



Abstract

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Project Title: INTERVENTIONS TO PROMOTE VENTILATOR WEANING

Abstract: *DESCRIPTION (As Adapted from the Investigator's Abstract): Weaning the critically ill patient from mechanical ventilation (MV) to spontaneous ventilation (SpV) continues to be a significant challenge for nursing. It is estimated that 9-37% of mechanically ventilated patients have difficulty with the immediate transition from MV to SpV due to hemodynamic instability caused by pre-existing left ventricular dysfunction. The purpose of this study is to examine interventions to optimize the cardiopulmonary (CP) hemodynamic changes associated with the immediate transition from MV to SpV while comparing commonly used modes (t-piece, continuous positive airway press and pressure support) of spontaneous ventilation in canine subjects with and without heart failure. The specific aims are: 1) to compare the effects of preload at normovolemia and hypervolemia prior to and following diuresis with furosemide on CP hemodynamics during the transition from MV to SpV (T-piece, CPAP & PS) in normal canines (GI) and in heart failure (paced) canines (GII). 2) to compare CP hemodynamics prior to and following afterload reduction with nitroprusside during the transition from MV to SpV (T-piece, CPAP & PS) in GI and GII canines. 3) to determine whether CP hemodynamic changes associated with the transition from MV to SpV prior to and following diuresis or afterload reduction alter autonomic nervous system tone as reflected by heart rate variability in GI and GII canines. The sample will consist of 116 canines randomly assigned to GI or GII. The GII canines will undergo pacemaker insertion and pacing for 7 weeks to produce a tachycardic chronic congestive heart failure. Under anesthesia, the subjects will be instrumented with state of the art biotechnology including a right ventricular ejection fraction pulmonary artery catheter and a Millar micromanometer pressure catheter to measure right ventricular function and a conductance catheter and Miller*

micromanometer pressure catheter to measure left ventricular function continuously. The data will be analyzed using repeated measures multivariate analysis of variance. The results of this study will provide insight into methods of optimizing cardiovascular function and the selection of an appropriate mode of spontaneous ventilation based on cardiovascular status that can be later tested in a randomized controlled trial in humans.

Thesaurus Terms:

*critical care nursing, nonhuman therapy evaluation, nursing intervention, respirator, respiratory disease /disorder therapy, respiratory therapy
autonomic nervous system, disease /disorder model, diuresis, furosemide, heart failure, hemodynamics, method development, neurohormone, nitroferricyanide, pulmonary respiration, respiratory airway volume, respiratory disorder
dog*

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