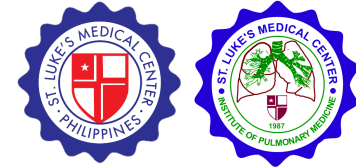


# Clinical Outcomes of Respiratory Therapist versus Physician Driven Extubation Protocol among Post Coronary Artery Bypass Graft (CABG) Surgery Patients

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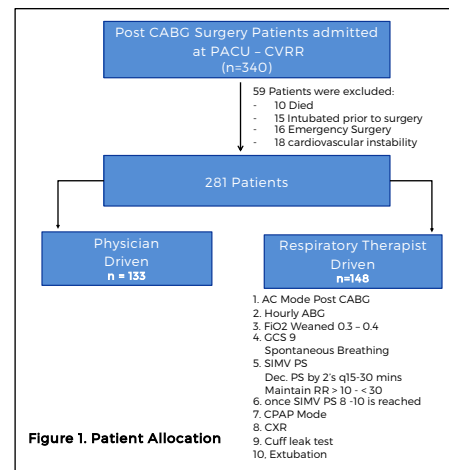


## Introduction

Coronary Artery Bypass (CABG) Surgery demonstrated improvement in the overall health-related quality of life and survival. The use of Respiratory Therapist Driven extubation protocol resulted in shorter extubation times, reduced cost, and length of stay when compared to physician driven weaning. Koch defined therapist driven protocol (TDP) as a patient care plan, which are initiated and implemented by respiratory care practitioners. TDP's allow the therapist the ability to evaluate the patient, initiate therapy, adjust, discontinue or even restart respiratory care treatments or procedures on as as needed basis once the protocols are ordered by the physician. They allow the therapist to work in a goal oriented, rather than task oriented environment (13). Budinger et.al., stated that therapist driven protocols (TDP's) have been shown to decrease the duration of mechanical ventilation, reduce cost, length of stay and improve the rate of weaning when compared with physician directed weaning (14). Respiratory Therapist can provide protocol based care that will hasten discontinuation from mechanical ventilation. This study was initiated to establish whether a respiratory therapist driven protocol would lead to a shorter extubation time, coronary care unit stay, hospital stay and lesser post-operative complications compared to physician driven extubation post Coronary Artery Bypass Graft surgery.

## Methodology

This is a retrospective analytical study conducted in January 2010 – December 2012. A total 281 patients were included, 133 patients were assigned under the physician driven and 148 patients were allotted to the RT driven group. Outcomes measured include duration of mechanical ventilation, Coronary Care Unit (CCU) stay, Hospital stay and incidence of Hospital Acquired Pneumonia (HAP). Chi square test was used to determine the statistical difference of the nominal variable and independent T-test for continuous variables. Mann Whitney U-Test was used to compute for the coronary artery disease. A p value of <0.05 was considered significant. Linear regression analysis was used to determine the factors associated with prolonged mechanical ventilation.



## Results

The duration of mechanical ventilation was 8.35 hours  $\pm$  12.38 hours in the Physician driven and 4.75 hours  $\pm$  2.11 hours in the RT driven group. The Physician driven group spent 2.78  $\pm$  1.76 days in the CCU while the RT Driven group was 11.36  $\pm$  5.05 days compared with RT Driven group with 9.55  $\pm$  3.92 days. Forty-one (41) patients (30.8%) developed HAP in the Physician group and Twenty-nine (29) patients (19.6%) in the RT Driven group.

Table 1. Outcome Measures

|   |                | Physician Driven Extubation<br>N 133 | Resp. Thpst. Driven Extubation<br>N 148 | P value |
|---|----------------|--------------------------------------|---|---------|
| Primary outcome: Extubation time (in hours) | Mean           | 8.35 hours                           | 4.75 hours                              | .001    |
|   | SD             | $\pm$ 12.38                          | $\pm$ 2.11                              |         |
| Secondary outcomes:                         |                |                                      |   |         |
| • Length of Extubation time (in days)       | Mean           | 2.78                                 | 1.79                                    | .000    |
|   | SD             | $\pm$ 1.76                           | $\pm$ 1.012                             |         |
| • Length of hospital stay (in days)         | Mean           | 11.36                                | 9.55                                    | .001    |
|   | SD             | $\pm$ 5.05                           | $\pm$ 3.92                              |         |
| Post-operative Complications:               |                | 41 (30.8%)                           | 29 (19.6%)                              | .030    |
|   | • HAP          | 5 (3.8%)                             | 0                                       | .054    |
|   | • Pleural eff. | 18 (13.53%)                          | 3 (1.07%)                               | 0.002   |
|   | • PMV          |                                      |   |         |

## Conclusion

The use of RT Driven extubation protocol is safe and efficient method in liberating patient from mechanical ventilation and reducing the CCU and hospital days and the incidence of Hospital Acquired Pneumonia (HAP).

## References:

- Parkash, J., Meij, S., Boj, E., Hagenholz, PG, Narta J. Criteria for Early Extubation after Intracardiac Surgery in Adults. *Anesth Annals*.1977; 56:703-8.
- Doering LV, Imperial-Perez F, Monsein S, et al. Preoperative and postoperative predictors of early and delayed extubation after coronary artery bypass surgery. *Am J Crit Care* 1998; 7:37-44.
- Wong DT, Cheng DC, Kustra R, et al. Risk factors of delayed extubation, prolonged length of stay in the intensive care unit and mortality in patients undergoing coronary artery bypass surgery with fast track cardiac anesthesia. *Anesthesiology* 1999; 91:936-944.
- Spivack SD, Shinozaki T, Albertini JJ, et al. Preoperative prediction of postoperative outcome: coronary artery bypass grafting. *Chest* 1996; 109:1222-1230.
- Thompson MJ, Elton RA, Mankad PA, et al. Prediction of requirement for, and outcome of, prolonged mechanical ventilation following cardiac surgery. *Cardiovasc Surg* 1997; 5:376-381.
- Habib RH, Zacharias A, Engoren M. Determinants of prolonged mechanical ventilation after coronary artery bypass grafting. *Ann Thoracic Surg* 1996; 62:1164-1171.
- Yende, S., Wunderink, R. Causes of prolonged mechanical Ventilation after Coronary Artery Bypass Surgery. *Chest* 2002; 122:245-252.
- Branca P, McGaw P, Light RW. Factors associated with prolonged mechanical ventilation following coronary artery bypass surgery. *Chest* 2001; 119:537-546
- Cheng DC, Karski J, Peniston C, et al. Early tracheal extubation after coronary artery bypass graft surgery reduces costs and improves resource use. *Anesthesiology* 1996; 85: 1300-1310
- Kollef MH, Wragge T, Pasque C. Determinants of mortality and multiorgan dysfunction in cardiac surgery patients requiring prolonged mechanical ventilation. *Chest* 1995; 107:1395-1401
- Anderson RJ, O'Brien M, MaWhinney S, et al. Renal Failure Predisposes Patients to adverse outcome after coronary artery bypass surgery: VA Cooperative study. *Kidney Int* 1999; 55:1057-1062.
- Oribabor, C, Khusid Z, F, Mansuroglo, N., Fisher2, E., Tortolani, A. Respiratory Therapy Driven Protocols Significantly decreased Reintubation Rates and Lowered Extubation Times in Cardiac Surgery Patients. *The Science Journal of American Association for Respiratory Care* 2010.
- Koch, Rudolph. Therapist Driven protocols: A Look Back and Moving into the Future. *Critical Care Clinics* 23(2007):149-159.
- Budinger GRS, Tobin M.J. Strategies for predicting successful weaning from Mechanical ventilation. *Chest* 2001; 120: 4005-245.

## Acknowledgements

To the men and women of the Institute of Pulmonary Medicine especially to our Respiratory Therapist.