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2001 Program
Investigator Initiated (2-year
project)

Project Title: Steroid-induced osteoporosis in lung transplant recipients

Project Summary: Approximately 70% of all lung failure patients who become candidates for lung transplantation were previous smokers. Osteoporosis is a co-morbidity present in nearly 100% of lung transplant candidates. Unfortunately, severe osteoporosis is a contraindication for lung transplantation. Patients are denied this life saving procedure because anti-rejection drugs (steroids) accelerate further bone loss after transplantation. The purpose of this project was to determine the efficacy of an anti-osteoporosis therapy designed to both prevent drug-induced bone loss and to stimulate new bone growth.

Project Successes: The first principal finding of this research is that administration of an anti-osteoporosis drug regimen (Fosamax; Alendronate, Merck Pharmaceutical) early in the post-operative period (3-10 days) is effective in preventing dramatic bone loss in the spinal vertebra when patients are receiving large doses of anti-rejection drugs that cause osteoporosis. The second principal research finding is that a program of specific resistance exercise including a lumbar extension machine (MedX Corp), was osteogenic and stimulated new bone growth. These findings demonstrate that lung transplant recipients can reverse established osteoporosis following lung transplantation despite the additional osteoporotic consequences of antirejection drug therapy.

Publications from BRP funded research in Peer Reviewed Journals:

Braith RW, Mitchell MJ, Baz MA, Fulton MN, Lisor CF. Resistance training prevents vertebral osteoporosis in lung transplant recipients. *J Cardiopulm Rehab.* 2003;23(5):367.

Braith RW, Mitchell MJ, Fulton MN, Lisor CF, Baz M. Resistance training attenuates glucocorticoid-induced osteoporosis in lung transplant recipients. *Med Sci Sports Exercise.* 2002;33(5):S204.

Selected presentations from BRP funded research:

Braith RW. *Resistance Training in Health and Disease.* Long Beach, CA: American Association of Cardiovascular and Pulmonary Rehabilitation National Meeting; October 8, 2004.

Braith RW. *Role of exercise training in weight loss and cardiac rehabilitation.* Toronto, Canada: 8th Annual Conference of Long-Term Complications of Treatment of Children & Adolescents for Cancer; June, 2004.

Braith RW. (Keynote Lecture) *Resistance training in cardiovascular disease.* Indianapolis, IN: American College of Sports Medicine International Meeting; June, 2004.

Braith RW. *Resistance Training Prevents Vertebral Osteoporosis in Lung Transplant Recipients.* Kansas City, KS: American Association of Cardiovascular and Pulmonary Rehabilitation National Meeting; October, 2003.

Braith RW. *Resistance Training Attenuates Glucocorticoid-Induced Osteoporosis in Lung Transplant Recipients.* St. Louis, MO: American College of Sports Medicine International Meeting; May, 2002.