

Title:

ABCDE Bundle Adherence: The Influence of Access to ABCDE-Enhancing Supplies and Equipment

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Session Title:

Interprofessional Collaboration Enhancing Clinical Outcomes

Slot:

L 11: Sunday, 30 July 2017: 8:30 AM-9:45 AM

Scheduled Time:

8:50 AM

Keywords:

bundle, intensive care unit and interprofessional

References:

Balas, M. C., Burke, W. J., Gannon, D., Cohen, M. Z., Colburn, L., Bevil, C., ... & Vasilevskis, E. E. (2013). Implementing the awakening and breathing coordination, delirium monitoring/management, and early exercise/mobility bundle into everyday care: opportunities, challenges, and lessons learned for implementing the ICU Pain, Agitation, and Delirium Guidelines. *Critical care medicine*, 41(9 Suppl 1), S116-27.

Balas, M. C., Vasilevskis, E. E., Olsen, K. M., Schmid, K. K., Shostrom, V., Cohen, M. Z., ... & Stothert, J. C. (2014). Effectiveness and safety of the awakening and breathing coordination, delirium monitoring/management, and early exercise/mobility (ABCDE) bundle. *Critical care medicine*, 42(5), 1024.

Boehm, L. M., Vasilevskis, E. E., & Mion, L. C. (2016). Interprofessional Perspectives on ABCDE Bundle Implementation: A Focus Group Study. *Dimensions of Critical Care Nursing*, 35(6), 339-347.

Boehm, L.M., Vasilevskis, E.E., Dietrich, M.S., Wells, N., Ely, E.W., Pandharipande, P.P., Mion, L.C. (In Press). Organizational domains are associated with variation in ICU provider attitudes regarding the ABCDE bundle, *American Journal of Critical Care*.

Boehm, L.M., Dietrich, M.S., Vasilevskis, E.E., Wells, N., Ely, E.W., Pandharipande, P.P., Mion, L.C. (In Press). ICU provider perceptions of ABCDE bundle workload burden are associated with adherence, *American Journal of Critical Care*.

Miller, M. A., Govindan, S., Watson, S. R., Hyzy, R. C., & Iwashyna, T. J. (2015). ABCDE, but in That Order? A Cross-Sectional Survey of Michigan Intensive Care Unit Sedation, Delirium, and Early Mobility Practices. *Annals of the American Thoracic Society*, 12(7), 1066-1071.

Abstract Summary:

This session will describe the accessibility of ABCDE-enhancing supplies and equipment in Intensive Care Units, attempting to implement the ABCDE interprofessional critical care bundle and generate hypotheses for future study.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will be able to describe benefits of implementing a multicomponent, interprofessional bundle to standardize critical care processes.	Describe the ABCDE interprofessional critical care bundle components and efficacy (5 minutes)
The learner will be able to list at least one area in which future research is needed to improve implementation of the ABCDE bundle.	Describe the study methods, data collection procedures, findings, and discuss conclusions as they relate to future research needs. (10 minutes)

Abstract Text:

Purpose: The ABCDE interprofessional bundle (**A**wakening and **B**reathing **C**oordination, **D**elirium monitoring and management, and **E**arly mobility) is an evidence-based approach to organizing Intensive Care Unit (ICU) people, processes, and technology to improve collaboration among disciplines and standardize critical care practices. Implementation of the ABCDE bundle is associated with improvements in delirium prevalence (62.3% pre-implementation vs 48.7% post-implementation, $p=0.02$), ventilator-free days (21 pre-implementation vs 24 post-implementation, $p=0.04$), and hospital mortality (20% pre-implementation vs 11% post-implementation, $p=0.04$). Despite this evidence, bundle adoption is limited. The perceived workload burden of ABCDE bundle execution has been inversely associated with likelihood of bundle adherence (OR=0.47, CI=0.28-0.79, $p=0.004$). Furthermore, limited access to supplies and equipment for ABCDE bundle execution is associated with increased difficulty performing the bundle ($r_s=0.37$, $p<0.001$). The objective of this study was to describe accessibility of ABCDE-enhancing supplies and equipment (e.g., overhead lifts and portable monitors) in units attempting to implement the ABCDE bundle.

Methods: This is a secondary analysis of data from a pilot study investigating organizational factors influencing ABCDE bundle implementation. The Conceptual Framework for Interprofessional Bundle Implementation guided the study. Physical environment data were collected from participating medical and surgical ICUs (n=10) in six academic medical centers. The principal investigator personally visited each site between April 2014 and August 2015, during which time available ABCDE-enhancing supplies and equipment were logged. Daily execution of the ABCDE bundle was at the discretion of the ICU team and guided by a standardized protocol. Adherence was tracked daily via the ABCDE bundle checklist. ABCDE bundle adherence is defined as all five components being completed on a ventilator day (i.e., **A**wakening trial [SAT], **B**reathing trial [SBT], **C**oordination [SAT precedes SBT], **D**elirium assessment, **E**arly mobility). ABCDE bundle adherence was aggregated at the unit level.

Results: Variation in ABCDE bundle adherence on ventilator days was noted to range between 38% and 85% across units. ABCDE bundle adherence was lesser in surgical ICUs compared to medical ICUs, but this did not reach statistical significance (63% vs. 75%, $z=1.89$, $p=0.059$). Upon evaluation of individual

bundle components, **C**oordination (89%) and **E**arly mobility (86%) had the least adherence for mechanically ventilated patients. Unit ABCDE-enhancing supply/equipment comparison demonstrated a range of 3-10 accessible items across units. The highest performing unit (adherence=85%) had access to two ABCDE-enhancing items while the lowest performing unit (adherence=38%) had access to seven ABCDE-enhancing items. The most frequently reported ABCDE-enhancing items ($\geq 80\%$) include walkers (n=9) and overhead lifts (n=7). The least commonly reported ABCDE-enhancing items ($\leq 20\%$) included nonpharmacologic delirium management tools (e.g., radio, earplugs) (n=2), bariatric chairs (n=2), portable monitors (n=2), turning straps (n=2), strength bands (n=2), portable ventilator (n=2), and sit-to-stand device (n=2).

Conclusion: The ABCDE bundle is recommended practice for critical care, but utilization is low and implementation varies. In this study, the number of ABCDE-enhancing supplies/equipment procured by the ICU is not noted to be consistent with greater adherence to the ABCDE bundle. In fact, there were more than twice the number of ABCDE-enhancing items in the lowest (n=7) performing unit compared to the highest performing unit (n=2). These data suggest that environmental factors contributing to the workload burden of ABCDE bundle execution may not be so much related to the presence or absence of ABCDE-enhancing supplies/equipment, but more so to unit architecture (e.g., configuration, number of corners) or distances to supplies/equipment. However, unit milieu (e.g., teamwork, coordination across disciplines) and policy and protocol factors (e.g., protocol complexity, role clarity) must also be more closely explored.