Comparison of Activity Force Recommended by Traditional Sternal Precaution Guidelines with the Load that Sternotomy Patients Lift While Practicing the “Keep Your Move in the Tube™” Educational Model

John Shannon BS, CCEP; Eric Diaz BS; Susan Triano MS, CCC-SLP; Richard Gach PT, DPT; Tim Bilbrey MBA; Jenny Adams, PhD

ABSTRACT

Introduction: Due to concerns about sternal dehiscence, sternotomy patients (CABG, transplant, LVAD, valve repair) are generally instructed not to perform upper body resistance exercise (greater than 5 pounds) for 6-12 weeks following surgery. However, if patients practice the “Keep Your Move in the Tube™” educational model (an alternative to current sternal precautions), loads can be lifted following surgery without weight or time restrictions.

Purpose: To compare the force of lifting 5 pounds (the load suggested by current guidelines) versus the force exerted by stenotomy patients who practiced Keep Your Move in the Tube™ while lifting a weighted load.

Design: Force dynamometry data was collected from 23 post-sternotomy patients (16 men and 7 women) as they performed the bicep curl while practicing Keep Your Move in the Tube™.

Methods: A Chatillon force dynamometer was used to obtain the isometric force measurement for lifting a weighted load (bicep curl). The bicep curl was performed three times by pulling against the force dynamometer. An unpaired t-test was used to compare the average force pounds exerted for the bicep curl activity with the recommended 5 pounds from the traditional sternal precaution guidelines. Patients were also asked to complete a pre- and post-activity confidence questionnaire.

Results: The patients exerted (mean ± SD) 42.63 ± 18.35 force pounds when lifting a weighted load. The average force exerted by the patients differed significantly from the force required to lift 5 pounds (p-value: 0.0001). No adverse events were observed. The patients’ confidence in lifting a weighted load while practicing Keep Your Move in the Tube™ improved for 96% of the participants.

Conclusions: While practicing Keep Your Move in the Tube™, these inpatient sternotomy patients were able to lift with substantially more force than would be required for the 5-pound restriction recommended by current traditional guidelines. Furthermore, they performed these activities an average of 9.5 days after surgery (range, 3-44 days); far earlier than the usual 10-12 week restriction.

BACKGROUND

Due to concerns about sternal dehiscence, patients who have had a sternotomy are traditionally instructed to not perform upper body resistance exercises or lift more than 5 pounds for 6-12 weeks following surgery.1 There is no evidence to support these restrictions and no consensus in the clinical application of sternal precautions among institutions worldwide. Significant variations include the amount of weight allowed to be lifted, the timeframe of the restrictions which can range from 6 weeks to 3 months, and the limitations of upper extremity use (use of one arm, use of no arms, use of both arms, no bending at the waist, etc.). These restrictions may delay recovery and inhibit mobilization. An alternative method to sternal precautions, Keep Your Move in the Tube™ was developed to allow greater movement and eliminate load lifting and time restrictions. When patients use this mindful movement philosophy, the length of the outstretched arm is shortened, allowing patients to perform load bearing activities as soon as they are able to do so without pain.

OBJECTIVE

• Demonstrate that patients are able to perform load bearing movements with their upper extremities during the acute phase of recovery utilizing the mindful movement philosophy of “Keep Your Move in the Tube™”

• Demonstrate that patients will report increased confidence in their ability to use their arms to pick up objects using “Keep Your Move in the Tube™” in the acute phase of recovery.

METHODS

Setting: This study was performed at Memorial Regional Hospital in Hollywood, Florida with patients from the cardiovascular intermediate care unit.

Subjects: Twenty three patients were enrolled in the study. There were 16 men and 7 women with a median age of 57 years. Participation in the study occurred from 3 to 44 days after surgery with a mean of 9.5 days. Patients’ surgical procedures included: aortic valve replacement, atrial septal repair, CABG, heart transplant, mitral valve repair, ascending aortic aneurysm repair and sternal dehiscence.

Design: A Chatillon force dynamometer was used to obtain the isometric force measurement for lifting a weighted load (bicep curl). Patients ambulated 100 meters to the therapy gym accompanied by the acute care exercise physiologist. The bicep curl was performed 3 times by pulling the handle on the force dynamometer. The heaviest load lifted of the three repetitions was recorded. An unpaired t-test was used to compare the recorded force in pounds exerted during a bicep curl to 5 pounds; the typical limitation of traditional sternal precautions. Patients were asked to complete a pre and post five-level Likert scale questionnaire to assess their confidence level in using their arms to lift an object.

RESULTS

Primary Outcomes: Patients exerted an average of 42.63 (± 18.35) pounds of force when performing the bicep curl using the force dynamometer. The force exerted by the patients differed significantly from the force required to lift 5 pounds (p-value: 0.0001).

Secondary Outcomes: Confidence increased at least one level for 96% of the patients. Sixty percent of patients indicated an increase in confidence of two or more levels.

CONCLUSIONS

Use of the Keep Your Move in the Tube™ philosophy enabled patients to lift substantially more force than the traditional 5 pound restriction. The lifting activity occurred a mean of 9.5 days after surgery; far earlier than the usual 6 to 12 week restriction. There were no complaints of pain and no adverse outcomes. Confidence levels increased in 22 of the 23 patients, an important factor in recovery and rehabilitation. In contrast to traditional sternal precautions, use of Keep Your Move in the Tube™ allows patients greater freedom of movement, more independence and increased confidence.

REFERENCES


