The High Price of Oversedation

Helping clinicians reduce expenses and improve patient outcomes[1-8]

It has been well documented that excessive sedation reduces the quality of care while increasing its expense;[1-4] however, oversedation still remains an issue in the intensive care unit (ICU).[5,6,7] The natural and compassionate wish to calm an agitated patient with sedatives may run counter to studies associating deeper sedation with longer hospital stays and poorer health outcomes.[1] But there is something you may be able to do. A practical combination of well-informed policy, procedures, training and novel technologies may enable your staff to help improve patient comfort without excess sedation, potentially improving patient care and trimming unnecessary costs.[1,2,8]

Oversedation—still common in the ICU[2,5-7]

Optimal sedation is a moving target, specific to the individual patient's changing condition.[9] It can be challenging to balance short-term goals of sedation, such as patient comfort, with long-term aims, such as earlier weaning from mechanical ventilation, shorter time in the ICU and minimized mortality.[1] The definition of best sedation level for a given situation varies across practitioners as well,[6] and sedation practices are highly variable from one institution to the next.[1] Clinical researchers have called for more consistent definition and measurement of oversedation in the ICU as important factors in raising standards of care.[6]

Despite the variability in definitions, clinical studies demonstrate a marked tendency toward oversedation in critical care.[2, 5-7] A 2000 study found that ICU staff overestimated patient need for sedation in as much as 54% of cases.[7] More recent epidemiologic data suggest that tendency hasn't changed.[5,6] A 2009 review of studies in ICU practice settings reported that 30 to 60% of sedation assessments found "deep" or "excess" sedation.[6] Rates of undersedation were much lower, ranging from 0 to 31%.[6] The use of benzodiazepines in particular is associated
with higher rates of oversedation, as well as higher health care costs.[5,6]

Importantly, these studies highlight differences between caregiver perception of sedation depth and the results of more objective ratings.[6,7,10] Despite an increased understanding of the problem, use of formal sedation assessments and protocols to optimize sedation for individual patients is not universal.[2,6] Even where institutional guidelines call for the use of assessments and protocols, staff compliance can be inconsistent.[6] This underscores the need to provide staff with not only continuing education to inform care decisions, but also tools that facilitate best practices in a busy care unit, every day, with every patient.

A costly problem[1]

Unaddressed, the tendency to oversedate generates ongoing costs in both quality and expense of critical care.[1] Key savings include shorter duration of intensive care and reduced drug costs.[1] Studies also suggest the potential to decrease unnecessary procedures and reduce risks of patient drug dependence, delirium and mortality.[1]

Duration of care

Oversedation is associated with longer hospital and ICU stays, as well as increased time on mechanical ventilation, with accompanying increases in risks of nosocomial infection and mortality.[1]

Interventions to improve sedation practices have been shown to reduce time on mechanical ventilation from 10 to 70%.[1] The introduction of daily sedation holidays reduced days on ventilation by a factor of 1.5 to 3.[1] Such sedation breaks can also increase ventilator-free days.[1]

Consistent with reduced ventilator time, the literature shows a reduction in length of ICU stay of 11 to 64%, as well as shorter overall hospital stays, with improvements in sedation management.[1] Daily sedation breaks reduced ICU stays by 35 to 64%.[1]

With an average ICU cost per day with no mechanical ventilation at $3,184 US, climbing to $3,968 US when mechanical ventilation was needed, reduction in both ICU stay and duration of mechanical ventilation can translate into considerable financial savings.[11] Given an average ICU stay of 14.4 days, an 11 to 64% reduction in length of stay by managing sedation saves 1.5 to 9.2 days.[11]

Pharmacologic costs

Avoiding excess sedation and improving the choice of sedative agent can reduce drug costs as well as lower risks of patient addiction and drug-induced delirium.[12,13]

Pharmacologic expense can decrease from between 22 to 94% with the use of sedation protocols compared with the cost of non-protocolized sedation.[1] Choice of medication alone could save hundreds of dollars a day,[14,15] while reducing days on mechanical ventilation[15] and in the ICU.[16] The cost savings may result not only from the use of less costly drugs but also options with higher upfront pricing but a lower dosage or other characteristics that shorten time on sedation.[16]

Results are mixed regarding changes in the duration of sedation, but some studies show a 39 to 50% decrease in total sedation time following the introduction of protocols to guide and standardize sedative use, particularly where staff compliance was high.[1] Along with time on sedation, total dosage tended to decrease.[1]

Additional procedures

Studies evaluating the impact of daily sedation holds have noted a reduction in neurologic diagnostic procedures ordered, including computed tomography, magnetic resonance imaging, and lumbar puncture.[17,18]

Patient outcomes and safety

Excess and prolonged sedation may increase patient mortality.[1,17] Daily sedation breaks coupled with spontaneous breathing trials (SBTs) in mechanically ventilated patients have been shown to improve one-year mortality after discharge from the ICU.[17] Improved choice of sedative drug[19] and daily sedation holds with SBTs[17] may impact patient performance in breathing trials, indicating a possible influence on the timely return to independent breathing. Studies also suggest a reduction in the incidence of nosocomial pneumonia with the introduction of sedation protocols.[1]

Help your staff prevent excess sedation

Well-crafted policies and procedures, together with staff training and supportive newer technologies, may reduce the incidence of oversedation and its associated costs in your care unit.[1,4]

A structured approach

Systematic programs to improve sedation can help ensure more consistent, evidence-based and patient-focused care.[8,9] An integrated approach that involves the physician, nurse and pharmacist in developing and implementing guidelines and protocols may dramatically improve outcomes.[4] It may also aid communication among health care professionals.[8,9]

Switching to protocol-based from empirical sedation and analgesia assessment has been shown to reduce hourly drug costs while improving patient comfort.[16,20] Patient-targeted protocols that optimize the choice of therapy and titrate dosage to a patient's needs may reduce pain, improve sedation quality and shorten ICU stays while also reducing pharmacologic costs by up to 50%.[16,21] Guidelines can also incorporate a cost–benefit evaluation of care decisions based on specific patient situations.[8] With care to design a protocol suited to available staff and resources and tailored to your patient population, it may be possible to improve effectiveness, safety and consistency of care as well as efficiency.[2,3] Implementation is low risk and can be performed at minimal cost.[2]

Assessment first[22-24]

Most effective patient-focused protocols center on one core principal: Evaluate before you sedate.[22-24]

Policies and procedures should emphasize assessment before sedation.[22-24] Identifying the underlying cause of agitation in each situation makes it possible to select the best course of action for patient comfort and safety.[24] The use of valid and reliable bedside assessment tools to measure pain, agitation, delirium and sedation helps clinicians more appropriately address each cause of patient discomfort, as well as to evaluate treatment effectiveness and titrate dosing.[2,9]

The American College of Critical Care Medicine recommends a protocol that assesses and treats any environmental issues, patient pain and delirium first, and then turns to sedation only if it is still necessary.[2] Sometimes a change in lighting or noise level in the patient's room will allow sleep.[25] Shifting the patient to a more comfortable position may provide relief without the need for medication.[25] (See "Environment management to reduce agitation" on this website) In other cases, the patient may respond best to analgesic therapy, with or without the need for sedation.[26,27] The incorrect choice in sedation may delay liberation from mechanical ventilation and worsen problems such as delirium, which remains underdiagnosed in the ICU.[28]

Pain and discomfort are leading sources of patient distress; at least 40% of patients in the ICU report experiencing moderate to severe pain.[2] Studies have indicated a tendency for caregivers to underestimate[29,30] and undertreat[2,31] pain. One study reported that staff failed to record patient self-reports of pain, and reassess pain after intervention, in the majority of cases.[32] Strategies that assess and treat pain before sedating can reduce time on mechanical ventilation and time in the ICU compared with standard sedative-hypnotic therapy,[26,33] and even decrease sedative dosage while improving sedation scores.[33]

Titrating sedation to need[2,3,27]

When sedation is called for, a clear protocol for dose titration and frequent monitoring is recommended to help limit oversedation[2,3,27] and minimize drug accumulation.[27] Updated recommendations from the American College of Critical Care Medicine emphasize a need for guidelines that encourage lighter sedation, reduced use of benzodiazepines and early patient mobility.[2] Dose should be titrated to the lowest effective dosage for the specific patient,[2,24] with care taken to gradually step down exposure where necessary to avoid addiction and withdrawal symptoms.[24]

Use of a simple scale to rate sedation depth, such as the Richmond Agitation-Sedation Scale or the Riker Sedation-Agitation Scale,[2] may decrease the incidence of oversedation,[24,34] in addition to reducing sedative and analgesic uses and time on ventilation.[24] Frequent assessment may help health care professionals more appropriately address a patient's dynamic condition, thus promoting closer monitoring to avoid oversedation.[2,9,27] (See also "Pharmacological Responses" on this website for further discussion.)

Daily awakenings are recommended, together with spontaneous breathing trials to evaluate whether a patient is ready for weaning from mechanical ventilation.[2] Daily sedation holidays, especially those paired with spontaneous breathing trials, demonstrably shorten ICU and hospital stays by days and have been associated with reduced mortality in the year following hospital discharge.[2,17,35,36] (See also "Daily sedation holidays" and "Spontaneous breathing trials and ventilator adjustments" on this website for details.)

Enabling health care professionals

Guidelines alone can be insufficient to change health clinician behavior.[2,37]

Adherence problems highlight the need to provide busy health care professionals with protocols that are easy to implement as well as tools that support best practices in the controlled chaos of the ICU. The American College of Critical Care Medicine recommends convenient, printed or computerized rating scales and protocol checklists to help staff compliance.[2] Newer technologies that facilitate or automate routine tasks may lower the burden on busy staff members. Clinical tools that alleviate causes of patient discomfort may also help by reducing the need for sedation.

The best standard of care

Oversedation is a problem in today's ICU, but recent research, published guidelines and new technologies outline a path to solutions. A well-designed program of protocol-driven sedation, assessment instruments, and clinical tools can help your staff to contain costs, comfort patients and improve outcomes simultaneously.

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