Newborn Critical Care Center (NCCC) Clinical Guidelines

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

I. Initial Mode and Settings

A. AC/VG

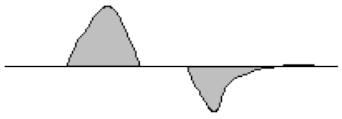
B. Tidal Volume (Vt):
   a. For infants <=750g: 5.5 mL/kg
   b. For infants >750g: 5 mL/kg

C. Respiratory rate (RR) 40

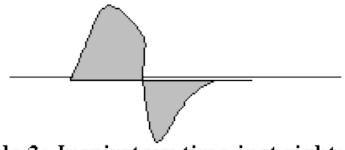
D. PEEP 6 cm H2O

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

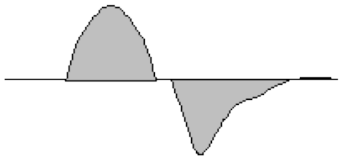
Example 1: Inspiratory time too long:



Example 2: Inspiratory time too short:



Example 3: Inspiratory time just right:



II. Poor Ventilation (PaCO2 > 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 (FIO2 ≥ 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 H2O (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 PaCO2 > 60, consider High Frequency Jet Ventilation

V. Weaning Ventilation (PaCO2 < 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

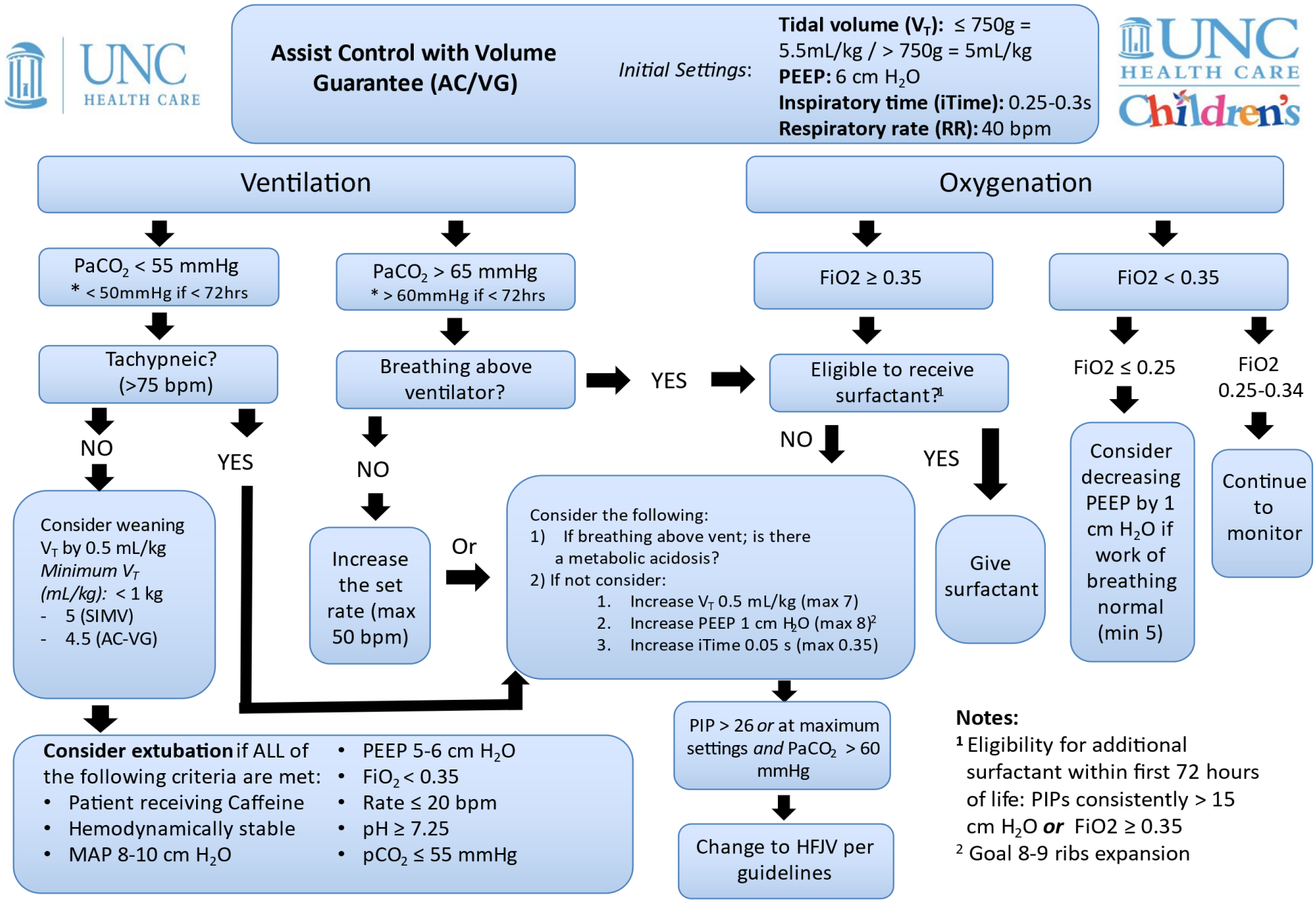
VI. Weaning Mean Airway Pressure (MAP)

A. If FiO2 < 0.25 and normal work of breathing, decrease PEEP by 1 cm H2O, to a minimum of 5
B. If FiO2 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 H2O
    d. PEEP 5-6 cm H2O
    e. FiO2 < 0.35
    f. RR ≤ 20 (if on SIMV-VG)
    g. pH ≥ 7.25
    h. pCO2 ≤ 55 mmHg

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



Notes:

[1] Eligibility for additional surfactant within first 72 hours of life: PIPs consistently > 15 cm H_2O ***or*** FiO2 ≥ 0.35

[2] Goal 8-9 ribs expansion