Guidelines for Initiation of Mechanical Ventilation Algorithm

This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient's individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.

***Non-invasive ventilation is NOT RECOMMENDED if patient is NOT in a negative pressure / isolated room**

Choose Familiar Mode
SIMV or PRVC
FiO_2 = 1.0*
*after the patient is settled, wean this down to an FiO_2 of 0.4 or a PaO_2 of 60-80 mmHg (8–10.6kPa)

Obstructive lung disease e.g. Asthma, COPD	**Other**	**Restrictive lung disease** e.g. ARDS
VT 5-6 ml/kg PBW *for Pressure Control, titrate PIP to achieve an expired VT of 5-6 ml/kg PBW *titrate to PaO_2 of 60-80 mmHg (8–10.6kPa)	**VT 6-8 ml/kg PBW** *for Pressure Control, titrate PIP to achieve an expired VT of 8-10 ml/kg PBW	**VT 6 ml/kg PBW** *for Pressure Control, titrate PIP to achieve an expired VT of 6 ml/kg PBW
PEEP 3-4 cmH_2O Keep PIP + PEEP < 30 cm H_2O	**PEEP 5 cmH_2O** * titrate to PaO_2 of 60-80 mmHg (8–10.6kPa) Keep PIP + PEEP < 30 cm H_2O	**PEEP 8-10 cmH_2O** * titrate to PaO_2 of 60-80 mmHg (8–10.6kPa) Keep PIP + PEEP < 30 cm H_2O
Rate 6-8 bpm *titrate to allow complete expiration	**Rate – Start at Patient's Preintubation RR (< 30bpm)** *titrate to $PaCO_2$ of 35 - 45 mmHg (4.7 - 6 kPa)	**Rate – Start at Patient's Preintubation RR (< 30bpm)** *titrate to $PaCO_2$ of 35 - 45 mmHg (4.7 - 6 kPa)

Additional Settings
Pressure support – 8-10 cmH_2O
Inspiratory trigger – 2 cmH_2O below the set PEEP
i times – Adults 1 sec; Toddlers/Children 0.7 sec; Neonates 0.5 sec

Abbreviations: SIMV, Synchronised Intermittent Mandatory Ventilation; PRVC, Pressure Regulated Volume Control; VT, Tidal Volume; PBW, Predicted Body Weight; PEEP, Positive End Expiratory Pressure; PIP, Peak Inspiratory Pressure

The Crashing Intubated Patient (Peri-Arrest or Arrest):
DOPES then **DOTTS**: The first mnemonic is how to diagnose the problem and the second mnemonic is how to fix the problem:

Diagnosing the Problem:

D = Displaced Endotracheal Tube or Cuff
O = Obstructed Endotracheal Tube: Patient biting down, kink in the tube, mucus plug
P = Pneumothorax
E = Equipment Check: Follow the tubing from the ETT back to the ventilator and ensure everything is connected
S = Stacked Breaths: Auto-PEEP. Patient unable to get all the air out from their lungs before initiating the next breath. Inspiratory time is much shorter than expiratory time (I/E ratio is anywhere from 1 to 3 or 1 to 4)

Fixing the Problem (Once you commit to this, do every step even if you fix the problem with one of the earlier letters):

D = Disconnect the Patient from the Ventilator: This fixes stacked breaths by decreasing intra-thoracic pressure and improving venous return
O = O_2 100% Bag Valve Mask: The provider should bag the patient not anyone else because this lets you get a sense of what the potential problem is. Look, Listen, and Feel

- Look: Watch the chest rise and fall, look at ETT and ensure it is the same level it was at when it was put in
- Listen: Air leaks from cuff rupture or cuff above the cords; Bilateral breath sounds; Prolonged expiratory phase
- Feel: Feel the pressure of pilot balloon of endotracheal tube, crepitus; How is the patient bagging (Hard to bag or too easy to bag)

T = Tube Position/Function: Suction catheter to ensure tube is patent; Can also use bougie if you don't have suction catheter, but be gentle (If to aggressive can cause potential harms); Ensure the tube is at the same level it was at when it was put in
T = Tweak the Vent: Decrease respiratory rate, decrease tidal volume, decrease inspiratory time. Biggest bang for your buck is decreasing the respiratory rate. This may cause respiratory acidosis (permissive hypercapnia)
S = Sonography: You can diagnose things much faster than waiting for respiratory therapist to come to the bedside or waiting for stat portable chest x-ray to be done.