Mechanized ventilation (MV) is an essential part of the support given to patients with respiratory failure, central nervous system injuries or undergoing postoperative care of adults, children or newborns.

This support, in conjunction with frequent invasive monitoring, may cause anxiety, agitation and pain. Children admitted to intensive care units (ICUs) have fear and anxiety both from the absence of their relatives and from the stressful environment, in which they constantly undergo painful procedures.

In particular, younger children have physiological responses to small stimuli, and they cannot appropriately verbalize their pain intensity or the location of their pain. Differentiating between sedation and analgesia is thus very difficult in young children.

However, there is a consensus that sedation and analgesia are essential for the comfort and safety of MV patients. Indeed, sedation and analgesia are proven to reduce MV-associated discomfort, which in turn reduces the use of oxygen, modulates the response to stress intensity, reduces the risk of injury associated with agitation and the displacement of invasive devices, and therefore promotes a patient’s safety and facilitates bedside care.

Ventilation support has shown a marked evolution; currently, mechanical ventilation support is frequently provided as a complement to, rather than a full replacement of, spontaneous respiration.

Despite all of the technical advances in MV, procrastination on the part of caregivers to begin gradual weaning from mechanical ventilation may cause unnecessary discomfort to the patient and may increase tracheal intubation and MV risks. Because the weaning period accounts for up to 40% of a patient’s total time on ventilation support and because there are numerous ventilation modes and strategies for different diseases, ventilation weaning protocols have been developed, accordingly. While these protocols are employed with all ventilated patients, respiratory support weaning methods have never been accurately studied using children, and these methods have mostly been extrapolated from trials in adults and premature children. Thus, these methods may be inappropriate for use with children.

The understanding that deep or prolonged sedation and analgesia may potentially increase morbidity and mortality led to the creation of a new model emphasizing the patient’s comfort while keeping them interactive, oriented and able to follow instructions. This new model is based...
on strategies to maintain an appropriate level of sedation,\(^{(1)}\) to provide daily sedation interruptions \(^{(12)}\) and to minimize the use of muscle relaxant drugs.\(^{(13)}\)

Because the optimized sedation/analgesia level cannot be established before the regimen is initiated, monitoring the degree of sedation is essential to prevent hyper- or sub-sedation. To date, no optimal general method to assess sedation in critically ill children is available.\(^{(3)}\) Scoring systems, such as the COMFORT system, have only been validated for severely ill MV children,\(^{(3)}\) and these systems are useful mainly in children requiring moderate sedation/analgesia.\(^{(5)}\) Moreover, little clinical experience is currently available for electroencephalogram (EEG) derived methods, such as the ‘bispectral index’ (BIS), and these methods have been validated only for anesthetized patients.\(^{(3)}\)

Although analgesic/sedative medications are widely prescribed drugs,\(^{(14)}\) in contrast to their use in adult patients, few protocols and guidelines for their use have been published in Pediatrics,\(^{\text{5,15}}\) and only scarce data are available regarding the dosages, safety and efficacy of these drugs and their combinations.\(^{(16)}\)

Regarding daily sedation interruptions, it was recently shown in a randomized controlled trial\(^{(17)}\) that children on MV for longer than 48 hours who were awakened once daily by an interruption of the infusion of sedation drugs had shorter stays in the ICU, received less of the sedation drugs, and had lower hospital costs when compared with continuously sedated patients. These results are comparable to findings in adult patients.

While this new model of sedation-analgesia and MV for severely ill children is a significant development, there is still a long and hard way ahead\(^{(18)}\) before we can say that ICU children are not with adequate therapeutic.\(^{(19)}\)

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**REFERENCES**


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