FDA SEDATION WORKSHOP

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DISCLOSURES

I have nothing to disclose
PRIMARY OUTCOME MEASURES

- Efficacy
- Safety
- Efficiency
EFFICACY DEFINITION


- “The creation of conditions necessary to safely facilitate the completion of a procedure through attenuation of pain, anxiety, and movement with amnesia or decreased awareness”

- For sedation to be considered efficacious:
  - 1) No unpleasant recall
  - 2) No sedation related adverse events resulting in abandonment of procedure, permanent complication, unplanned admission or prolonged hospital stay
EFFICACY OUTCOME MEASURES USED IN VARIOUS STUDIES

- Successful completion
- Patient and provider satisfaction
- Level of sedation achieved (generally by observation)
- Recall of procedure
- Physiological response
- Respiratory effort and obstruction
- Pulse oxymetry, capnography
- Interventions
- Time to discharge
- Post sedation side effects
A REVIEW OF IMPORTANT ELEMENTS IN SEDATION STUDY METHODOLOGY


- Review of dental sedation until that date
- Importance of blinding (removing from rater access to significant information that may bias) and reliability (variables are measured consistently between two or more individuals)
- Importance of behavioral outcome studies; difficulty in comparison because of different behavioral scales
- Review/Merits of Global scales v Restrictive scales
- May need different scales for different outcome
- Roadmap/Goals suggested then is still needed
- “Blinding and the establishment of reliability of behavioral measures should become as second-natured as giving local anesthesia.”
DEVELOPMENT AND VALIDATION OF THE PATIENT AND CLINICIAN SEDATION SATISFACTION INDEX FOR COLONOSCOPY AND UPPER ENDOSCOPY


- Call for better sedation evaluation
- Patient Satisfaction with Sedation Instrument (PSSI)
- Clinical Satisfaction with Sedation Instrument (CSSI)
- Satisfaction with sedation provides important outcome information
- Lack of previously validated satisfaction measures that are reliable
- Intended to provide evaluation beyond a global rate of satisfaction. May better measure satisfaction vs recall, ease of sedation delivery and sedation side effects
DEVELOPMENT AND VALIDATION OF THE DARTMOUTH OPERATIVE CONDITIONS SCALE


- Attempts to yield more information than whether the procedure was completed and level of sedation achieved
- Evaluates control of movement, stress, pain, and respiratory side effects
- Done by video recording and scoring
- Good inter-rater reliability
- Is able to evaluate sedation interventions, but not able to determine potential of serious morbidity or mortality
- Not for use on daily basis but allows for comparison of sedation techniques
COMPARISON OF DIFFERING SEDATION PRACTICE FOR UPPER ENDOSCOPIC ULTRASOUND USING EXPERT OBSERVATIONAL ANALYSIS OF THE PROCEDURAL SEDATION


- Use of Dartmouth Operative Conditions Scale (DOCS) in adults
- Observation analysis may allow better direct measurement of intraprocedural sedation
- Analyzed use of benzodiazepine/opioid combination vs propofol
- Separate tool needed for patient and provider satisfaction
- May be able to show significant differences in sedation regimens with low numbers of patients
- Able to analyze interventions but not able to analyze rare events
PROCEDURAL SEDATION AND RECALL IN THE EMERGENCY DEPARTMENT: THE RELATIONSHIP BETWEEN DEPTH OF SEDATION AND PATIENT RECALL AND SATISFACTION (A PILOT STUDY)


- Adults for orthopedic reduction
- Patients assessed level of recall, pain and satisfaction
- One group received midazolam/opioid other propofol/opioid
- Higher pain scores associated with increased recall level in midazolam group
- No mention of reliability/validity of depth of sedation level measure
THE EFFECT OF THE ASSIGNMENT OF A PRE-SEDATION TARGET LEVEL ON PROCEDURAL SEDATION USING PROPOFOL


- Assigned patient to two groups based on intention of moderate or deep sedation
- Actual level of sedation achieved based on ASA Standards, Guidelines and Statements
- BIS monitoring used but not for assignment of level of sedation achieved
- No difference in actual level of sedation achieved, but moderate sedation group
- Used ETCO2 as outcome measure to judge respiratory depression
- Simple recall questions
CAN WE IMPROVE THE ASSESSMENT OF DISCHARGE READINESS? A COMPARATIVE STUDY OF OBSERVATIONAL AND OBJECTIVE MEASURES OF DEPTH OF SEDATION IN CHILDREN


- Premise: “Current recommended discharge criteria might not be rigorous enough to detect residual sedation”
- Current discharge tools may allow for observer bias in underestimating depth of sedation
- BIS used as the standard for level of alertness
- BIS used in comparison to University of Michigan Sedation Scale (UMSS) and Modified Maintenance of Wakefulness Test (MMWT)
- Found tools used together had better correlation of BIS greater than 90 at discharge than either tool alone
Describes difficulty in sedation level scales such as Ramsay Scale and Observer’s Assessment of Alertness/Sedation (OAAS) because scales require disturbing the patient to elicit a response.

50 patients; BIS score correlated with Ramsay Scale and OAAS.

Ramsay Scale and OAAS correlated with each other well.

BIS correlated well but only at extremes of wakefulness and general anesthesia.

BIS did not correlate well at transition areas of moderate to deep and deep to general anesthesia.
Randomized into the two arms of the study
Primary outcome measure for efficacy was the Observational Scale of Behavioral Distress-Revised (OSBD-R)
This was scored by trained observers blinded to the study purpose and design. They reviewed video tapes of all of the sedations
Secondary measures were a Facial Affective Scale (FAS) completed by subjects, a visual analog scale completed by parents and ratings of difficulty of procedure by the orthopedic surgeon
Analysis of adverse events using threshold definitions
Call for reevaluation of existing paradigm of the sedation evaluation with respect to critical goal of adverse event prediction

Need for better risk assessment tool based on physiological monitoring

Goal of developing a risk-oriented sedation taxonomy that would yield a clear and consistent language to:

1. Facilitate quality assurance;
2. Provide and objective framework for standardized sedationist training and credentialing; and
3. Permit inclusion into computerized decision-support algorithms to facilitate more precise sedative delivery.
CONSENSUS BASED RECOMMENDATIONS FOR STANDARDIZING TERMINOLOGY AND REPORTING ADVERSE EVENTS FOR EMERGENCY DEPARTMENT PROCEDURAL SEDATION AND ANALGESIA IN CHILDREN


- Group of Pediatric Emergency Physicians and Anesthesiologists representing US (PECARN) and Canada (PERC) pediatric emergency research networks
- Goal was to propose a framework of definition and recommendations for reporting sedation terminology, time intervals, and adverse events for procedural sedation research
- Efficacy Definition: “The creation of conditions necessary to safely facilitate the completion of a procedure through attenuation of pain, anxiety, and movement with amnesia or decreased awareness.”

For sedation to be considered efficacious:

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Recommends intervention-based definitions versus threshold and duration definitions.

Authors acknowledge that this was most difficult decision to build consensus.

Examples for oxygen desaturation

- Instead or oxygen saturation level and duration, interventions would be recorded including:
  - vigorous stimulation
  - airway repositioning
  - suctioning, increased oxygen delivery
  - oral or nasal airway
  - application of positive pressure or ventilation
  - tracheal intubation
ADVERSE EVENT REPORTING TOOL TO STANDARDIZE THE REPORTING AND TRACKING OF ADVERSE EVENTS DURING PROCEDURAL SEDATION: A CONSENSUS DOCUMENT FROM THE WORLD SIVA INTERNATIONAL SEDATION TASK FORCE


- Uses descriptive and threshold terms to list adverse events.
- Adverse events are listed as Minimal (paradoxical response, recovery agitation), Minor (short desaturation, failed sedation) or Sentinel (cardiovascular collapse, prolonged apnea)
- Interventions are listed as Minor (airway repositioning, tactile stimulation), Moderate (CPAP, ventilation) or Sentinel (chest compressions, intubation)
- Outcome is listed as Minimal (no adverse outcome), Moderate (unplanned hospitalization) or Sentinel (death, permanent neurological deficit)
CONCLUSION

- Sedation study endpoints are broad and not consistent, leading to inability to compare study to study and drug to drug.
- There is some effort but no consensus on prioritizing the importance of different outcomes.
- Several scales exist, all have strengths and weaknesses. No one scale meets all outcome measurement needs.
- Physiological data to determine level of sedation and risk assessment does not exist.
- There have been significant efforts on standardizing terminology and reporting but no general consensus.
- There is need to better stratify risk by level of sedation.
REFERENCES


