lean Production, Lean Enterprise, and Lean Thinking) originated within production industries to increase process quality and efficiency. The Lean methodology aims to implement process improvements by utilizing a coordinated set of principles that modify processes in a way that promotes efficiency and reduces waste. Lean methodology has evolved from its traditional application in manufacturing and has migrated into other

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Table 3. Examples of Problems or Issues Raised and Addressed in the Respiratory Care Department Huddles in 2018

Issue	Resolution
RTs on the assigned floor not notified of RRTs (only the RRT team members)	Change in notification was made so that the RT on the RRT team and the RT on the patient floor are both notified electronically.
Fire alarm being activated when tobramycin nebulizers are given	Fire alarm output was replaced in the patient room.
Not enough 2-L water bags on multiple units	PAR for this item was increased in response to patient census.
National shortage of albuterol	Albuterol was removed from automated medication dispenser and continuous mixtures were made by pharmacy to monitor inventory.
MRI ventilator found unplugged and batteries dead	Replacement batteries were ordered, turnover process for MRI ventilator was reviewed with RT staff.
Pediatric ICU 48 missing air hose from blender	Equipment tech was replaced.
All blood analyzers in a unit locked due to overdue quality control	Process was developed with unit clinical nurse specialist to ensure timely completion of quality control and no delay in care.
No inhaled nitric oxide tank carrier available in the gas storage room	Additional tank carrier was ordered to ensure availability.

RT = respiratory therapist
RRT = rapid response team
PAR = periodic automatic replenishment levels
MRI = magnetic resonance imaging

settings, including finance, construction, and health care. Lean first started branching into health care in the late 1980s with initiatives like Continuous Quality Improvement.⁶ Health care scheduling and access are examples of issues that have been dealt with successfully in many health care organizations using Lean principles.⁷

Huddles are one of the many tools available in the Lean methodology. Team huddles have been shown to increase team processes when leaders reinforce principles of continuous improvement and collaboration.⁸ Huddles within health care align directly with the Affordable Care Act's emphasis on team-based care.^{9,10} By collaborating as a team in a huddle prior to shift start, teams can become more cohesive and effective at problem solving. Gardner et al⁸ reviewed a huddle process at 5 Veteran Affairs medical centers as a conduit to improve primary care education for residents. In their model, huddles were focused around 4 core domains: shared decision-making, sustained relationships, interprofessional collaboration, and performance improvement. Primary participants were medical residents and their associated fellows and attendings. Gardner and his colleagues⁸ reported that huddles provided ample opportunities for learning within the workplace. Learning opportunities were related to relationship building, care coordination, and vital camaraderie that is necessary for team-based, patient-centered care. Overall, the authors noted that team huddles increased team mentality and positively affected team performance.

Cracknell and colleagues¹¹ tested safety huddles in a single, large, acute care hospital in 4 front-line teams. Huddles were organized to be led by senior clinicians, nonhierarchical, and succinct. A key metric in this study was a reduction in patient falls. The authors reported that falls were reduced from an average of 12.4 falls/week to 5 falls/week.

Additionally, cultural surveys from participants showed improvement in 23 of 27 parameters, including overall safety on the units studied. The authors concluded that huddles are a key tool for decreasing harm to patients, increasing team empowerment, and improving safety culture.

In a study from an English pediatric hospital, Stapley et al¹² utilized staff interviews to explore staff perspectives and experiences with the Situational Awareness for Everyone (SAFE) program, which included huddles. Interviews from 76 staff members (nurses, physicians, leadership) across 4 wards were included in the qualitative study analysis, which occurred 4 months after the SAFE program was initiated. Positive feedback from interviewed staff related to huddles included increased awareness of important issues, improvement in communication, increased teamwork, increased efficiency, and improved forward thinking. Challenges raised by interviewed staff members included added pressure on staff work load, potential for junior nurses to be excluded, and potentially inadvertently reinforcing medical hierarchies. Overall, this study highlights the huddle process as a way of potentially identifying opportunities for improvement in employee working environments and in clinical practice.

In 2018, Johnson¹³ echoed the above studies, identifying that teams with poor communication often are unable to be organized, empowered, and responsive to a rapidly changing environment. Teams with poor communication also often lack a sense of safety and good team dynamics. Ultimately, poorly performing teams were directly associated with poor patient outcomes. From this article, the author suggests huddles as being the single, simplest tool aimed at improving communication and increasing employee satisfaction and patient outcomes.

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To our knowledge, our study is the first to review a huddle process within a respiratory care department. Respiratory care departments vary greatly from other departments within the health care environment. Many times respiratory care departments are not located in patient care areas. Additionally, respiratory therapists may cover multiple units in a single shift and be responsible for a variety of patient populations. The general nature of respiratory care departments serving entire institutions increases the risk for poor communication, which could potentially translate into poor patient outcomes.

In our department, one of the main barriers to problem resolution is that we operate in many patient care areas and lack opportunities for group communication. Department huddles allow issues to be communicated in real time and ensure that there is an assigned party accountable for resolution. The use of a department huddle translates into effective situational awareness. This increased situational awareness can then translate into staff information gathering, realization of significance, and better understanding of the importance of addressing and rectifying opportunities for improvement by staff members. Twice-daily department huddles can also aid in improving communication between shifts in a round-the-clock operation.⁸

In the analysis of our huddle process, we found that process improvement opportunities were identified once daily on average, and the majority of these opportunities were resolved within a week. Nearly half of these resolutions only required resources already present in the respiratory care department, and < 10% of opportunities needed to be escalated to the organizational level. For department leaders, the breakdown of types of problems and need for interdisciplinary involvement and escalation can aid in the planning and implementation of the huddle process. Knowing that most opportunities for improvement that are surfaced in huddles can be solved quickly and within the department is a key factor in comprehending the relationship to problem-solving capacity and throughput, time management of problem owners to ensure transparency, and success of huddle item resolution.

We encountered several barriers to the successful implementation of the huddle process. One of these barriers was staff timeliness. We found that not all staff members arrived in the department prepared to start the huddle at designated times. This lack of timeliness can create confusion because staff members who show up late miss vital information. Staff are expected to be on time for huddle 100% of the time. Department and institutional policies for lateness can allow for up to 3 lateness occurrences before corrective action is taken. If tardiness extended beyond the acceptable allowance, it was addressed following the corrective action matrix, which includes a verbal warning and follows a step-wise approach ending with termination. We also saw a barrier with our off-shift employees. Staff who

are not assigned to work shifts starting at either 06:45 or 18:45 were not able to attend the huddle. While information from the huddle is displayed and available to these staff members, the conversation around them is missed; thus, those personnel sometimes require separate conversations for information sharing. Additionally, lengthy huddles coupled with extensive patient shift report can delay the outgoing shift.

Staff ownership of huddle items is a component of the huddle audit with the aim to have more than half of huddle items owned by associates. Although staff ownership of issues is positive, our respiratory therapists utilize a block schedule where they may not work for several days. If they are a problem leader, then their report at huddle on a process improvement opportunity resolution might be delayed until their next scheduled shift. In these instances, if the staff member was not present on the due date to report out, the huddle leader would move the due date to the next day. This would occur until the owner was present for report out or another team member was assigned the responsibility of reporting the resolution.

Senior organizational leadership support was paramount to success in our journey throughout the huddle process. Because the huddle initiative was started as a trial with senior leadership departments, we received ample support to make this journey successful. Without support, the effectiveness and overall positive impact of huddles may have been impeded. One barrier that we encountered, which was resolved with the assistance of senior leadership, was a lack of staff engagement during huddles. Initially, staff were uncertain about huddle effectiveness and were not always forthcoming about raising process improvement opportunities during huddles. Additionally, huddle leaders (ie, respiratory therapy leadership and charge therapists) gave staff feedback to escalate concerns to respiratory care department huddles if they were brought up outside of the huddle forum. When items were escalated to huddles by respiratory care department staff, huddle leaders provided positive feedback and recognition in an effort to promote this behavior.

Conclusions

By utilizing a standard huddle process, our respiratory care department addressed both quick and complex problems in a timely fashion. This process allows transparency in problem solving as well as direct and expedient communication to department associates. The huddle process provided staff and leaders with a conduit to improve their work environment that is not limited to the confines of a single department, but also includes the whole enterprise. Further research is necessary to evaluate the impact of respiratory care department huddles on patient safety, patient and

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respiratory therapist satisfaction, staff engagement, and cost savings.

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