Tool Kit

ICU Sedation Guidelines of Care

December 2009
About This Document
The purpose of this document is to provide Intensive Care settings with recommendations and tools for the
development and implementation of an evidence-based standard for safe and effective management of pain,
sedation, and delirium in adult intensive care unit (ICU) ventilated patients.

Intended Audience
The document is intended for Intensive Care Clinical Leaders involved in the care of ICU patients.

Organization of This Document
The document is organized into two main sections: 1) clinical guidelines for adult, sedated ICU patients and
2) plan for implementing the guidelines in your institution.

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INTRODUCTION

CURRENT STATE

One third of all patients in intensive care units (ICUs) worldwide are mechanically ventilated. Common conditions in mechanically ventilated, critically ill, trauma patients are acute pain, anxiety, and delirium.

ICU patients frequently experience pain and physical discomfort from obvious factors, such as pre-existing diseases, invasive procedures, or trauma. Pain and discomfort also can be caused by:

- Monitoring and therapeutic devices such as catheters, drains, and endotracheal tubes
- Performing routine nursing care (e.g., airway suctioning, physical therapy, dressing changes, patient mobilization)
- Prolonged immobility

Jacobi et al (2002) found unrelieved pain may contribute to inadequate sleep and disorientation, and evoke a stress response. Severely ill patients in a stressful environment for prolonged periods may also experience delirium. Delirium itself is attributed to increased length of hospital stay, increased health care costs, and higher mortality. Additionally, the adult ICU patient may experience heart, lung, liver, and kidney complications, Post Traumatic Stress Disorder (PTSD), and long-term cognitive decline.

Further evaluation of clinical processes, protocols, and order management by San Diego Patient Safety Council members identified the following potential patient safety concerns for sedated adult ICU patients:

- Inconsistent interpretation of provider orders
- Inconsistent practice in the use of sedation and analgesia
- Lack of an executable plan with objective assessment tools and protocols for nursing to follow

This has resulted in the following consequences:

- Over and under sedation
- Variability between caregivers
- Variable and undesirable outcomes

Achieving an optimum level of comfort during continuous mechanical ventilation is a major goal in the care of critically ill patients. To do so, critical care health care professionals need a straightforward protocol that can be consistently executed.

CHARTER

Safe and effective management of an adult ICU patient’s pain and anxiety demands a delicate balance of analgesia and sedation protocols while managing delirium. As shown in Figure 1, an optimum state of analgesia, sedation, and delirium management result in reduced pain, decreased anxiety, managed delirium, amnesia, and recovery. Absence of coordinated care for these situations negatively affects the patient experience and clinical outcomes.

The San Diego Patient Safety Council developed an evidence-based standard for safe and effective management of pain, sedation, and delirium in the adult ICU ventilated patient. The objectives of this evidenced-based tool kit are to:

- Decrease pain
- Decrease anxiety
- Decrease ventilator days
- Decrease ICU length of stay
- Reduce long-term cognitive decline
- Avoid heart, lung, liver, and kidney complications
- Reduce the incidence of PTSD
- Reduce occurrences of spontaneous extubation
- Reduce the occurrence of delirium and/or improve the management of delirium.

**Figure 1: Balancing Pain and Anxiety Treatment**

![Figure 1: Balancing Pain and Anxiety Treatment](image-url)
**SCOPE**

The scope of the San Diego Patient Safety Council project includes intubated patients in adult ICUs who require more than 24 hours of ventilatory support. This project excludes the following types of patients:

- Extubated patients in adult ICUs
- Pediatrics
- Head trauma and burn injuries
- End of Life care
- Non-Intensive care
- Chemically paralyzed
- Chronic substance abuse

**PERFORMANCE IMPROVEMENT**

The San Diego Patient Safety Council consists of county wide representatives from acute facilities across multiple disciplines including nurses, pharmacists, physicians, and respiratory therapists. Council members reviewed literature, applied process improvement tools, and shared best practices to obtain consensus in building a comprehensive set of recommendations for safe and effective management of pain, sedation, and delirium in adult ICU ventilated patients. The tool kit consists of these consensus recommendations along with the tools from the literature to assist acute care organizations in implementing these recommendations.

**GUIDELINES**

**CARE MAP**

To ensure a balance of protocols in the care of ICU adult sedated patients, the San Diego Patient Safety Council developed a high level process map ([Figure 2](#)) outlining the care process of this patient population. Beginning with therapeutic sedation/analgesic, the patient’s care providers promote a natural sleep cycle, enhance the care environment, continuously assess the patient’s comfort, implement protocols including daily awakening trials, and evaluate therapy and adjust as needed. This tool kit provides findings and recommendations for each care component.
**Promote Natural Sleep Cycle**

**Sleep Cycle:** A sequence of sleep stages that usually begins with a period of about 80 minutes of NREM sleep followed by about 10 minutes of REM sleep. This cycle of approximately 90 minutes is repeated four to six times each night. If the sequence is interrupted (e.g., by external noise or a sleep disorder), the quality of sleep can suffer.

Sleep-related problems and sleep deprivation affect a patient’s health, well-being, and quality of life. The restorative powers of sleep must be incorporated into the care of any critically ill patient. The San Diego Patient Safety Council recommends the following practices to promote a patient’s natural sleep cycles.

**Promote sleep hygiene by establishing and restoring natural sleep cycles and creating a therapeutic environment for sleep (90 minutes minimum cycle), as follows:**

- **Allow natural sleep at night.** Adjust protocols and activities to provide a respite that nurtures relaxation and leads to natural sleep. Conduct patient activities and mobility during the day such as physical therapy/occupational therapy.
- **Stick to the schedule for sleep.** A specific sleep time must be established early in the patient’s care and consistently followed throughout treatment.
- **Avoid frequent waking tasks and prevent interruptions.** A minimum increment of 90 minutes of sleep is required; therefore, care providers must work to prevent frequent (i.e., every 15 minutes or 30 minutes) waking activities during the sleep period.
- **Allow uninterrupted naps for the patient during the day.** Regular 60- to 90-minute naps should be allowed and encouraged.
- **Use back massage to relax the patient for sleep.** Approximately 5-10 minutes of massage initiates the relaxation response.
- **Create a quiet, dark environment conducive to sleep.** As much as possible, lessen outside lighting, turn off lights including flashing indicators, and reduce human and mechanical noise.
- **Use natural sleep cues.** When establishing the patient’s sleep at night, use natural sleep cues, such as lighting, noise, and smells. If possible, provide a room with a window or provide lighting that mimics the 24 hour day to help patients regulate to daylight/darkness.
- **Use music therapy to encourage sleep.** Music therapy can decrease heart rate, respiratory rate, myocardial oxygen demand, anxiety, and improve sleep. Head phones with soft music preferred by the patient and comforting family messages are recommended.
- **Facilitate patient’s familiarity with environment.**

**Employ comfort measures:**

- Provide complementary holistic therapies
- Encourage family to stay at bedside
- Remove unnecessary lines and tubes
- Remove or minimize restraints
- Encourage family to be at the bedside and engage the patient in activities as well as sitting quietly with the patient to promote rest

**Patient Assessment Algorithm**

Considering the physiologic, behavioral, and pharmacological variables that exist with critically ill sedated adults, a problem-solving approach is important to consistent patient care. Key elements of this algorithm include measurable objectives, common language, and simple presentation of pertinent information. Figure 3 illustrates the San Diego Patient Safety Council’s recommended algorithm for care providers to achieve systematic decisions in the care delivery of sedated adult ICU patients.
**Figure 3: Assessment Algorithm for Sedated Adult ICU Patients**

**Is patient comfortable and at goal for Sedation and Analgesics?**

- Yes
  - Reassess goal daily
  - Titrate and taper therapy to maintain goal
  - Perform awakening trial, if appropriate

- No
  - Rule out/correct reversible causes
  - Use nonpharmacologic treatment
  - Optimize the environment

**Pain**

- Is patient in pain?
  - Yes: Use pain scale to assess patient
  - Set goal for analgesia
  - TARGET: Non-Verbal Pain Scale: 0 – 2
  - Critical Care Pain Observation Tool: 0 - 1

**Hemodynamically Stable**
- FentaNYL
- HYDROmorphone
- Morphine

**Hemodynamically Unstable**
- FentaNYL
- Renal Impairment
- FentaNYL
- HYDROmorphone

**Sedation**

- Is patient agitated / anxious?
  - Yes: Use scale to assess patient
  - Set goal for sedation
  - TARGET: Richmond Agitation Sedation Scale (RASS): 0 to -3
  - Riker Sedation-Agitation Scale (SAS): 3 to 4

**DRUG SELECTION:**
- Anticipate sedation (< 72 hours)
  - Midazolam
  - Propofol
  - Dexmedetomidine

- Anticipate sedation (> 72 hours)
  - LORazepam
  - Patient has renal impairment
  - LORazepam
  - Propofol

**SEDATION:**
- Use for RASS greater or equal to 2 levels below what is ordered
  - (e.g., RASS of -2 with an ordered goal of 0)
  1.) LORazepam/midazolam continuous infusion: Hold infusion until patient reaches RASS goal, then resume at one-half previous rate. Titrate per written orders.
  2.) Propofol continuous infusion: Decrease rate 5-10 mcg/kg/min every 10 minutes until patient reaches RASS goal. Titrate per written orders.
  3.) Morphine/HYDROmorphone/fentaNYL continuous infusion: Hold until patient reaches RASS goal, then resume at one-half previous rate. Titrate per written orders.

**Delirium**

- Is patient delirious?
  - Yes: Use scale to assess patient
  - Consider potential causes

**Pharmacologic Treatment for Delirium:**
- NPO:
  - Dexmedetomidine 0.2-1.5 mcg/kg/hr (Consider in patients failing spontaneous breathing trials secondary to agitation)
  - Haloperidol 2.5-5mg IV q 15 min prn + delirium (suggested max 35 mg/ day) (Consider decreased dose in hypoactive delirium)

- PO:
  - Aripiprazole 10-15 mg po daily (Consider when baseline QTc>440 msec)
  - Haloperidol 2.5-5 mg po q6 hr (Caution if baseline QTc >440 msec)
  - QUEtamine 50-200 mg po q12 hr (Consider if sedative properties desired)
  - Risperidone 0.5-1 mg po q12 hr (Caution baseline QTc >440 msec)

**Non-Pharmacologic Treatments for Delirium:**
- Ensure Daily Awakening Trials conducted
- Continually reorient patient
- Perform early mobilization
- Promote effective sleep / awake cycles
- Perform timely removal of catheters/physical restraints
- Ensure the use of eyeglasses, magnifying lenses, and hearing aids
- Minimize noise/stimulation at night
- Minimize Benzodiazepines for sedation
PAIN ASSESSMENT

All critically ill patients have the right to adequate analgesia and management of their pain. Some patients recall unrelieved pain when interviewed about their ICU stays. A patient’s pain experience in the ICU need not be memorable given effective attention and application of pain management and amnesic agents. This begins with an accurate and standard method of assessing and caring for a patient’s pain (Figure 4).

Although critical care clinicians strive to obtain self-report of pain from the patient, many factors compromise patients’ ability to communicate verbally, including the use of sedative agents, mechanical ventilation, and changes in level of consciousness. The use of validated pain scales for both the self-reporting and non-verbal reporting patient is strongly recommended by the council.

Additionally, the council recommends the following guidelines:

- **Evaluate the patient’s sedation and pain together.** A patient’s level of comfort is impacted by these two variables. An assessment should be conducted systematically on both.

- **Conduct pain assessment using an appropriate pain scale.** Effective pain assessment and response to therapy must be performed regularly using a validated scale appropriate to the patient population. Furthermore, a single, validated non-verbal pain scale should be used across an organization.

- **Search for presence of pain.** A sedated patient’s pain assessment must include further investigation and observation to better determine the presence of pain. Care providers should consider painful lines/tubes, injuries, procedures, and pain history in their assessment.

- **Determine the time since the patient’s last analgesic.** A patient’s pathology and analgesic history, specifically the time since the last analgesic agent was administered, as well as the dose and the effectiveness of the dose, need to be included when evaluating a patient’s pain intensity.

- **Ensure consistent analgesic therapy.** A therapy plan and goal of analgesia should be established for each patient and communicated to all caregivers. The goal of analgesia therapy should be re-evaluated and communicated to all caregivers as the patient’s clinical condition changes.

  - Provide bolus of analgesia to get ahead of the pain, especially before doing a patient procedure (e.g., turning, dressing changes, suction), and then infuse analgesia to sustain control.

  - Scheduled opioid doses or a continuous infusion are preferred over an “as needed” regimen to ensure consistent analgesia.

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**Figure 4: Pain Management Algorithm**

- **Is patient in pain?**
  - Use pain scale to assess patient
  - Set goal for analgesia

- **TARGET:**
  - Non-Verbal Pain Scale: 0 – 2
  - Critical Care Pain Observation Tool: 0 - 1

- **Consider potential causes**

- **Primary approach for pain:**
  - bolus for pain control and then infusion to sustain control

- **Hemodynamically Stable**
  - FentaNYL infusion at 25 – 50mcg/hr
  - HYDROMorphone infusion at 0.4 – 0.8 mcg/hr
  - Morphine infusion at 2 – 4 mcg/hr

- **Signs & Symptoms of Opiate Withdrawal**
  - Pupil dilation
  - Vomiting
  - Sweating
  - Diarrhea
  - Laceration
  - Hypertension
  - Rhinorrhea
  - Fever
  - Piloerection
  - Tachypnea
  - Tachycardia
  - Agitation

- **TITRATING OFF INFUSIONS:**
  - The potential for opioids withdrawal should be considered for patients receiving high doses or seven (7) days of continuous therapy. Doses should be tapered systematically (i.e. 10-30 percent per day) to prevent withdrawal symptoms.
Pain Assessment

- Start sedation therapy of agitated, critically ill patients only AFTER providing adequate analgesia and treating reversible physiological causes (e.g., hypoxemia, hypoglycemia, hypotension, and withdrawal from alcohol or other drugs).
- A Non-Steroidal Anti-Inflammatory (NSAID) or acetaminophen is recommended as an adjunct to opioids unless contraindicated.
- **Anticipate pain.** Preventing pain is more effective than treating established pain. Effective pain management requires care providers to anticipate a patient’s pain and adjust therapy as needed.

For pain assessment tools and the order set provided in this tool kit, see Appendix: Tools to Drive Success on page 26.

For additional education and resources on pain management including the 18 language pain assessment tool, refer to the Purdue Web Site (www.PartnersAgainstPain.com).

Self-Reporting of Pain

For the self-reporting patient, the 0-10 Numerical Pain Intensity Rating Scale, 0-10 Numeric Pain Distress Scale, and Wong-Baker FACES Pain Rating Scale may be considered for systematic use across critical care units. The following self-reporting pain assessment scale is a combination of all three scales (Figure 5).

**Figure 5: Self-Reporting Pain Assessment Scale**

**Wong-Baker FACES Pain Rating Scale**

Directions: When the patient is awake, show this card with the faces. Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Point to each face and ask the person to choose the face that best describes how he is feeling. Based on his response, circle the appropriate scale number.

**NOTE:** Although the numbers associated with this scale are 0-5, the scale number should be doubled to a scale of 0-10 in order to apply the standard order set.

![Self-Reporting Pain Assessment Scale](image)

**0-10 Numeric Pain Scales** (circle one)

*Adapted from: Hockenberry MJ, Wilson D: Wong’s essentials of pediatric nursing, ed. 8, St. Louis, 2009, Mosby. Used with permission. Copyright Mosby.

**Adapted from: Acute Pain Management: Operative or Medical Procedures and Trauma, Clinical Practice Guideline No. 1. AHCPR Publication No. 92-0032: February 1992; Agency for Healthcare Research & Quality, MD; 116-117.
Non-Verbal Reporting of Pain

In non-verbal patients unable to self-report pain level, the critical care clinician should use a validated, non-self-reporting pain scale. The non-verbal reporting pain tools evaluated by the council were the Critical-Care Pain Observation Tool (CPOT) and 10 Point Non-Verbal Pain Scale.7

There was not a clear preference from the council among the non-verbal pain scales. Both scales need additional research and both meet the assessment needs of care today. Therefore, the council voted to place both in this tool kit. It is the council’s recommendation that either pain scale may be used as part of assessing a patient’s sedation status.

For patient’s unable to self-report pain, observable behavioral/facial expressions (e.g., grimacing) and physiological indicators (e.g., tachycardia, hypertension) represent important indices for the assessment of pain.8 Other measures should be used to detect pain and evaluate intervention, such as searching for potential causes of pain and surrogate reporting (family members, caregivers) of pain and behavior/activity changes.6

Evaluation of the 10 Point Non-Verbal Pain Scale (Figure 6) by the council determined that the scale is condensed, easy-to-follow, more established, and includes and standardizes physiologic factors in the assessment. However, these same standardized physiologic indicators allow for arbitrary measurements, and there are too many other variables, which do not easily align with the 0-1-2 numbers. For this reason, the council recommended including the CPOT as another option to consider for pain assessment.

The Critical-Care Pain Observation Tool

Evaluation of the behavioral pain assessment tool, CPOT (Figure 7) by the council determined that CPOT is an easy to use and teach scale that may be used on all patients regardless of their level of consciousness and intubation status. This pain scale is less demanding of the provider, because it can be seamlessly integrated into daily care delivery and clinical assessment. The CPOT is a relatively new scale, which will require an education plan for implementation.

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**Figure 6: 10 Point Non-Verbal Pain Scale**

Directions: Observe patient per category and, based on your findings, circle the appropriate scale number.

### FACIAL EXPRESSION

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No particular smile or expression</td>
</tr>
<tr>
<td>1</td>
<td>Occasional grimace, tearing, frowning, and/or wrinkled forehead</td>
</tr>
<tr>
<td>2</td>
<td>Frequent grimacing, tearing, frowning, and/or wrinkled forehead</td>
</tr>
</tbody>
</table>

### ACTIVITY

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Lying quietly, normal position</td>
</tr>
<tr>
<td>1</td>
<td>Seeking attention through movement or slow cautious movement</td>
</tr>
<tr>
<td>2</td>
<td>Restless excessive activity and/or withdrawal reflexes</td>
</tr>
</tbody>
</table>

### GUARDING

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Lying quietly, no positioning of hands over area of body</td>
</tr>
<tr>
<td>1</td>
<td>Splitting areas of the body, tense</td>
</tr>
<tr>
<td>2</td>
<td>Rigid, stiff</td>
</tr>
</tbody>
</table>

### PHYSIOLOGIC PARAMETER

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Stable vital signs</td>
</tr>
<tr>
<td>1</td>
<td>Change over past 4 hours in any of the following SBP &gt; 20mmHg or heart rate &gt; 20 bpm</td>
</tr>
<tr>
<td>2</td>
<td>Change over past 4 hours in any of the following SBP &gt; 30mmHg or heart rate &gt; 26 bpm</td>
</tr>
</tbody>
</table>

### RESPIRATORY

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Baseline respiratory rate/oxygen saturation, compliant with ventilator</td>
</tr>
<tr>
<td>1</td>
<td>RR &gt; 10 above baseline or 5% decrease in oxygen saturation, mild ventilator asynchrony</td>
</tr>
<tr>
<td>2</td>
<td>RR &gt; 20 above baseline or 10% decrease in oxygen saturation, mild ventilator asynchrony</td>
</tr>
</tbody>
</table>

**SCORE:** _______  **Target Pain: 0 - 1**
**Figure 7: The Critical-Care Pain Observation Tool (CPOT)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facial expression</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relaxed, neutral</td>
<td>0</td>
<td>No muscle tension observed</td>
</tr>
<tr>
<td>Tense</td>
<td>1</td>
<td>Presence of frowning, brow lowering, orbit tightening and levator contraction or any other change (e.g., opening eyes or tearing during nociceptive procedures)</td>
</tr>
<tr>
<td>Grimacing</td>
<td>2</td>
<td>All previous facial movements plus eyelid tightly closed (the patient may present with mouth open or biting the endotracheal tube)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of movements or normal position</td>
<td>0</td>
<td>Does not move at all (doesn't necessarily mean absence of pain) or normal position (movements not aimed toward the pain site or not made for the purpose of protection)</td>
</tr>
<tr>
<td>Protection</td>
<td>1</td>
<td>Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements</td>
</tr>
<tr>
<td>Restlessness</td>
<td>2</td>
<td>Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerating ventilator or movement</td>
<td>0</td>
<td>Alarms not activated, easy ventilation</td>
</tr>
<tr>
<td>Coughing but tolerating</td>
<td>1</td>
<td>Coughing, alarms may be activated but stop spontaneously</td>
</tr>
<tr>
<td>Fighting ventilator</td>
<td>2</td>
<td>Asynchrony: blocking ventilation, alarms frequently activated</td>
</tr>
<tr>
<td>Talking in normal tone or no sound</td>
<td>0</td>
<td>Talking in normal tone or no sound</td>
</tr>
<tr>
<td>Sighing, moaning</td>
<td>1</td>
<td>Sighing, moaning</td>
</tr>
<tr>
<td>Crying out, sobbing</td>
<td>2</td>
<td>Crying out, sobbing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxed</td>
<td>0</td>
<td>No resistance to passive movements</td>
</tr>
<tr>
<td>Tense, rigid</td>
<td>1</td>
<td>Resistance to passive movements</td>
</tr>
<tr>
<td>Very tense or rigid</td>
<td>2</td>
<td>Strong resistance to passive movements, incapacity to complete them</td>
</tr>
</tbody>
</table>

**SCORE:** 

**Target Pain: 0 - 1**

Directions for use of the CPOT:
1. The patient must be observed at rest for one minute to obtain a baseline value of the CPOT.
2. The patient should be observed during nociceptive procedures (e.g., turning, endotracheal suctioning, wound dressing) to detect any changes in the patient’s behaviors to pain.
3. The patient should be evaluated before and at the peak effect of an analgesic agent to assess if the treatment was effective in relieving pain.
4. For the rating of the CPOT, the patient should be attributed the highest score observed during the observation period.
5. The patient should be attributed a score for each behavior included in the CPOT and muscle tension should be evaluated last, especially when the patient is at rest because just the stimulation of touch (passive flexion and extension of the arm) may lead to behavioral reactions.
SEDATION

Sedatives are drugs that calm a patient down, easing agitation and permitting sleep. Sedatives generally work by modulating signals within the central nervous system.

Robinson et al (2008) found continuous sedative infusions for critically ill patients have been shown to increase the duration of mechanical ventilation and length of intensive care stay, despite perceived advantages. The weaning of patients from mechanical ventilation is often hampered by the sedation they receive. Additionally, coordinated daily interruption of sedative infusions with objective re-titration in critically ill patients has been shown to decrease the durations of mechanical ventilation and length of ICU stay.

Clinical care practice guidelines and parameters developed by the Society of Critical Care Medicine (SCCM) recommend regular assessment and response to sedation therapy. The appropriate target level of sedation is a calm patient that can be easily aroused with maintenance of the normal sleep-wake cycle. Some patients may require deep levels of sedation to facilitate mechanical ventilation. Figure 8 illustrates the San Diego Patient Safety Council recommendations for managing patient sedation.

For sedation scales, both the Richmond Agitation Sedation Scale (RASS) and the Riker Sedation-Agitation Scale (SAS) are in practice at San Diego Patient Safety Council organizations. The RASS and SAS scales have been included in this tool kit for reference. The San Diego community has experience with both sedation scales and recommends each health care organization conduct its own evaluation of these two scales. It is important that a common scale is adopted for consistent and effective use throughout the organization.

Figure 8: Sedation Management Algorithm

**Is patient agitated / anxious?**
- Use scale to assess patient
- Set goal for sedation

**TARGET:**
- Richmond Agitation Sedation Scale (RASS): 0 to -3
- Riker Sedation-Agitation Scale (SAS): 3 to 4

**Consider potential causes**

**DRUG SELECTION:**
- Anticipate sedation (≤ 72 hours)
  - Midazolam
  - Propofol
  - Dexmedetomidine
- Anticipate sedation (> 72 hours)
  - LORazepam
  - Patient has renal impairment
  - LORazepam
  - Propofol

**SEDATION:**
- Use for RASS greater or equal to 2 levels below what is ordered (e.g., RASS of -2 with an ordered goal of 0)
  1.) LORazepam/midazolam continuous infusion: Hold infusion until patient reaches RASS goal, then resume at one-half previous rate. Titrate per written orders.
  2.) Propofol continuous infusion: Decrease rate 5-10 mcg/kg/min every 10 minutes until patient reaches RASS goal. Titrate per written orders.
  3.) Morphine/HYDROMorphone/fentaNYL continuous infusion: Hold until patient reaches RASS goal, then resume at one-half previous rate. Titrate per written orders.

**TITRATING OFF INFUSIONS:**

The potential for benzodiazepine or propofol withdrawal should be considered for patients receiving high doses or seven (7) days of continuous therapy. Doses should be tapered systematically (i.e. 10-30 percent per day) to prevent withdrawal symptoms.

**Symptoms of benzodiazepine withdrawal:** Fever, Hypertension, Tachycardia, Tachypnea, Tremors/seizures, Hyper-reflexia, Altered mental status, Disorientation, Hallucinations, Psychotic behavior.

**EXCESSIVE SEDATION INVOLVING BENZODIAZEPINES**

Flumazenil (Romazicon) - use lower doses in patients receiving benzodiazepines ≥ 7 days
- Flumazenil 0.2 mg (2 mL) IV over 30 seconds. Wait 30 seconds. Reassess.
- May give additional 0.3 mg (3 mL) over 30 seconds if needed. Reassess.
- Additional doses of 0.5 mg (5 mL) can be administered over 30 seconds at 1-minute intervals as needed (maximum cumulative dose = 3 mg).

For sedation assessment tools and the order set provided in this tool kit, see Appendix: Tools to Drive Success on page 26.
Sedation

RASS is a 10-point scale, with four levels of anxiety or agitation (+1 to +4 [combative]), one level to denote a calm and alert state (0), and 5 levels of sedation (-1 to -5) culminating in unarousable (-5). The values and definitions for each level of agitation and sedation are displayed in Table 1, as are the instructions for assessment.

Table 1: Richmond Agitation Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative, overtly combative, violent, immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very Agitated, pulls or removes tube(s) or catheter(s), aggressive</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated, frequent non-purposeful movement, fights ventilator</td>
</tr>
<tr>
<td>+1</td>
<td>Restless, anxious but movements not aggressive vigorous</td>
</tr>
<tr>
<td>0</td>
<td>Alert and Calm</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy, not fully alert, but has sustained awakening (&gt;10 seconds) (eye-opening/eye contact) to voice</td>
</tr>
<tr>
<td>-2</td>
<td>Light Sedation, briefly awakens with eye contact to voice (&lt;10 seconds)</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate Sedation, movement or eye opening to voice (but no eye contact)</td>
</tr>
<tr>
<td>-4</td>
<td>Deep Sedation, no response to voice, but movement or eye opening to physical stimulation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable, no response to voice or physical stimulation</td>
</tr>
</tbody>
</table>

SAS was the first scale proven to be reliable and valid in critically ill adults. SAS scores a patient’s level of consciousness and agitation from a 7 point list describing patient behavior.13

Table 2: Riker Sedation-Agitation Scale (SAS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Dangerous Agitation</td>
<td>Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side</td>
</tr>
<tr>
<td>6</td>
<td>Very Agitated</td>
<td>Requiring restraint and frequent verbal reminding of limits, biting ETT</td>
</tr>
<tr>
<td>5</td>
<td>Agitated</td>
<td>Anxious or physically agitated, calms to verbal instructions</td>
</tr>
<tr>
<td>4</td>
<td>Calm and Cooperative</td>
<td>Calm, easily arousable, follows commands</td>
</tr>
<tr>
<td>3</td>
<td>Sedated</td>
<td>Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again</td>
</tr>
<tr>
<td>2</td>
<td>Very Sedated</td>
<td>Arouses to physical stimuli but does not communicate or follow commands, may move spontaneously</td>
</tr>
<tr>
<td>1</td>
<td>Unarousable</td>
<td>Minimal or no response to noxious stimuli, does not communicate or follow commands</td>
</tr>
</tbody>
</table>

Guidelines for SAS Assessment

1. Agitated patients are scored by their most severe degree of agitation, as described.
2. If patient is awake or awakens easily to voice (“awaken” means responds with voice or head shaking to a question or follows commands), that is a SAS 4 (same as calm and appropriate – might even be napping).
3. If more stimuli such as shaking is required but patient eventually does awaken, that is a SAS 3.
4. If patient arouses to stronger physical stimuli (may be noxious) but never awakens to the point of responding yes/no or following commands, that is a SAS 2.
5. Little or no response to noxious physical stimuli is a SAS 1.

This helps separate sedated patients into those you can eventually awaken (SAS 3), those you can not awaken, but can arouse (SAS 2), and those you can not arouse (SAS 1).

Non-Pharmacologic Sedation Strategies

If the patient is anxious or agitated, consider non-medication or environmental strategies to assist with management, such as environment modification, relaxation, back massage, and music therapy when appropriate.
Delirium occurs in up to 65 percent of hospitalized patients, and up to 87 percent of patients admitted to the ICU. The outcomes of delirium can be serious for the patient and should be considered as another organ failure that affects patient outcome. Delirium is associated with higher mortality and increased length of hospital stay and health care costs. Delirium must be considered when assessing pain based on ICU sedation. Figure 9 illustrates the San Diego Patient Safety Council recommendations for managing delirium in sedated adult ICU patients.

**Figure 9: Delirium Management Algorithm**

Delirium, characterized by fluctuations in mental status such as inattention, disorganized thinking, hallucinations, disorientation, and an altered level of consciousness, is a frequent occurrence in the intensive care unit (ICU).

Delirium can further be defined as:

- Hyperactive delirium: previously referred to as ICU psychosis, hyperactive delirium includes such symptoms as hypervigilance, restlessness, anger, irritability, and uncooperativeness and is associated with better overall outcomes.
- Hypoactive delirium: the more common and deleterious form, is characterized by lack of awareness, decreased alertness, sparse or slow speech, lethargy, decreased motor activity, and apathy.
- Mixed delirium: is apparent in those patients with a mixed clinical picture and may occur in up to 54 percent of patients.

**Risk Factors for Delirium**

Delirium in patients usually develops between 24 and 72 hours after admission to ICU. Factors placing patients at risk for delirium before or during hospitalization exist and must be considered in assessing and treating delirium. Known risk factors for delirium include:

- Risk factors before hospitalization: cognitive impairment, chronic illness (including hypertension), advanced age (over 65 years), depression, smoking, alcoholism, and severity of illness.
- Risk factors during hospitalization: Congestive heart failure, sepsis, prolonged restraint use and immobility, withdrawal, seizures, dehydration, hyperthermia, head trauma, intracranial space-occupying lesions, and the use of specific medications: Lorazepam/ Midazolam, Morphine/fentanyl, and Propofol.
Assessing for Delirium

Delirium is categorized according to level of alertness and level of psychomotor activity. Careful evaluation, accurate identification, and prompt treatment of delirium can successfully minimize or prevent adverse patient outcomes. Practical recommendations for care providers to consider when assessing delirium include:

- **Assess with a validated scale** – It is recommended that the nurse assess for the existence of delirium using a validated delirium scale. This assessment should be performed once a shift. Tools used to assess for the presence of delirium were evaluated by the council and included: Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and Intensive Care Delirium Screening Checklist (ICDSC) (Tables 3 and 4).

- **Assess for QTc Prolongation** – QTc is the QT interval corrected for heart rate. All standard EKGs display the QTc (Figure 10). QTc > 440-460 msec is generally considered prolonged, but each institution is encouraged to address monitoring guidelines as appropriate. Baseline QTc monitoring is recommended for patients receiving agents that put them at risk for increased QTc (see agents listed in Table 7 on page 21). More frequent monitoring for patients with multiple risk factors should be considered.

- **Perform Daily Awakening Trial** – A Daily Awakening Trial ensures the patient is not overly sedated and allows drugs to be cleared from the system. In turn, this allows for an assessment of ventilatory status (see Daily Awakening Trial on page 19).

Treating Delirium

The treatment of a patient’s delirium should include both pharmacologic and non-pharmacologic therapy. For pharmacologic therapy, large randomized trials comparing agents for efficacy are minimal, and no single agent has overwhelming evidence to support superiority for treatment of delirium. Drug selection based on patient-specific factors is recommended in treating delirium. For a comparison of suggested agents for delirium, see Table 7: Agents for Delirium on page 21. During the council’s discussion on maximum dosage of agents, a debate existed regarding Haloperidol; some sources suggested a maximum total daily dose of 35 mg/day and other sources suggested a maximum total daily dose of 20 mg/day. The council recommends careful consideration when determining maximum total daily dose for agents treating delirium. NOTE: Dosing ranges provided in this tool kit are general guidelines and are not intended to supersede clinical judgment of prescriber.

Suggested non-pharmacologic treatments of delirium include:

- Ensure Daily Awakening Trials performed
- Continually reorient patient to environment/surroundings
- Perform early mobilization
- Promote effective sleep/awake cycles
- Perform timely removal of catheters/physical restraints
- Ensure the use of eyeglasses, magnifying lenses, hearing aids
- Minimize continuous noise/stimulation at night
- Minimize benzodiazepine for sedation

For delirium assessment tools and the order set provided in this tool kit, see the Appendix: Tools to Drive Success on page 26.
Confusion Assessment Method for the Intensive Care Unit

The CAM-ICU considers patients delirious when an acute onset of mental status changes or a fluctuating course is accompanied by either disorganized thinking or an altered level of consciousness. The CAM-ICU addresses verbal and non-verbal patients and is a more established, reliable, faster, and easy to interpret tool. It provides higher sensitivity and incorporates the RASS scale. The CAM-ICU is not a hallucination assessment and assesses only a point in time. Educating staff on the CAM-ICU requires significant instruction and demands focused time to perform the assessment correctly. Figure 11 provides an algorithm for using the CAM-ICU to assess for delirium.

For additional educational resources on ICU delirium including the CAM-ICU Training Manual and CAM-ICU Worksheet, go to the Vanderbilt University Medical Center web site at www.icudelirium.org.

Figure 11: Delirium Assessment (CAM-ICU) Algorithm

Delirium Assessment (CAM-ICU): 1 AND 2 AND (Either 3 OR 4)

1. Acute Onset or Fluctuating Course
   - An acute change from mental status baseline?
   - Or Patient’s mental status fluctuating during the past 24 hrs
   - [Yes/No]
   - No: Stop No delirium
   - Yes: Proceed to next step

2. Inattention
   - Please read the following ten letters: S A V E A H A R T
   - Scoring: Error when patient fails to squeeze on the letter “A”
   - [≥3 Errors]
   - <3 Errors: Stop No delirium
   - ≥3 Errors: Proceed to next step

3. Altered Level of Consciousness (“actual” RASS)
   - If RASS is 0, proceed to next step
   - If RASS is other than zero
   - [RASS]
   - Patient is Delirious

4. Disorganized Thinking
   - 1. Will a stone float on water? (Or: Will a leaf float on water?)
   - 2. Are there fish in the sea? (Or: Are there elephants in the sea?)
   - 3. Does one pound weigh more than two pounds? (Or: Do two pounds weigh more than one?)
   - 4. Can you use a hammer to pound a nail? (Or: Can you use a hammer to cut wood?)
   - 5. Command:
     - Say to patient: “Hold up this many fingers” (Examiner holds two fingers in front of patient)
     - “Now do the same thing with the other hand” (Not repeating the number of fingers)
     - If patient is unable to move both arms for the second part, ask patient “hold one more finger”
   - [≥2 Errors]
   - <2 Errors: Stop No delirium

Copyright © 2003, Vanderbilt Medical Center. Harvard CAM-ICU Flowsheet (by Houman Amirfarzan, M.D., Wes Ely, M.D.)
### Table 3: Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)

**FEATURE 1: Acute Onset or Fluctuating Course**

Positive, if answer ‘yes’ to either 1A or 1B.

<table>
<thead>
<tr>
<th>1A:</th>
<th>Is the patient different than his/her baseline mental status?</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>1B:</th>
<th>Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation scale (e.g., RASS, GCS, or previous delirium assessment)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

**FEATURE 2: Inattention**

Positive, if either score for 2A or 2B is less than 8

<table>
<thead>
<tr>
<th>2A: AUDITORY (Letter – ASE)</th>
<th>Score (out of 10):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directions: Say to the patient, “I am going to read you a series of 10 letters. Whenever you hear the letter ‘A’ indicate by squeezing my hand.” Read letters from the following letter list in a normal tone: SAVE A HA ART</td>
<td></td>
</tr>
<tr>
<td>Scoring: Errors are counted when patient fails to squeeze on the letter “A” and when the patient squeezes on any letter other than “A.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2B: VISUAL (Pictures - ASE)</th>
<th>Score (out of 10):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directions: Use the Picture Packets (A and B) on the next page.</td>
<td></td>
</tr>
</tbody>
</table>

**FEATURE 3: Disorganized Thinking**

Positive, if the combined score is less than 4

<table>
<thead>
<tr>
<th>3A: Yes/No Questions</th>
<th>Combined Score (3A + 3B):</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Use either Set A or B, and alternate on consecutive days if necessary):</td>
<td>(out of 5)</td>
</tr>
<tr>
<td>1. Will a stone float on water?</td>
<td>3A Score</td>
</tr>
<tr>
<td>2. Are there fish in the sea?</td>
<td>1. Will a leaf float on water?</td>
</tr>
<tr>
<td>3. Does one pound weigh more than two pounds?</td>
<td>2. Are there elephants in the sea?</td>
</tr>
<tr>
<td>4. Can you use a hammer to pound a nail?</td>
<td>3. Do two pounds weigh more than one pound?</td>
</tr>
<tr>
<td>4. Can you use a hammer to cut wood?</td>
<td>4. Can you use a hammer to cut wood?</td>
</tr>
</tbody>
</table>

(Patient earns 1 point for each correct answer out of 4) **3A Score**

<table>
<thead>
<tr>
<th>3B: Command</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Say to patient: “Hold up this many fingers: (Examiner holds two fingers in front of patient) &quot;Now do the same thing with the other hand: (Not repeating the number of fingers). <em>If patient is unable to move both arms, for the second part of the command ask patient to “Add one more finger”</em></td>
<td></td>
</tr>
</tbody>
</table>

(Patient earns 1 point if able to successfully complete the entire command) **3B Score**

**FEATURE 4: Altered level of Consciousness**

Positive, if the actual RASS score is anything other than "0” (zero)

<table>
<thead>
<tr>
<th>Alert</th>
<th>Spontaneously fully aware of environment and interacts appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vигильный</td>
<td>Hyper alert</td>
</tr>
<tr>
<td>Лихорадочный</td>
<td>Drowsy but easily aroused, unaware of some elements in the environment, or not spontaneously interacting appropriately with the interviewer; becomes fully aware and appropriately interactive when prodded minimally</td>
</tr>
<tr>
<td>Stupor</td>
<td>Becomes incompletely aware when prodded strongly; can be aroused only by vigorous and repeated stimuli, and as soon as the stimulus ceases, stuporous subject lapses back into the unresponsive state.</td>
</tr>
</tbody>
</table>

(Features 1 and 2 and either Feature 3 or 4): **Overall CAM-ICU:**

Positive

Negative

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2B: VISUAL (Pictures - ASE)

Step 1: 5 pictures
Directions: Say to the patient, “Mr. or Mrs. __________, I am going to show you pictures of some common objects. Watch carefully and try to remember each picture, because I will ask what pictures you have seen.” Then show Step 1 of either Packet A or Packet B, alternating daily if repeat measures are taken. Show the first 5 pictures for 3 seconds each.

Packet A

Packet B

Step 2: 10 pictures
Directions: Say to the patient, “Now I am going to show you some more pictures. Some of these you have already seen and some are new. Let me know whether or not you saw the picture before by nodding your head yes (demonstrate) or no (demonstrate).” Then show 10 pictures (5 new 5 repeat) for 3 seconds each (Step 2 of Packet A or B, depending upon which form was used in Step 1 above).

Scoring: This test is scored by the number of correct “yes” or “no” answers during the second step (out of a possible 10). To improve the visibility for elderly patients, the images are printed on 6”x10” buff colored paper and laminated with a matte finish. Note: If a patient wears glasses, make sure he/she has them on when attempting the Visual ASE.

Packet A

Packet B
The Intensive Care Delirium Screening Checklist (ICDSC)

The ICDSC evaluates the level of consciousness, inattention, disorientation, hallucinations, psychomotor activity, speech or mood disturbance, sleep disturbance, and fluctuation of symptoms. The ICDSC tool includes all of the relevant components needed in a delirium assessment and provides scoring based on 12 hours of behavior, which affords better specificity and higher, over time reliability. However, the tool is labor intensive and the 0-8 scale implies a range of more or less delirium. Furthermore, the tool’s complicated scoring is a teaching challenge.

**Table 4: Intensive Care Delirium Screening Checklist (ICDSC)**

<table>
<thead>
<tr>
<th>Intensive Care Delirium Screening Checklist</th>
<th>SCORE</th>
</tr>
</thead>
</table>
| **1. Altered level of consciousness. Choose ONE from A-E.**
  Note: May need to reassess patient if recent administration of sedation therapy. |
  A. Exaggerated response to normal stimulation SAS = 5, 6, or 7 Score 1 point
  B. Normal wakefulness SAS = 4 Score 0 point
  C. Response to mild or moderate stimulation (follows commands) **Stop assessment**
  D. Response only to intense and repeated stimulation (e.g., loud voice and pain) SAS = 2 **Stop assessment**
  E. No response SAS = 1 **Stop assessment** |
| **2. Inattention. Score 1 point for any of the following abnormalities:**
  A. Difficulty in following commands OR
  B. Easily distracted by external stimuli OR
  C. Difficulty in shifting focus *Does the patient follow you with their eyes?*
| **3. Disorientation. Score 1 point for any of the following abnormality:**
  A. Mistake in either time, place, or person
  *Does the patient recognize ICU caregivers who have cared for him/her and not recognize those that have not? What kind of place are you in? (list examples)* |
| **4. Hallucinations or Delusions. Score 1 point for either:**
  A. Equivocal evidence of hallucinations or a behavior due to hallucinations (Hallucination = perception of something that is not there with NO stimulus) OR
  B. Delusions or gross impairment of reality testing (Delusion = false belief that is fixed/unchanging)
  *Any hallucinations over past 24 hrs? Are you afraid of the people or things around you? (fear that is inappropriate to clinical situation)* |
| **5. Psychomotor Agitation or Retardation. Score 1 point for either:**
  A. Hyperactivity requiring the use of additional sedative drugs or restraints in order to control potential danger (e.g., pulling IV lines out or hitting staff) OR
  B. Hypoactive or clinically noticeable psychomotor slowing or retardation
  *Based on documentation and observation over shift by primary caregiver*
| **6. Inappropriate Speech or Mood. Score 1 point for either:**
  A. Inappropriate disorganized or incoherent speech OR
  B. Inappropriate mood related to events or situation
  *Is the patient apathetic to current clinical situation (i.e., lack of emotion)? Any gross abnormalities in speech or mood? Is patient inappropriately demanding?*
| **7. Sleep/Wake Cycle Disturbance. Score 1 point for either:**
  A. Sleeping less than four hours at night OR
  B. Waking frequently at night (do not include wakefulness initiated by medical staff or loud environment) OR
  C. Sleep ≥ 4 hours during day
  *Based on primary caregiver assessment*
| **8. Symptom Fluctuation. Score 1 point for:**
  Fluctuation of any of the above items (i.e., 1–7) over 24 hours (e.g., from one shift to another)
  *Based on primary caregiver assessment*

**Total ICDSC Score (Add 1 through 8):**

A total ICDSC score ≥ has a 99 percentage sensitivity correlation for a psychiatric diagnosis of delirium

IMPLEMENT PROTOCOLS

ICU Sedation Order Set

The San Diego Patient Safety Council developed a standard order set establishing clear and complete orders and guidelines to reduce variability in dosages by various practitioners for the same patient (see Tables 5, 6, and 7).

When implementing this order set, consider the following recommendations:

- Individualize medication, dosage, route, and frequency to patient assessments of patient status
- Encourage intermittent dosing rather than continuous infusion
- Adhere to Propofol guidelines
- Ensure specific orders for assessing and performing Daily Awakening Trials

**Table 5: Agents for Analgesia**

<table>
<thead>
<tr>
<th></th>
<th>Approximate Equivalent Single IV Dose</th>
<th>Typical Infusion Rate</th>
<th>Onset to Peak Effect</th>
<th>Duration</th>
<th>Average Price/Day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opioids</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FentaNYL</td>
<td>100-200 mcg</td>
<td>50-200 mcg/hr</td>
<td>2-5 min</td>
<td>0.5-2 hours</td>
<td>$26/day at a rate of 100 mcg/hr</td>
<td>Fastest onset and shortest duration.</td>
</tr>
<tr>
<td>HYDROmorphine (Dilaudid&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>1.5-2 mg</td>
<td>0.2-3 mg/hr</td>
<td>20-30 min</td>
<td>3-4 hours</td>
<td>$23/day at a rate of 1.6 mg/hr</td>
<td>5-10x more potent than morphine.</td>
</tr>
<tr>
<td>Morphine</td>
<td>10 mg</td>
<td>2-10 mg/hr</td>
<td>20-30 min</td>
<td>3-4 hours</td>
<td>$20/day at a rate of 10 mg/hr</td>
<td>Avoid in hypotension. Active metabolite accumulates in renal dysfunction. May cause itching due to histamine release (not a true allergy). Decreases preload, which may be beneficial in pulmonary edema.</td>
</tr>
<tr>
<td><strong>NSAIDs (Parenteral)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibuprofen (Caldolor&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>400-800 mg</td>
<td>IVPB over 30 mg</td>
<td>Not reported</td>
<td>6 hours</td>
<td>$7 per 400mg dose</td>
<td>Infuse over 30 minutes. Not to exceed 3200 mg/day. Black box warnings: Nonsteroidal anti-inflammatory drugs (NSAIDs) may increase the risk of serious cardiovascular thrombotic events. Risk may increase with duration of use. Contraindicated in setting of CABG. NSAIDs increase the risk of gastrointestinal adverse effects.</td>
</tr>
<tr>
<td>Ketorolac (Toradol&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>15-60 mg</td>
<td>IV push</td>
<td>1-2 hours</td>
<td>4-6 hours</td>
<td>$0.50-0.80 per 15 mg dose</td>
<td>Max adult dose 120 mg/day (60 mg/d in elderly or weight &lt;50 kg). Do not use for &gt;5 days. Avoid use in renal dysfunction. Monitor for gastrointestinal adverse effects. Black box warning: Nonsteroidal anti-inflammatory drugs (NSAIDs) may increase the risk of serious cardiovascular thrombotic events. Contraindicated in setting of CABG.</td>
</tr>
</tbody>
</table>

<sup>a</sup> Equivalent prices and doses are approximations and may vary by institution and patient-specific differences in onset and duration of effect.

<sup>b</sup> Doses higher than recommended in the chart above may be required. Weight-based doses are reported for the following agents, but use may result in high infusion rates (FentaNYL 0.7-10 mcg/kg/hr; HYDROmorphine 7-15 mcg/kg/hr; morphine 0.07-0.5 mg/kg/hr). Based on clinical experience, more typical infusion rates are included in the table.

References:

# Table 6: Agents for Sedation

<table>
<thead>
<tr>
<th>Drug</th>
<th>Typical IV Bolus Dose</th>
<th>Typical Infusion Rate</th>
<th>Onset to Peak</th>
<th>Duration</th>
<th>Average Price/Day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Propofol</strong>&lt;sup&gt;a&lt;/sup&gt; (Diprivan&lt;sup&gt;b&lt;/sup&gt;)</td>
<td>0.03-0.15 mg/kg (max 20 mg)</td>
<td>5-80 mcg/kg/min</td>
<td>1-2 min</td>
<td>&lt;20 min</td>
<td>$36/day at a rate of 50 mcg/kg/min</td>
<td>Fastest onset and shortest duration. Avoid in hypotension. Dose/rate related hypotension/bradycardia. Avoid IV push bolus due to increased risk of hypotension (if bolus required and low risk of hypotension, limit dose to 10-20 mg). Monitor triglycerides. Provides 1.1 kcal/mL. Monitor for propofol-related infusion syndrome.</td>
</tr>
<tr>
<td><strong>Midazolam</strong>&lt;sup&gt;b&lt;/sup&gt; (Versed&lt;sup&gt;c&lt;/sup&gt;)</td>
<td>1-6 mg</td>
<td>1-10 mg/hr</td>
<td>5-10 min</td>
<td>1.5-2 hours</td>
<td>$70/day at a rate of 8 mg/hr</td>
<td>Fast onset - good for acute agitation/anxiety. Active metabolite accumulates in renal dysfunction. Midazolam 2-3 mg is approximately equivalent to 1 mg LORazepam. <em>Midazolam is associated with increased incidents of delirium.</em></td>
</tr>
<tr>
<td><strong>LORazepam</strong>&lt;sup&gt;b, e&lt;/sup&gt; (Ativan&lt;sup&gt;d&lt;/sup&gt;)</td>
<td>1-3 mg</td>
<td>1-5 mg/hr</td>
<td>15-20 min&lt;sup&gt;e&lt;/sup&gt;</td>
<td>2-4 hours</td>
<td>$38/day at a rate of 4 mg/hr</td>
<td>Slower onset but longer duration. Risk of propylene glycol toxicity with high doses (anion-gap acidosis, ↑ Serum Creatinine, ↑ Lactate). Monitor serum osmolality if rate &gt; 6 mg/hour and consider possible PG toxicity if osmol gap &gt;10-15&lt;sup&gt;3,4&lt;/sup&gt; <em>LORazepam is associated with increased incidents of delirium.</em></td>
</tr>
<tr>
<td><strong>Dexmedetomidine</strong> (Precedex&lt;sup&gt;f&lt;/sup&gt;)</td>
<td>1 mcg/kg over 20 min (not recommended)</td>
<td>0.2-1.5 mcg/kg/hr</td>
<td>30 min</td>
<td>2-4 hours</td>
<td>$408/day at a rate of 0.8 mcg/kg/hr</td>
<td>Limited data for use as a 1&lt;sup&gt;st&lt;/sup&gt; line agent. FDA approved for use &lt;24 hrs (studied up to 7 days in literature). FDA approved max dose = 0.7 mcg/kg/hr (studied up to 1.5 mcg/kg/hr). No respiratory depression - consider for patient failing spontaneous breathing trial due to agitation/anxiety. Dose/rate related hypotension and bradycardia–bolus not recommended. May cause hyper/hypotension. Consider higher starting dose if used as monotherapy. Expensive.</td>
</tr>
</tbody>
</table>

<sup>a</sup> Equivalent prices and doses are approximations and may vary by institution and patient-specific differences in onset and duration of effect.

<sup>b</sup> Midazolam and LORazepam doses higher than recommended in the chart above may be required. Weight-based doses are reported for the following agents, but use may result in high bolus doses and infusion rates (Midazolam bolus 0.02-0.08 mg/kg and infusion 0.04-0.2 mg/kg/hr; LORazepam bolus 0.02-0.06 mg/kg and infusion 0.01-0.1 mg/kg/hr). Based on clinical experience, more typical bolus doses and infusion rates are included in the table.

References:
### Table 7: Agents for Delirium

<table>
<thead>
<tr>
<th>Antipsychotic Agent</th>
<th>Dosage Form</th>
<th>Metabolism</th>
<th>Metabolizing Enzyme</th>
<th>Equiv. Dosages (approx) (mg)</th>
<th>Max Dose (mg/day)</th>
<th>QTc Prolongation</th>
<th>Sedation</th>
<th>Adverse Effects</th>
<th>Orthostatic Hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haloperidol (Haldol)</td>
<td>Tab, IV injection</td>
<td>T½: 21 hrs Hepatic</td>
<td>CYP3A4, 2D6</td>
<td>2</td>
<td>35*</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Queitapine (SEROquel)</td>
<td>Tab</td>
<td>T½: 6 hrs Hepatic</td>
<td>CYP3A4</td>
<td>125</td>
<td>400</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Risperidone (Risperdal)</td>
<td>Tab, ODT tab, solution (1 mg/ml)</td>
<td>T½: 3 hrs Hepatic</td>
<td>CYP2D6, 3A4</td>
<td>1</td>
<td>4</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Aripiprazole (Abilify)</td>
<td>Tab, solution (5mg/ml), IM injection</td>
<td>T½: 75 hrs Hepatic</td>
<td>CYP2D6, 3A4</td>
<td>5</td>
<td>30</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Ziprasidone (Geodon)</td>
<td>Capsule</td>
<td>T½: 7 hrs Hepatic</td>
<td>CYP3A4, 1A2</td>
<td>40</td>
<td>160</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>OLANZapine (ZyPREXA)</td>
<td>Tab, ODT tab, IM injection</td>
<td>T½: 30 hrs Hepatic</td>
<td>CYP1A2</td>
<td>5</td>
<td>20</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Black Box Warning:** Increased mortality seen when used in elderly patients with dementia-related psychosis due to cardiovascular or infectious complications.

The use of these agents for delirium in ICU patients has not been tested in large, randomized, placebo-controlled trials.

*Use heightened caution and be aware that there is a dose related QT interval prolongation and torsades de pointes (TdP) risk when using in excess of >20 mg per day.*

*a Low: 3-10 msec, Medium: 10-15 msec, High: > 15 msec

*b Increased with IV formulation

*c Caution: Bone marrow suppression; blood dyscrasias

*d Secondary to high risk for QT prolongation

*e Secondary to high risk for metabolic syndrome
A Daily Awakening Trial (or Sedation Vacation) is titrating down continuous infusions of sedatives or holding sedation bolus until the patient is awake.

A Daily Awakening Trial determines a patient's minimum level of sedation and identifies the minimum effective dose. Once the patient is awake and responsive, an accurate sedation, pain, and delirium assessment can be obtained, as well as a spontaneous breathing trial of the ventilated patient. It is recommended to couple spontaneous breathing trial protocols with sedation protocols. Findings show that combining a spontaneous breathing trial protocol with a daily wakening trial results in patients spending less time on mechanical ventilation, less time in coma, and less time in intensive care and the hospital.

Figure 12 illustrates the combining of a daily awakening trial and spontaneous breathing trial to achieve improved clinical outcomes. Please note this algorithm provides recommendations for each element, which may vary based on the patient population and unit needs.

---

**Guidelines**

**PERFORM DAILY AWAKENING TRIAL**

**Figure 12: Daily Awakening Trial and Spontaneous Breathing Trial**

**Daily Awakening Algorithm**

The following algorithm contains recommendations from the San Diego Patient Safety Council. Elements may vary based on your patient population and unit needs.

- **Assess for Daily Awakening**
  - Increased Intracranial pressure issues
  - Neuromuscular blockade
  - Significant ventilation support required, such as very high PEEP, FiO2
  - CABG immediate post-op
  - And other site specific exclusionary criteria

- **Perform Daily Awakening**
  - Wean / Stop sedation
  - Consider decreasing narcotics infusion by 25-50%

- **Is patient awake and calm?**
  - Use sedation scale (SAS 3-4 or RASS 0 to -1)

- **Proceed to SBT**
  - Take opportunity to assess patient's pain
  - Titrate narcotics as needed for pain

**Spontaneous Breathing Trial**

- **Assess for Spontaneous Breathing Trial (SBT) (RN and RCP)**
  - Calm and co-operative (SAS score of 3 to 4; RASS 0 to -1)
  - Hemodynamically stable
  - PEEP < 8
  - FiO2 ≤ 0.60
  - pH > 7.34
  - SpO2 > 90%

- **Conduct SBT for 1 Minute**
  - Mode CPAP
  - PEEP = 0
  - Pressure support vent. at least 5 - 10
  - FiO2 unchanged

- **After 1 minute, calculate Rapid Shallow Breathing Index (RSBI):**
  - RSBI = Respiratory Rate/Tidal Volume in liters
  - <105 = 80% success
  - >105 = 95% failure

- **Conduct SBT for up to 2 hours**
  - Continuously Reassess

- **Successful Completion SBT**
  - Discuss Arterial Blood Gases and Extubation Plan with Physician

**SBT Termination Criteria:**

- Respiration Rate >35/minute for > 5 minutes
- SpO2 < 90% for > 2 minutes
- New Ectopy
- Heart Rate change 20% from baseline
- Blood Pressure change 20% from baseline
- Accessory muscle use
- Increased anxiety/diaphoresis

**Return patients who fail a SBT to their previous ventilator settings**

**Discuss with MD pm vs. continuous sedation/pain**
Daily Awakening Trials – Summary Recommendations

- Components recommended for a Daily Awakening Trial:
  - Consistency – should follow a standardized nurse-driven protocol
  - Continuity – need to ensure a set time for the patient during daylight hours
  - Coordination – need to ensure Daily Awakening Trial is coordinated with other disciplines, specifically physical therapy, occupational therapy, and respiratory therapy activities.

- Exclusions to a Daily Awakening Trial:
  - Increased intracranial pressure issues
  - Neuromuscular blockade
  - Pressure-regulated pulmonary ventilation with an inverse ratio
  - Coronary artery bypass graft immediate post-operation

- Process for weaning drug (per drug)
  - Target – Use sedation scale targets (-1 on the RASS)
  - Sedatives – decrease by 50 percent or off
  - Narcotics – consider reducing narcotics if still sedated (or SAS of 3-4)

- Assess as part of Daily Awakening Trial:
  - Pain
  - Delirium
  - Spontaneous Breathing Trial / rapid-shallow breathing index

- If continued sedation required, start at lower dose than previously—50 percent of original or lowest effective dose during titration—the most recent titration dose (before reaching -1 RASS)
  - Bolus and titrate up to reach target goal as appropriate; do not resume at previous rate
  - Abort Daily Awakening Trial if patient becomes physiologically unstable during procedure
GUIDELINES FOR IMPLEMENTING CARE

This section provides a description of the methodology used by the San Diego Patient Safety Council to develop the guidelines in this toolkit. It is recommended that this same methodology is used to implement these guidelines at a healthcare facility.

Mobilize Commitment

To start, form a council and manage resistance by identifying the organization stakeholders, such as:

- Anesthesia
- Nursing Leadership
- Clinical Pharmacists
- Critical Care Nurses
- Clinical Nurse Specialists/Educators
- Intensivists
- Information Technology
- Pain Service
- Pharmacy and Therapeutics Committee
- Pharmacy Leadership, Buyers/Wholesaler Supplier
- Policy and Procedure Committee
- Process Improvement Department
- Standard order sets owners and developers.

Define and Evaluate the Current State

The current state must be identified to effectively target change. The council needs to gather the data in preparation for implementing these recommendations. It is important to work with all stakeholders to obtain agreement on suggested standards for the organization.

Create a Shared Need

The case for standardization must be based on research, literature reviews, etc. Additionally, facilitation should be encouraged to allow for discussion and clarification on the front-end to be sure that the group is in full alignment on what is included and excluded in the project. The outcome should be a concise description of the case for standardization.

Elevator Speech

An “Elevator Speech” can be used to quickly convey key elements of the campaign to staff, such as:

- **What**: The goal of the project is to implement an evidence-based standard for safe and effective management of pain, sedation, and delirium in adult ICU ventilated patients.
- **Why**: It is important because the use of sedation in these complex patients is challenging to manage and poses a high risk of patient harm.

- **Success**: We will achieve success when we have implemented an effective system to guide the multidisciplinary team in providing safe, effective, and reliable sedation.
- **Need**: We need your support and commitment to successfully implement this new ICU process of care.

Standardize, Simplify, and Clarify

A standard approach to ICU sedation administration across healthcare facilities within a region should extend beyond assessments, therapy, and dosing units. It is recommended that policies and procedures, documentation, tools, and standard orders are standardized to simply and clarify administration for improved patient safety.

Policies, Procedures, and Process

Standard policies, procedures, and work processes are effective methods that provide a margin of safety in minimizing variance in managing pain, sedation, and delirium in adult ICU ventilated patients.

Documentation

A comprehensive and careful analysis of documentation should be conducted to identify documentation forms, both paper and computerized, that need to be changed and standardized. For example, Nursing Assessment, Medication Administration Record, and Input and Output documentation need to be updated with new assessment guidelines, therapies, etc.

Establish Standard Order Sets

Standard order sets ensure consistent and accurate product ordering, delivery, and use, thereby reducing potential medication errors. The council recommends that each hospital establishes standard order sets for pain, sedation, and delirium in adult ICU ventilated patients.

Measures of Success

The focused improvement effort must include clearly defined methods of measuring the success of safety procedures. These success metrics should be continually referenced and validated throughout the project.
### ICU Sedation Project Charter

<table>
<thead>
<tr>
<th><strong>Project Title:</strong></th>
<th>ICU Sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sponsor:</strong></td>
<td>Hospital Association of San Diego &amp; Imperial County</td>
</tr>
<tr>
<td><strong>Process Owner:</strong></td>
<td>Hospital, Critical Care</td>
</tr>
<tr>
<td><strong>Facilitator:</strong></td>
<td>Nancy Pratt, RN, MSN</td>
</tr>
<tr>
<td><strong>Project Start Date:</strong></td>
<td>29 January 2009</td>
</tr>
<tr>
<td><strong>Project End Date:</strong></td>
<td>31 December 2009</td>
</tr>
</tbody>
</table>

### Problem Statement:

For patients in adult ICUs, there are:
- Inconsistent interpretation of provider orders
- Inconsistent practice in the use of sedation and analgesia
- Lack of an executable plan with objective assessment tools and protocols for nursing to follow

The effect of these shortcomings has resulted in the following consequences:
- Over and under sedation
- Variability between caregivers
- Variable and undesirable outcomes

### Customer(s) and Requirements:

Critical care health care professionals need a straightforward protocol that can be consistently executed.

### Team Members:

- Alvarado Hospital
- CareFusion
- Fallbrook Hospital
- Hospital Association of San Diego & Imperial Counties
- Palomar Pomerado Health
- Rady Children’s Hospital San Diego
- Scripps Health
- Sharp HealthCare
- Tri-City Medical Center
- UCSD Medical Center
- VA Healthcare San Diego

### Project Scope:

This project includes intubated patients in adult ICUs who require more than 24 hours of ventilatory support. This project excludes the following types of patients:
- Extubated patients in adult ICUs
- Pediatrics
- Head trauma and burn injuries
- End of Life care
- Non-Intensive care
- Chemically paralyzed
- Chronic substance abuse

### Deliverables:

Tool kit for the assessment and management of intubated ICU adult patients who need sedation to include:
1. Guidelines/Protocols and Algorithm
2. Assessment Tools (pain, sedation, and delirium scales)
3. Evidenced-based Order Set

### Goal and Other Potential Benefits of Appropriate Sedation Protocol:

To develop an evidenced-based tool kit that supports the achievement of the following metrics of appropriate sedation:
- Decrease pain
- Decrease anxiety
- Decrease patient’s ventilator days
- Decrease patient’s ICU length of stay
- Reduce long term cognitive decline
- Avoid heart, lung, liver, and kidney complications
- Reduce the incidence of PTSD
- Reduce occurrences of spontaneous extubation
- Reduce the occurrence of delirium and/or improve the management of delirium
REFERENCES


**ADULT ICU PAIN ORDERS**

1. **Target pain score _______** (based on pain assessment)

2. For patient’s pain, select **one** of the following:

   - **FENTANYL CONTINUOUS INFUSION**

     FentaNYL infusion at _______ mcg/hr (e.g., 25–50 mcg/hr)

     A. FentaNYL bolus at _______ mcg (e.g., 12.5 mcg) IV every 5 minutes _pain score 2-3_ (mild pain).

     B. FentaNYL bolus at _______ mcg (e.g., 25 mcg) IV every 5 minutes _pain score 4-6_ (moderate pain).

     C. FentaNYL bolus at _______ mcg (e.g., 50 mcg) IV every 5 minutes _pain score 7-8_ (severe pain).

     - Repeat boluses until pain controlled.
     - If the patient requires >2 boluses in an hour, increase rate by _______ mcg/hr (e.g., 12.5–25 mcg/hr) every hour.
     - Maximum dosage = _______ mcg/hr (e.g., 100–200 mcg/hr).
     - Notify physician for oversedation or when target pain score not achieved at maximum dosage.

   - **HYDROMORPHONE (DILAUDID®) CONTINUOUS INFUSION**

     HYDROmorphone infusion at _______ mg/hr (e.g., 0.4–0.8 mg/hr)

     A. HYDROmorphone bolus at _______ mg (e.g., 0.2 mg) IV every 10 minutes _pain score 2-3_ (mild pain).

     B. HYDROmorphone bolus at _______ mg (e.g., 0.4 mg) IV every 10 minutes _pain score 4-6_ (moderate pain).

     C. HYDROmorphone bolus at _______ mg (e.g., 0.8 mg) IV every 10 minutes _pain score 7-8_ (severe pain).

     - Repeat boluses until pain controlled.
     - If the patient requires >2 boluses in an hour, increase rate _______ mg/hr (e.g., 0.2 – 0.4 mg/hr) every hour.
     - Maximum dosage = _______ mg/hr (e.g., 3 mg/hr).
     - Notify physician for oversedation or when target pain score not achieved at maximum dosage.

   - **MORPHINE CONTINUOUS INFUSION** (Avoid in patients with cardiovascular instability or renal impairment)

     Morphine infusion at _______ mg/hr (e.g., 2–4 mg/hr)

     A. Morphine bolus at _______ mg (e.g., 1 mg) IV every 10 minutes _pain score 2-3_ (mild pain).

     B. Morphine bolus at _______ mg (e.g., 2 mg) IV every 10 minutes _pain score 4-6_ (moderate pain).

     C. Morphine bolus at _______ mg (e.g., 4 mg) IV every 10 minutes _pain score 7-8_ (severe pain).

     - Repeat boluses until pain controlled.
     - If the patient requires >2 boluses in an hour, increase rate by _______ mg/hr (e.g., 1–2 mg/hr) every hour.
     - Maximum dosage = _______ mg/hr (e.g., 10 mg/hr).
     - Notify physician for oversedation or when target pain score not achieved at maximum dosage.

---

Prescriber / PID: _____________________ Date/Time: ________________ Nurse: ______________________ Date/Time: ________________
ICU Pain Management Protocol

Self-Reporting Pain Assessment Scale

Wong-Baker Faces Pain Rating Scale*

Directions: When the patient is awake, show this card with the faces. Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Point to each face and ask the person to choose the face that best describes how he is feeling. Based on his response, circle the appropriate scale number.

NOTE: Although the numbers associated with this scale are 0-5, the scale number should be doubled to a scale of 0-10 in order to apply the standard order set.

0-10 Numeric Pain Scales** (circle one)

*Adapted from: Hockenberry MJ, Wilson D: Wong’s essentials of pediatric nursing, ed. 8, St. Louis, 2009, Mosby. Used with permission. Copyright Mosby.

**Adapted from: Acute Pain Management: Operative or Medical Procedures and Trauma, Clinical Practice Guideline No. 1. AHCPR Publication No. 92-0032: February 1992; Agency for Healthcare Research & Quality, MD; 116-117.
**Non-Verbal Pain Scale**

Directions: Define target pain score using the 10 Point Numerical Rating Scale. Observe the patient per category and, based on your findings, circle the appropriate scale number.

<table>
<thead>
<tr>
<th>FACIAL EXPRESSION</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>No particular smile or expression</td>
</tr>
<tr>
<td>1</td>
<td>Occasional grimace, tearing, frowning, and/or wrinkled forehead</td>
</tr>
<tr>
<td>2</td>
<td>Frequent grimacing, tearing, frowning, and/or wrinkled forehead</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Lying quietly, normal position</td>
</tr>
<tr>
<td>1</td>
<td>Seeking attention through movement or slow cautious movement</td>
</tr>
<tr>
<td>2</td>
<td>Restless excessive activity and/or withdrawal reflexes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GUARDING</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Lying quietly, no positioning of hands over area of body</td>
</tr>
<tr>
<td>1</td>
<td>Splitting areas of the body, tense</td>
</tr>
<tr>
<td>2</td>
<td>Rigid, stiff</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHYSIOLOGIC PARAMETER</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Stable vital signs</td>
</tr>
<tr>
<td>1</td>
<td>Change over past 4 hours in any of the following SBP &gt; 20mmHg or heart rate &gt; 20 bpm</td>
</tr>
<tr>
<td>2</td>
<td>Change over past 4 hours in any of the following SBP &gt; 30mmHg or heart rate &gt; 26 bpm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESPIRATORY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Baseline respiratory rate/oxygen saturation, compliant with ventilator</td>
</tr>
<tr>
<td>1</td>
<td>RR &gt; 10 above baseline or 5% decrease in oxygen saturation, mild ventilator asynchrony</td>
</tr>
<tr>
<td>2</td>
<td>RR &gt; 20 above baseline or 10% decrease in oxygen saturation, mild ventilator asynchrony</td>
</tr>
</tbody>
</table>

**Score:** _____ **Target Pain: 0-1**
**NON-VERBAL PAIN SCALE (CPOT)**

Define target pain score using the Non-Verbal Pain Scale (Critical Care Pain Observation Tool or CPOT) when appropriate.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facial expression</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relaxed, neutral</td>
<td>0</td>
<td>No muscle tension observed</td>
</tr>
<tr>
<td>Tense</td>
<td>1</td>
<td>Presence of frowning, brow lowering, orbit tightening and levator contraction or any other change (e.g. opening eyes or tearing during nociceptive procedures)</td>
</tr>
<tr>
<td>Grimacing</td>
<td>2</td>
<td>All previous facial movements plus eyelid tightly closed (the patient may present with mouth open or biting the endotracheal tube)</td>
</tr>
<tr>
<td><strong>Body movements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of movements or normal position</td>
<td>0</td>
<td>Does not move at all (doesn’t necessarily mean absence of pain) or normal position (movements not aimed toward the pain site or not made for the purpose of protection)</td>
</tr>
<tr>
<td>Protection</td>
<td>1</td>
<td>Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements</td>
</tr>
<tr>
<td>Restlessness</td>
<td>2</td>
<td>Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed</td>
</tr>
<tr>
<td><strong>Compliance with the ventilator</strong> (intubated patients)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerating ventilator or movement</td>
<td>0</td>
<td>Alarms not activated, easy ventilation</td>
</tr>
<tr>
<td>Coughing but tolerating</td>
<td>1</td>
<td>Coughing, alarms may be activated but stop spontaneously</td>
</tr>
<tr>
<td>Fighting ventilator</td>
<td>2</td>
<td>Asynchrony: blocking ventilation, alarms frequently activated</td>
</tr>
<tr>
<td><strong>Vocalization</strong> (extubated patients)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talking in normal tone or no sound</td>
<td>0</td>
<td>Talking in normal tone or no sound</td>
</tr>
<tr>
<td>Sighing, moaning</td>
<td>1</td>
<td>Sighing, moaning</td>
</tr>
<tr>
<td>Crying out, sobbing</td>
<td>2</td>
<td>Crying out, sobbing</td>
</tr>
<tr>
<td><strong>Muscle tension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relaxed</td>
<td>0</td>
<td>No resistance to passive movements</td>
</tr>
<tr>
<td>Tense, rigid</td>
<td>1</td>
<td>Resistance to passive movements</td>
</tr>
<tr>
<td>Very tense or rigid</td>
<td>2</td>
<td>Strong resistance to passive movements, incapacity to complete them</td>
</tr>
</tbody>
</table>

**SCORE:** __ Target Pain: 0 - 1

**Directions for use of the CPOT:**
1. The patient must be observed at rest for one minute to obtain a baseline value of the CPOT.
2. The patient should be observed during nociceptive procedures (e.g., turning, endotracheal suctioning, wound dressing) to detect any changes in the patient’s behaviors to pain.
3. The patient should be evaluated before and at the peak effect of an analgesic agent to assess if the treatment was effective in relieving pain.
4. For the rating of the CPOT, the patient should be attributed the highest score observed during the observation period.
5. The patient should be attributed a score for each behavior included in the CPOT and muscle tension should be evaluated last, especially when the patient is at rest because just the stimulation of touch (passive flexion and extension of the arm) may lead to behavioral reactions.
**ADULT ICU SEDATION ORDERS**

1. **Target sedation score _______** (based on sedation assessment)
2. **Perform Daily Awakening Protocol**
3. **Select from below one of the agents ± boluses to treat agitation/anxiety.**
4. **Notify physician if patient has hemodynamic instability or if target sedation score not achieved at maximum dosages.**

---

**BOLUSES FOR BREAKTHROUGH AGITATION/ANXIETY (Recommended for rapid control)**

- Midazolam ________ mg (e.g., 1 – 2 mg) IV every 10 minutes **prn mild agitation** (e.g., RASS +1 to +2), and
- Midazolam ________ mg (e.g., 2 – 5 mg) IV every 10 minutes **prn moderate/severe agitation** (e.g., RASS +3 to +4)
  
  **OR**

- Lorazepam ________ mg (e.g., 0.5) IV every 20 minutes **prn mild agitation** (e.g., RASS +1 to +2), and
- Lorazepam ________ mg (e.g., 1 mg) IV every 20 minutes **prn moderate/severe agitation** (e.g., RASS +3 to +4).

---

**PROPOFOL (DIPRIVAN®) Infusion (Recommended for sedation <72 hours. Avoid in patients with cardiovascular instability.)**

- Start propofol IV infusion at ________ mcg/kg/min (e.g., 5-10 mcg/kg/min).
- Bolus (if checked above) with midazolam as directed or propofol ________ mg (0.03-0.15 mg/kg, max 10-20 mg) for breakthrough agitation
- Titrate propofol by ________ mcg/kg/min (e.g., 5-10 mcg/kg/min) every 5 minutes until target sedation score achieved.
- **Maximum rate = ________ mcg/kg/min (e.g., 60 mcg/kg/min).**
- Reduce infusion rate by ½ for SBP < ________ mm Hg. Notify physician if patient has hemodynamic instability.
- Notify physician if target sedation score not achieved at maximum dosages.
- **Oversedation:** Wean Propofol by 10 mcg/kg/min every 10 min until sedation score at goal.

---

**MIDAZOLAM (VERSED®) Infusion (Recommended for sedation <72 hours. Not recommended in impaired renal function.)**

- Start midazolam infusion at ________ mg/hr (e.g., 1 – 3 mg/hr).
- Bolus (if checked above) with midazolam as directed for breakthrough agitation/anxiety.
- If the patient requires >2 boluses in an hour, increase rate **by** ________ mg/hr (e.g., 1 – 2 mg/hr) every hour.
- **Maximum infusion rate = ________ mg/hr (e.g., 10 mg/hr).**
- Notify physician if target sedation score not achieved at maximum dosages.
- **Oversedation:** Hold infusion until sedation score at goal. Restart infusion at ½ previous rate.
**LORAZEPAM (ATIVAN®) Infusion** (Recommended for sedation >72 hours)

- Start LORazepam infusion at _______ mg/hr (e.g., 0.5–1 mg/hr).
- Bolus (if checked above) with midazolam OR lorazepam as directed for breakthrough agitation/anxiety.
- If the patient requires >2 boluses in an hour, increase rate by _______ mg/hr (e.g., 1 – 2 mg/hr) every hour.
- Maximum infusion rate = _______ mg/hr (e.g., 10 mg/hr).
- Notify physician if target sedation score not achieved at maximum dosages.
- Oversedation: Hold infusion until sedation score at goal. Restart infusion at ½ previous rate.

**PATIENTS FAILING SPONTANEOUS BREATHING TRIALS DUE TO AGITATION:**

**DEXMEDETOMIDINE (PRECEDEX®)** (Recommended for short-term use. Avoid in patients with cardiovascular instability.)

- Start dexmedetomidine infusion at _______ mcg/kg/hr (e.g., 0.2 – 0.7 mcg/kg/hr).
- Bolus (if checked) with midazolam for breakthrough agitation as directed below.
- Titrate dexmedetomidine by _______ mcg/kg/hr (e.g., 0.1 – 0.2 mcg/kg/hr) every hour until target sedation score achieved.
- Maximum rate = _______ mcg/kg/hr (e.g., 1 – 1.5 mcg/kg/hr).
- Notify physician if patient has hemodynamic instability or if target sedation score not achieved at maximum dosages.

Prescriber / PID: _____________________ Date/Time: ______________  Nurse: ______________________ Date/Time: _____________
### Richmond Agitation Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4 Combative</td>
<td>Overtly combative, violent, immediate danger to staff</td>
</tr>
<tr>
<td>+3 Very Agitated</td>
<td>Pulls or removes tube(s) or catheter(s); aggressive</td>
</tr>
<tr>
<td>+2 Agitated</td>
<td>Frequent non-purposeful movement, fights ventilator</td>
</tr>
<tr>
<td>+1 Restless</td>
<td>Anxious but movements not aggressive vigorous</td>
</tr>
<tr>
<td>0 Alert and Calm</td>
<td>Not fully alert, but has sustained awakening (&gt;10 seconds) (eye-opening/eye contact) to voice</td>
</tr>
<tr>
<td>-1 Drowsy</td>
<td>Briefly awakens with eye contact to voice (&lt;10 seconds)</td>
</tr>
<tr>
<td>-2 Light Sedation</td>
<td>Movement or eye opening to voice (but no eye contact)</td>
</tr>
<tr>
<td>-3 Moderate Sedation</td>
<td>No response to voice, but movement or eye opening to physical stimulation</td>
</tr>
<tr>
<td>-4 Deep Sedation</td>
<td>No response to voice or physical stimulation</td>
</tr>
</tbody>
</table>

**Procedure for RASS Assessment:** The basis of the RASS assessment is to see what amount of stimulation is necessary to evoke a response and evaluate sedation.

- **Observe patient.**
  - a. Patient is alert, restless, or agitated. (Score 0 to +4)
- **If not alert, state patient’s name and say “open eyes and look at (speaker).”**
  - b. Patient awakens with sustained eye opening and eye contact. (Score –1)
  - c. Patient awakens with eye opening and eye contact, but not sustained. (Score –2)
  - d. Patient has any movement in response to voice but no eye contact. (Score –3)
- **When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.**
  - e. Patient has any movement to physical stimulation. (Score –4)
  - f. Patient has no response to any stimulation. (Score –5)


## Riker Sedation-Agitation Scale (SAS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Dangerous Agitation</td>
<td>Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side</td>
</tr>
<tr>
<td>6</td>
<td>Very Agitated</td>
<td>Requiring restraint and frequent verbal reminding of limits, biting ETT</td>
</tr>
<tr>
<td>5</td>
<td>Agitated</td>
<td>Anxious or physically agitated, calms to verbal instructions</td>
</tr>
<tr>
<td>4</td>
<td>Calm and Cooperative</td>
<td>Calm, easily arousable, follows commands</td>
</tr>
<tr>
<td>3</td>
<td>Sedated</td>
<td>Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again</td>
</tr>
<tr>
<td>2</td>
<td>Very Sedated</td>
<td>Aroused to physical stimuli but does not communicate or follow commands, may move spontaneously</td>
</tr>
<tr>
<td>1</td>
<td>Unarousable</td>
<td>Minimal or no response to noxious stimuli, does not communicate or follow commands</td>
</tr>
</tbody>
</table>


### Guidelines for SAS Assessment

1. Agitated patients are scored by their most severe degree of agitation as described.
2. If patient is awake or awakens easily to voice (“awaken” means responds with voice or head shaking to a question or follows commands), that is a SAS 4 (same as calm and appropriate – might even be napping).
3. If more stimuli such as shaking is required but patient eventually does awaken, that is SAS 3.
4. If patient arouses to stronger physical stimuli (may be noxious) but never awakens to the point of responding yes/no or following commands, that is a SAS 2.
5. Little or no response to noxious physical stimuli represents SAS 1.

This helps separate sedated patients into those you can eventually wake up (SAS 3), those you can't awaken, but can arouse (SAS 2), and those you can't arouse (SAS 1).
## ADULT ICU DELIRIUM ORDERS

☑️ Assess for Delirium using standardized scale (e.g., CAM-ICU or ICDSC)

**NOTE:** Provided dosing ranges are general guidelines and are not intended to supersede clinical judgment of prescriber.

### FOR BREAKTHROUGH AGITATION - check box to select agent(s):

- **HALOPERIDOL (HALDOL®) BOLUSES**
  - Haloperidol _______ mg (e.g., 2.5-5 mg) IV every 15 min prn agitation/delirium.
  - Maximum daily dose = _______ mg/day (Suggested max total daily dose is 35 mg/day)
  - Monitor for Qtc prolongation _______

### MAINTENANCE TREATMENT FOR AGITATION/DELIRIUM - check box to select agent(s):

- **HALOPERIDOL (HALDOL®)**
  - Haloperidol _______ mg (e.g., 2.5-5 mg) PO every _______ hours (e.g., 6 hours).
  - Maximum daily dose (including PRN doses) = _______ mg/day (Suggested max daily dose is 35 mg/day)
  - Monitor for Qtc prolongation _______

- **RISPERIDONE (RISPERDAL®) TABLET OR ORALLY DISINTEGRATING TABLET (ODT)**
  - Risperidone _______ mg (e.g., 1 – 2 mg) PO every _______ hours (e.g., 12 hours).
  - Maximum daily recommended dose is 4 mg/day
  - Monitor for Qtc prolongation _______

- **ARIPIPRAZOLE (ABILIFY®)**
  - Aripiprazole _______ mg (e.g., 5 – 10 mg) PO daily OR _______ mg (e.g., 9.75 mg) IM daily.
  - Maximum daily recommended dose is 30 mg/day
  - Monitor for Qtc prolongation _______

- **QUETIAPINE (SEROQUEL®)**
  - Quetiapine _______ mg (e.g., 50 mg) PO every _______ hours (e.g., 12 hours).
  - Maximum daily recommended dose is 200 mg q12h.
  - Monitor for Qtc prolongation _______

- **DEXMEDETOXIMIDE (PRECEDEX®)** (Consider in patients failing spontaneous breathing trials secondary to agitation)
  - Loading dose _______ mcg (1 mcg/kg) over 20 min (not recommended due to risk of hypotension).
  - Start dexmedetomidine infusion at _______ mcg/kg/hr (e.g., 0.2 – 0.7 mcg/kg/hr).
  - Titrate dexmedetomidine by _______ mcg/kg/hr (e.g., 0.1 – 0.2 mcg/kg/hr) every hour until target sedation score achieved.
  - Maximum rate = _______ mcg/kg/hr (e.g., 1 – 1.5 mcg/kg/hr).
  - Notify physician if patient has hemodynamic instability or if target sedation score not achieved at maximum dosages.

**Note:** Provided dosing ranges are general guidelines and are not intended to supersede clinical judgment of prescriber.

Prescriber / PID: _____________________ Date/Time: _______________ Nurse: _____________________ Date/Time: _______________
**CONFUSION ASSESSMENT METHOD IN THE ICU (CAM-ICU)**

Directions: If patient’s RASS is above -4 (-3 through +4), refer to the following chart and assess for delirium using the Confusion Assessment Method in the ICU (CAM-ICU) on the next page.

### Delirium Assessment (CAM-ICU): 1 AND 2 AND (Either 3 OR 4)

1. **Acute Onset or Fluctuating Course**
   - An acute change from mental status baseline?
   - Or Patient’s mental status fluctuating during the past 24hrs
   - **Yes**
   - **No**
   - **Stop**
   - **No delirium**

2. **Inattention**
   - Please read the following ten letters: S A V E A H A A R T
   - Scoring: Error: when patient fails to squeeze on the letter “A”
   - Error: when the patient squeezes on any letter other than “A”
   - **≥3 Errors**
   - **<3 Errors**
   - **Stop**
   - **No delirium**

3. **Altered Level of Consciousness ("actual" RASS)**
   - If RASS is zero, Proceed to next step
   - **RASS**
   - **0**
   - **≥2 Errors**
   - **<2 Errors**
   - **Stop**
   - **Patient is Delirious**
   - **Stop**
   - **No delirium**

4. **Disorganized Thinking**
   - 1. Will a stone float on water? (Or: Will a leaf float on water?)
   - 2. Are there fish in the sea? (Or: Are there elephants in the sea?)
   - 3. Does one pound weigh more than two pounds? (Or: Do two pounds weigh more than one?)
   - 4. Can you use a hammer to pound a nail? (Or: Can you use a hammer to cut wood?)
   - 5. Command:
     - Say to patient: “Hold up this many fingers” (Examiner holds two fingers in front of patient)
     - “Now do the same thing with the other hand” (Not repeating the number of fingers)
   - If patient is unable to move both arms for the second part, ask patient “add one more finger”

Harvard CAM-ICU Flowsheet (by Houman Amirfarzan, M.D., Wes Ely, M.D.) Copyright © 2003, Vanderbilt Medical Center
### Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)

#### Table 3: Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)

<table>
<thead>
<tr>
<th>FEATURE 1: Acute Onset or Fluctuating Course</th>
<th>Positive, if answer ‘yes’ to either 1A or 1B.</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A: Is the patient different than his/her baseline mental status?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1B: Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation scale (e.g. RASS), GCS, or previous delirium assessment?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FEATURE 2: Inattention**

Positive, if either score for 2A or 2B is less than 8

First, attempt the Letters (ASE). If patient is able to perform this test and the score is clear, record this score and move to Feature 3. If patient is unable to perform this test or the score is unclear, then perform the Pictures ASE.

<table>
<thead>
<tr>
<th>2A: AUDITORY (Letter – ASE)</th>
<th>Record score (enter NT for not tested)</th>
<th>Score (out of 10):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directions: Say to the patient, &quot;I am going to read you a series of 10 letters. Whenever you hear the letter ‘A’ indicate by squeezing my hand.&quot; Read letters from the following letter list in a normal tone:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S A V E A H A A R T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scoring: Errors are counted when patient fails to squeeze on the letter &quot;A&quot; and when the patient squeezes on any letter other than &quot;A.&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2B: VISUAL (Pictures - ASE)</th>
<th>Record score (enter NT for not tested)</th>
<th>Score (out of 10):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directions: Use the Picture Packets (A and B) on the next page.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FEATURE 3: Disorganized Thinking**

Positive, if the combined score is less than 4

<table>
<thead>
<tr>
<th>3A: Yes/No Questions</th>
<th>(Use either Set A or B, alternate on consecutive days if necessary):</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set A</td>
<td>Set B</td>
<td>Combined Score (3A + 3B):</td>
<td></td>
</tr>
<tr>
<td>5. Will a stone float on water?</td>
<td>5. Will a leaf float on water?</td>
<td>(out of 5)</td>
<td></td>
</tr>
<tr>
<td>6. Are there fish in the sea?</td>
<td>6. Are there elephants in the sea?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Does one pound weigh more than two pounds?</td>
<td>7. Do two pounds weigh more than one pound?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Can you use a hammer to pound a nail?</td>
<td>8. Can you use a hammer to cut wood?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Patient earns 1 point for each correct answer out of 4)</td>
<td>3A Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B: Command</td>
<td>Say to patient: &quot;Hold up this many fingers: (Examiner holds two fingers in front of patient) &quot;Now do the same thing with the other hand: (Not repeating the number of fingers). *If patient is unable to move both arms, for the second part of the command ask patient to &quot;Add one more finger&quot;)</td>
<td>(Patient earns 1 point if able to successfully complete the entire command)</td>
<td>3B Score</td>
</tr>
</tbody>
</table>

**FEATURE 4: Altered level of Consciousness**

Positive if the actual RASS score is anything other than "0" (zero)

<table>
<thead>
<tr>
<th>Alert</th>
<th>Spontaneously fully aware of environment and interacts appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigilant</td>
<td>Hyper alert</td>
</tr>
<tr>
<td>Lethargic</td>
<td>Drowsy but easily aroused, unaware of some elements in the environment, or not spontaneously interacting appropriately with the interviewer; becomes fully aware and appropriately interactive when prodded minimally</td>
</tr>
<tr>
<td>Stupor</td>
<td>Becomes incompletely aware when prodded strongly; can be aroused only by vigorous and repeated stimuli, and as soon as the stimulus ceases, stuporous subject lapses back into the unresponsive state.</td>
</tr>
</tbody>
</table>

(Features 1 and 2 and either Feature 3 or 4): Overall CAM-ICU: Positive | Negative |

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2B: VISUAL (Pictures - ASE)

Step 1: 5 pictures

Directions: Say to the patient, “Mr. or Mrs. _________, I am going to show you pictures of some common objects. Watch carefully and try to remember each picture, because I will ask what pictures you have seen.” Then show Step 1 of either Packet A or Packet B, alternating daily if repeat measures are taken. Show the first 5 pictures for 3 seconds each.

Packet A

Packet B

Directions: Say to the patient, “Now I am going to show you some more pictures. Some of these you have already seen and some are new. Let me know whether or not you saw the picture before by nodding your head yes (demonstrate) or no (demonstrate).” Then show 10 pictures (5 new, 5 repeat) for 3 seconds each (Step 2 of Packet A or B, depending upon which form was used in Step 1 above).

Scoring: This test is scored by the number of correct “yes” or “no” answers during the second step (out of a possible 10). To improve the visibility for elderly patients, the images are printed on 6”x10” buff colored paper and laminated with a matte finish.

Note: If a patient wears glasses, make sure he/she has them on when attempting the Visual ASE.

Packet A

Packet B
# Intensive Care Delirium Screening Checklist (ICDSC)

<table>
<thead>
<tr>
<th>Intensive Care Delirium Screening Checklist</th>
<th>SCORE</th>
</tr>
</thead>
</table>

## 1. Altered level of consciousness. Choose ONE from A–E.

<table>
<thead>
<tr>
<th>Option</th>
<th>SAS</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Exaggerated response to normal stimulation</td>
<td>5, 6, or 7</td>
<td>1 point</td>
</tr>
<tr>
<td>B. Normal wakefulness</td>
<td>4</td>
<td>0 point</td>
</tr>
<tr>
<td>C. Response to mild or moderate stimulation</td>
<td>3</td>
<td>1 point</td>
</tr>
<tr>
<td>(follows commands) If LOC related to recent sedation/analgesia, score 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Response only to intense and repeated stimulation (e.g., loud voice and pain)</td>
<td>2 **</td>
<td>Stop assessment</td>
</tr>
<tr>
<td>E. No response</td>
<td>1 **</td>
<td>Stop assessment</td>
</tr>
</tbody>
</table>

Note: May need to reassess patient if recent administration of sedation therapy.

## 2. Inattention. **Score 1 point for any of the following abnormalities:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Difficulty in following commands OR</td>
</tr>
<tr>
<td>B. Easily distracted by external stimuli OR</td>
</tr>
<tr>
<td>C. Difficulty in shifting focus</td>
</tr>
</tbody>
</table>

Does the patient follow you with their eyes?

## 3. Disorientation. **Score 1 point for any of the following abnormality:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Mistake in either time, place, or person</td>
</tr>
</tbody>
</table>

Does the patient recognize ICU caregivers who have cared for him/her and not recognize those that have not? What kind of place are you in? (list examples)

## 4. Hallucinations or Delusions. **Score 1 point for either:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Equivocal evidence of hallucinations or a behavior due to hallucinations (Hallucination = perception of something that is not there with NO stimulus) OR</td>
</tr>
<tr>
<td>B. Delusions or gross impairment of reality testing (Delusion = false belief that is fixed/unchanging)</td>
</tr>
</tbody>
</table>

Any hallucinations over past 24 hrs? Are you afraid of the people or things around you? (fear that is inappropriate to clinical situation)

## 5. Psychomotor Agitation or Retardation. **Score 1 point for either:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Hyperactivity requiring the use of additional sedative drugs or restraints in order to control potential danger (e.g., pulling IV lines out or hitting staff) OR</td>
</tr>
<tr>
<td>B. Hypoactive or clinically noticeable psychomotor slowing or retardation</td>
</tr>
</tbody>
</table>

Based on documentation and observation over shift by primary caregiver

## 6. Inappropriate Speech or Mood. **Score 1 point for either:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Inappropriate disorganized or incoherent speech OR</td>
</tr>
<tr>
<td>B. Inappropriate mood related to events or situation</td>
</tr>
</tbody>
</table>

Is the patient apathetic to current clinical situation (i.e., lack of emotion)?

Any gross abnormalities in speech or mood? Is patient inappropriately demanding?

## 7. Sleep/Wake Cycle Disturbance. **Score 1 point for either:**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Sleeping less than four hours at night OR</td>
</tr>
<tr>
<td>B. Waking frequently at night (do not include wakefulness initiated by medical staff or loud environment) OR</td>
</tr>
<tr>
<td>C. Sleep ≥ 4 hours during day</td>
</tr>
</tbody>
</table>

Based on primary caregiver assessment

## 8. Symptom Fluctuation. **Score 1 point for:**

Fluctuation of any of the above items (i.e., 1–7) over 24 hours (e.g., from one shift to another)

Based on primary caregiver assessment

**TOTAL ICDSC SCORE (Add 1 – 8)**

A total ICDSC score ≥ has a 99 percentage sensitivity correlation for a psychiatric diagnosis of delirium

# Agents for Analgesia

<table>
<thead>
<tr>
<th>Opioids</th>
<th>Approximate Equivalent Single IV Dose</th>
<th>Typical Infusion Rate</th>
<th>Onset to Peak Effect</th>
<th>Duration</th>
<th>Average Price/Day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FentaNYL</td>
<td>100-200 mcg</td>
<td>50-200 mcg/hr</td>
<td>2-5 min</td>
<td>0.5-2 hours</td>
<td>$26/day at a rate of 100 mcg/hr</td>
<td>Fastest onset and shortest duration.</td>
</tr>
<tr>
<td>HYDROmorphone (Dilaudid&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>1.5-2 mg</td>
<td>0.2-3 mg/hr</td>
<td>20-30 min</td>
<td>3-4 hours</td>
<td>$23/day at a rate of 1.6 mg/hr</td>
<td>5-10x more potent than morphine.</td>
</tr>
<tr>
<td>Morphine</td>
<td>10 mg</td>
<td>2-10 mg/hr</td>
<td>20-30 min</td>
<td>3-4 hours</td>
<td>$20/day at a rate of 10 mg/hr</td>
<td>Avoid in hypotension. Active metabolite accumulates in renal dysfunction. May cause itching due to histamine release (not a true allergy). Decreases preload, which may be beneficial in pulmonary edema.</td>
</tr>
</tbody>
</table>

**NSAIDs (Parenteral)**

<table>
<thead>
<tr>
<th>NSAIDs (Parenteral)</th>
<th>Approximate Equivalent Single IV Dose</th>
<th>Typical Infusion Rate</th>
<th>Onset to Peak Effect</th>
<th>Duration</th>
<th>Average Price/Day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ibuprofen (Caldolor&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>400-800 mg</td>
<td>IVPB over 30 mg</td>
<td>Not reported</td>
<td>6 hours</td>
<td>$7 per 400mg dose</td>
<td>Infuse over 30 minutes. Not to exceed 3200 mg/day. Black box warnings: Nonsteroidal anti-inflammatory drugs (NSAIDs) may increase the risk of serious cardiovascular thrombotic events. Risk may increase with duration of use. Contraindicated in setting of CABG. NSAIDs increase the risk of gastrointestinal adverse effects.</td>
</tr>
<tr>
<td>Ketorolac (Toradol&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>15-60 mg</td>
<td>IV push</td>
<td>1-2 hours</td>
<td>4-6 hours</td>
<td>$0.50-0.80 per 15 mg dose</td>
<td>Max adult dose 120 mg/day (60 mg/d in elderly or weight &lt;50 kg). Do not use for &gt;5 days. Avoid use in renal dysfunction. Monitor for gastrointestinal adverse effects. Black box warning: Nonsteroidal anti-inflammatory drugs (NSAIDs) may increase the risk of serious cardiovascular thrombotic events. Contraindicated in setting of CABG.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>References:</th>
</tr>
</thead>
</table>
## AGENTS FOR SEDATION

<table>
<thead>
<tr>
<th>Drug</th>
<th>Typical IV Bolus Dose</th>
<th>Typical Infusion Rate</th>
<th>Onset to Peak</th>
<th>Duration</th>
<th>Average Price/Day</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propofol (Diprivan&lt;sup&gt;a&lt;/sup&gt;)</td>
<td>0.03-0.15 mg/kg (max 20 mg)</td>
<td>5-80 mcg/kg/min</td>
<td>1-2 min</td>
<td>&lt;20 min</td>
<td>$36/day at a rate of 50 mcg/kg/min</td>
<td>Fastest onset and shortest duration. Avoid in hypotension. Dose/rate related hypotension/bradycardia. Avoid IV push bolus due to increased risk of hypotension (if bolus required and low risk of hypotension, limit dose to 10-20 mg). Monitor triglycerides. Provides 1.1 kcal/mL. Monitor for propofol-related infusion syndrome</td>
</tr>
<tr>
<td>Midazolam&lt;sup&gt;b&lt;/sup&gt; (Versed&lt;sup&gt;c&lt;/sup&gt;)</td>
<td>1-6 mg</td>
<td>1-10 mg/hr</td>
<td>5-10 min</td>
<td>1.5-2 hours</td>
<td>$70/day at a rate of 8 mg/hr</td>
<td>Fast onset - good for acute agitation/anxiety. Active metabolite accumulates in renal dysfunction. Midazolam 2-3 mg is approximately equivalent to 1 mg LORazepam. Midazolam is associated with increased incidents of delirium.</td>
</tr>
<tr>
<td>LORazepam&lt;sup&gt;b&lt;/sup&gt; (Ativan&lt;sup&gt;d&lt;/sup&gt;)</td>
<td>1-3 mg</td>
<td>1-5 mg/hr</td>
<td>15-20 min&lt;sup&gt;e&lt;/sup&gt;</td>
<td>2-4 hours</td>
<td>$38/day at a rate of 4 mg/hr</td>
<td>Slower onset but longer duration. Risk of propylene glycol toxicity with high doses (anion-gap acidosis, ↑ Serum Creatinine, ↑ Lactate). Monitor serum osmolality if rate &gt; 6 mg/hour and consider possible PG toxicity if osmol gap &gt;10-15&lt;sup&gt;f&lt;/sup&gt; LORazepam is associated with increased incidents of delirium.</td>
</tr>
<tr>
<td>Dexmedetomidine (Precedex&lt;sup&gt;g&lt;/sup&gt;)</td>
<td>1 mcg/kg over 20 min (not recommended)</td>
<td>0.2-1.5 mcg/kg/hr</td>
<td>30 min</td>
<td>2-4 hours</td>
<td>$408/day at a rate of 0.8 mcg/kg/hr</td>
<td>Limited data for use as a 1&lt;sup&gt;st&lt;/sup&gt; line agent. FDA approved for use &lt;24 hrs (studied up to 7 days in literature). FDA approved max dose = 0.7 mcg/kg/hr (studied up to 1.5 mcg/kg/hr). No respiratory depression - consider for patient failing spontaneous breathing trial due to agitation/anxiety. Dose/rate related hypotension and bradycardia–bolus not recommended. May cause hyper/hypotension. Consider higher starting dose if used as monotherapy. Expensive.</td>
</tr>
</tbody>
</table>

<sup>a</sup> Equivalent prices and doses are approximations and may vary due by institution and due to patient-specific differences in onset and duration of effect.

<sup>b</sup> Midazolam and LORazepam doses higher than recommended in the chart above may be required. Weight-based doses are reported for the following agents, but use may result in high bolus doses and infusion rates (Midazolam bolus 0.02-0.08 mg/kg and infusion 0.04-0.2 mg/kg/hr; LORazepam bolus 0.02-0.06 mg/kg and infusion 0.01-0.1 mg/kg/hr). Based on clinical experience, more typical bolus doses and infusion rates are included in the table.

References:
# Agents for Delirium

<table>
<thead>
<tr>
<th>Antipsychotic Agent</th>
<th>Dosage Form</th>
<th>Metabolism</th>
<th>Metabolizing Enzyme</th>
<th>Equiv. Dosages (approx) (mg)</th>
<th>Max Dose (mg/day)</th>
<th>QTc Prolongation Potential Dose Related Effect</th>
<th>Sedation</th>
<th>Dopaminergic Receptor Affinity/Extrapyramidal Symptoms</th>
<th>Anticholinergic Effects</th>
<th>Orthostatic Hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haloperidol (Haldol)</td>
<td>Tab, IV injection</td>
<td>T½: 21 hrs</td>
<td>Hepatic</td>
<td>CYP3A4, 2D6</td>
<td>2</td>
<td>35*</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Black Box Warning: Increased mortality seen when used in elderly patients with dementia-related psychosis due to cardiovascular or infectious complications. The use of these agents for delirium in ICU patients has not been tested in large, randomized, placebo-controlled trials.</td>
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</tr>
<tr>
<td>QUetiapine (SEROquel)</td>
<td>Tab</td>
<td>T½: 6 hrs</td>
<td>Hepatic</td>
<td>CYP3A4</td>
<td>125</td>
<td>400</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Risperidone (Risperdal)</td>
<td>Tab, ODT tab, solution (1 mg/ml)</td>
<td>T½: 3 hrs</td>
<td>Hepatic</td>
<td>CYP2D6, 3A4</td>
<td>1</td>
<td>4</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Aripiprazole (Abilify)</td>
<td>Tab, solution (5mg/ml), IM injection</td>
<td>T½: 75 hrs</td>
<td>Hepatic</td>
<td>CYP2D6, 3A4</td>
<td>5</td>
<td>30</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>The following agents are NOT recommended for ICU use.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ziprasidone (Geodon)</td>
<td>Capsule</td>
<td>T½: 7 hrs</td>
<td>Hepatic</td>
<td>CYP3A4, 1A2</td>
<td>40</td>
<td>160</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>OLANZapine (ZyPREXA)</td>
<td>Tab, ODT tab, IM injection</td>
<td>T½: 30 hrs</td>
<td>Hepatic</td>
<td>CYP1A2</td>
<td>5</td>
<td>20</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

* Use heightened caution and be aware that there is a dose related QT interval prolongation and torsades de pointes (TdP) risk when using in excess of >20 mg per day.

a Low: 3-10 msec, Medium: 10-15 msec, High: > 15 msec
b Increased with IV formulation
c Caution: Bone marrow suppression; blood dyscrasias
d Secondary to high risk for QT prolongation
e Secondary to high risk for metabolic syndrome
**DAILY AWAKENING TRIAL PROTOCOL SHEET (TEMPLATE)**

*The following protocol sheet contains recommendations from the San Diego Patient Safety Council. Elements may vary based on your patient population and unit needs.*

1. **Assess for Daily Awakening**
   - Exclusions:
     - Increased Intracranial pressure issues
     - Neuromuscular blockade
     - Significant ventilation support required, such as very high PEEP (___), FiO2 (___)
     - CABG immediate post-op
     - Other site specific exclusionary criteria:
       - __________________________
       - __________________________

2. **Perform Daily Awakening**
   - Wean / Stop sedation
   - Consider decreasing narcotics infusion by 25-50%

3. **Is Patient Awake and Calm? Use sedation scale (SAS 3-4 or RASS 0 to -1)?**
   - Take opportunity to assess patient’s pain
   - Titrate narcotics as needed for pain
   - If no, Restart Sedation at ½ previous dose (No Rapid Shallow Breathing Index)
   - If yes, proceed to Spontaneous Breathing Trial

4. **Assess for Spontaneous Breathing Trial (SBT) (performed by RN and RCP)**
   - **Patient must meet all criteria to proceed to conduct SBT***
     - Calm and co-operative (SAS score of 3 to 4; RASS 0 to -1)
     - Hemodynamically stable
     - PEEP < 8
     - FiO2 < 0.60
     - PH > 7.34
     - SpO2 > 90%

5. **Conduct SBT for 1 Minute**
   - Mode CPAP
   - PEEP = 0
   - Pressure support vent. at least 5 - 10
   - FiO2 unchanged
   - After 1 minute, calculate Rapid Shallow Breathing Index (RSBI):
     
     \[
     \text{RSBI} = \frac{\text{Respiratory Rate}}{\text{Tidal Volume in liters}}
     \]
     
     <105 = 80% success
     >105 = 95% failure
   - If RSBI successful, continue to conduct SBT for up to 2 hours
   - If RSBI failure, return to previous ventilator settings

6. **Conduct SBT for up to 2 hours and Continuously Reassess**
   - **Successful Completion SBT ~~~**
     - Discuss Arterial Blood Gases and Extubation Plan with Physician

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**SBT Termination Criteria:**
- Respiration Rate >35/minute for >5 minutes
- SpO2 < 90% for > 2 minutes
- New Ectopy
- Heart Rate change 20% from baseline
- Blood Pressure change 20% from baseline
- Accessory muscle use
- Increased anxiety/diaphoresis

- Return patients who fail a SBT to their previous ventilator settings and re-screen in 24 hours
- Discuss with MD prn vs. continuous sedation/pain