Published in final edited form as:

J Crit Care. 2012 April ; 27(2): 218.e1–218.e7. doi:10.1016/j.jcrc.2011.11.007.

Implementation challenges in the intensive care unit: the why, who and how of daily interruption of sedation

Melissa A. Miller, BSN, MD, MS[Clinical Lecturer],

Pulmonary and Critical Care Medicine, University of Michigan, 1500 E. Medical Center Drive, TC 3916, Ann Arbor, MI 48109-5360, Phone: (734) 936-5047, Fax: (734) 936-5048

Emily A. Bosk, MSW[Doctoral Student],

Sociology and Social Work, University of Michigan, 3A23 NIB, 300 North Ingalls, SPC 5419, Ann Arbor, MI 48109-5419

Theodore J. Iwashyna, MD, PhD[Assistant Professor of Internal Medicine], and

Pulmonary & Critical Care Medicine, University of Michigan, 3A23 NIB, 300 North Ingalls, SPC 5419, Ann Arbor, MI 48109-5419

Sarah L. Krein, PhD, RN[Research Investigator]

Ann Arbor VA HSR&D Center of Excellence, Research Associate Professor, Department of Internal Medicine, University of Michigan, Veterans Affairs Ann Arbor Healthcare System, 2215 Fuller Road, Room HSR&D, Ann Arbor, MI 48105-2399

Melissa A. Miller: melmille@umich.edu; Emily A. Bosk: emily.bosk@gmail.com; Theodore J. Iwashyna: tiwashyn@umich.edu; Sarah L. Krein: sarah.krein@va.gov

Abstract

Purpose—Despite strong medical evidence and policy initiatives supporting the use of daily interruption of sedation in mechanically ventilated patients, compliance remains suboptimal. We sought to identify new barriers to daily interruption of sedation.

Materials and Methods—We conducted 5 focus groups of intensive care unit (ICU) physicians, nurses, and respiratory therapists over a two-month period to identify attitudes, barriers, and motivations to perform a daily interruption of sedation. Each focus group was audiotaped and the transcripts analyzed using qualitative methods to identify recurrent themes.

Results—There was wide consensus on the importance of daily interruptions of sedation, however practitioners usually performed sedation interruption for 1 of 5 distinct reasons: minimizing the dose of sedation, performing a neurologic exam, facilitating ventilator weaning, reducing ICU length of stay, and assessing patient pain. Participants rarely espoused more than one main reason, and there was no shared understanding of why one might do a DIS. This lack of shared understanding led to different patients being selected and diverse approaches to carrying out the DIS.

© 2011 Elsevier Inc. All rights reserved.

Correspondence to: Melissa A. Miller, melmille@umich.edu.

None of the authors have conflicts of interest to declare.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conclusions—Despite apparent consensus, lack of shared understanding of the rationale for an intervention may lead to divergent practice patterns and failure to implement standardized, evidence-based practice.

MeSH Keywords

Interdisciplinary Communication; Conscious Sedation; Intensive Care; Mechanical Ventilators

Introduction

Failure of diffusion of highly effective innovations remains a ubiquitous problem in medical care, with important adverse consequences for patients.^{1, 2} This translation gap is found across the spectrum of care. For example, a recent study showed that only about 40% of healthcare workers comply with recommended hand hygiene practices.³ Likewise, rates of beta blocker prescription after myocardial infarction remained low decades after definitive evidence showing their benefits.^{4–6} And, in a recent international survey, barely half of patient days of acute lung injury were managed with an evidence-based ventilation strategy.^{7, 8} Protocolization of care has been advocated as an important tool for improving dissemination of evidence-based practices. However, even large-scale protocolization may leave substantial deficits, as demonstrated by persistent low compliance with severe sepsis treatment recommendations even after a national campaign to improve practice.⁹

The daily interruption of sedation (DIS) in mechanically ventilated intensive care unit (ICU) patients is another example of the failure to translate evidence into widespread practice change.¹⁰ In principle, the diffusion of the DIS should have been rapid and complete. This simple intervention was shown in two highly publicized randomized controlled trials – including a multi-center trial – to reduce mortality, shorten length of stay, and decrease other adverse events.^{11, 12} Repeated follow-up studies showed no evidence of adverse psychological consequences.^{13–15} Moreover, DIS is almost assuredly cost saving, at the very least by decreasing ICU length of stay and sedative drug needs for mechanically ventilated patients.^{11, 12} Despite these facts and its sponsorship by prominent critical care initiatives including the Surviving Sepsis campaign guidelines¹⁶ and ventilator bundles promoted by the Institute for Healthcare Improvement (IHI) and the Michigan Health and Hospital Association (MHA) Keystone Center for Patient Safety & Quality,^{17, 18} a recent review of a decade of international studies found that between 1–78% of physicians report using DIS.¹⁰ Most physicians who describe using DIS do so only in a portion of their patients.¹⁰ A more recent survey of ICU professionals revealed that less than half of respondents practice daily sedation interruption on more than half of ICU days.¹⁹ The only prior survey of perceived barriers to DIS reported that the majority of respondents reported the lack of a physician order or lack of nursing acceptance as a major barrier to DIS.²⁰ While this work affirms the low performance of DIS and suggests professional differences as a cause for poor compliance, the absence of an order or acceptance reveals little about the reasons and motivations for such absences.

We therefore sought to gain a deeper understanding of the failures of translation of DIS in an effort to identify strategies to improve widespread implementation of evidence based medicine. We hypothesized that in-depth discussion by ICU professionals would reveal novel possible mechanisms for the translation failure. We conducted focus groups with physicians, nurses, and respiratory therapists about their attitudes and perceived barriers to the implementation of DIS.

Materials and Methods

Design Overview

We conducted focus groups to identify attitudes, barriers, and incentives to perform DIS. Focus groups are a common qualitative method used in exploratory studies to generate hypotheses and provide rich data to describe a phenomenon.^{21–23} In light of the limits of closed-ended questions common in typical survey structure and quantitative methods, we sought to generate new hypotheses about the reasons for low implementation of DIS through the use of qualitative methods and open discussion by key practitioners involved in DIS.

Setting and Participants

The study setting was a 20-bed medical intensive care unit which utilizes a closed staffing model in an academic center. The unit has a long history of multidisciplinary cooperation, supported by monthly multidisciplinary meetings between nursing, medicine, nutritional support, social work, and infection control. At the time of the study, DIS was already established as standard of care in this unit, with a mature protocol in place. The unit has participated in the Michigan Keystone Intensive Care Unit (ICU) patient safety project since 2003, which emphasizes continual professional education, multidisciplinary use of checklists, and ongoing emphasis on improved outcomes. As part of this initiative, each patient chart includes a daily communication tool documenting, among other things, use of the daily interruption of sedation, which must be addressed by the medical team and nursing. To place our findings in context for unit comparison, in 2009, the average unit occupancy was 95%. There were 1213 admissions, with an average length of stay of 5.7 days. The average day 1 APACHE III score for these admissions was 71.3, in the highest acuity quartile for all ICU's participating in the APACHE system. (A.A. Kramer, personal communication)

Over a 2-month period, we recruited attending physicians, pulmonary/critical care (internal medicine) fellows, registered nurses, and respiratory therapists who regularly work in the unit to participate in focus groups to discuss sedation practices as well as attitudes toward the DIS. Nurses, physicians, and respiratory therapists are the primary professions involved in the DIS in this unit. Although pharmacists are central to sedation practice decisions in some institutions, they play a more indirect, advisory role in this unit, and so were not included in the focus groups. Individuals were recruited to participate in five focus groups, using email and flyers, with a goal of approximately 5 participants in each group. Attending physicians and pulmonary/critical care fellows were organized into 2 separate groups, and 3 groups included a mix of nurses and respiratory therapists. Physicians were separated from other professionals to minimize the potential for intimidation and suppression of discussion. The Institutional Review Board of the University of Michigan Medical Center approved the study (HUM00033117). Informed consent was obtained from each participant for participation in the study and for audio recording of the focus groups. Refreshments were the only incentive for participation, and participants (except attending physicians) volunteered to attend focus groups on their own time. One department, Respiratory Care, did offer to pay its employees for their time on an hourly basis.

Measurement

Focus groups were conducted in the hospital, and lasted for 60–90 minutes each. We asked participants to discuss their feelings toward and experiences with sedation and the daily interruption of sedation, and to reflect on both internal and external motivators and barriers. When necessary, probing questions were used to clarify or augment participant comments. The semi-structured focus group guide is included in the appendix. Groups were co-facilitated by an MD (with a nursing background) and a medical sociologist (who also has a

Masters in Social Work). Each focus group was audiotaped and the tapes transcribed by an experienced medical transcriptionist.

Analysis

Our qualitative analysis approach was largely inductive; themes were identified from the data.²⁴ Following a conventional content analysis approach, members of the research team first read the transcripts to obtain a general sense of potential themes.²⁵ Then, codes describing key concepts were derived from the text, in a process known as open coding.²⁶ An initial set of codes was established by having 3 members of the research team independently code 2 transcripts. The codes were refined using an iterative process over several meetings involving all 4 team members and the code definitions were then documented in a qualitative codebook. Two members of the team (MAM and EAB) subsequently coded all of the transcripts, with any discrepancies resolved by a third team member (SLK), and the transcripts and codes were entered into NVivo8 software (Doncaster, Victoria, Australia). The software was used to generate summary reports of all data under each code for each focus group. These summary reports were reviewed by each member of the multidisciplinary study team with common themes identified for each focus group, followed by a comparison of themes and variations within themes across groups. Key themes were identified following a series of discussions by the study team.

Results

In total, 21 people participated in focus groups, including 5 attending intensivists, 4 physicians in training (pulmonary and critical care fellows), 8 nurses, and 3 respiratory therapists (RT's). Group composition including gender and years of experience are summarized in Table 1.

During the analysis, three major themes emerged related to decision making regarding DIS: 1) why the intervention was being done; 2) who was selected; and, 3) how it was performed.

Why are we doing this?

The focus group participants identified 5 distinct reasons for why one might conduct a daily interruption of sedation (Table 2). First, some participants identified as a goal reducing the total dose of sedation the patient received by finding the minimal dose necessary to maintain sedation. Second, others saw DIS as facilitating ventilator weaning. Third, some advocated that DIS was necessary to allow an adequate neurologic exam as part of routine screening for adverse outcomes. Fourth, providers asserted that DIS was useful because it reduced length of stay. Fifth, several participants identified the ability to more accurately assess their patients' level of pain by direct communication as an important reason they carried out DIS.

All 5 of the reasons for performing a DIS were discussed by nursing and physician participants. However, within each profession, most practitioners espoused only a single rationale, and there was no consensus within groups as to which of these reasons was most important. Interestingly, although many physicians felt that other professions had different goals for DIS, on the whole, both nurses and physicians had substantial overlap in their rationales for why to perform a DIS. However, respiratory therapists were predominantly focused on the role of DIS in facilitating weaning.

These diverse views appeared to strongly influence patient selection and exclusion. Even more notable, the distinct personal motivations for performance of the DIS translated into very different approaches to how one conducted the DIS and the definition of success or failure.

Nearly Everyone, Except...

There was universal consensus that every patient should be considered eligible for a DIS every day. Participants from each profession agreed that the default position is that every patient should be considered for sedation interruption. Participants cited multiple reminders, including the protocol and the interdisciplinary communication tool. They also reported motivation from medical literature reporting improved patient outcomes with sedation interruption.

Despite this apparent consensus, however, there were marked disagreements on which specific patients would be excluded from a DIS. For example, one attending stated, “unless they’re extremely ill, like if they’re paralyzed and on the oscillator”, whereas his colleague said, “If the patient’s hemodynamically unstable, on pressors, that takes the daily interruptions off the table.” Between nurses, the diversity in exclusion criteria was even more marked, as most nurses held a more individualized patient approach. For instance, one nurse said, “I usually try everyone, unless they’re on really, really high vent settings like reverse I:E and 100% and nitric...” and another said, “if your FiO₂ is less than 70%, PEEP of 5 or less, you do a daily interruption.” Further quotes illustrating the broad variability in exclusion criteria are in Table 3.

Fast or Slow, but for How Long?

All groups acknowledged there was a protocol in place that directed an approach to carrying out the DIS, but many participants felt that the realities of patient care often demanded deviations from that protocol. The actual protocol describes the preferred method as turning off the sedative drip(s). As an alternative for a patient who may not tolerate abrupt discontinuation, there is an option of turning the drip down by half sequentially over several hours. Endpoints are described as a communicating patient, or intolerance to interruption, defined as extreme agitation, desaturation, hemodynamic instability, or patient-ventilator asynchrony. Translation of this protocol into actual practice, however, appeared to vary considerably within and between all groups. (Table 4) As one nurse stated, “I have a feeling that if you ask the nurses in our unit if they did a daily holiday, and they said ‘yes’ and you would ask them what they did, you would get a different answer from a lot of people.” These differences in approach to carrying out a DIS related to differences in motivations in performing a DIS. As one fellow who espoused neurologic exam as a motivating reason stated, “I just didn’t think that 2 minutes off sedation was any different than 2 minutes on half sedation.”

There was also wide variation in definition of the endpoint of an interruption. Although the protocol describes assessment endpoints, there are no specifics as to how or when these might occur or the overall goal of a DIS in a particular patient. In our discussion, despite probing by the moderators, most participants could not articulate a defined endpoint or describe success of an interruption. There was a general assumption that sedation would need to be restarted, with emphasis on how this would happen. Few practitioners embraced the idea that a “holiday” may be indefinite. One attending stated, “I think that also depends on your goals. I’m going to be more aggressive and go longer with sedation holidays if I think we’re getting somebody to the point that we’re going to be lifting them off the vent. If I see getting them off the vent as something that’s several weeks off, then I’m not going to push very hard with the sedation holiday.” One nurse clearly expressed the confusion in endpoints: “Do you go 25% more after an hour? Two hours? Four hours? I mean how do you, what criteria are you using, where’s your endpoint and where do you go from there? There’s no clear protocol for that. It’s purely subjective.” The experience level of the participants did not appear to affect the lack of consensus; there was diversity of opinion and practice in those with more and less experience.

Discussion

Despite almost universal agreement in the medical literature, knowledge of that literature, a well-specified protocol, and nominal consensus within groups, there was no shared understanding of why a DIS should be done, who should be excluded or how it should be performed, even within one academic intensive care unit. Moreover, variation in rationale for the DIS implies very different approaches to intervention performance and likely contributed to a general confusion on who should be excluded. Importantly, this variation was found among all professions and across all groups. Very little of the variation in goals was explained by professional perspective. In contrast, participants from different professions shared a similar lack of consensus on patient goals and overall outcome.

Our findings suggest that knowledge of and consensus on the goals of a multidisciplinary intervention may be vital to its successful implementation. That is, despite agreement that an intervention should be done, in the absence of a shared deeper understanding about why they are doing it, conscientious practitioners may nullify an apparent consensus as they try to optimize the intervention for their own patients. This lack of consensus has been relatively unexplored as a barrier to a multidisciplinary intervention. In a prominent review of the efficacy of checklists, the authors discuss the importance of the summary and simplification of instructions, feedback on outcomes, and culture change.²⁷ Ely and colleagues have shown great success with a collaborative approach and standardized care processes in reducing oversedation and its multiple adverse consequences. However, this unit, in which the present study occurred, employs such techniques, and yet practitioners still describe wide discrepancies in practice.²⁸ Little attention has been paid in the literature to communication of the medical goals and fundamental mechanisms of the intervention itself, thus highlighting a potentially important area for implementation science, particularly for complex interventions that require professional judgment to be implemented effectively.

One might suggest that a way to combat this lack of consensus in future iterations of a protocol may be to more clearly delineate goals in the protocol. However, the protocol in place in the unit at the time of the study included a description of many of the goals of DIS. More specific instructions regarding the specific of interruption and definition of endpoints could be useful; however, such changes may not suffice. Indeed, the medical literature does not offer a clear consensus as to the mechanism by which the benefits of DIS are obtained. Absent such a scientific foundation, one approach has been to redefine a daily interruption of sedation as a “spontaneous awakening trial”.¹¹ This label change may result in a perspective shift from “interruption” of sedation, which suggests that sedation will be restarted, to an “awakening” trial, with the overall goal of patient alertness. Given that many clinical recommendations are not based on a single biomedical mechanism, but instead on multiple clinical outcomes, it is unlikely that this problem is unique to the DIS. The persistent difficulty in implementing low tidal volume ventilation after the ARDSnet trial,^{8, 29, 30} or the resistance to checklists in patient safety may be other examples. Another possible way to counteract the effect of the lack of consensus is the use of a “champion”. The role of the champion in improving implementation has been studied in other areas, such as infection control.³¹ Pharmacists may act in such a role in some institutions, as may other professionals, such as charge nurses and clinical nurse specialists.

Our paper has a number of limitations. It is important to highlight that our results do not *prove* a causal link between the diversity of views about who, how and why to perform a DIS. Such proof would likely require a study specifically designed to address this question, informed by the novel hypotheses generated from the present work. But our results do highlight the links providers seem to draw between their motivations and their practice. Any

quality improvement initiative would likely need to address, and reorient, the cognitive framework of the providers in addition to other causal factors.

Our study has a small sample size if judged by the standard of nationally representative surveys. Some might argue that a quantitative study with such a survey would be more generalizable. However, our study was exploratory in nature, with the purpose of discovering previously unknown barriers to the implementation of DIS. The finding of a lack of organizational consensus as to why a DIS should be done, and the translation of this lack of consensus into wide variation in described practice and patient selection was clearly discernible using focus groups. It would be more challenging to detect using traditional survey methodology with closed-ended questions, especially given the superficial consensus on the “correct answer”, however future studies quantifying the prevalence of these findings would be useful for validation. Our work also raises questions about the validity of any observational study that involves self-report of whether or not a DIS was performed and whether or not a patient was eligible. Direct observation and evaluation of patients and behavior may be needed as part of future studies to determine the relative prevalence of the five perspectives we unmasked and their effects on practice. Also, our study involved participants who represented a wide range of positions, perspectives and levels of experience and was conducted in a highly functioning academic intensive care unit, with preexisting multidisciplinary cooperation and emphasis on improving outcomes. Therefore our findings may apply to other similar intensive care units – although care must be taken in any such generalization, particularly in considering units in which DIS is not already established as standard of care. Further, though in our institution pharmacists have an indirect advisory role, in many centers pharmacists are central to decisions regarding sedation practices. The likely diverse views of pharmacists need to be considered in future work.

Conclusions

Despite the strength of evidence supporting the use of DIS, widespread application of this intervention to ICU patients has been far from satisfactory. Our findings suggest that a major reason for this discrepancy in actual practice may be a lack of consensus in why we should perform DIS. Moreover, it is likely that this lack of consensus is a barrier to performance of many other interventions, especially those with multiple clinical outcomes as motivating factors or those interventions that involve interventions that require the application of clinical judgment (in contrast to the administration of a pill). It has been suggested that professional differences are a major cause of intervention noncompliance.²⁰ In contrast, our results show wide variation within professional groups, and that between professional groups there is substantial overlap in motivation. Five very different reasons to perform DIS led to 5 very different approaches to the intervention itself in this multidisciplinary group of ICU practitioners.

Acknowledgments

The authors would like to thank Cathy Strachan, MS, RN, for her assistance with acuity and occupancy data.

This study was supported by the National Institute of Health NIH/NHLBI T32: HL07749-17 (MAM) and K08: HL091249-03 (TJI). The sponsor was not involved with the study’s design, conduct, or reporting. All authors had full access to all of the data in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis.

References

1. Balas, E.; Boren, S. Managing clinical knowledge for health care improvement. In: Bommel, J.; McCray, A., editors. Yearbook of Medical Informatics 2000: Patient-Centered Systems. Stuttgart, Germany: Schattauer Verlagsgesellschaft mbH; 2000. p. 65-70.
2. Lenfant C. Shattuck lecture--clinical research to clinical practice--lost in translation? *NEng J Med*. 2003; 349:868–874.
3. Erasmus V, Daha T, Brug H, et al. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. *Infect Control Hosp Epidemiol*. 2010; 31:283–294. [PubMed: 20088678]
4. Burwen D, Galusha D, Lewis J, et al. National and state trends in quality of care for acute myocardial infarction between 1994–1995 and 1998–1999: the medicare health care quality improvement program. *Arch Intern Med*. 2003; 163:1430–1439. [PubMed: 12824092]
5. Ellerbeck EF, Jencks SF, Radford MJ, et al. Quality of care for Medicare patients with acute myocardial infarction. A four-state pilot study from the Cooperative Cardiovascular Project. *JAMA*. 1995; 273:1509–1514. [PubMed: 7739077]
6. Krumholz HM, Radford MJ, Wang Y, et al. National use and effectiveness of beta-blockers for the treatment of elderly patients after acute myocardial infarction: National Cooperative Cardiovascular Project. *JAMA*. 1998; 280:623–629. [PubMed: 9718054]
7. Esteban A, Ferguson N, Meade M, et al. Evolution of mechanical ventilation in response to clinical research. *Am J Respir Crit Care Med*. 2008; 177:170–177. [PubMed: 17962636]
8. Kalhan R, Mikkelsen M, Dedhiya P, et al. Underuse of lung protective ventilation: analysis of potential factors to explain physician behavior. *Crit Care Med*. 2006; 34:300–306. [PubMed: 16424706]
9. Ferrer R, Artigas A, Levy M, et al. Improvement in process of care and outcome after a multicenter severe sepsis educational program in Spain. *JAMA*. 2008; 299:2294–2303. [PubMed: 18492971]
10. Mehta S, McCullagh I, Burry L. Current sedation practices: lessons learned from international surveys. *Crit Care Clin*. 2009; 25:471–488. vii. [PubMed: 19576525]
11. Girard T, Kress J, Fuchs B, et al. Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial. *Lancet*. 2008; 371:126–134. [PubMed: 18191684]
12. Kress JP, Pohlman AS, O'Connor MF, et al. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. *NEng J Med*. 2000; 342:1471–1477.
13. Kress J, Gehlbach B, Lacy M, et al. The long-term psychological effects of daily sedative interruption on critically ill patients. *Am J Respir Crit Care Med*. 2003; 168:1457–1461. [PubMed: 14525802]
14. Treggiari M, Romand J-A, Yanez ND, et al. Randomized trial of light versus deep sedation on mental health after critical illness. *Crit Care Med*. 2009; 37:2527–2534. [PubMed: 19602975]
15. Jackson J, Girard T, Gordon S, et al. Long-term cognitive and psychological outcomes in the awakening and breathing controlled trial. *Am J Respir Crit Care Med*. 2010; 182:183–191. [PubMed: 20299535]
16. Dellinger RP, Carlet J, Masur H, et al. Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock. *Intensive Care Med*. 2004; 30:536–555. [PubMed: 14997291]
17. Implement the Ventilator Bundle: Five Million Lives Campaign. Institute for Healthcare Improvement; <http://www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/ImplementtheVentilatorBundle.htm>
18. Pronovost PJ, Berenholtz SM, Goeschel C, et al. Improving patient safety in intensive care units in Michigan. *J Crit Care*. 2008; 23:207–221. [PubMed: 18538214]
19. Patel R, Gambrell M, Speroff T, et al. Delirium and sedation in the intensive care unit: survey of behaviors and attitudes of 1384 healthcare professionals. *Crit Care Med*. 2009; 37:825–832. [PubMed: 19237884]

20. Tanios M, de Wit M, Epstein S, et al. Perceived barriers to the use of sedation protocols and daily sedation interruption: a multidisciplinary survey. *J Crit Care*. 2009; 24:66–73. [PubMed: 19272541]
21. Barbour RS. Making sense of focus groups. *Medical Education*. 2005; 39:742–750. [PubMed: 15960795]
22. Kitzinger J. Qualitative research. Introducing focus groups. *BMJ*. 1995; 311:299–302. [PubMed: 7633241]
23. Pope C, Ziebland S, Mays N. Qualitative research in health care. Analysing qualitative data. *BMJ*. 2000; 320:114–116. [PubMed: 10625273]
24. Miles, MB.; Huberman, AM. *Qualitative Research Analysis: An Expanded Sourcebook*. 2. Thousand Oaks, California: Sage Publications, Ltd; 1994.
25. Hsieh H-F, Shannon S. Three approaches to qualitative content analysis. *Qual Health Res*. 2005; 15:1277–1288. [PubMed: 16204405]
26. Strauss, A.; Corbin, J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. 17. Thousand Oaks, CA: Sage Publications, Ltd; 1990.
27. Bosk C, Dixon-Woods M, Goeschel C, et al. Reality check for checklists. *Lancet*. 2009; 374:444–445. [PubMed: 19681190]
28. Vasilevskis E, Ely EW, Speroff T, et al. Reducing iatrogenic risks: ICU-acquired delirium and weakness--crossing the quality chasm. *Chest*. 2010; 138:1224–1233. [PubMed: 21051398]
29. Dennison C, Mendez-Tellez P, Wang W, et al. Barriers to low tidal volume ventilation in acute respiratory distress syndrome: survey development, validation, and results. *Crit Care Med*. 2007; 35:2747–2754. [PubMed: 17901838]
30. Rubenfeld G, Cooper C, Carter G, et al. Barriers to providing lung-protective ventilation to patients with acute lung injury. *Crit Care Med*. 2004; 32:1289–1293. [PubMed: 15187508]
31. Damschroder LJ, Banaszak-Holl J, Kowalski CP, et al. The role of the champion in infection prevention: results from a multisite qualitative study. *Qual Saf Health Care*. 2009; 18:434–440. [PubMed: 19955453]

Table 1

Participant Characteristics

Group	Number of participants	Professional Role	N Male/Female	Years of experience
Group 1	5	Attending	4/1	18mos-28 years
Group 2	4	Fellow	2/2	2–3 years
Group 3	5	Nurses	3/2	2–24 years
Group 4	4	2 Nurses, 2 RT's	1/3	3–30 years
Group 5	3	2 Nurses, 1 RT	3/0	2–12 years

Table 2

5 Major Reasons Why

Minimize dose of sedation
Neurologic exam
Ventilator weaning
Reduced length of stay
Assessment of pain and discomfort

Table 3

Who?

RN	<p>“I don’t know, 60% or less and 10 of PEEP or less, I usually give it a try”</p> <p>“if they’re febrile...it doesn’t show us that they’re well enough to start the weaning phase...” [and so they are excluded]</p> <p>“You kind of have to look at each patient individually you know, some of them really need to be sedated... because they’re so sick, and they, you know, de-sat if they wake up even the slightest, but um, then there’s other patients that do amazing with no sedation”</p>
RT	<p>“If they’re that sick, and we can’t get parameters on them, they shouldn’t be awake”</p> <p>“if the patient’s going for a trach in an hour... procedures or if they’re going to put a line in, there’s no sense in waking them...”</p>
Fellow	<p>“Maybe we know that they desaturate when they try to bathe them,...any time they move...those are the people I worry about...”</p>
Attending	<p>“Oscillators, higher modes of mechanical ventilation that I think are inherently annoying to an individual who wakes up... APRV, bi-level, inverse ratio...”</p> <p>“Hemodynamically unstable on pressors...”</p> <p>“...CAT scan, they have to have an MRI, whatever...”</p>

Table 4

How?

RN	<p>"I'll just go down by 2 drops...do a couple things, go down by two more drops... then I would wait and start cutting down again and see if they start to wake up."</p> <p>"I'm very comfortable now just stopping the sedation at point X and just watching the patient very closely."</p>
RT	"Some nurses will wean it just a little bit and the patient's still snowed and other nurses will be really aggressive about it and the patients are fine"
Fellow	<p>"It's meds off, it's meds off."</p> <p>"I guess one could argue since it's such a short duration, it doesn't matter if the meds are all the way off..."</p>
Attending	"I mean if it's 10 minutes, then it's 10 minutes and you get the information...if you turn off the sedation and the patient is fine, then you leave it off and then restart at half the dose... then escalate again..."