

Clinical Pearl: Squaring the Evidence on Rounding

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“The primary goal of care in the neonatal intensive care unit (NICU) is to optimize each infant’s health before discharge. Clinicians work towards this goal through the following objectives: 1) correctly diagnosing their condition(s), 2) prescribing the correct treatment for the condition, and 3) minimizing harm. (1) Though these processes occur throughout the day, much of the work occurs during rounds. However, what is the evidence that guides the practice of rounding?”

The primary goal of care in the neonatal intensive care unit (NICU) is to optimize each infant’s health before discharge. Clinicians work towards this goal through the following objectives: 1) correctly diagnosing their condition(s), 2) prescribing the correct treatment for the condition, and 3) minimizing harm. (1) Though these processes occur throughout the day, much of the work occurs during rounds. However, what is the evidence that guides the practice of rounding?

Before reviewing the evidence for rounds, it is crucial to define rounds. According to Dr. Gordon Caldwell, a physician with the National Health Service in the United Kingdom, who has published and discussed “The Importance of Ward Rounds,” rounding is the “production line of inpatient services” and consists of repeated cycles of:

- “This is what we believe is going on.
- This is our plan and what we think will happen.
- Did it happen as anticipated? If not, why not? And if it has, was that just good luck or expert clinical care?
- This is what we plan to do next.” (1)

Dr. Caldwell notes that these four processes are analogous to

the repeated deductive and inductive Plan-Do-Study-Act (PDSA) quality improvement cycles. (1,2) Therefore, it is not surprising that many of the studies on rounds in the NICU are quality improvement projects aimed at reducing harm and unnecessary interventions.

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Some projects addressing rounds in the NICU have improved patient outcomes by ensuring that essential aspects of clinical care are regularly assessed and addressed. For example, daily discussion of extubation readiness at a single center was associated with reduced ventilator-associated events in the neonatal, pediatric, and cardiac intensive care units. (3) Also, a multicenter project to reduce postoperative pain in infants from the NICU who underwent surgery found that routine discussion of pain management during rounds with parental involvement reduced unrelieved pain by 35% and improved family satisfaction without increasing sedation scores. (4) Other projects did not demonstrate improvement because outcomes were remote or rare. For example, there is evidence that antacid exposure in infants in the NICU is associated with pneumonia, necrotizing enterocolitis, and decreased time to first fracture. (5) A project that mandated discussion of antacid treatment indications and goals reduced antacid exposure but did not measure any of the aforementioned outcomes. (5)

Each of these individual studies makes a compelling argument to address their studied topic on rounds. Nevertheless, how does one incorporate the daily discussion of analgesia, antacids, and extubation readiness in addition to the routine discussion of antibiotics, nutrition, growth, and cardiorespiratory status? One solution could be a comprehensive rounding checklist to address multiple care items. A single center project implemented such a comprehensive checklist through a “low-tech” (i.e., laminated card) and, later, “high-tech” (i.e., checklist embedded within the electronic health record) solution. (6) They improved checklist compliance from 31 to 87% and notably decreased time to completion by minimizing verbiage in the checklist’s prompts and by hiding questions

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that were not relevant (e.g., central line access questions did not appear in the checklist if the patient did not have a central line). The project did not evaluate any patient outcomes but did demonstrate that barriers to checklist compliance include forgetting to complete (>90%), interruptions (>90%), and perceived lack of relevance (>80%). (6)

“Despite the ubiquity of rounds, few research studies, observational or controlled trials, have evaluated the process of rounds in the NICU; however, there are more studies across all medical fields, including adult medicine. Several studies have addressed the basics of rounds – the presence of two or more clinicians (usually a nurse and physician) discussing the patient in a structured format, known as structured interdisciplinary rounds, at the patient’s bedside, known as bedside rounds.”

Despite the ubiquity of rounds, few research studies, observational or controlled trials, have evaluated the process of rounds in the NICU; however, there are more studies across all medical fields, including adult medicine. Several studies have addressed the basics of rounds – the presence of two or more clinicians (usually a nurse and physician) discussing the patient in a structured format, known as structured interdisciplinary rounds, at the patient’s bedside, known as bedside rounds. Two studies noted improved communication and teamwork with structured interdisciplinary rounds; however, no change in length of stay or other patient outcomes was seen. (7,8) A systematic review of randomized control trials or non-randomized cohort studies found 29 studies (21 randomized controlled trials) that evaluated bedside rounds compared to an alternate form of rounds. The review found a slight, statistically significant improvement in the patient experience with bedside rounds. However, there was a limited effect on patient-centered outcomes like patient knowledge. (9) Many included studies incorporated other aspects of care such as scripting or checklists. Several pediatric studies included family-centered rounds, where families were encouraged to participate by asking questions and providing feedback on plans. (9) There was significant heterogeneity in these studies, decreased adherence to the intervention, and risk of bias. Few studies reported on clinical outcomes. (9)

These studies have demonstrated that rounds often struggle from a lack of consistency. Though rounds “may be routine and ordinary [they] are highly complex, “ making consistent application of best practice more difficult. (1) Some of this complexity involves the large number of decisions that clinicians must make. An observational study of 920 patient rounds in the medical intensive care unit found that physicians make nine decisions per patient per day, or about 102 in total per day. (10) The number of decisions varied significantly by an intensivist and decreased with later rounding time or earlier time in the intensivist’s rotation. These findings hint at perceived human weaknesses – variation in thought processes, background knowledge, unfamiliarity at the

beginning of a patient care rotation, and fatigue associated with the work of rounds. (10)

Nevertheless, humans “have no need to apologize for their failure to achieve machine-like standards... They are good at other things – original thought, for one, empathy and compassion, for another. It is true that people are distractible – but in fact, this provides a major survival advantage.” (11) And this is probably the case in rounds. The failure to complete an entire checklist perfectly due to interruptions may be because the patient is acutely ill and has an urgent issue that needs addressing and is not covered by the checklist. Alternatively, perhaps clinicians need to stop rounds, pivot, and address another decompensating patient. Only a robot with a set algorithm would continue completing a rounding checklist while another patient is in terminal bradycardia.

How do we leverage the best of our human qualities – prioritization, creativity, empathy, and compassion – while mitigating our weaknesses? We would argue that we must increase the number of studies evaluating rounds. What works and what does not work? Anecdotally, rounds review the “numbers” from the front-line clinician (resident, hospitalist, or nurse practitioner), followed by a plan discussion. Assessments may or may not be explicitly stated. A potential study could involve a randomized comparison of traditional rounding, where numbers are rehearsed verbally, compared to a group where clinicians individually and quietly review the data, followed by an explicit group discussion of the assessment and then plan. Explicitly assessing the patient might ensure that everyone shares the same mental model. Other potential studies could vary the type of data reviewed during rounds. Does explicit discussion of total nutrition intake in kcal/kg or g/kg of protein and fluid intake in mL/kg improve nutrition delivery? Does a visual review of data improve trend identification over an audio review?

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These trials could be conducted in simulated environments to determine what tools and manner of discussion yield the best results, defined by desired orders and plans (i.e., earlier extubation, improved nutrition delivery, minimized opiate usage, complex shared decision-making). The pervasiveness of rounds as a daily mainstay of how we communicate and function as a team in a way

beguiles its complexity both as a concept and as a process. There are many avenues to explore concerning rounds that deserve further study and attention, perhaps alongside experts in organizing complex processes – Engineers in operations – who can help us better understand this complex process we experience daily. By doing so, we may better identify what is most needed from rounds and how we can maximize their efficiency to improve real and meaningful outcomes in patient care and the clinician, team, and family experience.

“Maybe there is a simple approach to organizing a clinician’s approach to rounds like the one I learned as a first-year resident from my senior resident, Dr. Bill Meadow, at Lurie Children’s in 1977. He had us organize our rounding sheet in this way: Fluids and nutrition, calcium, Glucose, respiratory, cardiovascular, hematologic-coagulation, gastrointestinal, infection, neurological, musculoskeletal, and skin (personal communication, Hageman, May 28, 2024).”

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References:

1. Caldwell G. The Importance of Ward Rounds. Published online October 16, 2013. Accessed May 18, 2024. <https://www.dropbox.com/s/tzep6wa8sw4ik0b/The%20Importance%20of%20Ward%20Rounds%20plus%20appendices.pdf?e=1&dl=0>
2. Langley GJ, Moen RD, Nolan KM, Nolan TW, Norman CL, Provost LP. Chapter Four: The Science of Improvement. In: *The Improvement Guide*. Second Edi. Jossey-Bass; 2009:75-88.
3. Wu AG, Madhavan G, Deakins K, et al. Pediatric Ventilator-Associated Events Before and After a Multicenter Quality Improvement Initiative. *JAMANetwOpen*. 2023;6(12):e2346545. doi:10.1001/jamanetworkopen.2023.46545
4. Bapat R, Duran M, Piazza A, et al. A Multicenter Collaborative to Improve Postoperative Pain Management in the NICU. *Pediatrics*. 2023;152(2). doi:10.1542/peds.2022-059860
5. Reinhart RM, McClary JD, Zhang M, Marasch JL, Hibbs AM, Nock ML. Reducing Antacid Use in a Level IV NICU: A QI Project to Reduce Morbidity. *Pediatr Qual Saf*. 2020;5(3):e303.

doi:10.1097/pq9.0000000000000303

6. Carr LH, Padula M, Chuo J, et al. Improving Compliance with a Rounding Checklist through Low- and High-technology Interventions: A Quality Improvement Initiative. *Pediatr Qual Saf*. 2021;6(4):e437. doi:10.1097/pq9.0000000000000437
7. O’Leary KJ, Wayne DB, Haviley C, Slade ME, Lee J, Williams MV. Improving teamwork: impact of structured interdisciplinary rounds on a medical teaching unit. *Journal of general internal medicine*. 2010;25:826-832. doi:10.1007/s11606-010-1345-6
8. O’Leary KJ, Haviley C, Slade ME, Shah HM, Lee J, Williams MV. Improving teamwork: impact of structured interdisciplinary rounds on a hospitalist unit. *Journal of hospital medicine : an official publication of the Society of Hospital Medicine*. 2011;6:88-93. doi:10.1002/jhm.714
9. Ratelle JT, Sawatsky AP, Kashiwagi DT, et al. Implementing bedside rounds to improve patient-centred outcomes: a systematic review. *BMJ Qual Saf*. 2019;28(4):317. doi:10.1136/bmjqs-2017-007778
10. McKenzie MS, Auriemma CL, Olenik J, Cooney E, Gabler NB, Halpern SD. An observational study of decision making by medical intensivists. *Critical Care Medicine*. 2015;43:1660-1668. doi:10.1097/ccm.0000000000001084
11. Merry AF, Brookbanks W. The Human Factor. In: *Merry and McCall Smith’s Errors, Medicine and the Law*. Second. Cambridge University Press; 2017:53-102.

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