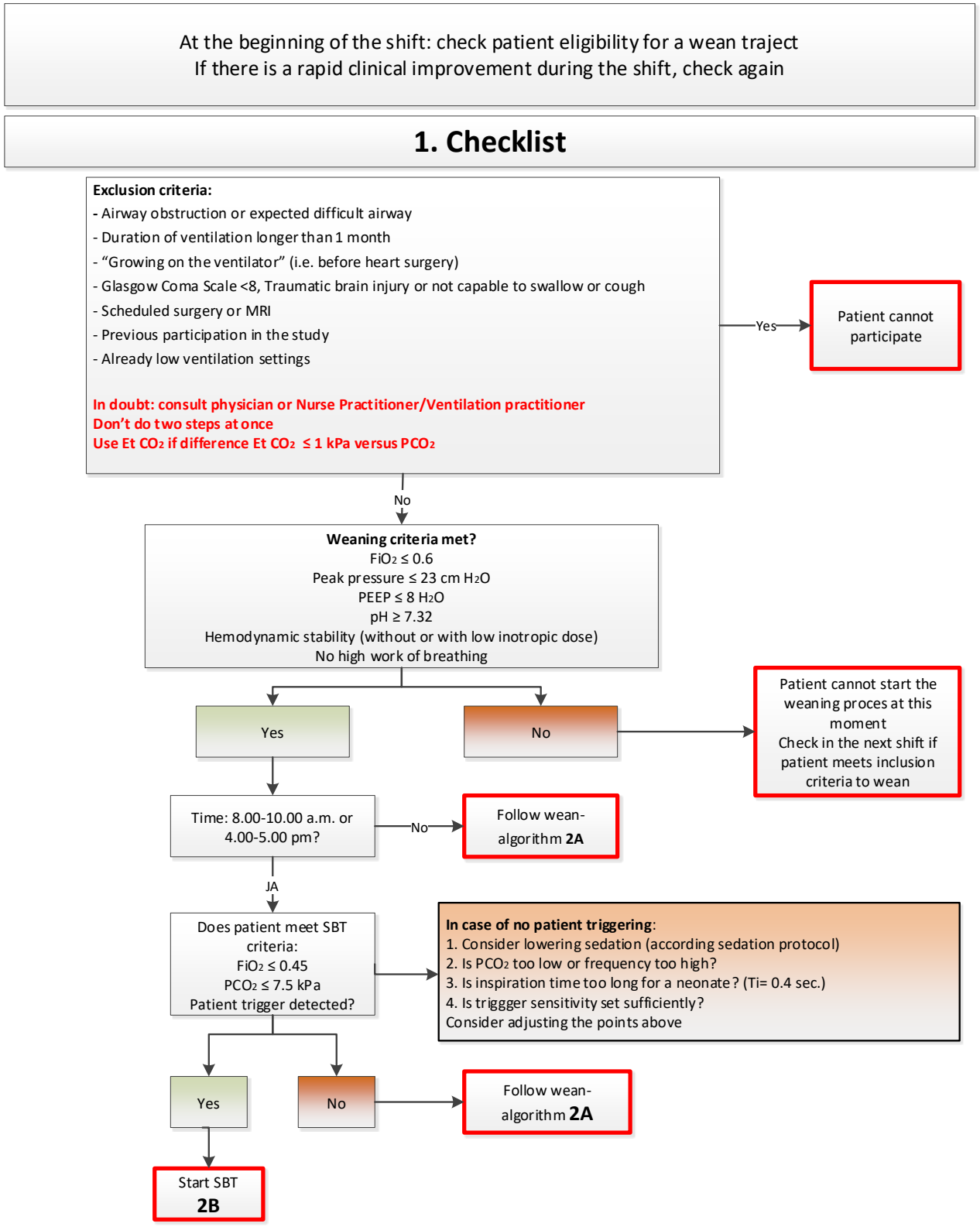
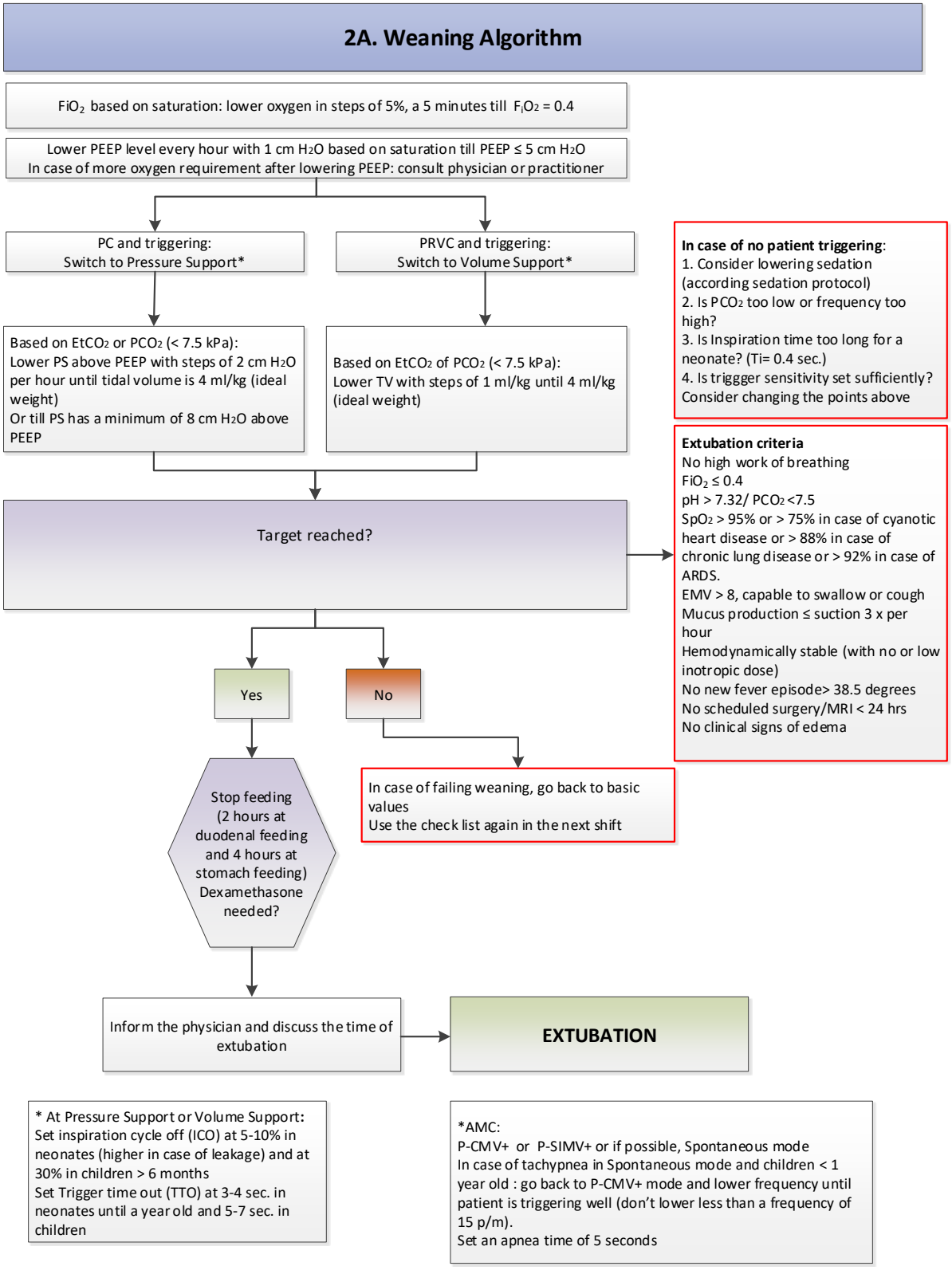
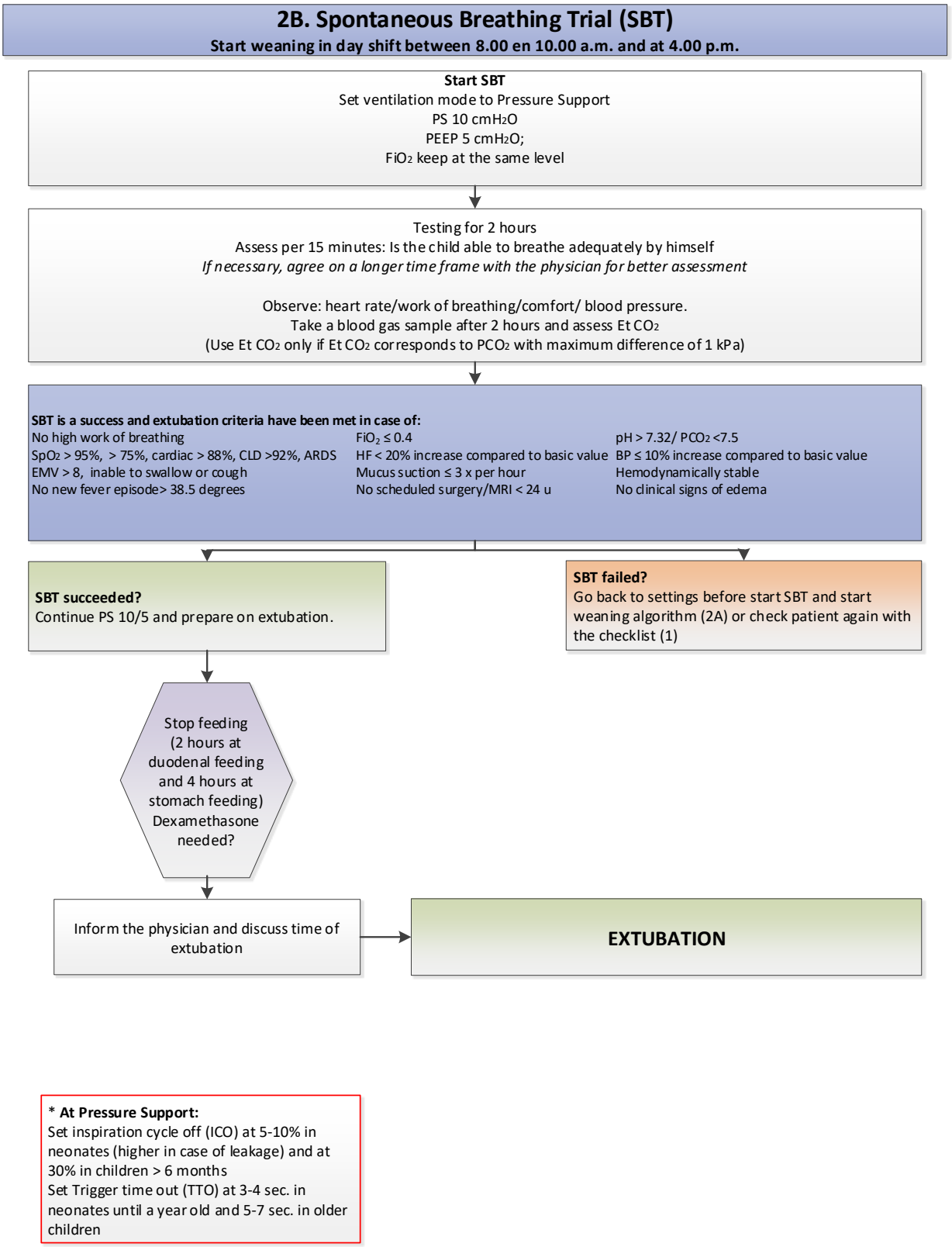
Supplemental file 2. Protocol for determining type of weaning



Supplemental file 3. Weaning algorithm



Supplemental file 4. Spontaneous Breathing Trial (SBT)



Explanation Nurse-led weaning protocol, supplemental file 2-4

1. Checklist start criteria: Weaning can be started at any time of the day if the patient meets the start criteria according the checklist (supplemental file 1). PEEP is being decreased in steps of 1 cmH_2O every hour when FiO_2 is ≤ 40%. If more oxygen is required when PEEP is being decreased, the nurse should consult a physician, nurse practitioner or ventilation practitioner (registered nurse with additional training in ventilation management) about the necessity of increasing PEEP. The saturation limit is ≥ 95% for most children, but ≥ 88% for children with chronic lung disease, ≥ 92% for children with ARDS and ≥ 75% for cardiac patients with mixed circulation. (18)

2. Wean algorithm: If the patient breathes spontaneously ('triggers the ventilator'), the wean algorithm can be followed (supplemental file 2). The ventilation mode is set to a support mode; for the Servo i, the 'auto-mode' mode (with pressure support (PS) for pressure control (PC) and volume support (VS) for pressure regulated volume control (PRVC); for the Hamilton the PS mode. If the patient does not trigger the ventilator, the possible reason and a solution have to be found to stimulate triggering. In the Amsterdam UMC, the mode was set to PC or PC-SIMV if the support mode led to tachypnea, and the frequency was lowered until the patient was triggering well. PS above PEEP can be reduced to a minimum of 8 cmH_2O in one-hour steps of 2 cmH_2O above PEEP, or the tidal volume can be reduced to a minimum of 4 ml/kg.

3: Spontaneous Breathing Trial (Supplemental file 3). For patients meeting the start criteria, an SBT was planned between 8 and 10 a.m. and again in the afternoon around 4 and 6 p.m., with the following ventilation settings during 2 hours: PS 10 cmH_2O above PEEP 5 cmH_2O, and FiO_2 equal to the start of the SBT. During the SBT, the patient was observed to see whether he or she could breathe calmly with the predefined range for respiratory rate, with stop criteria if the SBT fails.