

Weaning from Mechanical Ventilation

Section Editor: seat open

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Disclaimer: This protocol is an educational reference intended to support — not replace — institutional policy, pharmacy and therapeutics review, and individual clinical judgment. Verify current dosing, contraindications, and local formulary/practice constraints before adopting into an EMR or using in patient care.

Overview

Delayed liberation from mechanical ventilation adds ventilator days, sedation exposure, and ICU length of stay without benefit once a patient is ready. A daily, protocolized spontaneous breathing trial (SBT), coordinated with sedation interruption, is the core intervention. The 2024 AARC guideline simplified this considerably: no rapid shallow breathing index (RSBI) calculation is required, and SBTs can be run with low-level pressure support or a T-piece — the standardized daily process matters more than the specific technique.

Steps

01 Screen for SBT Readiness Every Morning

- Coordinate screening with multidisciplinary rounds, targeting a completed SBT **before noon** each day.
- Readiness = evidence of some reversal of the underlying cause of respiratory failure, **adequate oxygenation, hemodynamic stability**, and the patient can **initiate an inspiratory effort**.
- **RSBI is not required** to determine readiness (2024 AARC guideline; moderate sensitivity but poor specificity, and calculating it can unnecessarily delay testing).

02 Coordinate with Sedation Interruption

- Pair the SBT with a same-day sedation awakening trial — sedation depth is a major driver of ventilator days, and the awakening trial is the gate to the breathing trial, not a parallel, disconnected process.

03 Conduct the SBT

- Run for 30–120 minutes with either **low-level pressure support (≤ 8 cmH₂O)** or a **T-piece** — evidence does not favor one over the other; use whichever your unit can execute consistently.
- Do **not** increase FiO₂ during the trial — hold it at baseline so inadequate oxygenation isn't masked.

04 Determine Pass or Fail

Table 1. SBT pass criteria (assess throughout the trial)

DOMAIN	FAILURE SIGNS
Respiratory	Tachypnea, accessory muscle use, paradoxical breathing, worsening SpO ₂ /gas exchange
Hemodynamic	New tachycardia, hypertension/hypotension, arrhythmia
Neurologic	Agitation, diaphoresis, anxiety, decreased consciousness

05 If Pass — Verify Extubation Readiness

- Confirm mental status and ability to protect the airway.
- Assess secretion burden and cough strength.
- If a prolonged intubation and no cuff leak, consider a cuff-leak test and corticosteroid pretreatment per local practice before proceeding.
- If all criteria met → **proceed to extubation**; if not → **do not extubate**, manage as a reversible-cause issue (Step 6) even though the SBT itself passed.

06 If Fail — Multidisciplinary Review for Reversible Causes

Review with the bedside team for potentially reversible contributors:

- Sedation (residual effect, inadequate interruption)
- Volume overload
- Respiratory mechanics (bronchospasm, secretions, auto-PEEP)
- Cardiac dysfunction
- Delirium
- Metabolic derangements (electrolytes, acid-base, endocrine)

07 Decide Repeat Timing Based on the Intervention

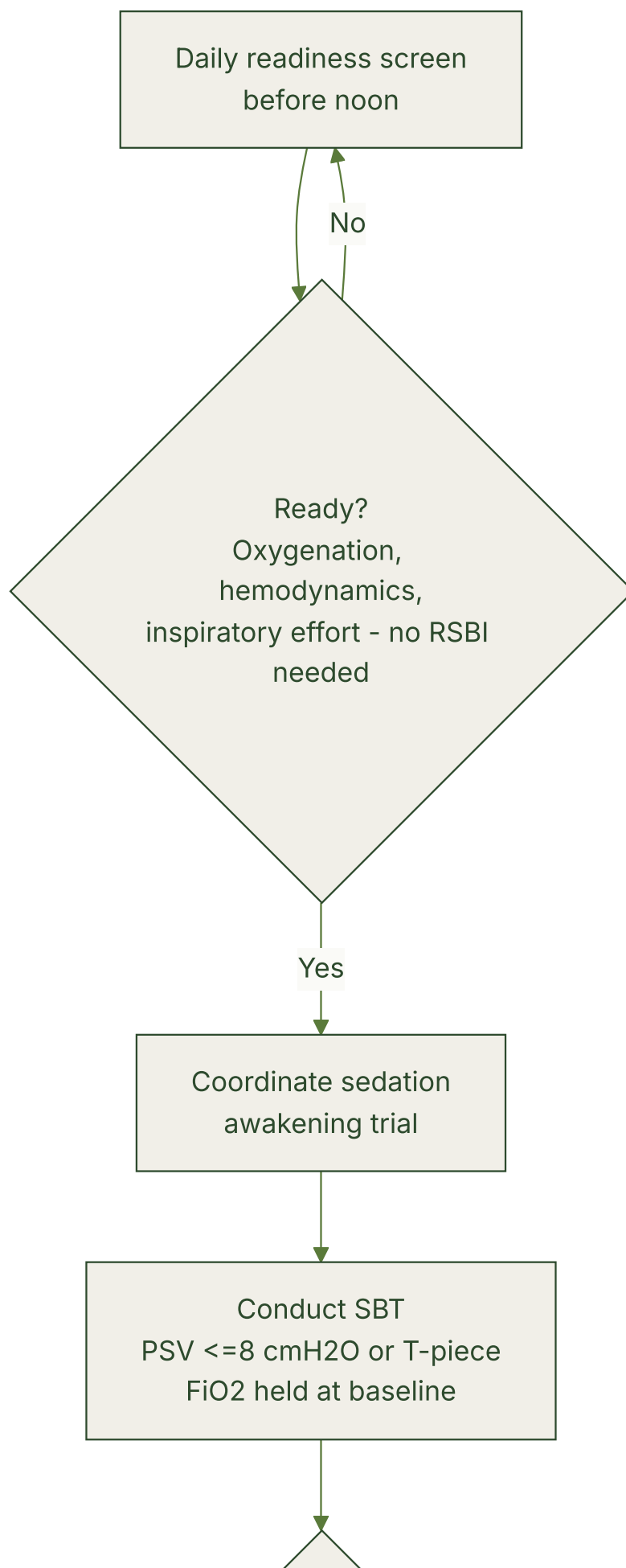
- **Quick intervention (< 12 hours to effect)** — implement it, repeat the SBT **later the same day**.
- **Long intervention (> 12 hours to effect)** — implement it, repeat the SBT **the next morning**.
- If no clear reversible cause is identified, mark "not ready yet" and repeat the SBT the next morning as part of the standard daily screen.

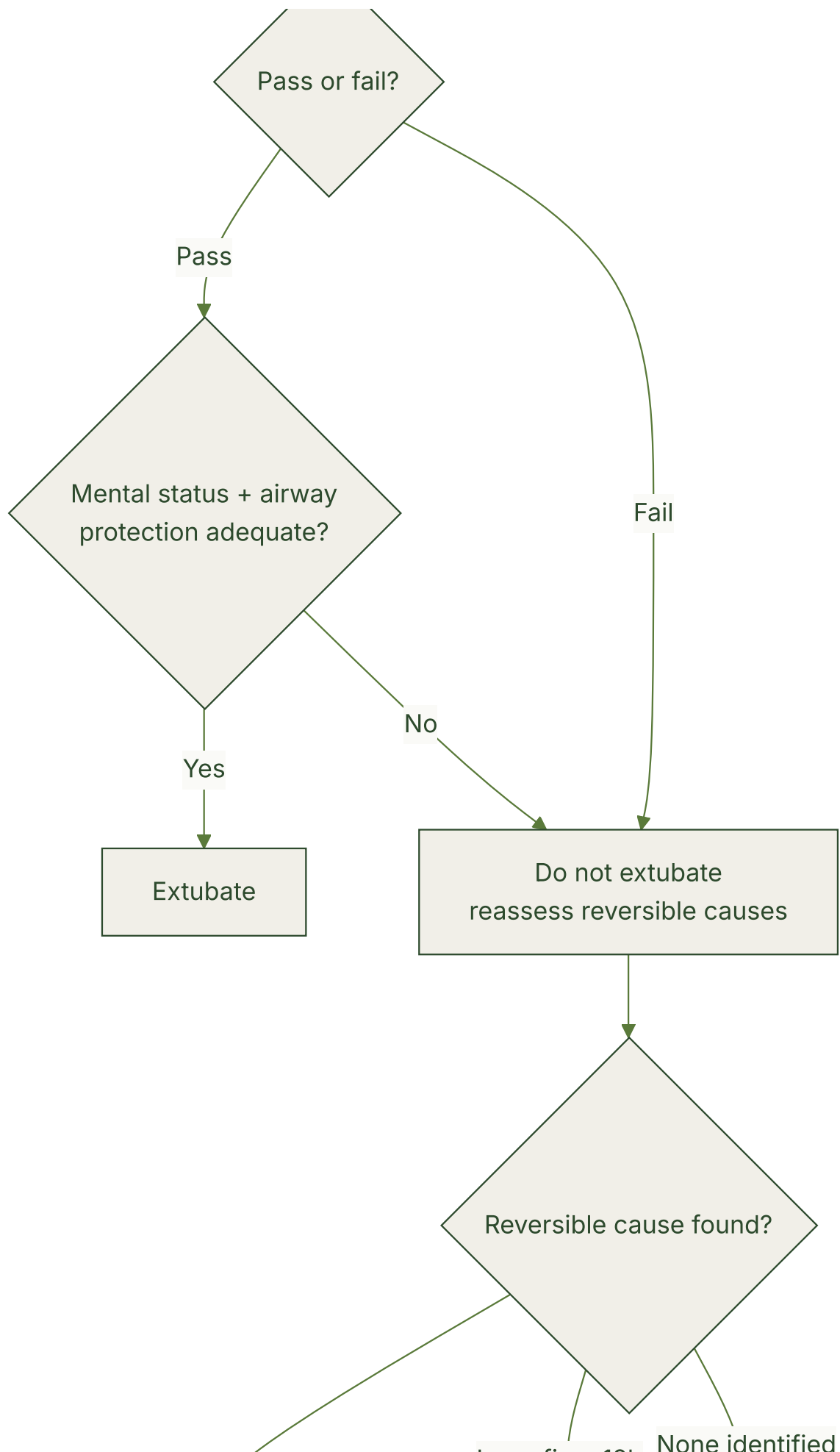
08 Post-Extubation Monitoring

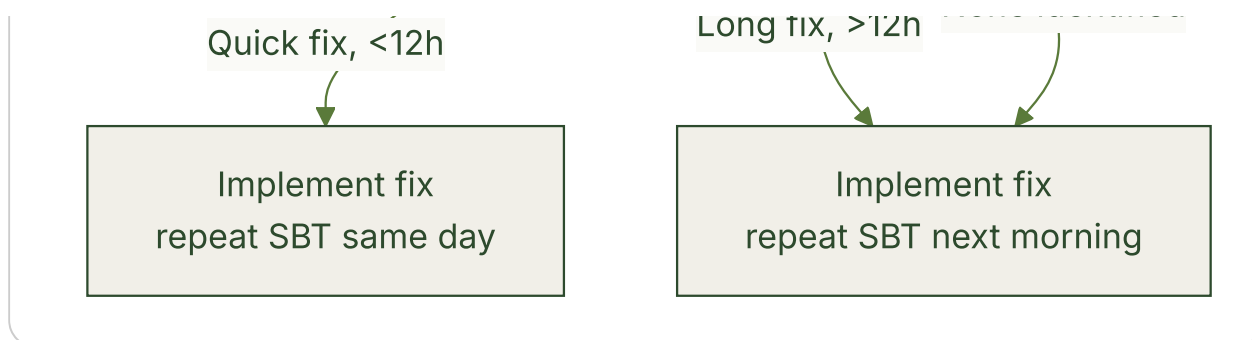
- Watch for post-extubation respiratory distress, stridor, and secretion management failure in the first hours.
- Consider prophylactic HFNC or NIV in patients at high risk of extubation failure (obesity, cardiac disease, prior difficult weaning), per local respiratory therapy protocol.

Algorithm









EMR Order Set

PHYSICIAN ORDERS

- Enroll patient in daily SBT/weaning protocol.
- Extubation order (post-SBT-pass, post-airway-assessment).
- Reintubation contingency criteria, documented in advance.

NURSING ORDERS

- Daily sedation awakening trial, coordinated with respiratory therapy timing.
- SBT readiness checklist documentation (oxygenation, hemodynamics, inspiratory effort — RSBI field removed/optional, not required).
- Extubation readiness checklist (mental status, airway protection, secretions/cough).

RESPIRATORY THERAPY ORDERS

- Conduct SBT per protocol: PSV $\leq$ 8 cmH₂O or T-piece, FiO₂ held at baseline, standard duration 30–120 minutes.
- Post-extubation HFNC/NIV per local high-risk criteria.
- Cuff-leak test when indicated (prolonged intubation, no baseline leak).

Build notes — make the SBT readiness fields structured (yes/no per domain) rather than free text so ventilator-days and SBT-pass-rate metrics can be pulled automatically; do not make RSBI a required field.

Adoption Notes

- Champion: respiratory therapy-driven protocol with physician oversight — RT typically screens and initiates; physician confirms extubation. This is a role change from RSBI-gated physician-initiated screening at many sites and should be called out explicitly in staff education.
- Coordinate go-live timing with nursing (sedation awakening trial workflow) since the two trials are meant to run together.
- Stage rollout: pilot the "no RSBI required" change first, since it's the most likely point of resistance from staff trained on older protocols.

Success Metrics & Monitoring

Ventilator days, SBT pass rate, time from readiness to first SBT, extubation success rate, and reintubation rate within 48–72 hours. Track via ventilator flowsheet data/critical care database; review monthly during rollout.

Suggested Reading

- 1 Roberts KJ, Goodfellow LT, Battey-Muse CM, et al. AARC Clinical Practice Guideline: Spontaneous Breathing Trials for Liberation From Adult Mechanical Ventilation. **Respir Care**. 2024;69(7):891–901. doi:10.4187/respcare.11735. Primary current guideline this protocol is built from — removes the RSBI requirement, allows PSV or T-piece, and recommends a standardized before-noon daily approach.
- 2 Girard TD, Kress JP, Fuchs BD, et al. 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(9607):126–134. Established the paired sedation-interruption + SBT approach this protocol's Step 2 is built on.

3 MacIntyre NR, Cook DJ, Ely EW Jr, et al. Evidence-based guidelines for weaning and discontinuing ventilatory support. **Chest**. 2001;120(6 Suppl):375S–395S. Foundational weaning guideline; largely superseded by the 2024 AARC update on the RSBI question — kept here for historical context only.

Revision History

VERSION	DATE	EDITOR	SUMMARY
0.1	2026-07-19	FunctionalHealth editorial team	Initial version, grounded in local weaning-algorithm slide and 2024 AARC SBT guideline

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