

One Sedation Scale: The RASS with Safety Guidelines (RASS-SG)

Nan Davidson, MA, RN, CNS-BC
Porter Adventist Hospital - Centura Health
Denver, CO

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Porter Adventist Hospital - Centura Health

- Centura Health - 17 Hospital System
- Porter Hospital - Level 3 Trauma, 368 Beds
 - Behavioral Health Services
 - Cancer Care Center
 - Cardiovascular Institute
 - Center for Joint Replacement
 - Centura Health Transplant Program
 - Complex Medicine
 - Craniofacial & Skull Base Disorders
 - Robotics Institute
 - Spine Institute
- Magnet™ designation since January 2009
- 500+ Registered Nurses
- 83% Bachelor's or Higher
- 46% National Nursing Certification



Belinda Shaw, DNP, RN, CEN, NE-BC
Chief Nursing Officer



Diversity in Practice: Strength Through Collaboration

- **Goal: Research to advance nursing practice and enhance patient safety**
 - Describe the Value of the RASS with Safety Guidelines
 - To support nursing to achieve optimal clinical outcomes
 - To prevent hospital acquired harm that reduces unnecessary hospital costs

Background/Significance

Opioid Safety

- **Patient safety is an essential aspect of opioid therapy**
 - Respiratory depression is the most serious side effect associated with opioid administration

SEDATION PRECEDES OPIOID-INDUCED RESPIRATORY DEPRESSION

(Pasero C. (2009); Pasero C, McCaffery M. (2002); Pasero C, McCaffery M. (1994)

Opioid Safety

- **Every. Single. Hospital. Has a story.**
 - “In 1999, Fairview Southdale Hospital, part of a 7 hospital system, was devastated by the death of an otherwise healthy patient from apparent opioid induced respiratory depression.” (Mehall, 2007)
 - In 2009, Porter Hospital experienced the same
 - It is always a perfect storm
 - Sedation surveillance is critical to preventing opioid harm

Opioid Safety

- **Interesting report...**
 - “Sedation is an extremely useful assessment parameter to observe the clinical effects of opioids. In fact, sedation is the most important predictor of respiratory depression in patients receiving IV opioids - a fact that only 22% of physicians, pharmacists, and nurses knew when taking a recent opioid knowledge assessment.” (Grisinger, 2013)

Opioid Safety

- **Serial monitoring of sedation level is critical to guide opioid administration to prevent respiratory compromise**
 - Recommend use of a standard, evidence-based sedation scale:
 - To ensure clear communication
 - To ensure safe administration of opioids

Communication Surveillance

Opioid Safety

- **Reliability/Validity are reported on a handful of sedation scales:**
 - **Intent to sedate and prevent opioid induced oversedation**
 - Richmond Agitation Sedation Scale (RASS)
 - Tested on opioids and other medications that cause sedation; observations of patients
 - **Intent to prevent opioid induced oversedation**
 - Pasero Opioid Sedation Scale (POSS)
 - Tested on opioids; scenario based survey
 - Moline - Roberts Pharmacologic Sedation Scale
 - Tested on opioids, benzo and anesthetic agents

Opioid Safety

- **Some hospitals have decided to use more than one sedation scale depending on the intent.**
 - **Iowa Model for Evidence-Based Practice to Promote Quality Care** (Hess, 2014)
 - At the core of the model is thoughtful consideration for the strength of the evidence and application of the EBP change at the bedside
 - **If Strength of the Evidence is Not Sufficient... Conduct Research!**

Opioid Safety

- **Evidence-Based Practice Considerations:**
 - **Application concerns using 2 different scales**
 - If you find a patient sedated, do you know the cause?
 - Sedation is a symptom common to several etiologies:
 - Opioid cause
 - Other sedating medication cause
 - Clinical cause
 - Extend use of an existing tool
 - For example: Glasgow Coma Scale originally used to assess LOC after head injury in the neuro ICU, now applied to acute medical/traumatic head injury patients

Opioid Safety

- Evidence-Based Practice Application Considerations
 - Safety concerns using 2 different scales
 - Communication between staff, units
 - Reliability of the nurse choosing the proper scale
 - ICU patients can be sedated (RASS) and on opioids (other scale)
 - Epidural (RASS) and opioids (other scale)
 - RASS already in place
 - Mechanical ventilation bundle; ICU delirium assessment

The Problem

- No reports found of a single sedation scale used to:
 - Provide goal directed sedation
 - Prevent oversedation due to opioids

Important to generate new knowledge that builds on existing science.

Purpose

- Describe effect of education and utilization of the RASS with Safety Guidelines (RASS-SG) *on nurse confidence, utilization and communication* of sedation level when giving opioids.
- Describe the effect of the RASS with Safety Guidelines (RASS-SG) and color graphics *to accurately guide the administration of opioids* to prevent unintended oversedation.
- Describe the *impact* on unintended opioid oversedation events.

Methods

Sedation Scale: The RASS

- Tested in ICU and med-surg unit
 - Robust reliability and validity to induce
 - Good reliability and validity 0.7 (p<.05) to 0.95 (p<.001) to prevent
- Tested with opioids and other medications that cause sedation
- Nurse Likes: Defined steps
 - Stimulation (Verbal → Physical)
 - Duration of Eye Contact (10 sec)
 - (Arousal + content of thought = consciousness)
- Nurse Dislikes: **No opioid administration guidelines!**

Score	Sign	Description
0	Open eyes	Spontaneously or on eye contact
1	Eye opening to verbal	Eye opening to verbal command or eye contact
2	Eye opening to physical	Eye opening to physical stimulation
3	Sluggish eye opening	Sluggish eye opening to verbal or physical stimulation
4	Unresponsive to eye opening	Unresponsive to eye opening
5	Unresponsive to eye opening	Unresponsive to eye opening


Richmond Agitation and Sedation Scale (RASS) (Used with permission, Sessler, et. al. 2002)

RASS-SG Development

- Safety Consideration Guidelines Sedation Levels 0 to -5
 - Expert Panel of Advanced Practice Nurses (6) in pain management added safety considerations and color to guide opioid administration to prevent unintended oversedation
 - Safety Consideration Guidelines include a recommendation for each sedation level of 0 to -5:
 - **Adjustment** of opioid or other sedating medication
 - **Monitoring** frequency
 - **Rescue** intervention

RASS-SG Development

- **Color Coded Sedation Levels and Safety Guidelines**



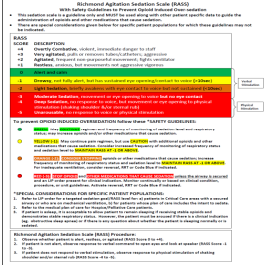
GREEN (RASS 0)
-SAFE to administer opioid or other medication that may cause sedation

YELLOW (RASS -1)
-CAUTION OPIOIDS
-Consider increase frequency of monitoring to MAINTAIN RASS at -1 or above

ORANGE (RASS -2)
-CONSIDER STOPPING OPIOIDS
-Increase frequency of monitoring to MAINTAIN RASS at -1 or above
-Consider rescue

RED (RASS -3, -4, -5)
-STOP OPIOIDS
-Monitor continually
-Activate rescue

RASS with Safety Guidelines (RASS-SG)



MODIFICATIONS

- Safety guidelines
- Color coding
- Considerations for specific patient populations

- Use whether intent is to prevent or to sedate
- Use in ICU or floor

Descriptive Quasi-Experimental Design

- **Setting**
 - General Med-Surgical Unit, 32 beds
 - Ortho, Joint Replacement, 24 beds
 - Spine, 24 beds
- **Sample**
 - Nurses: Convenience sample of critical and non-critical care
 - Patient Records:
 - Identified by daily census report
 - Within the first 48 hours of admission

Descriptive Quasi-Experimental Design

Research Question 1

- **Nurses**
 - What is nurse confidence, utilization and communication of sedation level when administering opioids?
 - Establish Content Validity
 - Pre – Post Survey Monkey

Descriptive Quasi-Experimental Design

Research Question 2

- **Patients**
 - Do safety considerations guide opioid administration to prevent oversedation?
 - Pre – Post RASS-SG with opioid; Patient record review
 - Pre – Post pain level with opioid; Patient record review

Descriptive Quasi-Experimental Design

Research Question 3

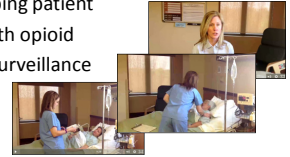
- **Overall Outcome**
 - What is the impact on preventing unintended opioid induced oversedation?
 - Naloxone rescue/1000 patient days

RASS-SG Education Intervention

- **Intervention**
 - **IRB approval**
 - **Education campaign** (Jan-Feb 2012)
 - CBT with video
 - Inservice; 1:1
 - Posted in medication rooms
 - **Used the scale for 2 weeks on the unit**
 - **Data collection** (2/2012 through 6/2013)

RASS-SG Education Intervention

- **Intervention**
 - **Education using video and computer based training**
 - Scenario for each level of sedation
 - Assessment of the sleeping patient
 - Paired pain/sedation with opioid
 - Importance of nursing surveillance

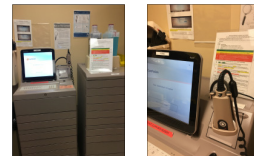


RASS-SG Education Intervention

- **Intervention**
 - **Education 1:1**
 - Ensure nurses knew how to perform an accurate sedation assessment with a return demonstration
 - Ensure nurses knew to pair sedation assessment with pain and document

RASS-SG Education Intervention

- **Intervention**
 - **Education:** Posted in medication rooms
 - Visual of the tool to reference

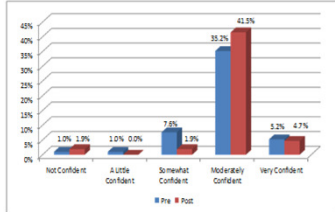


Results

Question 1: Nurse Confidence, Utilization, Communication

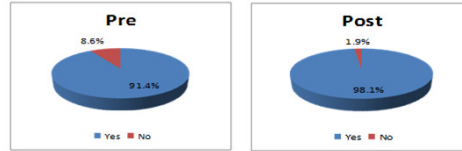
- **Nurse Demographics** (N=158 RN's)
 - Convenience sample of non-critical and critical care from 2 facilities completed pre- and post-surveys
 - 97 ICU
 - 47 floor
 - 14 procedural

Question 1: Nurse Confidence (N=105 pre; 53 post)



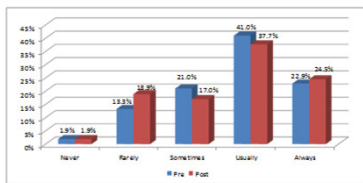
Confidence in ability to assess sedation moved from somewhat to moderately

Question 1: Nurse Utilization (N=105 pre; 53 post)



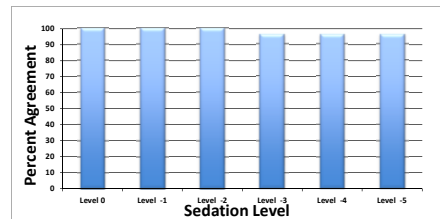
Utilization of a sedation level to determine whether or not to administer opioid improved

Question 1: Nurse Communication (N=105 pre; 53 post)



Communication of sedation level to other care providers was less than expected

Question 1: Content Validity of Safety Guidelines (N=53)



96-100% agreement with safety consideration guidelines 0 to -5

Question 2: Accuracy of Safety Guidelines to Prevent Opioid Induced Oversedation

- Chart review based on inclusion criteria
 - Records were identified by daily census report
 - Within the first 48 hours of admission when opioid for acute pain was most likely to be administered
 - Who were cared for by non-float, regular staff who completed the RASS-SG education.

Question 2: Accuracy of Safety Guidelines to Prevent Opioid Induced Oversedation

Patient Demographics (N=153 opioid doses in 51 patients)						
Patient Type	Gender	Age	POD	BMI		
TKA	31	M 22	X = 64.9	One = 71	X = 30.8	
THA	11	F 29	Range = 41-82	Two = 81	Range = 19.7-52.6	
Spine	6			Three = 1		
General	3					

Question 2: Accuracy of Safety Guidelines to Prevent Opioid Induced Oversedation

Opioid Demographics (N=153 opioid doses in 51 patients)				
Opioid Type		Opioid Route		Opioid to Reassess Time (min)
Oxy IR	61	PO	146	X = 73 min
Norco	48	IV	6	Range = 33-135 min
Dilaudid	30	IM	1	
Percocet	7			
Lortab	3			
MSO4	2			
MS Contin	2			

Question 2: Accuracy of safety guidelines to prevent opioid induced oversedation

		Paired Samples Test							
		Paired Differences			95% Confidence Interval of the Difference				
		Mean Change	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pre-Opioid RASS	.211	.596	.047	-.119	.304	4.524	141	.000
	Post-Opioid RASS								

- Significant change pre- to post- RASS levels ($p < .0001$; N=151)
 - Mean change = 0.211
 - Mean pre- RASS = .00
 - Mean post- RASS = -0.21
- Significant correlation between pre- and post- RASS levels ($p < .0001$)

Question 2: Interpretation

- **RASS-SG guides the nurse to make clinical decisions when administering opioids to prevent oversedation**
 - Significant change in pre and post RASS-SG
 - Nurses stopped at the RASS-SG of -0.211, or just below 0 on the scale, and remained in the safe zone between 0 and -1
 - **Significant correlation between pre and post sedation levels**
 - Indicating the pairs moved together consistently and over time
 - A reliable measure of sedation and adjustment of opioid to stay in safe zone

Question 2: Effect on Pain Level

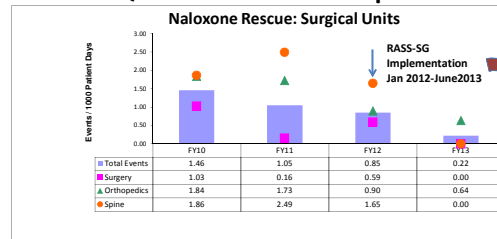
		Paired Samples Test							
		Paired Differences			95% Confidence Interval of the Difference				
		Mean Change	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pre-Opioid Pain Level	.521	4.007	.339	-.148	1.191	1.540	139	.126
	Post-Opioid Pain Level								

- **No significant change from pre and post pain levels** ($p = .126$; N=146)
 - Mean change = 0.521
 - Mean pre pain = 4.47
 - Mean post pain = 3.95 (N=146)
- **Significant correlation between pre and post pain levels** ($p < .0001$)

Question 2: Interpretation

- **Pain Level Decreased**
 - **Although not statistically significant (4.47 to 3.95)**
 - Questions: Were nurses hesitant to give too much pain medicine? Was pain controlled?
 - Serial opioid doses were recorded, so pain may have gone down incrementally totaling more than the mean.
 - Pain may already have been controlled, or close to goal, at the mild to mod level on 0-10 scale.
 - **Significant correlation between pre and post pain levels**
 - Indicating the pairs moved together consistently and over time → a reliable measure of pain.

Question 3: Overall Impact



Opioid induced oversedation events requiring naloxone decreased from 0.85/1000pt days to 0.22/1000 pt days, a **74% decrease over 18 months.**

Conclusions/Implications for Practice

- **ONE Sedation Scale Ensures HIGH RELIABILITY**
 - Accurate communication of sedation level
 - Surveillance for safety using guidelines to adjust opioid and patient monitoring frequency

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **Communication of Sedation Level**
 - Now, more than ever, with standardization of care...
 - between units
 - throughout hospitals, organizations
 - across computer systems, electronic health records
 - ...it is critical to develop tools to ensure safe communication of the patient condition that translates across continuum of care

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- The RASS-SG is a **SINGLE** scale that communicates sedation level to the health care team, organization and electronic health record (EHR) **regardless of intent.**
 - Nurse confidence and scale utilization increased
 - Need to improve
 - Communication at handoff
 - shift to shift and provider to provider
 - Build into nurse work and EHR

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **Surveillance for Safety and Nursing Value**
 - In an era of hospital transparency, to prevent any hospital acquired condition, the results of this study are clinically significant.

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- The RASS-SG provides valid safety statements and color that guide clinical decisions when administering opioids.
 - Pain moved from mod to mild level
 - Safety was maintained

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **RASS-SG training made a difference!**
 - Ensured consistency in performing an accurate sedation assessment
 - Stressed paired pain and sedation levels with opioid administration; now in EHR
 - Highlighted nursing role to prevent unintended sedation

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **Surveillance for Safety and Nursing Value**
 - **Financial Impact of Opioid Harm**
 - Increased LOS (10.3% - 55%) (Odeira, 2007; Kessler, 2013)
 - Increased total hospital costs (7.4% - 47%) (Odeira, 2007; Kessler, 2013)
 - Legal costs claim payments (median = \$216,000/event) (Bain, et al., 2015)
 - **Linking nurse surveillance to the value based metrics of cost savings because of avoided harm is "added value".** (Webster, et al., 2016)

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **Surveillance for Safety and Nursing Value**
 - **The value of nurse surveillance is reported to reduce hospital acquired costs related to CLABSI, CAUTI, PIP, and Falls** (Pappas, et al., 2013)
 - **Now the added value of nurse sedation surveillance and use of safety guidelines to prevent hospital acquired opioid harm is reported**
 - Further research to attach costs avoided

High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Conclusions/Implications for Practice

- **The Value of Nursing**
 - Sedation surveillance, using safety guidelines to adjust opioid and patient monitoring, is key to prevent unintended harm
 - **The RASS with Safety Guidelines is a safe and effective tool that supports nurses to achieve the NO HARM GOAL!**



High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

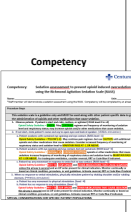
- **Study replicated in affiliated hospitals**
 - Porter Adventist Hospital: 2012-14
 - Littleton Adventist Hospital: 2013-16
 - Parker Adventist Hospital: 2013-16





Questions/Discussion

Competency



Professional Agitation Sedation Scale (PASS)

1. The sedation scale is applicable to all patients requiring sedation/analgesia.

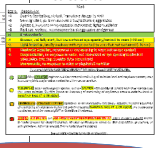
2. The sedation scale is applicable to all patients requiring sedation/analgesia.

3. The sedation scale is applicable to all patients requiring sedation/analgesia.

4. The sedation scale is applicable to all patients requiring sedation/analgesia.

5. The sedation scale is applicable to all patients requiring sedation/analgesia.

Pocket Cards



High Reliability

- Communication of Sedation Level
- Surveillance Using Safety Guidelines

Contact Information

Nan Davidson, MA, RN, CNS-BC
 Clinical Nurse Specialist, Surgical Services
 Porter Adventist Hospital, Centura Health
 Denver, CO

303-765-6164
nancydavidson@centura.org
nandavidson@msn.com



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