



Nurses' experience with patient deterioration and rapid response teams

Cynthia Ruiz, MS, APRN-CNS, CCRN^a, Karolina Golec, MSN, RN, CCRN^a, Susan C. Vonderheid, PhD, RN^{b,*}

^a Northwest Community Healthcare, 800 W. Central Rd., Arlington Heights, IL 60005, USA

^b University of Illinois Chicago, 845 S. Damen Ave., Chicago, IL 60612, USA

ARTICLE INFO

Keywords:

Rapid response team
Rapid response system
Clinical deterioration
Qualitative research
Nurses' experiences

ABSTRACT

Background: While timely activation and collaborative teamwork of Rapid Response Teams (RRTs) are crucial to promote a culture of safety and reduce preventable adverse events, these do not always occur. Understanding nurses' perceptions of and experiences with RRTs is important to inform education and policy that improve nurse performance, RRT effectiveness, and patient outcomes.

Aim: The aim of this study was to explore nurse perceptions of detecting patient deterioration, deciding to initiate RRTs, and experience during and at conclusion of RRTs.

Methods: A qualitative descriptive study using semi-structured focus group interviews was conducted with 24 nurses in a Chicago area hospital. Interviews were audio-recorded, transcribed verbatim, and coded independently by investigators. Thematic analysis identified and organized patterns of meaning across participants. Several strategies supported trustworthiness.

Results: Data revealed five main themes: identification of deterioration, deciding to escalate care, responsiveness of peers/team, communication during rapid responses, and perception of effectiveness.

Conclusions: Findings provide insight into developing a work environment supportive of nurse performance and interprofessional collaboration to improve RRT effectiveness. Nurses described challenges in identification of subtle changes in patient deterioration. Delayed RRT activation was primarily related to negative attitudes of responders and stigma. RRT interventions were often considered a temporary fix leading to subsequent RRTs, especially when patients needing a higher level of care were not transferred. Implications include the need for ongoing RRT monitoring and education on several areas such as patient hand-off, RRT activation, nurse empowerment, interprofessional communication, role delineation, and code status discussions.

Despite early warning scoring systems (EWSS) designed to help nurses and other clinicians detect changes in a patient's condition, subtle changes are not always detected on a timely basis, and there can be unexpected deterioration (Mushta et al., 2018). Rapid Response Teams (RRTs) are commonly composed of nurses, physicians, respiratory therapists, and pharmacists, and intended to quickly intervene to prevent further deterioration. A catalyst to integrate RRTs into organizations was the 2004 Institute of Healthcare Improvement's launch of the 100,000 Lives Campaign that listed RRTs as one of six crucial initiatives to improve healthcare quality, patient safety and save lives (Stollendorf & Jones, 2015). In 2008, a Joint Commission National Patient Safety Goal required hospitals to implement systems to enable "healthcare staff members to directly request additional assistance from a specially trained individual(s) when the patient's condition appears to be worsening."

These systems have increasingly become an important strategy for organizations to promote a culture of safety and reduce preventable adverse events (Stollendorf, 2017). RRTs can reduce unplanned intensive care unit (ICU) admissions, cardiac arrest, and mortality rates, and improve effective communication among health professionals (Lyons et al., 2018; Maharaj et al., 2015; Rocha et al., 2018).

There are common processes that are crucial to effective RRTs: identification of patient deterioration, initiation of RRTs, teamwork during RRTs, and outcomes of RRTs (Chalwin et al., 2016; Dukes et al., 2019; Lyons et al., 2018). Unfortunately, barriers to activating RRTs and effective teamwork have been reported. A study that compared top-performing hospitals with lower performing hospitals showed that in top performing hospitals staff nurses collaborated with RRTs during and after activation reducing fear of reprisal (Dukes et al., 2019). Recent reviews of literature found that delays in RRT activation are common

* Corresponding author.

E-mail addresses: cruiz@NCH.org (C. Ruiz), kgolec@NCH.org (K. Golec), vonde@uic.edu (S.C. Vonderheid).

<https://doi.org/10.1016/j.apnr.2024.151823>

Received 9 November 2023; Received in revised form 6 July 2024; Accepted 9 July 2024

Available online 14 July 2024

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and influenced by person-related factors (e.g., clinical expertise of nurses and physicians, social norms, and support from colleagues), and organization-related factors (e.g., support from hospital leaders, EWSS sensitivity and specificity, monitoring technology) (Braaten, 2015; Chua et al., 2017; Lyons et al., 2018; Massey et al., 2016; Tilley & Spencer, 2020).

At Northwest Community Healthcare, chart audits also indicated delays in activation of RRTs. To reduce delays, it is important to understand nurses' perceptions of these delays as well as their overall experiences with RRTs. Yet, few studies have comprehensively examined nurses' voices about their RRT experiences from identification of patient decompensation through outcomes such as whether nurses perceived there were unresolved health concerns (Braaten, 2015; Petersen et al., 2017). The purpose of this qualitative descriptive study is to explore nurse perceptions of detecting patient deterioration, deciding to initiate RRTs, and experience during and at conclusion of RRTs. Findings will inform nursing education and policy, and subsequently improve quality of care and patient outcomes.

1. Methods

1.1. Design

This qualitative descriptive study employed focus groups with direct care registered nurses to explore nurses' perceptions of identifying patient deterioration and RRT experiences (Sandelowski, 2000, 2010). This study was not guided by an a priori theory; our intent was to explore the meaning of nurses' descriptions of their experiences.

1.2. Sample

The setting for this study was a 489-bed acute care community-based, three-time Magnet recognized, Chicago metropolitan area hospital that serves >20,000 inpatients annually. There were 914 RRTs in fiscal year 2019–2020. This study was approved by the Institutional Review Board.

1.3. Recruitment

We recruited nurses for three focus groups with 6–10 participants per focus group from medical (neurology, oncology, and medical-pulmonary), cardiac/telemetry, surgical, and acute rehabilitation. Purposive sampling was used to recruit participants across all shifts and variation in years of experience and units. Inclusion criteria were direct care nurses employed by the hospital who have activated or participated in 3 or more RRTs within the last year. Exclusion criteria included nurses in administrative or clinical educator positions. Recruitment strategies included distributing the study flyer using email blast, posting flyers in break rooms, and in-person rounding on adult inpatient units. Participants received a \$25 gift card to thank them for their time.

1.4. Data collection

Data were collected in July 2021 and August 2021. Following informed consent, participants completed a brief survey to collect demographic and work experience characteristics. Focus groups were led

by two trained moderators using a semi-structured interview guide (Table 1) with open-ended questions based on a review of the literature and four content experts. Main questions were driven by research describing RRT processes referenced above. The same moderator (author S.C.V.) led all the groups while the co-moderator (author K.G.) took field notes that were shared with participants at the end of each focus group to confirm accuracy. To minimize bias moderator training includes being non-judgmental and creating a welcoming and safe environment; moderators were also not in the line of authority and could not impact performance evaluations. Each 1-hour focus group was audio recorded to ensure all key terms and phrases were documented and allow for assessment of the field note accuracy.

1.5. Analysis

Audio recordings were transcribed verbatim. Data analysis used an inductive approach and was an iterative process moving back and forth in the six phases of thematic analysis described by Braun and Clarke (2006): (a) familiarizing yourself with the data; (b) generating initial codes; (c) searching for themes; (d) reviewing themes; (e) defining and naming themes; and (f) producing the report. Investigators independently manually reviewed transcripts several times to identify key words and phrases that were then assigned codes. Investigators then met to discuss any differences and reach consensus. Codes were examined for inter-relatedness and organized into higher level themes and subthemes. Themes and subthemes were illustrated by quotes. Participant socio-demographics and other characteristics were analyzed using descriptive statistics. Trustworthiness was supported by several strategies: verifying accuracy of interview summaries with participants at the end of sessions; independent investigators confirming coding; repeated reviewing of transcripts, coding, emerging themes, and interpretation; engaging in reflexivity throughout the research process; and maintaining an audit trail (Creswell & Miller, 2000).

2. Results

The sample included 24 nurses with 2 to 30 years of experience. Nurses represented a variety of units. The majority (70 %) self-identified as White/Caucasian, had a BSN (83 %) and nearly half (42 %) were certified. Number of RRTs per year ranged from 3 to 75 with 48 % participating in 10 to 15, and 44 % participating in 3 to 8 (Table 2). Data revealed five main themes: Identification of deterioration, deciding to escalate care, responsiveness of peers/team, communication during rapid responses, and perception of effectiveness (Table 3). Data saturation was achieved - participant responses became repetitive and represented existing themes and subthemes.

2.1. Identification of deterioration

This theme had six subthemes.

2.1.1. Timing

Nurses often reported that symptoms of deterioration were identified during handoff or around change of shift. Bedside handoff was seen as an important activity to identify potential concerns and time for the oncoming nurse to ask questions about the patient's baseline. One

Table 1
Semi-structured interview guide.

- Tell us about your experiences of identifying patient deterioration? You might have a specific experience to share.
- What decisions are you considering when you identify patient deterioration?
- What facilitates or helps you decide to call the Rapid Response Team?
- What barriers or challenges might delay or prevent you from calling a RRT?
- When you called a RRT, how was interaction with the responding team and your peers on their arrival?
- During a rapid response, how well does the team communicate about the clinical deterioration? How would you like your team members to support you during a RRT?
- Following a RRT, when the patient remains on the floor vs. being transferred to ICU, in general, how do you feel about the outcome of a RRT?

Table 2
Sample characteristics (N = 24).

	N	(%)
Years of nursing experience		
2–3	4	(17)
4–6	5	(21)
8–13	7	(29)
14–30	7	(29)
>30	1	(4)
Primary unit		
Medical units	9	(38)
Surgical units	5	(21)
Cardiac tele	7	(29)
Float	1	(4)
Rehab	1	(4)
NR	1	(4)
Education		
AD	2	(8)
BSN	19	(79)
Masters	2	(8)
NR	1	(4)
Certification		
Yes	10	(42)
No	13	(54)
NR	1	(4)
Race		
White	16	(67)
Asian	4	(17)
Hispanic	1	(4)
Black	1	(4)
NR	2	(8)
Number of RRTs		
3–5 RRTs/year	6	(25)
6–8 RRTs/year	5	(21)
10–15 RRTs/year	11	(46)
≥30 RRTs/year	2	(8)

Not report = NR.

participant stated, “Have they always talked that way?...You’re picking up on something that they may not be.” (P2,FG1). Unexpected symptoms of deterioration were also more likely to be identified on day shift, “That’s tricky because night shift, you don’t wake up the patient every hour. Then you come in the morning thinking, oh, maybe they’re just sleeping. They’re tired overnight. They were restless for two days, and they’re just catching up.” (P9,FG1). Participants indicated the off-going night shift nurse might not have rounded on a patient for a few hours before hand-off and missed changes in the patient’s condition. Additionally, deterioration was less obvious when a patient is expected to be fatigued later in the day. A participant said, “when they’ve been doing therapy all day. Then they sleep and take a nap. You’re, wait a second. This isn’t a nap.” (P1,FG1). Nurses acknowledged subtle changes were likely not identified earlier in the shift, “I feel like most of the time, there has probably already been a change earlier on that you probably missed”. (P8,FG1).

2.1.2. Symptom presentation

Nearly all nurses expressed confidence to identify acute changes while subtle changes were more challenging. A nurse described the ease of identifying acute changes, “a patient that wasn’t requiring oxygen all of a sudden does require oxygen” (P2,FG1). Identification of subtle changes is easier when the patient is known to the nurses, “most of our nurses know the patients. We’ve all had them, so you can say, oh, this is different than they were yesterday” (P3,FG3). Subtle changes can be masked by the disease process and perceived as baseline; however, some nurses question whether it is subtle deterioration.

2.1.3. Nurses experience

A nurse’s experience played an important role in being able to detect deterioration. A nurse stated, “I was told by a nurse when I was in training that if you’re patient feels cold and clammy...they’re gonna

die...I usually call a rapid, even if I don’t have the vitals to support it” (P4,FG 2).

2.1.4. Instinct

All nurses expressed the importance of instinct when identifying deterioration and deciding to call the RRT. “I think a lot of that [identifying deterioration] is your instincts. It’s a learning process to learn to trust your instincts. If you really feel like you need to call it, you probably should call it” (P4,FG1) and “I think it is gut...You just know if you have the time or you don’t have the time for somebody to come in and look, or you think, no, we need to get more people here right now.” (P5, FG1).

2.1.5. Acuity too high for unit

Nurses described admitting patients that had unstable vital signs on arrival and RRTs were needed within a few hours, “You could tell the patient was gonna deteriorate just based on looking at the chart...vital signs.” (P2,FG1). Another participant stated, “There was definitely a correlation between when they were admitted from the emergency department and when they came out of ICU. Within 24 hours, we were calling Rapid Responses...we sent them right back in—ping-ponged.” (P2,FG1).

2.1.6. Staffing levels

Staffing levels were related to nurses’ inability to identify subtle deterioration because they were not able to monitor their patients as closely as they preferred, contributing to distress. A participant described “you have one nurse with four patients, and you got two critical ones... and the nurse is just psychologically struggling because she’s afraid ‘What if I go to the bathroom and I come out and my patient has expired? What do I do then?’ You almost feel like you can’t breathe.” (P6,FG3). Patients would also have a change in condition that required

Table 3
Themes and subthemes.

Theme	Subthemes
Identification of Deterioration	• Timing • Symptom presentation: acute vs subtle, family • Nursing Experience • Instinct • Acuity too high for unit • Staffing levels not allowing close observation • Organization and unit culture
Deciding to Escalate Care	• Second set of eyes - second opinion
Responsiveness of Teams and Peers	• Peer support-positive before team arrives and during • Negative interactions with RRT responders
Communication During Rapid Responses	• Responder delay • Effectiveness of communication varied
Perceptions of Effectiveness	• Clear role delineation • RRTs often considered a temporary fix • RRTs as impetus for code status discussion

closer monitoring (e.g., hypoglycemia or increasing agitation), yet staffing levels remained the same. This more frequently occurred on nights and weekend shifts.

2.2. Deciding to escalate care

This theme had two subthemes.

2.2.1. Culture differs by unit

Culture of the organization and a unit was a dominant factor when deciding whether to call RRTs. Several nurses described stigma as a barrier to calling RRTs. “I think some nurses, there’s a stigma about calling a rapid. Some people don’t want to because they’re worried about what the ICU nurse is gonna say to them.” (P3,FG2). Others stated “... you better have done everything and you’d better be ready to intubate the patient”...(P4,FG2), “You have to do everything before you call the Rapid Response...because you don’t wanna be questioned.” (P2, FG1), and “Nurses struggled to call RRT because they feel stupid, or they are just second guessing.” (P2,FG3). In contrast, some participants perceived the organization and unit were supported, “Our culture, I think, encourages it. Relying on the autonomy of other nurses throughout the organization and people on your unit to make sure that you feel secure and that you’re making the right decision to call it.” (P7, FG1).

2.2.2. Second set of eyes - second opinion

Nurses commonly sought a second opinion from an experienced and trusted nurse colleague when assessing potentially subtle changes in the patient’s condition, especially if it was the first shift with the patient, before calling RRTs. Respondents said, “You start...at your level with your peer or your charge nurse and then you escalate.” (P5 FG 2). “I feel like it’s definitely a nurse that you trust, somebody that you have respected their judgment, experience...”(P2,FG1), and “Hey, come take a look at my patient. What do you think? Do you know them from before? From yesterday, do you think there’s a difference in how they look?” (P2,FG3).

A consultation was also sought when a nurse wanted to problem solve and consider additional nursing interventions that could treat symptoms of deterioration. Participants stated, “Sometimes it takes... trial and error if it’s something that you can fix right then and there, or if you need someone else’s help or more eyes on the patient...” (P3,FG2), and “I think we do that [consult a peer] because you’re also getting somebody else’s outside perspective of, “Am I missing something?”.” (P2,FG1). Additionally, without an experienced nurse to consult, nurses were more likely to call RRTs, “If I had to guess, I think that maybe they would call them a little bit more on PMs and nights just because of the lack of regular staff, support managers, educators”. (P7,FG1).

2.3. Responsiveness of peers and team

This theme had three subthemes.

2.3.1. Positive peer support before the team arrives and during

Participants consistently reported that their nurse peers were supportive when calling RRTs, “...when we call a rapid, we have an excellent team response within our own team and then ICU, whenever they come by.” (P3,FG3), and “The night crew, we are very tight. We are each other’s resource.” (P8,FG3). Despite the willingness of peers to help, there can be a lack of coordination on arrival, “...I feel like RRTs are a little more chaotic recently because we do have a lot of new grads on [unit].” (P2,FG2).

2.3.2. Negative interactions with RRT responders

The majority of nurses described negative attitudes and excessive questioning by RRT responders on arrival. One nurse reported RRT responses this way, “If...you didn’t do everything short of intubation, you’re gonna hear about it. Why didn’t you do this before you called us? Why didn’t you do this? Why didn’t you do this?”. (P4,FG2). The questioning of the nurse’s judgment is more frequent when the patient is relatively stable after the nursing interventions. Another interaction with responders was described as, “Oh, your patient vasovagaled? Are they fine now? Okay, goodbye. We’re not gonna take them anyway... So why’d you call?”. (P3,FG2). Even when the patient is not stable, the responders can have a negative attitude. A participant stated,

“Especially when the patient doesn’t look all that unstable... we need this patient transferred, the nurse has been in that room for two hours already. There’s three patients that have not gotten their morning meds. Obviously, there’s something that needs to be done. We get the “What are we supposed to do?” kind of attitude...”.

(P2,FG1)

Negative interactions caused hesitancy to call RRTs across groups. “There is a lot of hesitancy. We do get a little bit of the attitude...At one point I think I apologized for calling it and I don’t think I should have to feel that way.” (P1,FG2).

2.3.3. Responder delay

Nurses expressed concern about a delay between the time RRTs are called and the time teams arrive. Reasons for the delay were competing emergencies and the distance the team needs to walk from one clinical area to the next, and fewer resources on the weekend, “On a weekend, my coworker had a patient seizing and another rapid was called, so the team left her while she was bringing that patient for a stat CAT scan... She was pretty stressed about that.” (P1,FG2).

RRTs are called when attending physicians are not responding to paging and attending physicians request that nurses call RRTs to ensure

Table 4

Implications for practice.

- Reinforce bedside hand-off to establish patient's baseline
- Educate nurses to identify and articulate patterns of deterioration: "paint a clinical picture"
- Develop a mentor program for new nurses
- Offer assertive communication training with role-plays
- Create a RRT checklist
- Establish role delineation
- Adjust nurse to patient ratio post-RRT
- Create Stepdown ICU unit
- Ensure nights and weekends have adequate resources and access to providers to obtain orders to address deterioration pre-RRT
- Limit admissions and transfers at change of shift, when possible

the patient is assessed and treated more quickly. A nurse explained: "I've called the doctor and he has told me. I don't know what to do. Call the RRT." (P3,FG1).

2.4. Communication during rapid responses

This theme had two subthemes.

2.4.1. Effectiveness of communication varied

Nurses expressed having effective communication with their peers and charge nurses saying "It's the collaborative thing..." (P2,FG1) and "They will ask if my patients need anything or I'll just let them know, 'Please take care of [other patient] if you could pass out the medicine.'" (P7,FG3).

Nurses expressed communication with RRT members was typically effective and orders needed were received, "I feel like they're usually always on our side. They see that we are concerned. Like, 'What's going on? Tell me more.'" (P8,FG1). In contrast, communication could be ineffective. "They're on the phone with the intensivist telling them what's going on, so now it's a real game of telephone. They're asking me. I'm telling them. They're telling the intensivist. It's kinda goofy". (P4,FG2). Participants stated that nurses could improve communication about patient history and current clinical concerns, "The primary nurse for the patient should be the one saying, like, 'This is why my patient's here. This is what has been abnormal this morning. This is now what's happening... so they can paint a little bit of a picture.'" (P3,FG1). Many participants shared that compared to newer nurses, experienced nurses were more likely to "paint a picture" of the patient's background and current changes, "I think sometimes that [team communication] doesn't always go well because the charge or the primary care nurse has been a nurse for one year, they're in a total panic." (P6,FG3).

2.4.2. Clear role delineation

Nurses consistently discussed the importance of having clear RRT roles and obtaining needed equipment. A nurse stated "the charge is typically more responsible for going in and getting the charting started and then that primary nurse is available to talk to the ICU staff...somebody grabs the crash cart". (P5,FG2). Another participant described that nurses try to "...get blood sugar, get vitals, set everything up. Having everything, have a non-rebreather." (P6,FG1). Sometimes there were too many people in the room, "When somebody yells out, 'Go get me a Lasix,' I have three people tripping over each other to get to the Pyxis." (P6,FG3). Another respondent stated, "We gotta get people back to the floor to help with call lights or just checking on patients to make sure they're okay 'cause you're in that room for a good amount of time". (P5,FG2).

Having clear roles was particularly important for inexperienced nurses. A nurse described her experience, "It took a long time for me to feel...comfortable with RRTs until I could literally, in my head, figure out what, in order, needs to be done...I almost had to think of it as a mental checklist". (P7,FG1).

2.5. Perceptions of effectiveness

This theme had two subthemes.

2.5.1. RRTs were often considered a temporary fix

Some nurses indicated subsequent RRT activations may have been avoided with earlier patient transfer to ICU. One nurse stated, "...they already had an RRT. It's going down again. We put a Band-Aid on it, but now they're bleeding again...Then their pressure drops again. They're Band-Aiding these bullet holes". (P2,FG1). Other nurses were satisfied about half the time, "I feel like it's 50/50. Either you fixed it and they're fine, or there's the other half of the time when you call an RRT within the same shift, you're calling another RRT because the same reason". (P3,FG3).

2.5.2. RRTs as impetus for code status discussion

RRTs for patients with complex comorbidities had limited effectiveness and became the impetus to discuss code status with the family. One nurse described this situation,

"The patients decline. They have multiple comorbidities to the point where they should have had this conversation for multiple reasons. Then this stranger from ICU calls them, saying, 'Hey. We might need to intubate your dad because he's declining.' They're like, 'Wait. What are you talking about?' This is not new, not different. They've had CHF. They've had COPD. They've had end-stage renal disease for years, yet they're still a full code at 93 years old".

(P2,FG1)

3. Suggestions to improve

Nurses described several recommendations and strong opinions to improve the RRT process. Patients need to have a plan of care to address code status so patients understand their options. A nurse stated, "With my lady... there was a DNR blank form sitting on the couch. I know someone started the conversation, but it wasn't helpful". (P1,FG2).

Another nurse illustrated the need for a code status discussion by primary care providers, "The conversation doesn't have to start here. It can start at the doctor's offices". (P3,FG1). A few nurses also described patients and families who waiver when deciding their own code status. Challenges arise when a patient's choice differs from their family. "I think code status, on our floor, has been very difficult...we have a patient that oscillates between wanting to be a full code or a DNR or they're not even sure". (P6,FG3).

Participants suggested more user-friendly RRT documentation in the electronic medical record and RRT simulations similar to mock codes "...I was thinking of the roles we play, just like in the code". (P2,FG3). Lower nurse-patient ratios were seen as important after RRTs when the patient is not transferred to a higher level of care, yet remains unstable. "I wish there was a way, after rapid, just that nursing, in general, could have a lower patient ratio..." (P3,FG3). Nurses also recommended a stepdown unit be created to accommodate patients who continue to need a higher level of care, but might not meet ICU criteria. Another

recommendation is to establish a back-up RRT for times when there are simultaneous RRTs and/or codes.

4. Discussion

It is widely known that timely activation and collaborative teamwork are crucial to the effectiveness of RRTs yet, they do not always occur. A qualitative approach allowed us to obtain detailed descriptions of nurses' challenges and facilitators related to detecting patient deterioration, deciding to activate RRTs, and experiences with RRTs. Findings provide insight into developing a work environment supportive of nurse performance and interprofessional collaboration to improve RRT effectiveness. Results highlight the need for strategies beyond education of nurses to improve early detection of patient deterioration, to facilitate empowerment of nurses to be leaders at the bedside, and to offer more interprofessional training to optimize collaboration during critical events. In contrast to our study setting, RRTs at top-performing hospitals typically had designated members, incorporated proactive rounding to identify and treat patients at-risk of deterioration, empowered nurses to initiate RRTs without fear of reprisal and being viewed as less capable, and collaborated with nurses during and at the conclusion to foster shared learning compared to low-performing hospitals (Dukes et al., 2019). Prospective studies using a framework such as TeamSteps (Agency for Healthcare Research and Quality, 2024) to implement and evaluate RRTs could add insight into team dynamics. TeamSteps focuses on improving methods of communication and application of teamwork principles and tools (interprofessional briefings, huddles, debriefings). Additionally, nurses should be on the team creating policy to standardize RRTs. Components of a comprehensive policy could include: the purpose of RRTs, composition and training of team members, roles and responsibilities, competency assessment, and procedures: initiation, reasons for activation, positive team dynamics, criteria for transferring to higher level of care, debriefing, and data collection, analysis and reporting for quality improvement. Monitoring adherence to policy is essential to identify targets to improve RRT effectiveness and satisfaction of nurses and other healthcare professionals.

Nurses were confident in their ability to identify acute changes in the deteriorating patient that would warrant activating RRTs. Ability to detect subtle changes was challenging for all nurses but was particularly concerning due to the rising number of novice nurses and lower staffing on nights. These findings are consistent with Petersen et al. (2017) who found less resources on nights led to less monitoring. Our study also found there was delayed identification of deterioration on days related to sleep. Patients having poor sleep on nights and those returning from physical therapy often sleep during the day, challenging the nurse to determine a change in status versus exhaustion. Nurses in our study strongly supported bedside report between the night and day nurse as an important practice to identify subtle changes. This allows the incoming nurse to ask if concerning observations were within normal limits for that patient. Although studies have shown that bedside report improves patient safety (e.g., falls) and patient satisfaction (Bressan et al., 2019), research is needed to examine the impact on timely identification of deterioration.

Nurses in our study appreciated having the same patient for several days in a row. Consistent with Massey et al. (2016), familiarity with the patient allowed them to detect subtle changes that otherwise may not have been identified earlier. Braaten (2015) noted active surveillance was key to initiating RRTs rather than a reliance on monitoring physiologic data in the medical record. As the nursing shortage threatens the amount of time spent in direct care, subtle changes are more likely to be missed.

Nurses consistently expressed that culture at the organization and unit levels was a dominant factor when deciding whether to activate RRTs. In contrast to nurses being supported on some units, negative reactions from RRT members discouraged nurses on others. Nurses perceived their judgment was questioned and felt reprimanded and

belittled. These strong negative reactions delayed future activation. Other studies have also described the link between negative experiences and delayed RRT activation (Dukes et al., 2019; Lyons et al., 2018; Tilley & Spencer, 2020).

Prior to calling RRTs, participants typically sought a second opinion from an experienced and trusted peer similar to previous studies (Astroth et al., 2013; Braaten, 2015). Consultations were considered key when assessing subtle changes in the patient's condition. Organizations also need to ensure there is an experienced charge nurse on each shift. When experienced nurses were not available, novice nurses erred on the side of caution and called RRTs. Confirmation of deterioration or concerning symptoms by another nurse likely empowered the primary nurse to call RRTs.

Nurses were troubled about the inability of some nurses to effectively communicate during RRTs. This was particularly concerning when the charge nurse, who is expected to be a resource, is also less experienced. Newer nurses were more likely to struggle to "paint a clinical picture" - articulate a clear, succinct description of pertinent medical history, current medical treatment, nursing interventions to address deterioration, and trends in vital signs and lab values. This suggests that healthcare organizations and nursing programs need to better prepare nurses to "connect the dots" and organizations could enhance nursing orientation through mock RRT simulations and mentorship programs. Research examining the effectiveness of RRTs identifies the importance of a communicative culture (Lyons et al., 2018). In our sample of nurses in a community-based hospital, we found if a physician is not present, a RRT nurse relays information via telephone from the primary nurse to the physician. This "game of telephone" may negatively impact the speed of communication and contribute to delayed treatment. Nurses' ability to communicate the patient's change in condition warrants investigation.

Not having clear role delineation negatively affects communication during RRTs. A strong primary or charge nurse was important for assigning tasks, limiting the number of personnel in the room to those who were essential for stabilizing the patient, and delegating care for other patients. The American Heart Association's guidelines for advanced cardiac life support (ACLS) recommend team role delineation and communication strategies (e.g., closed-loop communication) to facilitate effective communication. Organizations can create RRT checklists and offer interprofessional RRT training with role-play. Our organization used a lanyard system for role delineation during mock codes, which could be applied to RRTs.

RRTs were seen as essential for obtaining urgent medical assessments and treatments to prevent care escalations; however, RRTs were not viewed as consistently effective. Nurses voiced that the negative attitude of RRT members and the band-aid approach of RRTs contributed to further deterioration and delayed transfer to a higher level of care. The band-aid approach prevented a comprehensive, long-term care plan and lowered nurses' job satisfaction and morale. Chalwin et al. (2016) also reported that failure to resolve issues identified at an initial RRT led to nurse frustration and subsequent RRTs.

Findings from this study provide evidence to inform education of nursing staff, revise policy and procedure, and implement quality improvement strategies to improve nurse performance and interprofessional collaboration, and subsequently patient outcomes. Table 4 summarizes the above recommendations for practice.

Limitations of our study include sampling from one Magnet recognized community-based hospital, no participant had less than two years' experience, and participants were primarily white women. Compared to similar sized Magnet organizations, the percentages of certified nurses were marginally higher (3 %) and percentages of BSN nurses was 12 % higher (American Nurses Credentialing Center, 2022). During the study period, new graduate nurses composed 2.8 % (n = 23) of all nurses, thus, reducing the number of potential recruits. Our organization's 1- and 2-year retention rates were 88 % and 77 %, respectively, among those hired the year before and during data collection. Our rates were higher

than the 76 % retention rate of 1-year new graduates reported in a national survey of Magnet and non-Magnet hospitals (NSI Nursing Solutions, Inc., 2024). Higher retention rates in Magnet hospitals have been well documented (Park et al., 2016). New graduate and other less experienced nurses may not have been comfortable sharing their experiences. Without their voices, our results might be biased by experienced nurses who had unrealistic expectations about the performance of newer nurses. Thus, our findings might have limited generalizability to more diverse settings.

5. Conclusions

Ability to detect subtle changes was challenging for all nurses and was magnified for novice nurses. Delays in activating RRTs were primarily related to negative attitudes of responders and stigma. Communication during RRTs was hampered by the inability of nurses to effectively communicate and lack of role delineation. Overall, nurses' perceptions of the effectiveness of RRTs were mixed. RRTs were considered a temporary fix and there was a need for subsequent RRTs to address ongoing instability, especially when the patient was not transferred to a higher level of care. A key implication is the need for inter-professional education about RRTs and ongoing quality improvement to optimize team performance and patient safety. Studies have focused on activation of RRTs and research is needed to investigate communication during RRTs similar to research examining resuscitation team communication during cardiac arrest at top performing organizations (Nallamothu et al., 2018).

CRedit authorship contribution statement

Cynthia Ruiz: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Validation, Writing – original draft, Writing – review & editing. **Karolina Golec:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. **Susan C. Vonderheid:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Validation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

None.

Acknowledgements

The authors thank the nurses who participated in this study, the many nursing leaders who provided support, and Northwest Community Healthcare for funding this study. We also would like to thank Teresa Kisch, PhD, RN, NPD-BC, NEA-BC, CNMSRN for reviewing the manuscript.

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