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contributed to increased lean mass compared to the control program. A subsequent 6-month period of home-based resistance training was not sufficient to maintain the improved glycemic control, indicating that supervised programs may be necessary in this population.

To address the challenge of translating these research findings into practice, we have embarked on a number of initiatives designed to increase community access to quality strength training programs among older adults with or at risk of type 2 diabetes. Based on our research evidence, the resistance exercise programs used in all of these initiatives are individualised, progressive and performed on a regular basis. The first initiative has involved the establishment of partnerships with 5 health and fitness facilities in the metropolitan setting, whereby health and fitness personnel have been specially trained to deliver evidence-based resistance training for people with or at risk of type 2 diabetes. Consumers are supported and encouraged to attend designated exercise sessions on an ongoing basis under the supervision of trained staff members. The second initiative, conducted in 2 metropolitan community health centres, involves an 8-week introductory resistance training program supervised by physiotherapists who have received the specialised training. Within this model, once consumers graduate from the introductory program, they receive guidance and support to continue a maintenance program in a local health and fitness facility. The third initiative involves a pilot project designed to assess the feasibility and efficacy of providing resistance training to older residents in the rural setting via a mobile facility. This project involves a purposefully built vehicle that transports resistance training equipment (dumbbells, ankle weights) to small rural communities on a regular basis by local health workers who have been supported by specialised workforce development. The project has not only contributed to an increase in awareness of the importance of resistance training among older residents, but has addressed many of the barriers to participation in the rural setting. Each initiative incorporates a framework covering key indicators of process and impact evaluation.

This presentation will share the experience and lessons learned from these initiatives and discuss the strategies that have been established to address the sustainability of community-based resistance training programs for people with or at risk of type 2 diabetes.

Reducing the Risk of Osteoporosis and Fractures: An Algorithm for Exercise Prescription and Therapy

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Exercise is an integral part of osteoporosis prevention and management during all stages of life. While exercise prescription guidelines for improving cardiovascular and muscle health are well defined, there is little evidence to base the prescription of exercise for osteoporosis prevention and management. Recommendations for prescribing exercise in relation to osteoporosis will vary according to an individual’s age, fracture risk, functional ability, and level of pain or disability. Thus, a generic exercise prescriptive approach is not appropriate because activities that have been shown to be beneficial in healthy, asymptomatic individuals are likely to be contraindicated for individuals at high risk of fracture. The following algorithm has been developed by extending existing exercise guidelines for bone health prescription for middle-aged and older adults (not the frail elderly)\(^1\) (Figure). This algorithm is unique because it takes into account individual differences based on both the level of fracture risk as assessed by bone densitometry [bone mineral density (BMD)] and an individual’s functional/clinical risk status. Thus, the goal of an exercise program for asymptomatic individuals with normal bone density (T-score above –1 SD) should be to maintain or increase bone density while improving muscle strength. Resistance exercises combined with a variety of high impact exercises are appropriate for this low risk group. For individuals with low bone mass (T-score between –1 and –2.5 SD), but with no history of fracture (e.g., moderate risk of fracture) the goal should be to maintain bone density and to reduce the risk of falling as these individuals tend to fracture as a result of falls. Thus,
Is BMD Normal? (T-score Above -1.0 SD)

Yes
BMD T-score Above -1.0 SD

No
BMD T-score -1.0 to -2.5 SD

Does the patient have atraumatic fractures or osteoporosis

No

Yes

Are there significant risk factors (height loss, falls, pain, posture) or impaired functional status?
(impaired balance, postural stability, co-ordination, strength, mobility, gait, cognitive and/or sensory function)

No

Yes

1. Low Risk
Vigorous exercise program
(aerobic or resistance training; moderate weight-bearing impact exercise)

2. Intermediate Risk
Modified exercise program
(resistance training, low impact, falls prevention, posture educator, monitor)

3. High Risk
Physical therapy program
(low impact, falls prevention, posture educator, maintain function, supervise)

4. Low/Intermediate Risk
Active exercise program
(aerobic and resistance training, moderate weight-bearing impact exercise)
moderate to vigorous weight-bearing activities with minor modifications to reduce impact loading are appropriate. For high-risk individuals, which include those with osteoporosis (T-score below –2.5 SD) and/or a history of atraumatic fracture, there is no evidence that vigorous weight-bearing exercise will correct this condition, and it may in fact increase the risk of fracture. Since fractures in this group are due to a reduction in the mechanical competence of bone, modified exercise programs are required that primarily focus on preventing falls (improving strength, balance and coordination). While this algorithm is intended as a reference to aid decision making for exercise prescription for health care professionals in the management of osteoporosis, it should be used in concert with the basic principles of exercise prescription/training and adequate nutrition. In this presentation, I will describe the characteristics of loading and principles of training specific to bone and muscle health and functional status (e.g., balance), and present four case studies outlining exercise prescription examples for each of the four risk categories defined in the algorithm.

**Resistance Exercise Leads to Decreased Risk Factors for Secondary Stroke in Chronic Stroke Survivors**

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**Background:** There is up to a 30% chance of secondary stroke during the first five years after experiencing a stroke. Hypertension and inactivity are modifiable risk factors which typically respond to customized exercise. Although the benefits of exercise are well known to able-bodied participants, limited work has investigated the effectiveness of intensive exercise in persons with long term disabilities due to stroke. The aim of this study was to determine whether intensive aerobic or resistance exercise might safely modify risk factors for secondary stroke in chronic stroke survivors. **Methods:** Twenty-one community chronic stroke survivors (mean age = 60.12 ± 13.56 years, males = 12) were recruited. All were independent ambulators with mild to moderate hemiparesis (right = 9) and randomly assigned to 1 of 2 groups: an aerobic-based (n = 10, recumbent stepping) or a resistance-based (n = 11, TheraBand resistance training) exercise group. The aerobic group exercised for at least 30 min at 40–60% Max HR with an average resistance load of 344.12 ± 175.5 W. The resistance group exercise program included a 15-min warm-up and circuit training using TheraBand resistance equipment. Each group underwent exercise training for 8 weeks (1-hr sessions, 3 x/week). Cardiovascular fitness (i.e.: resting and postexercise blood pressure & heart rate to a modified 6-min exercise test) and physical performance testing (Timed Up & Go & grip strength) were conducted pre–post test. Nonparametric statistical analysis was used to reduce the data due to the small sample size. **Results:** A Mann-Whitney U comparison of the data revealed that the posttest mean arterial pressure (MAP) and rate pressure product (RPP) were significantly different for the resistance group compared to the aerobic group (MAP = -10.11% vs. +4.86%, respectively) and (RPP = -7.15% vs. +7.18%, respectively). Furthermore, physical performance measurements exhibited similar group-specific improvements in strength on the affected side and walking speeds (Affected Grip = +26.78% vs. +12.79%, and Gait Velocity = +7.68% vs. +2.68%, respectively). All values were significant at the 0.05 level. **Conclusion:** The results suggest that chronic stroke survivors can respond safely and appropriately to exercise programs emphasizing resistance training to improve cardiovascular health to decrease risk factors associated with secondary stroke. **Clinical Significance:** Future efforts are needed to develop appropriate long-term fitness programs for chronic stroke survivors incorporating resistance exercise. *Note: Supported By:* The American Stroke Foundation, The American Heart Association, and TheraBand, Inc.