



WEANING & SBTs

Liberation from Mechanical Ventilation

WAKE UP

& breathe

READINESS TO WEAN

screen daily - all should be trending right

- ✓ **Cause improving:** underlying respiratory failure resolving
- ✓ **Oxygenation:** $\text{PaO}_2/\text{FiO}_2 > 150-200$ on $\text{FiO}_2 \leq 0.4$, $\text{PEEP} \leq 5-8$
- ✓ **Haemodynamics:** stable, minimal / no vasopressors, no ischaemia
- ✓ **Airway:** adequate cough, manageable secretions
- ✓ **Neurology:** awake / arousable, initiating breaths, $\text{pH} \geq 7.25$

THE LIBERATION SEQUENCE

pair the awakening and breathing trials

SAT

Spontaneous Awakening Trial - stop sedation, assess



SBT

Spontaneous Breathing Trial - 30-120 min



EXTUBATE

Assess airway, cough & secretions, then pull tube

SBT METHOD

Technique: PS 5-8 + PEEP 5 (or CPAP / T-piece)

Duration: 30-120 min (30 enough for most)

Screen: $\text{RSBI} = \text{RR} / \text{VT(L)} < 105$ predicts success

Passed SBT $\neq$ ready to extubate

STOP THE SBT IF

fail $\rightarrow$ rest, retry in 24 h

- $\text{RR} > 35 / \text{min}$ or rising
- $\text{SpO}_2 < 90\%$ or $\text{PaO}_2 < 60$ on $\text{FiO}_2 \geq 0.5$
- $\text{HR} > 140$ or $> 20\%$ change; new arrhythmia
- $\text{SBP} > 180$ or < 90 mmHg
- Agitation, anxiety, diaphoresis
- Accessory muscle use / paradoxical breathing

EXTUBATION & CUFF-LEAK

Ready: passed SBT + alert + protects airway + good cough + manageable secretions

Cuff-leak: test if high-risk (prolonged / traumatic, large tube, reintubation)

Fail: leak < 110 mL or $< 10-15\%$ VT $\rightarrow$ laryngeal oedema risk

If fail: methylprednisolone ≥ 4 h before extubation

POST-EXTUBATION

- **Prophylactic NIV** - for high-risk (> 24 h vent, COPD / hypercapnia, CHF, obesity)
- **HFNO** - for hypoxaemic / high-risk patients
- **NIV is NOT a rescue** - for established failure - it delays reintubation and worsens outcome

WHY WEANING FAILS

find and fix before retrying

RESPIRATORY

Load up / capacity down: secretions, bronchospasm, atelectasis, weak muscles

CARDIAC

Weaning-induced pulmonary oedema - negative-pressure breathing raises preload / afterload

NEUROMUSCULAR

ICU-acquired weakness, critical-illness polyneuropathy, oversedation, delirium

METABOLIC

Low K / PO_4 / Mg, acidosis, malnutrition, anxiety, poor sleep

WEANING CATEGORIES (WIND): Simple - liberated on the first SBT. Difficult - up to 3 SBTs or ≤ 7 days from the first. Prolonged - > 3 SBTs or > 7 days: use a protocol, fix reversible causes, nutrition + rehab, consider early tracheostomy.

PEARLS & PITFALLS

- Pair the SAT with the SBT - sedation interruption is what most often unlocks a successful trial.
- A passed SBT tests the lungs, not the airway - assess mentation, cough and secretions separately.
- RSBI is a screen, not a verdict; a borderline value with an otherwise passing SBT should not block extubation.
- Use NIV / HFNO prophylactically in high-risk patients; waiting to rescue with NIV costs lives.

