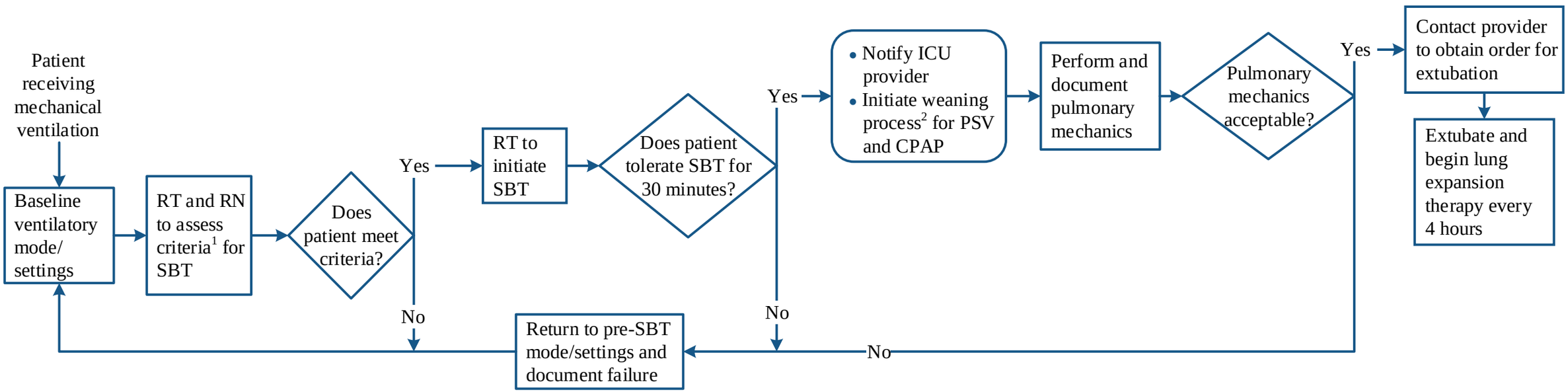
Spontaneous Breathing Trial and Mechanical Ventilation Weaning Process

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

ASSESSMENT **INTERVENTION**



[1]See Appendix A for SBT Criteria
[2]See Appendix B for Weaning Process

RT = respiratory therapist
RN = registered nurse
SBT = spontaneous breathing trial
PSV = pressure support ventilation
CPAP = continuous positive airway pressure

Department of Clinical Effectiveness V2
Approved by the Executive Committee of the Medical Staff on 01/29/2019

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APPENDIX A: SBT Criteria

Spontaneous Breathing Readiness Assessment shall be completed by RT and RN by 8 am (unless otherwise ordered)

(All must be met in order to proceed with protocol)

- Stable hemodynamics (MAP greater than 60 mmHg, HR less than 120 bpm)
- No significant dysrhythmias (unless chronic). If patient has a dysrhythmia, contact ICU provider prior to proceeding with SBT.
- If patient is receiving vasopressor therapy, contact ICU provider prior to proceeding
- The most recent ABG values are as follows: pH greater 7.28, PCO_2 less than 60 mmHg (unless chronic), and PO_2 greater than 60 mmHg. If ABG is not available, SpO_2 shall be greater than or equal to 92%.
- Temperature less than 102°F
- Ventilator rate is set to no greater than 20 bpm and spontaneous respiratory rate is less than 35 bpm
- Capability to breathe spontaneously
- FiO_2 less than or equal to 0.50
- PEEP less than or equal to 10 cm H_2O
- Capable of lifting head off pillow
- Prior to the initiation of SBT, the RASS score should be greater than or equal to -2 (see Appendix C)

MAP = mean arterial pressure
ABG = arterial blood gas
PCO_2 = partial pressure of carbon dioxide
PO_2 = partial pressure of oxygen
SpO_2 = arterial oxygen saturation
FiO_2 = fraction of inspired oxygen
PEEP = positive end-expiratory pressure
RASS = Richmond Agitation-Sedation Scale

APPENDIX B: Weaning Process

- Change ventilator settings to PS of 6 cm H_2O and titrate PS to deliver tidal volume of 5 mL/kg of ideal body weight
- Monitor patient's respiratory status as appropriate

Note: If there are signs of intolerance increase PS by 2 cm H_20 every 10 minutes until RR less than or equal to 30 bpm, obtain ABG and notify the physician of results

- Once the weaning process has reached acceptable level (*i.e.*, PSV of 6 and acceptable spontaneous pulmonary mechanics) consult the physician for extubation orders.

Note: If extubation orders are received from a non-critical care provider (*i.e.*, primary physician), the RT should notify the patient's critical care physician prior to the tube removal

PS = pressure support
PSV = pressure support ventilation

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APPENDIX C: Richmond Agitation Sedation Scale (RASS)

+4	Combative	Overly combative, violent, immediate danger to staff
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent, non-purposeful movement, fights ventilator
+1	Restless	Anxious, but movements not aggressive or vigorous
0	Alert and calm	-
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to voice (greater than or equal to 10 seconds)
-2	Light sedation	Briefly awakens with eye contact to voice (less than 10 seconds)
-3	Moderate sedation	Movement or eye openings to voice (but no eye contact)
-4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	Unarousable

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SUGGESTED READINGS

Ely, E. W., Meade, M. O., Haponik, E. F., Kollef, M. H., Cook, D. J., Guyatt, G. H., & Stoller, J. K. (2001). Mechanical ventilator weaning protocols driven by nonphysician health-care professionals: evidence-based clinical practice guidelines. *Chest Journal, 120*(6_suppl), 454S-463S.

MacIntyre, N. R., Cook, D. J., Ely, E. W., Epstein, S. K., Fink, J. B., … Heffner, J. E. (2001). Evidence-based guidelines for weaning and discontinuing ventilatory support: a collective task force facilitated by the American College of Chest Physicians; the American Association for Respiratory Care; and the American College of Critical Care Medicine. *Chest Journal, 120*(6_suppl), 375S-396S.

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DEVELOPMENT CREDITS

This practice consensus statement is based on majority expert opinion of the SBT and Mechanical Ventilation Weaning workgroup at the University of Texas MD Anderson Cancer Center for the population. These experts included:

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