

Less Pain, More Gain:

Implementing Evidence-Based Practice in Pain and Sedation

Andrew C. Faust, PharmD, BCPS; LSS Yellow Belt
Texas Health Presbyterian Dallas

Objectives

- + Define different quality improvement models and methods to incorporate evidence-based medicine in the intensive care unit
- + Review implementation of analgo-sedation protocol in the medical ICU to illustrate transformation of guidelines to clinical practice

Audience Survey

- + Professions
- + Academic vs. Community Institutions
- + One intensivist group? Two? More than two?
- + Medical ICU? Surgical? Mixed? Trauma?
- + Have worked on implementing new practice to your ICU
- + Have read a neat new RCT in a big journal that you thought you needed to implement in your ICU

What is “Evidence-Based” Practice

- + Thoughtful use of current best available evidence in decision-making
 - + Individual case-based
 - + Broader delivery of care
- + Supported by varying levels of evidence
 - + R, DB, PC, multicentered huge trial
 - + Retrospective, single-center studies
 - + Expert/Personal opinions
 - + Meta-analyses
- + Straightforward, specific treatments vs. highly complex issues on some of our sickest, most vulnerable patients
 - + Ex: Universal decolonization with mupirocin/CHG vs. Low-tidal volume ventilation for ARDS

Clinical Practice Guidelines

- + Accumulation of the best practices, current evidence
 - + “Provide a current and transparently analyzed review of the relevant research with the aim to guide clinical practice” – 2018 PADIS Guidelines
 - + “The goal of these clinical practice guidelines is to recommend best practice for managing PAD to improve clinical outcomes in adult ICU patients.” - 2013 PAD guidelines
- + Guidelines are not cookbooks
 - + Ex: DKA/HHS treatment
- + 80 / 20 rule?
 - + There will ALWAYS be exceptions to guidelines because patients are not uniform

Ease of Implementing EBP

- + Quality of evidence and impact on patients
 - + Was this a RCT?
 - + Is the outcome significant?
 - + Example: Improved oxygenation vs. improved survival
- + How similar is my institution and practice to the setting in the paper?
 - + Was study/trial in a MICU and you practice in CVICU?
 - + Is the nursing staff and resources similar to your institution?
 - + Example: “No sedation” protocol in ICU – nursing ratio was 1:1 or, if needed, an additional HCW could help watch patient
- + Implementation science
 - + Field of study dedicated to understanding facilitators and barriers to adopting EBP

ARDS Example

- + High quality data demonstrate that low tidal volume ventilation improves ARDS mortality
 - + Given a strong recommendation by clinical practice guidelines
- + Implementation of intervention has been as low as 19% in some practices
- + WHY?
 - + Multiple barriers to implementation
 - + Under-recognition of disease state
 - + Physicians not wanting to give up control of vent
 - + Perception of contraindications
 - + Etc.
 - + Implementation science has some recommendations on framework for assessing barriers

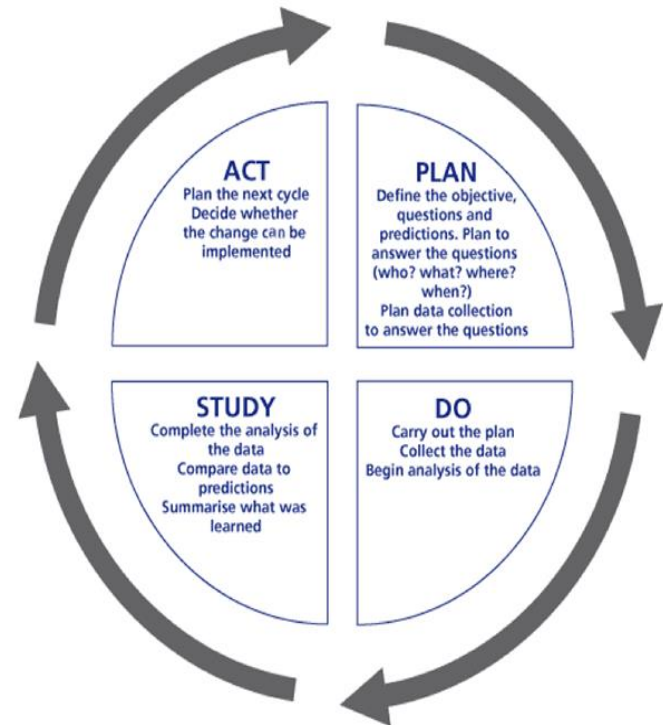
Methods for Implementing Change

- + Should think of any change as a process / quality improvement project
 - + ICU care is very interconnected – multiple disciplines and departments may be affected by change
 - + What worked well in a RCT may not work well in your practice site, especially if there are multiple interventions
 - + Ex: ABCDE bundles, sepsis bundles, etc.
- + Consider your implementation a small, pragmatic research study!
- + Different methods for looking at change implementation
 - + Step 1 should ALWAYS be to PLAN!
 - + Should involve as many of the disciplines as possible
 - + Ex: Changing your sedation protocol will influence pharmacy, nursing, physicians....but also RT, PT/OT, nutrition, etc.

Give me six hours to chop down a tree and I will spend the first four sharpening the axe – Abraham Lincoln

Plan, Do, Study, Act Model

- + One method endorsed by AHRQ
- + Plan:
 - + What are root causes?
 - + We LOVE to fix things in ICU care – resist the urge to jump to conclusions
 - + What is the problem?
 - + Who can help fix / be affected by change?
 - + What data are we going to collect along the way?
- + Do:
 - + Experiment by changing a root cause / condition
- + Study:
 - + What happened when we implemented change? Why?
- + Act:
 - + What do we need to change / improve on?



Lean Six Sigma Methods

- + Lean:
 - + Relates to the relentless elimination of waste

- + Six Sigma:
 - + Relates to elimination of defects / variations in processes that may result in undesirable outcomes
 - + Many six sigma tools are applicable to implementation of new practices and evidence based medicine
 - + DMAIC (define, measure, analyze, improve, and control) is one tool
 - + Too often we go from “there’s a problem/opportunity, let’s implement this solution” → Avoid Cobra Effects!!

Example: Antibiotics in Sepsis

- + “Septic patients in our hospital never get their antibiotics on time”
- + Some tools to consider:
 - + Define the problem and the goal
 - + Example: X% of patients get antibiotics within 1 hour now. Our goal is to increase this to Y %.
 - + Figure out what the process currently is and where the hang ups are
 - + Value stream mapping, asking “5 why’s,” Ishikawa diagrams, etc.
 - + When you do implement, how are you going to measure and then sustain the gain?



Analgesiation Practice at THD

PADIS in 2018 – A very general overview!

- + Pain is first – it should be treated first
 - + Opioids remain treatment of choice
 - + **Management of pain for adult ICU patients should be guided by routine pain assessment and pain should be treated before a sedative agent is considered** (THD paper included in references)
 - + Ask the patient (awake and interactive patients are, generally, a good thing!)
 - + Use objective scores when patients cannot report
- + When indicated, use a sedative agent
 - + Keep sedation light (when possible) and be objective
 - + Minimize benzos (don't completely eliminate)
 - + Especially continuous infusion benzodiazepines, which have been shown to increase ventilator duration, delirium, etc.
 - + Benzos are still acceptable for acute agitation and effect of intermittent use isn't well known
 - + Propofol or dexmedetomidine preferred

PADIS in 2018 – A very general overview!

- + Delirium
 - + Is bad – we think
 - + Lots of conflicting evidence about both short and long term effects
 - + No “magic bullets” for treatment or prevention
 - + Multicomponent, nonpharmacological management might be helpful
- + Immobility
 - + Get patients moving – either walking on the vent or at least range of motion / PT / OT exercises
- + Sleep
 - + The ICU is not a great place to get good sleep
 - + Implement a sleep-promotion protocol?
 - + Likely expanding area of research for sleep hygiene / sleep maintenance

THD's Analgosedation Practice

- + Practice changed in 2012
 - + ICU ACM group
 - + ACM = accountable clinical management
 - + Financial incentives to physician group
 - + One of the group's metrics was to implement a new sedation protocol
 - + Anticipation of the "soon to be released" SCCM guidelines
- + Increasing interest in using analgesia-first practice
 - + Analgesia was mentioned in the prior guidelines (2002)
 - + Lots of talk amongst critical care groups and review papers
 - + Increasing recognition that our propofol-first attitude was NOT treating pain....which is exceedingly common
 - + And growing tired of the "which sedative is best?" debates when pain management may have been the key!

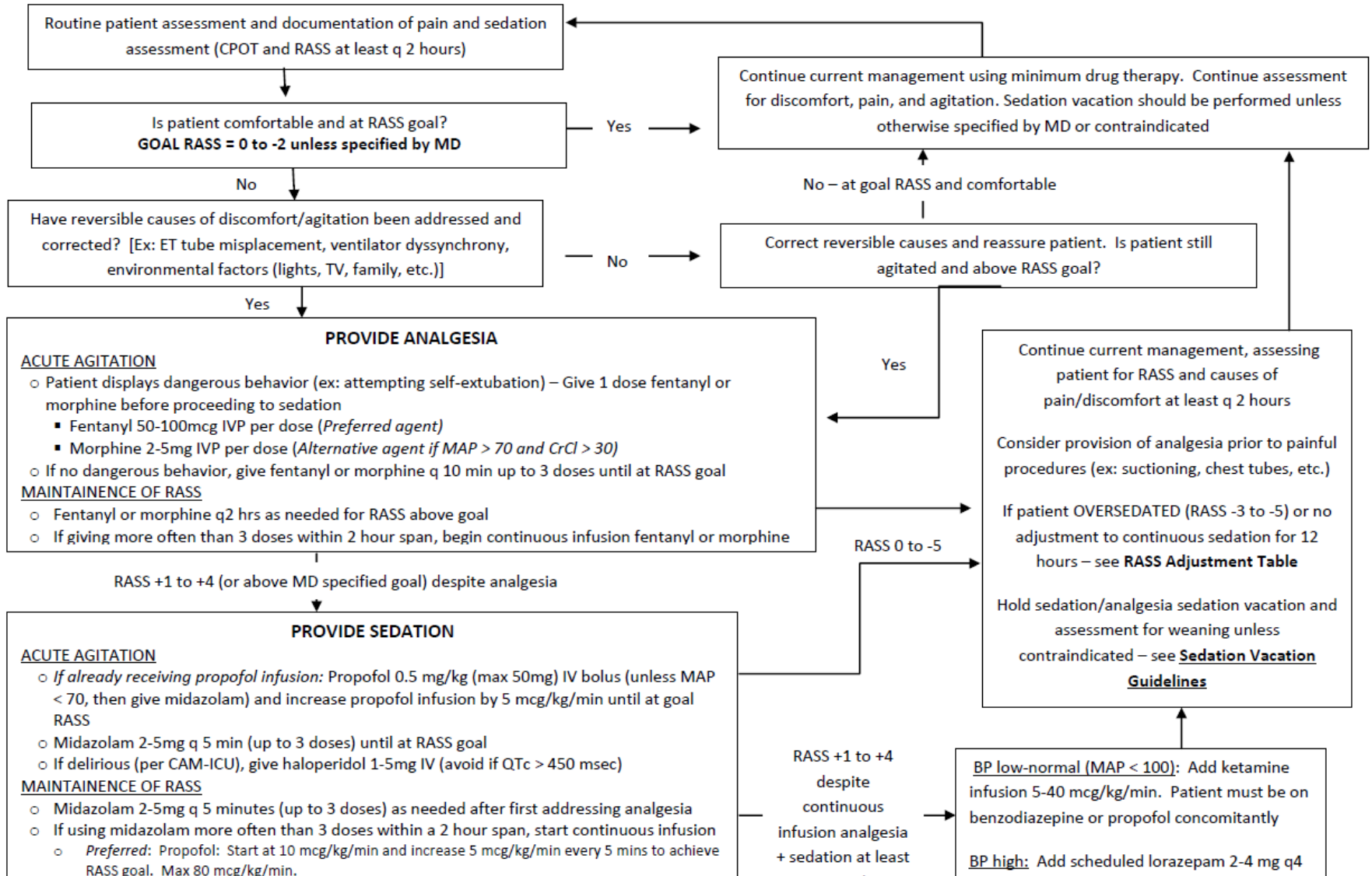
Planning

- + Multidisciplinary team
 - + Lead by clinical pharmacists
 - + Included physicians and nursing
- + Reviewed other hospitals protocols, guidelines, review papers, and primary literature
 - + How much of this would apply to a 24 bed MICU at a community teaching hospital with one group of intensivists?
- + Assessed what current practices already were
 - + Already using RASS and CPOT
 - + Not great about treating pain (few patients getting continuous infusion analgesics)
- + Knew we wanted to study this as a process improvement project
 - + Used pharmacy resident resources

THD Intensive Care Unit Sedation and Analgesia Protocol (Expected Duration of Intubation > 24 hours)

ONLY FOR USE IN PATIENTS ON MECHANICAL VENTILATION – See Order Set in EPIC

Exclusions to protocol include: Therapeutic Hypothermia, Prone Positioning, Neuromuscular Blockade, Pressure Control Ventilation



Planning

- + LOTS of nursing education
 - + Planned inservices
 - + On-the-fly huddles
 - + Newsletters (bathrooms work great!)
- + LOTS of physician education
- + Tried to anticipate barriers
 - + “Isn’t it bad that patients are more awake?! That seems mean!”
 - + Access to medication
 - + Went to pre-mixed, outsourced fentanyl bags to load in PYXIS
 - + Toyed with the idea of narcotic boxes in the rooms
 - + IT / EHR support

Do

- + Implemented in late 2012
- + Emphasized early, aggressive treatment of pain with intermittent and, if needed, continuous fentanyl
- + Minimized sedation
 - + Preferred drug was intermittent benzodiazepine followed by continuous propofol
- + RASS goal, daily awakenings/sedation vacation, and ventilator weaning guidelines unchanged

Study / Act

- + During implementation period, held weekly meetings
 - + Looking at accidental extubations, complications, success stories, barriers, etc.
 - + Continually looking to improve process
- + Nursing questionnaire sent to address knowledge deficits but also concerns
- + Quickly learned that bedside RTs were a vital part of our group that we'd omitted from planning
 - + Ventilator and tubing positioning were changed to prevent inadvertent ventilator disconnection
 - + Practices of taping ETT were addressed
- + Physical restraints were addressed
 - + More use of mittens
- + LOTS of early wins
 - + Patients communicating needs with iPads, computers, message boards, etc.

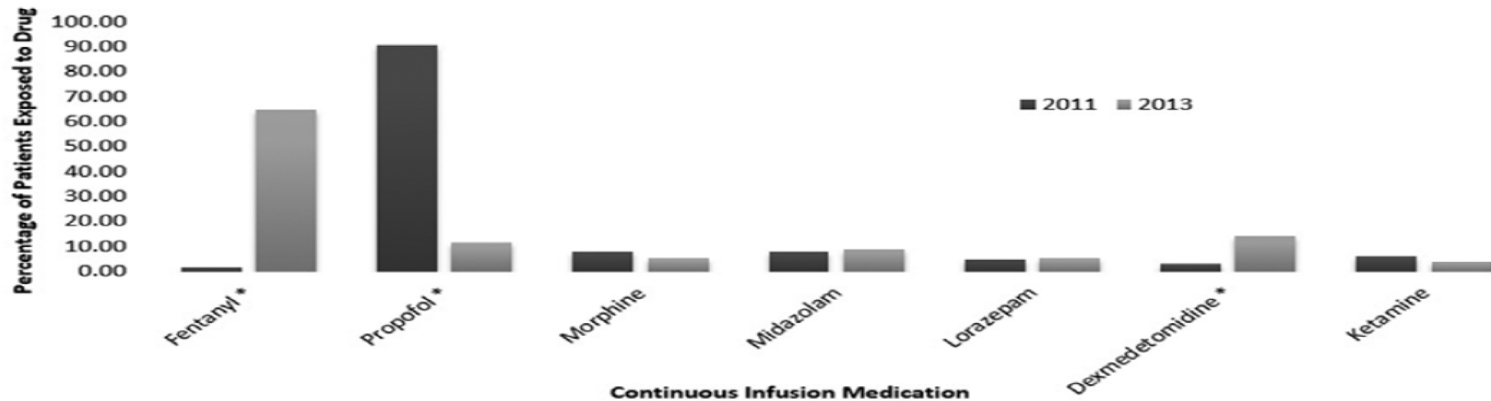
Results

- + Retrospective, pragmatic study in MICU
 - + Applicability to SICU, CVICU, etc.??
- + 65 patients in propofol-based protocol (2011 group) vs. 79 patients in fentanyl-based protocol (2013 group)
 - + More male patients in 2011 group
- + Duration of MV reduced with fentanyl-based protocol
 - + 138.3 +/- 132.6 vs. 92.9 +/- 73.3 hours
 - + Difference of 26.6 hours (95% CI, 44.98 to 8.26) in linear regression
- + Lighter sedation and better pain control with fentanyl-based protocol

Medication Use in Study

- + Fentanyl use went up
 - + Per patient: 1436.2 mcg fent equivalents vs. 7516.8 mcg ($p < 0.001$)
- + Sedative use
 - + Propofol: Per patient: 14,192.3 mg vs. 1503.2 mg ($p < 0.001$)
 - + Other sedatives stayed about the same
 - + Use of continuous infusion of any sedative: 92.3% vs. 38.0% ($p < 0.001$)
- + Drug costs decreased ~ \$225 per patient

Exposure to Continuous Infusion Analgesics and Sedatives by Year



Application of EBP / Guidelines

- + Nowhere in the guidelines does it say exactly how to manage your ICU patients
 - + Realize that you cannot treat every inevitability with a protocol or order set
 - + Zebras DO exist
- + Work as a group to come up with your own best practice based on available evidence
 - + If you are not cohesive in your approach, even the best evidence and best practices WILL LIKELY FAIL!
- + Look at implementation of EBP and clinical guidelines as QI/PI projects
 - + Texas SCCM is a great place to share your successes and lessons learned
- + Anticipate problems and try to mitigate unintended consequences

THANK YOU!!

+ Andrewfaust@texashealth.org