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Interprofessional Perspectives on ABCDE Bundle Implementation: A Focus Group Study

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Abstract

Background—The ABCDE bundle is a multifaceted, interprofessional intervention that is associated with reduced ventilator and delirium days as well as increased likelihood of mobility in intensive care.

Objectives—To describe organizational domains that contribute to variation in ABCDE bundle implementation as reported by ICU providers and to examine the capability of a conceptual framework for identifying variation in ABCDE bundle implementation.

Methods—We conducted two separate focus groups that included nurses, respiratory therapists, occupational and physical therapists (N=16) from the Surgical and Medical ICUs at one academic medical center. All participants had experience performing ABCDE bundle activities.

Results—Variation in how the ABCDE bundle was interpreted and executed within and across disciplines was noted. Organizational facets, the physical environment, labor quantity and quality, task burden, provider attitudes and patient characteristics were noted to influence ABCDE bundle execution. The difficulty coordinating and implementing early mobility was emphasized.

Discussion—The number of disciplines required to perform an activity and individual component complexity was reported to influence ABCDE bundle implementation. Nurses repeatedly described challenges with coordinating care across disciplines. Small tests of change, adequate staffing, interprofessional training and protocol development efforts, and role modeling may be effective methods for successful ABCDE bundle implementation.

Keywords

intensive care unit; interprofessional; implementation; ABCDE bundle

Background

Admission to the intensive care unit, especially when receiving mechanical ventilation, can result in oversedation and immobility that in turn can lead to Intensive Care Unit (ICU) delirium and ICU-acquired weakness (ICU-AW).¹ Delirium and/or ICU-AW occur in as many as 80% of ICU patients, often go unrecognized, and are frequently augmented not only by critical illness, but also ICU treatment modalities.^{2,3} Delirium and ICU-AW are predictors of increased time on mechanical ventilation, hospital length of stay, hospital costs as well as lower probability of short- and long-term survival.^{4–7} Furthermore, both delirium and ICU-AW are predictors of institutionalization, inability to return to work, and the development of physical disability and cognitive impairment that result in a societal burden in the billions of dollars annually.^{8–10} With as many as 70% of mechanically ventilated patients surviving critical illness, the magnitude of delirium and ICU-AW necessitates the study of practices to optimize the care of individuals during their hospitalization.¹¹

The ABCDE bundle (**A**wakening and **B**reathing Coordination, **D**elirium assessment / management, **E**arly mobility) is a recommended interprofessional, multicomponent strategy proposed to improve collaboration among disciplines, standardize ICU processes, as well as break the cycle of oversedation and prolonged mechanical ventilation that precipitates delirium and ICU-AW.¹ The bundle is endorsed by the Society of Critical Care Medicine, amongst others, which has initiated a nationwide quality improvement collaborative of 77 ICUs to implement the bundle (www.iculiberation.org). Implementation of the ABCDE bundle has been shown to be safe and is associated with reduced ventilator, delirium, and hospital days and increased mobility.^{12–14} Despite recommendations and supportive evidence, Miller and colleagues reported that, among over 280 interdisciplinary participants, only 12% have implemented the ABCDE bundle.¹⁵ Two other recent studies have described the challenges of ABCDE bundle implementation and identified a variety of factors, including intervention-related issues, communication and coordination difficulties, knowledge deficits, staff turnover, workload concerns, and documentation burden.^{16,17} While these challenges have been identified, there is still limited interprofessional qualitative data describing factors associated with ABCDE bundle nonadherence or a conceptual framework to guide a standardized systematic approach for examination of factors that are amenable to intervention. The research aim for this open-dialogue qualitative study was to 1) further describe constructs and factors that may contribute to variations in ABCDE bundle implementation, as reported by a multidisciplinary group of healthcare professionals responsible for the conduct of bundle components and 2) examine the validity of a

conceptual framework for identifying variation in ABCDE bundle implementation. The factors contributing to variation in ABCDE bundle implementation will be generally defined as organizational domains.

Methods

Setting and Sample

A focus group study was conducted at an 834-bed metropolitan academic medical center. Multiprofessional focus groups were the preferred method for data collection because of the interprofessional interactions required for ABCDE bundle execution. Participation was open to staff responsible for clinical implementation of ABCDE processes of care, including nurses (RN), physical therapists (PT), occupational therapists (OT), and respiratory therapists (RT). Eligibility required individuals work in the 22-bed Surgical or 34-bed Medical ICU and had employed one or more of the ABCDE bundle components at least twice in the previous month. Participant eligibility was confirmed via 1:1 conversation with the investigator prior to the focus groups. ABCDE bundle activities were recommended practice in the two units at the time of the study, but neither unit had implemented an ABCDE protocol.

Conceptual Framework

The current literature provides frameworks for understanding organizational domains (e.g., work conditions, equipment, policies, labor quantity and quality) that influence organizational outcomes.^{18,19} However, there is no framework to elucidate variation in providers' implementation of the ABCDE bundle. We devised a conceptual framework a priori to facilitate development of focus group questions and data analysis. The conceptual framework was built on the premise that organizational facets (policy/protocol matters & unit milieu), physical environment, labor quantity/quality, and tasks could have a direct influence on provider attitudes and the internal disposition to execute the ABCDE bundle (Figure 1). Patient characteristics (e.g., gender, severity of illness, age, etc.) were factors proposed to moderate adherence to the ABCDE bundle.

Focus group procedure

The institutional review board approved the study. Participants were provided with an informed consent document; however, a waiver of documentation of informed consent was approved to preserve anonymity. Recruitment strategies consisted of 1:1 emails to individuals recommended by unit or department managers as well as break room flyers and word of mouth. Twenty-six potential participants contacted the principle investigator; 16 (62%) were eligible and participated in the focus groups. The remaining potential participants (N=10) were excluded because they did not work in the eligible units or did not meet eligibility criteria. The participants represent healthcare professionals with a good working rapport. The participant sample number is also consistent with the SICU and MICU staffing models (i.e., one PT/OT consult team shared between units [n=4], two RTs/shift, and 1:2 nurse to patient ratio).

Two focus groups (N=7, N=9) were conducted in a private off-unit hospital meeting room during lunch, with a boxed meal provided. Each focus group included staff from both units and lasted approximately 1.5 hours. The focus groups utilized a dual moderator design as outlined by Krueger.²⁰ The same procedure was used for each group. The principal investigator moderated the session and ran a digital recorder. The co-investigator, with extensive focus group experience, recorded notes, relevant cues, and body language. Participants were welcomed, provided lunch, and given an explanation of the study. After participant and investigator introductions, investigators reviewed ground rules of maintaining statement confidentiality and allowing each participant to finish a point before speaking.

We developed and utilized a set of semistructured, open-ended questions for both focus groups (see Supplemental Digital Content). Questions enhanced direction of discussion to activities associated with the ABCDE bundle as a whole as well as the process required to conduct the individual components. In addition, participants were asked to discuss barriers and facilitators to ABCDE bundle execution. Active listening throughout the session enhanced the investigator's use of probes to uncover unexpected information, gain detailed descriptions, and clarify concepts not clearly defined by the participants. Focus group sessions were audio taped. Participants received \$30 gift cards as compensation for their time.

Qualitative Data Analysis

An independent transcription service transcribed discussions verbatim. The data consisted of approximately 170 minutes of interview data, represented as 65 pages of transcription and focus group notes. The two investigators first reviewed the transcripts and field notes independently, applying first cycle provisional coding guided by the conceptual framework to color-code similar themes.^{20,21} Together, through a joint and iterative process, we then categorized the codes into final themes. Supportive quotes were extracted to illustrate study themes. Validation was obtained through member checking with study participants as well as triangulation through the use of two analysts, consideration of different theories, and comparison of study themes to previous research findings.

Results

Participant information is described in Table 1. The majority of participants were nurses (63%) and female (88%). For privacy purposes, further participant demographic information was not collected. Additionally, because of low number representation, PT/OT comments were combined to protect confidentiality. Seven themes were consistent with the study's framework and described below.

Organizational Facets

Organizational facets are defined as those constructs related to policy and protocol factors (i.e., protocol accessibility, clarity, complexity; role clarity; practice variation; training & understanding) and unit milieu (i.e., coordination, unit culture, peer advocacy).

Policy and Protocol Factors—Participants cited that ABCDE bundle components were an expected part of their practice. Participants verified the presence of protocols for spontaneous awakening trials and spontaneous breathing trials, but no clear protocol existed for early mobilization.

RT: “As far as respiratory, no matter which unit they’re on, they do have protocols to go by.”

RN: “...the mobility part isn’t really a protocol...so a lot of it is nursing judgment if PT and OT aren’t there...”

Participants from each discipline commented on their personal role in ABCDE bundle execution and the timing of different components. Variation in understanding of profession-specific roles and bundle-specific processes required as part of the ABCDE bundle was noted among disciplines. While experts have provided a guideline for implementation of the ABCDE bundle, participant summaries demonstrate the process is not straight forward.²² Despite the collective participant agreement on the ABCDE bundle process, a number of comments demonstrate variation in actual practice of select bundle components described below.

Delirium assessment: “[PT/OT_a] I defer [delirium] assessment to the nurse.” “[PT/OT_b] We will also do cognitive assessments as well and, if we think we need a full assessment, we’ll defer to speech [therapy].” “[RN_a] We use the SAVEAHAART [CAM-ICU], squeeze my hand on the letter ‘A’.” “[RN_b] If I walk in the room and am able to have a conversation with [the patient], RASS [Richmond Agitation-Sedation Scale] is zero, and appropriate and have a good attention span, then I won’t do SAVEAHAART with them or anything.”

Awakening trial: “[RN_c] At a designated time you pause the sedation and you let the patient wake up, and you make an assessment of how the patient is doing with the sedation turned off.” “[RN_d] If they’ve been on 30 [mcg/kg/min] of propofol, at least half it to 15 [mcg/kg/min] and then...turn it off and evaluate.” “[RN_e] If the patient passes the screen, then I will...delay both sedation and analgesic medications. I usually set it for 15 minutes and I’m standing, watching the patient. But, I pause everything completely...”

Unit Milieu—Interprofessional team dynamics was noted to play a significant role in enhancing bundle awareness and coordination in addition to fostering teamwork. For example, PT/OT indicated that early mobility doesn’t end when they leave the room and good handoff communication and bundle advocacy through peer leadership is essential to continue patient progress. However, nurse participants did not seem to have a full understanding of PT/OT job demands and role in early mobility within the ICU. Current literature suggests at least once daily mobilization, describing the PT role as assessment of the patient’s physical ability to participate in mobility.²² Of note, the PT/OT team can only evaluate a patient if an order is placed. Nurses are responsible for ensuring safety screening and mobilization for all patients. Indeed, participants frequently mentioned the difficulty with coordinating and implementing the mobility component of the bundle. Mobilization, more so than any other bundle component, required all the health professionals to coordinate

their activities. As one RN indicated below, the outcome may not be perceived to be worth the effort.

RN: "...you spend all this time prepping for it [mobility] and getting [equipment] and getting all these people in the room and then [the patient] only make[s] it three feet."

RN: "Because PT and OT have so many patients, they don't see every patient every day... you never know what time they're going to be coming to see your patient, if they are that day."

RN: "I didn't know how important it [mobility] was, or that it could benefit a patient. In nursing school you don't learn about mobilization...or ICU delirium."

PT/OT: "I mean mobility isn't just a PT thing and it's not just an RN thing, it's a team thing. Whatever I think the nurses can safely do I'm like, 'Hey, I'm leaving the walker in the room. You can walk [the patient] to the bathroom. They don't need to be using the bedpan anymore.' Whatever it is just so I've handed off to [the nurse] what they're able to do with a patient when I'm not there."

RN: "When you're talking about assessing delirium, the SBT [Spontaneous Breathing Trial], the SAT [Spontaneous Awakening Trial], all of these things can be done with your hands tied behind your back. Essentially...it's an assessment that is not requiring your physical strength or that of more than one person... If I can get someone up by myself, it's not such a big deal. It's a part of your normal assessment or a part of what you're trying to get done...but as soon as you have to start coordinating things it gets complicated."

Physical Environment

The physical environment includes those factors that require significant capital input by the organization (e.g., furniture, equipment, technology). Patients unable to ambulate were described as being put in chair position in the bed or transferred to a neuro or cardiac chair for upright positioning, while patients capable of standing were described as being transferred to a chair. One RT described some mechanically ventilated patients as capable of ambulation, but, "A lot of our RTs never walked anybody on the vent because you can't make the [portable] vent to be 40% [FiO₂]." This RT's primary point – some RT staff are not aware of an option to temporarily utilize more oxygen during ambulation. Nurses also expressed dissatisfaction with equipment, primarily lifts, due to "trouble fitting [lifts] under the beds or around the chair" and "...you have to...figure out where you're going to hang chest tubes and [catheters]". Yet, others described lifts as useful.

RN: "We...used the Steady [lift]...because we wanted her using her legs. ...rather than three people dragging her across the room and throwing her up in the bed, we made use of the equipment."

Lastly, unit size and layout influenced participant ability to monitor patients or conduct bundle activities. As one nurse described, "...we're not in a wide open unit where you can sit and have eyes on two patients. You literally can't do that. Even though there are

windows, it doesn't work. So I have a feeling...if we had a more open unit...I would be more comfortable."

Labor Quantity and Labor Quality

The dearth of ancillary staff (e.g., nurse aides), nurses, and physical and occupational therapy staff (i.e., labor quantity) was commonly cited as a barrier to conducting ABCDE bundle activities, especially early mobility. Even with a PT/OT consult in place, staffing may still not be sufficient for ICU patients to be evaluated by a therapist (e.g., weekends, holidays).

PT/OT: "...on weekends ICU is last priority...you are not going to see a therapist, unless we're slow...we're not staffed to do it."

RN: "...we all have a job to do and we all want the best for patients. If physical therapy can't get to them, that's just another responsibility as an RN...that you're doing PT and nursing today."

RN: "...you're really busy all day. What falls to the bottom of the priority list is range of motion [mobility]."

Participants noted the expertise and education level of a healthcare professional (i.e., labor quality) could influence their ability to discern delirium, whether a patient is ready to advance within the bundle (e.g., level of mobility, sedation cessation, ventilator weaning), or to perform early mobilization. PT and OT participants described utilizing clinical judgment to discern a patient's capability of and stability for performing mobilization activities, working with respiratory therapists and nurses to ensure patient safety.

RN: "...observations and monitoring of the patient...the appropriate interventions. You really have to put a lot of emphasis on not only assessment, but on the entire nursing process [for ABCDE]..."

RN: "It probably wouldn't occur to many ICU nurses to walk a ventilated patient."

PT/OT: "I can't tell you how many nurses...are like, 'Why does my back hurt so badly?' I'm like, 'Did you ask the patient to help?' you know."

PT/OT: "...if [nursing is] weaning [the patient] and there's plans for extubation in the next couple hours usually we'll hold off and let them get extubated. If there are no plans for extubation for the day we go ahead and work with [the patient] and try to use our clinical judgment. Do they need to be back on a rate or a different setting or should we just try working with [the patient] on their wean settings? We may have RT come in and put [the patient] back on a rate or whatever they need to be on."

Tasks

Participants commented on the complexity of scheduling the various interdisciplinary tasks as well as coordinating with patients and other healthcare professionals. Participants noted difficulties secondary to competing patient needs and job responsibilities as well as a lack of sufficient time to assess patients for readiness. Competing responsibilities in the ICU include

the number of admissions, discharges, and transfers during a shift; critical events (e.g., cardiopulmonary arrest events); and off unit procedures requiring nurse and/or respiratory therapist accompaniment (e.g., MRI, CT scan, etc.).

RN: "...it requires coordinating someone else getting involved to watch [your] other patient. But usually we wouldn't say, 'Oh, I'll titrate your drips while you go do the heavy lifting,' ...usually you'll offer...to get the other patient up or something. ...I'll look for a moment where I feel safe going in and mobilizing one patient, but there's days where that just is not going to happen..."

RN: "If I'm talking about getting my intubated patient up out of the bed, walking around, I know that's at least going to take an hour out of my twelve hours. Then I may have another patient, so it's really just carving out the time, scheduling a time with PT and RT."

RN: "...it's terrifying the thought of being caught with a patient I'm trying to mobilize and seeing on a monitor my other patient needing someone to titrate their drip and I'm not there. ...and it's for the safety of one patient...to not mobilize another one, which is kind of sad..."

Nurses described their decision-making as being influenced by time constraints. The length of time involved with accessing and utilizing lift equipment often resulted in abandonment of use. Nurses reported performing activities of daily living for a patient in an effort to conserve time. Nurses also reported working diligently on a time schedule in order to successfully conduct the ABCDE bundle. Including patients in that scheduling process added an additional challenge.

RN: "...sometimes when I say I can do it at two, [PT has] got their schedule mapped out and they can't. So, we need to work better on that."

RN: "I'm not available when the patient wants to get up, and when I'm ready the patient wants to take a nap."

Provider Attitudes

Provider attitudes refer to the internal disposition of healthcare professionals and their way of thinking. Reports of provider apprehension, fear, or discomfort could be significant barriers to conducting the ABCDE bundle. For example, participants referred to staff abandoning attempts to complete ABCDE bundle activities for fear of device removal (e.g., endotracheal tube, central line, etc.) or patient decompensation. In addition, physical and occupational therapists described challenges in physician and nurse comfort level with rehabilitation approaches.

PT/OT: "There's been nurses that say, 'Uh uh, you're not touching them intubated.' ...I just do education with them and ask, 'Could you at least let me try?'"

Sharing a successful history of safe practice seemed to facilitate nurse and physician agreement with conducting early mobilization. One occupational therapist reported, "...we've never had a self extubation while walking [patient], and we've never had a fall while

walking [patient].” In addition, some participants expressed greater comfort with progressing the patient through bundle activities. These providers rationalized that the ICU is the safest place to attempt the ABCDE bundle. As the participants stated, “...sometimes it works great...it’s a crap shoot, just try” and “...if something were to go wrong, we’re in the exact place we need to be.”

Patient Characteristics

Lastly, participants identified patient physical and mental states that influence their decision to execute ABCDE bundle components. Physical states described to preclude ABCDE execution included the patient’s weight (“our average patient is 250 plus pounds”), use of an artificial airway (e.g., tracheostomy or endotracheal tube), severity/type of illness (e.g., severe ARDS, open abdomen), and apneic episodes.

RN: “...open belly patients, they’re not a candidate to be extubated at all. So, we’re not doing any spontaneous awakening trials on those patients because...that would be very unsafe for the patient.”

RT: “...[the patient] can’t do SBT because we can’t wean him off of 100% [FiO₂]...it’s the disease process.”

Patient mental states hindering ABCDE bundle execution were described as anxiety and fear of movement due to “too many beeps”. Nurses described patients inhibiting their own progress for fear of doing something wrong stating, “[patients] are afraid to move, they’re attached to so many things that every time they move, something beeps...they’re happy just lying in one spot and not moving.” In addition, a patient’s ability and willingness to follow directions for participation were key factors influencing adherence (e.g., heavy sedation, not waking up, and agitation). Patients “have to be alert enough and willing to follow instructions” to participate in the ABCDE bundle.

Discussion

The goal of this exploratory study was to describe organizational domains that contribute to ABCDE bundle implementation based on a conceptual framework derived from literature review. This study demonstrated the validity of the conceptual framework in revealing organizational domains responsible for practice variation and underutilization of the ABCDE bundle. Five major interrelated domains (i.e., organizational facets, labor quantity, labor quality, tasks, physical environment) were noted to affect provider attitudes (i.e., internal disposition and way of thinking) and subsequently ABCDE protocol adherence. Based on participant discussion, we identified that the *organizational facets* domain requires refinement. Dividing this domain would allow for closer scrutiny for potential interventions. Thus, the framework would better serve future research and ABCDE bundle implementation efforts if *organizational facets* were divided into two domains: 1) Policy and Protocol Factors and 2) Unit Milieu (e.g., teamwork, coordination, etc.). This modification to the framework would be necessary prior to utilization in the conduct of intervention studies.

Additional findings bear comment. ICU professionals varied in their knowledge and practice, which was further complicated by variation in or lack of unit policies and

protocols. The presence of a protocol and accessibility of this information not only clarified shift and role responsibilities, but also provided guidelines for consistent protocol application. A nurse may feel uneasy with independently carrying out mobilization due to lack of knowledge, skill, or protocol to guide practice. Respiratory, physical and occupational therapists may not be comfortable with mobilization of ICU patients due to severity of illness, lack of training or equipment naiveté. PTs and OTs described nurse and physician lack of comfort in allowing them to independently conduct mobility activities with the patient, citing a need to “earn the right” to work independently by demonstrating their competence. However, in this pilot study, this discomfort was not consistently expressed amongst all participants and, thus, caution should be applied in generalizing this as a barrier. Interprofessional and multifaceted education might be considered with interprofessional protocol implementation to enhance knowledge, understanding, and role clarity and competency across healthcare professionals.

Multiple participants reflected on discipline-specific challenges regarding ABCDE bundle execution and the role of the patient. Indeed, we discovered that a major organizational domain that influenced adherence was the complexity of the protocol and the number of disciplines required. First, a number of nurses described the difficulty of coordinating care across disciplines and arranging activities while still managing the care of multiple patients. Next, respiratory therapists described themselves as auxiliaries, being called in when needed. If the RT is not available when called, delays and challenges in conducting bundle activities emerge. Third, participants indicated the importance of the patient as a team member and the role of the patient in being able to implement. For example, a patient may prefer to conduct mobilization after a nap or watching an episode of a television show. Subsequently, other members of the interprofessional team may not be available when the patient is ready. Participant comments revealed that those ABCDE activities that can be done by one healthcare professional are more likely to be successfully implemented; whereas, those requiring coordination among multiple professionals and the patient are more challenging and reluctantly executed (e.g., mobility).

Interestingly, several participants classified themselves as unit peer leaders based on their self-described knowledge and ability to influence others to utilize the ABCDE bundle. Per the literature, peer leaders (e.g., opinion leaders) are friendly, trustworthy, influential role models whose employ has been linked with the adoption of evidence-based practice.²³ Though the role has not been clearly described, it is apparent that peer/opinion leaders may persuade providers to manage patients using evidence. Similar to other studies on implementation of best evidence, the presence of effective peer/opinion leaders to endorse the ABCDE bundle may facilitate utilization and sustainability and thus advocacy needs to be further refined specific to the peer leader who advocates, not just administration.²³

There are limitations to consider in this study. First, the study was conducted in a single academic medical center. Despite the uniqueness of the setting, the conceptual framework identifies generalizable organizational domains influencing ABCDE bundle implementation and adherence that can be applied to any ICU setting. Second, the small number of participants (n=16) could have limited our ability to fully assess all factors that contribute to variations in bundle implementation, though we did achieve a good representation from each

of the eligible professions. We need to continue examining the ability of the conceptual framework to guide future research. In addition, the participating providers may have had strong beliefs about the ABCDE bundle driving their desire to attend focus group interviews. Lastly, there is a loss of richness in the data due to the absence of ABCDE bundle observation in the real world setting. Despite these limitations, the study offers a multidisciplinary perspective on structure and process factors that influence ABCDE bundle execution. The interprofessional team of experienced and novice ICU provider participants spoke to ABCDE bundle use in both Medical and Surgical ICUs. In addition, the interprofessional dialogue was without tension or limitation during the interviews. Overall, the use of open-ended questions through interprofessional focus group interviews was a successful way of gathering information about the factors that influence ABCDE bundle implementation.

Clinical Implications

Participants identified the complexity of bundle coordination, especially the collaboration required for early mobilization. The best return on investment for ICUs may comprise staffing sufficient to ease the coordination of mobility, given mobility was described as the most complex and difficult bundle component to initiate. Considerations for sufficient staffing might include specially trained, unit-based nurse aides, mobility technicians, or other dedicated staff to offset the task burden associated with mobility to improve not only adherence but also patient and organizational outcomes.¹⁴ Awareness of the bundle practices and equipment through interprofessional education and training may also facilitate adherence. Patient benefits demonstrated from protocol use should be emphasized in training (e.g., improved survival, reduced ventilator days and length of stay, better quality of life).^{12,24,25} Lastly, tracking and reporting patient and organizational outcome data may enhance provider buy-in and performance.²⁶ Additional recommendations to facilitate ABCDE bundle adherence and strategies to address organizational challenges are presented in Figure 2.

Conclusions

The ABCDE bundle is an evidence-based protocol that can improve hospital outcomes for critically ill patients (e.g., ICU-AW and delirium).¹² We developed a conceptual framework to explain variation in ABCDE bundle implementation and identified several organizational domains that influence ABCDE bundle implementation and interprofessional coordination. Improving patient outcomes related to delirium and ICU-AW requires the successful implementation of the ABCDE bundle through further exploration of organizational domains that are amenable to intervention.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1. Conceptual framework of organizational domains influencing provider's adherence to the ABCDE bundle

Organizational domains (i.e., organizational facets, physical environment, labor quantity & quality, and tasks) are hypothesized to influence provider decision/ability to adhere to the ABCDE bundle protocol. Adherence can also be influenced by patient characteristics (e.g., severity of illness, comorbidities, etc.). ABCDE bundle utilization is hypothesized to influence tertiary outcomes such as hospital length of stay, patient cognition, and patient physical abilities.

Organizational facets
<ul style="list-style-type: none"> • "advocating for [physical and occupational] therapy orders...double check bedrest orders" • "good handoff [with the nurse] on what the patient was able to do [e.g., mobility, SBT]" • "show us videos of other...units that are mobilizing patients" • Clear guidelines and protocols for consistent ABCDE bundle application • Interprofessional multifaceted training to build knowledge and awareness • Design opt-out protocols • Use multiprofessional peer leaders to role model, advocate and act as experts of the ABCDE bundle
Physical environment
<ul style="list-style-type: none"> • Unit layout considerations during design phase • Strategic placement of necessary equipment to foster ease of use
Labor quantity
<ul style="list-style-type: none"> • Unit dedicated staff (e.g., PT/OT, mobility tech) or more manpower in general • Sufficient number of nurse aids or orderlies
Labor quality
<ul style="list-style-type: none"> • Use 'small tests of change' or simulation as an opportunity to provide experience for providers
Tasks
<ul style="list-style-type: none"> • Standardize approaches for care to improve efficiency and effectiveness (e.g., timing, process) • Encourage family members and patients to independently mobilize, if indicated • Create balanced patient assignments that foster ABCDE bundle execution
Provider attitudes
<ul style="list-style-type: none"> • Employ 'small tests of change' to inspire clinician confidence
Patient characteristics
<ul style="list-style-type: none"> • "communicate to [patient] the importance...you need to work so...you'll be strong and...progress" • Reassure patient about "beeps" and "really praise them" • Build a routine for the patient • Document goals on white boards to enhance overall communication

Figure 2. Addressing challenges to ABCDE bundle implementation

Focus group participants provided suggestions for addressing barriers to ABCDE bundle implementation are demonstrated in quotations. Further methods for addressing barriers have been included based on recommendations in the literature.^{16,27,28}

Table 1**Focus group participants**

A total of 16 individuals participated in the focus group study. Each focus group included a provider from each professional category (i.e., nursing, respiratory therapy, and rehabilitation). Each focus group included participants from both participating units (i.e., MICU and SICU).

Discipline	Focus Group 1	Focus Group 2	Total
Occupational Therapist	1	1	2
Physical Therapist	1	0	1
Registered Nurse	4	6	10
Respiratory Therapist	1	2	3
Total	7	9	16