

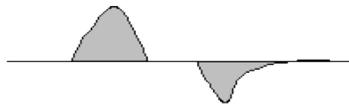
# Newborn Critical Care Center (NCCC) Clinical Guidelines

## Guidelines for Initial Ventilation of Infants 28 - 30 Weeks (During the First Seven Days of Life)

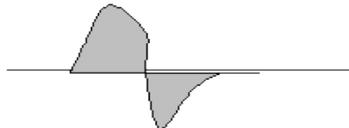
### I. Initial Mode and Settings

- A. AC/VG
- B. Tidal Volume (Vt):
  - a. For infants  $\leq 750\text{g}$ : 5.5 mL/kg
  - b. For infants  $>750\text{g}$ : 5 mL/kg
- C. Respiratory rate (RR) 40
- D. PEEP 6 cm H<sub>2</sub>O
- E. I-Time (Ti): 0.25-0.3 sec
  - a. P-max limit setting: 26
  - b. Evaluate flow-time curve to determine sufficiency of Ti
    - i. If Ti is too long, flow ends but desired volume will remain until expiration

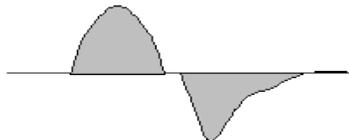
Example 1: Inspiratory time too long:



Example 2: Inspiratory time too short:



Example 3: Inspiratory time just right:



- ii. If Ti is too short, flow is interrupted and desired volume not reached.

### II. Poor Ventilation (PaCO<sub>2</sub> > 60 mmHg first 72 hours, >65 after 72 hours)

- A. Important to first assess the infant's breath sounds, chest movement, and evaluate pressure readings and pressure/flow/volume tracings on the ventilator. Also take into account recent chest radiographs.
- B. Is the infant breathing above the ventilator?
  - a. If yes:
    - i. If eligible for surfactant consider administering
    - ii. Consider the presence of a metabolic acidosis which could contribute to respiratory compensation (tachypnea)
    - iii. If respiratory problem is suspected, consider increasing Vt 0.5 mL/kg (max 7)
  - b. If no:
    - i. Consider increasing Vt 0.5 mL/kg (max 7)

- ii. Consider increasing RR to a maximum of 50

### III. Poor Oxygenation ( $\text{FIO}_2 \geq 0.35$ )

- A. Important to first assess the infant's breath sounds, chest movement, and evaluate pressure readings and pressure/flow/volume tracings on the ventilator. Also take into account recent chest radiographs looking specifically at expansion. Consider suctioning.
- B. If eligible for surfactant, administer surfactant
- C. If not eligible for surfactant, individually consider
  - a. Increasing PEEP by 1 cm H<sub>2</sub>O (max 8)
  - b. Increasing Ti 0.05 sec (max 0.35)
  - c. Increasing Vt 0.5mL/kg (max 7)

### IV. If PIP is reading > 26 (PIPs of up to 28-30 may be appropriate after a team discussion) OR at upper limit of VT and PaCO<sub>2</sub> > 60, consider High Frequency Jet Ventilation

### V. Weaning Ventilation (PaCO<sub>2</sub> < 50 mmHg in first 72 hrs, <55 after first 72 hrs)

- A. Important to first assess the infant's breath sounds, chest movement, and evaluate pressure readings and pressure/flow/volume tracings on the ventilator. Also take into account recent chest radiographs.
- B. Is the infant tachypneic (RR > 75)?
  - a. If yes:
    - i. Consider the presence of a metabolic acidosis which could contribute to respiratory compensation (tachypnea)
    - ii. If no metabolic acidosis, then consider extubating if meets criteria (see below), or otherwise changing the mode of ventilation (consider SIMV-VG)
  - b. If no:
    - i. Consider weaning Vt by 0.5 mL/kg
    - ii. Minimum Vt (mL/kg):
      - 1. ≤750g: 5.5
      - 2. 750g—1kg: 5
      - 3. ≥1 kg: 4.5

### VI. Weaning Mean Airway Pressure (MAP)

- A. If  $\text{FIO}_2 < 0.25$  and normal work of breathing, decrease PEEP by 1 cm H<sub>2</sub>O, to a minimum of 5
- B. If  $\text{FIO}_2$  0.25-0.34, continue present management

### VII. Extubation Criteria

- A. Consider extubation if ALL of the following criteria are met:
  - a. Patient receiving caffeine
  - b. Hemodynamically stable
  - c. MAP 8-10 cm H<sub>2</sub>O
  - d. PEEP 5-6 cm H<sub>2</sub>O
  - e.  $\text{FIO}_2 < 0.35$
  - f.  $\text{RR} \leq 20$  (if on SIMV-VG)
  - g.  $\text{pH} \geq 7.25$
  - h.  $\text{pCO}_2 \leq 55$  mmHg

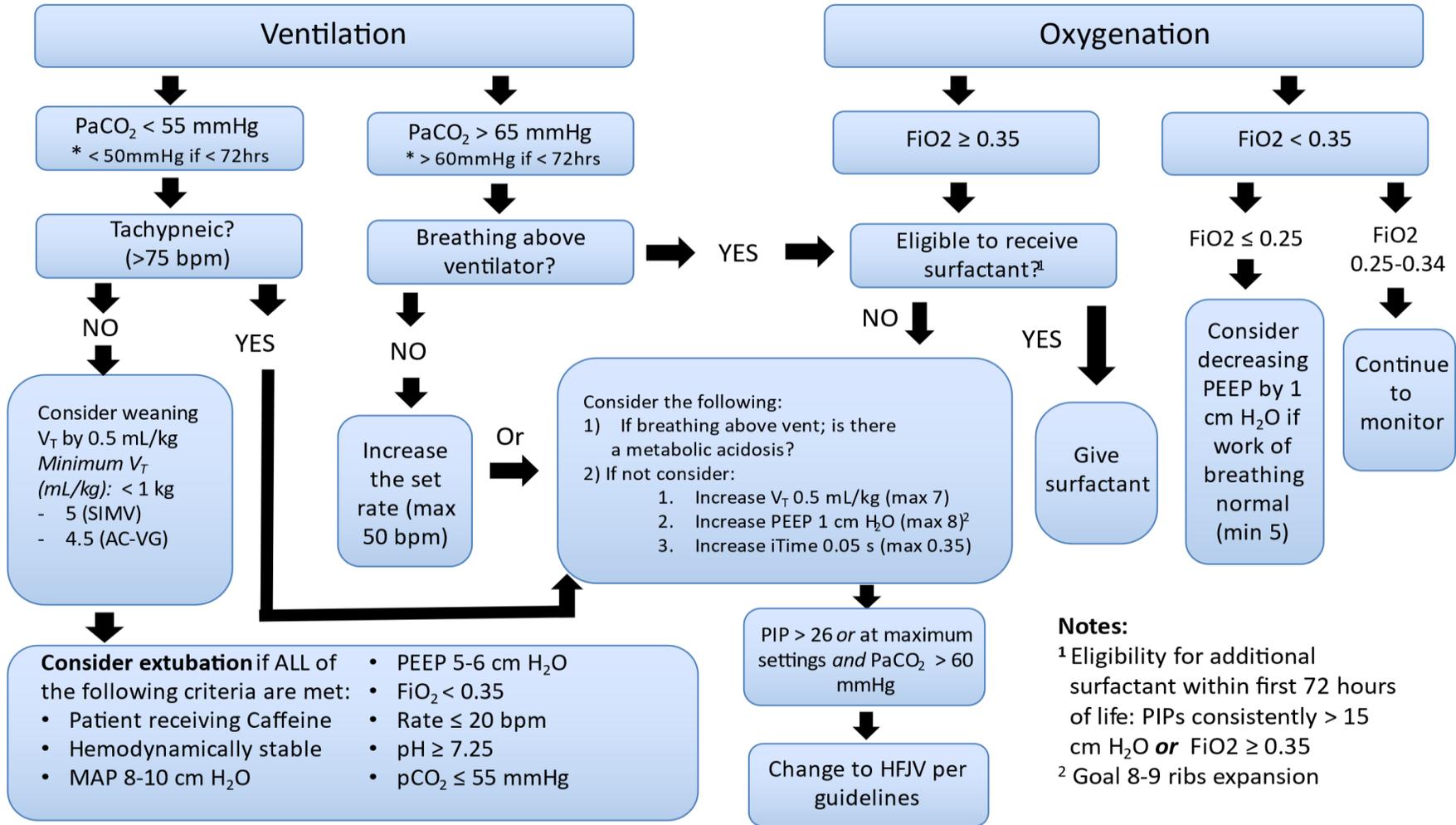
# Mechanical ventilation within first 7 days of life in infants < 30 weeks GA with RDS



**Assist Control with Volume Guarantee (AC/VG)**

*Initial Settings:*

- Tidal volume ( $V_T$ ):  $\leq 750g = 5.5mL/kg$  /  $> 750g = 5mL/kg$
- PEEP: 6 cm H<sub>2</sub>O
- Inspiratory time (iTime): 0.25-0.3s
- Respiratory rate (RR): 40 bpm



**Notes:**

<sup>1</sup> Eligibility for additional surfactant within first 72 hours of life: PIPs consistently > 15 cm H<sub>2</sub>O **or** FiO<sub>2</sub> ≥ 0.35

<sup>2</sup> Goal 8-9 ribs expansion