APPENDIX N

LIBERATION FROM MECHANICAL VENTILATION протокол
(FAST TRACHEAL EXTUBATION ≤ 48 AFTER ELECTIVE CABG)

Objective:

To describe the protocol for liberation from mechanical ventilation after an elective CABG < 48 hours after surgery in conjunction with the CABG clinical pathway.

Description:

The liberation from mechanical ventilation protocol is designed to allow for the expedient discontinuation of mechanical ventilatory support on patient after an elective CABG < 48 hours after surgery. It is designed for patients without significant risk for postoperative cardiac and pulmonary complications while achieving fast tracheal extubation time without compromising patient safety. This approach complies with the overall goals of the CABG clinical pathway of this institution. The liberation from mechanical ventilation protocol, as designed by the CABG clinical pathway steering committee, is as follows:

Liberation from Mechanical Ventilation Protocol
(Fast Tracheal extubation After Elective CABG)

Patient Criteria:

This protocol will be used only for patients after an elective CABG. Initiation of the protocol will be indicated in the physician’s order sheet.

Equipment:

Oxygen saturation monitor, Arterial blood gas machine

Initial Ventilator Settings:

The initial ventilator settings will be called from the OR. Ventilator mode will be assist-control, with FiO2 at 100%, tidal volume set at 6 – 8 mL/Kg Predicted Body Weight (PBW) and ventilator rate set at 12 - 16. A PEEP of 5 cms H2O may be added for atelectasis prevention. The Predicted Body Weight (PBW) shall be computed as follows:

Males: 50 + 2.3 x (height in inches – 60)
Females: 45.5 + 2.3 (height in inches – 60)

ABG must be done upon arrival at RR/SICU. The physician may make ventilator adjustments with ABG done after 30 minutes of the adjustment. The initial settings and adjustments must be documented in the chart.
Readiness Testing:

Before initiating liberation procedure the patient must be assessed by the physician and the following criteria met:

Hemodynamic stability
- MAP >65, CVP and PCWP <20, CI >2
- No/ low dose vasopressor
- No acute ischemia
- Absence of new arrhythmia
No excessive postoperative bleeding (> 2 mL/Kg/hour)

Adequate oxygenation
- PaO2/FiO2 > 150 – 200
- FiO2 weaned to ≤ 0.4 while maintaining SaO2 ≥ 95%
- PEEP ≤ 5 – 8 cms H2O
- ≥ 7.25 pH < 7.55

Acceptable weaning parameters
- NIF < - 15 cms H2O
- RSBI (f/VT) ≤ 105
- Cdyn (≥ 30 mL/ cms H2O), Cstat (≥ 30 mL/ cms H2O)

Acceptable electrolytes (Na, K)
Acceptable neurologic status (GCS ≥ 12, follows commands)
No sedative agent infusion

Liberation procedure:

If readiness testing criteria are met, begin spontaneous breathing trial thru T-piece for 30 – 120 minutes at 6 lpm. During the procedure, assess for tolerance to spontaneous breathing trial.

Criteria for Tolerance to SBT:

While on T-piece, assess the following:

Gas exchange acceptability
- SaO2 ≥ 90%
- PaO2 ≥ 60 mm Hg
- pH ≥ 7.32
- increase in PaCO2 ≤ 10 mm Hg

Hemodynamic stability
- HR < 120 -140 beats/min
- HR not changed > 20%
- ≥ 90 mm Hg systolic BP < 180 mm Hg
- BP not changed > 20%
- no pressors required

Stable ventilatory pattern
- RR ≤ 30 breaths/ min
- RR not changed > 50%
No change in mental status
- Somnolence, Anxiety, Agitation, Coma
No evidence of increased work of breathing
- use of accessory muscles of respiration
- thoracoabdominal paradox

If patient shows tolerance at the end of the SBT (30 – 120 minutes), do ABG and assess acceptability.

Extubation procedure:

After physician approval (with written order in the patient chart) spontaneous breathing trial will be discontinued and patient will be extubated (Physician must be present during extubation). After extubation patient will receive oxygen supplementation at 6 lpm via nasal cannula. ABG may be repeated after an hour of extubation and oxygen supplementation may then be weaned while maintaining a SaO2 goal ≥ 95%. Lung expansion maneuvers must be instituted once patient is stable (see lung expansion maneuver protocol). Patient will then be nebulised with either Salbutamol alone or Salbutamol + Ipratropium every 6 hours for 3 days to facilitate mucociliary clearance.

Special Instructions:

The success of the liberation protocol depends on effective communication between the physician, respiratory therapist and nurse. Any concerns about the patient’s status that cannot be resolved by the fellow-on-duty should be addressed to the attending physician.

REFERENCES
1. Evidence-Based Guidelines for Weaning and Discontinuing Ventilatory Support. CHEST, 2001
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Patient enters RR after CABG

Physician place patient on weaning protocol

Patient ready for weaning? (see readiness testing)

Proceed with SBT using T-Piece for 30 – 120 minutes

Patient tolerated SBT? (see criteria for tolerance of SBT)

Proceed to extubation

TERMS DEFINED
CABG – Coronary Artery Bypass Graft; SBT – Spontaneous Breathing Trial; NIF – Negative Inspiratory Force; RSBI – Rapid Shallow Breathing Index; CdyN – Dynamic Lung Compliance; Cstat – Static Lung Compliance; Change in mental status – onset of any of the following: somnolence, anxiety, agitation, coma; increased work of breathing – evidence of use of accessory muscles of respiration and/or thoracoabdominal paradox; PSV – Pressure Support Ventilation; PPC – Postoperative Pulmonary Complications

REFERENCES
1. Evidence-Based Guidelines for Weaning and Discontinuing Ventilatory Support. CHEST, 2001