

A protocol mandating a daily interruption of sedatives and spontaneous breathing trial improves patient outcome

In critically ill, mechanically ventilated, non-surgical patients, a protocol pairing daily mandatory sedation breaks (spontaneous awakening trials - SAT) with spontaneous breathing trials (SBT) results in earlier extubation, shorter ICU stay, shorter hospital stay and lower mortality at one year (NNT=7) compared to standard care.

Level of evidence: 1⁺⁺ (RCT with a low risk of bias)

Appraised by: Michael Irvine

Citation: Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled Trial). *Lancet* 2008; 371: 126-34.

Lead author: Timothy Girard.

Three-part clinical question:

Patients: Adult ICU patients expected to require mechanical ventilation for more than 12 hours.

Intervention: Protocol of daily interruption of sedation (SAT) followed by SBT vs normal patient-targeted sedation and SBT.

Outcome: Primary – ventilator-free days in first 28 days; Secondary – time to ICU and hospital discharge, 28-day mortality, one-year survival, duration of coma and delirium.

Search terms: mechanical ventilation, sedation, weaning, spontaneous breathing trials.

The study: Non-blinded, multi-centre randomised control trial with intention-to-treat analysis.

The study patients: Adults admitted to one of four intensive care units in the USA between October 2003 and March 2006.

Inclusion criteria: Expected to require mechanical ventilation for >12 h.

Exclusion criteria: Postoperative surgical patients, admission after cardiopulmonary arrest, already ventilated for more than two weeks, death or withdrawal of life support imminent,

profound neurological deficits (large stroke/severe dementia) or already enrolled in another trial.

One thousand, six hundred and fifty-eight patients were considered eligible, 336 enrolled and randomised. SAT involved mandatory daily interruption of sedatives unless contraindicated (eg increased ICP, active myocardial ischemia, paralysed), and passed if the patient opened eyes to verbal stimuli or tolerated sedative interruption for more than 4 h. SBT involved reducing support to either a T-tube or CPAP of 5 cm H₂O or pressure support <7 cm H₂O and was failed if the patient developed respiratory rate >35 or <8, SpO₂ <88% for more than 5 min, an acute arrhythmia, or two or more of HR >130 or <60 bpm, accessory muscle use, diaphoresis, abdominal paradox in 120 minutes. If the patient passed the SBT, the physician was informed of the result and the patient was extubated if felt appropriate. A ventilator-free day was defined as a day breathing without assistance during the study period, starting with extubation (as long as the period of unassisted breathing lasted for at least 48 hours). Patients who died counted as having no ventilator-free days.

Control group: (N=168; 168 analysed): Patients received normal care with patient-targeted sedation managed by clinical staff including sedation breaks as appropriate and a daily SBT.

Intervention group: (N=168; 167 analysed): Patients received patient-targeted sedation with a daily spontaneous awakening trial (interruption of sedation). If they passed this, they went on to an SBT. If they failed the SAT, sedation was restarted at half the previous dose and titrated as needed.

The evidence (EN = enteral nutrition):

Outcome	Time to outcome	CER	EER	RRR	ARR	NNT
Death	28 days	0.345	0.280	19%	0.065	NS
	95% confidence intervals:			NS	NS	NS
Death	1 year	0.577	0.440	24%	0.137	7
	95% confidence intervals:			5 to 42%	0.031 to 0.243	4 to 32

Non-event outcomes	Time to outcome	Control	Intervention	P-value
Ventilator-free days	28 days	11.6	14.7	0.02
Time till ICU discharge (days)	ICU discharge	12.9	9.1	0.01
Time till hospital discharge (days)	Hospital discharge	19.2	14.9	0.04
Duration of coma (days)	ICU stay	3	2	0.01

There was an increased incidence of self extubation in the intervention group but not an increased incidence of self extubation requiring re-intubation.

EBM comments:

1. Do the methods allow accurate testing of the hypothesis? **Yes.**
2. Do the statistical tests correctly test the results to allow differentiation of statistically significant results? **Yes.**
3. Are conclusions valid in light of the results? **Yes.**
4. Did results get omitted and why? **Yes.** One patient withdrew before starting protocol.
5. Did they suggest areas of further research? **Yes.** They recommended a repeat trial including postoperative surgical patients. These patients were excluded in this study because of concerns about interaction of analgesia requirements and sedation interruption.
6. Did they make any recommendations based on the results and were they appropriate? **Yes.** They appropriately recommend that a strategy of mandatory daily paired sedation break trials (unless contraindicated) and spontaneous breathing trials should become standard practice.
7. Is the study relevant to my clinical practice? **Yes.**
8. What level of evidence does this study represent? **1⁺⁺**
9. What grade of recommendation can I make on this result alone? **A.**
10. What grade of recommendation can I make when this study is considered along with other available evidence? **A.** There is an increasing body of evidence in favour of daily sedative interruption.
11. Should I change my practice because of these results? **Yes,** if you do not already practice this intervention in your ICU.
12. Should I audit my current practice because of these results? **Yes,** although many ICUs claim to practice daily sedation breaks and breathing trials in practice this is not actually achieved as often as it should be. A mandatory daily protocol may help reduce this variability.

Appraised by: Michael Irvine, SpR Anaesthesia, Addenbrookes NHS Trust.
Email: ingloss.lodge@btinternet.com

Reviewed by Chris Cairns.