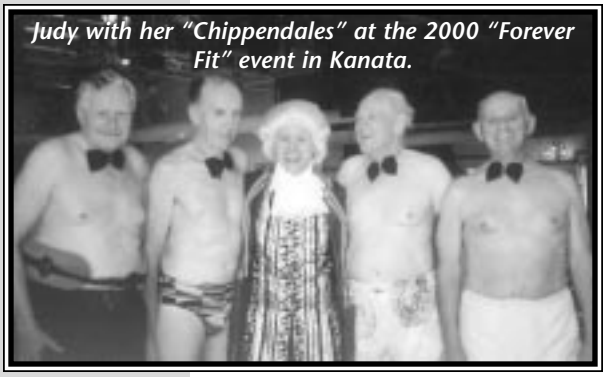
AQUAFITNESS FOR OLDER ADULTS? YOU BET!

Submitted by Elizabeth Fox, P.T., Aquatic Therapist, CALA Certified, CALA Presenter – CALA Conference 2002.

Age-related changes in physical function affecting older water exercisers.

Parameter	*Changes with Aging*	*Effects of Water Exercise*
Muscular Strength	• Declines by ~1.5% per decade after age 60 • Number of motor units and muscle fibres decrease • Type II (fast twitch) fibre size decreases • Total muscle CSA decreases by ~10% after age 50	• Isometric and isokinetic strength gains • Functional ability improves
Muscular Endurance	• Muscular endurance capacity similar to young adults • Ability to carry absolute load over time decreased • Post-exercise recovery time increased	• Improved capacity to perform repeated joint actions per second

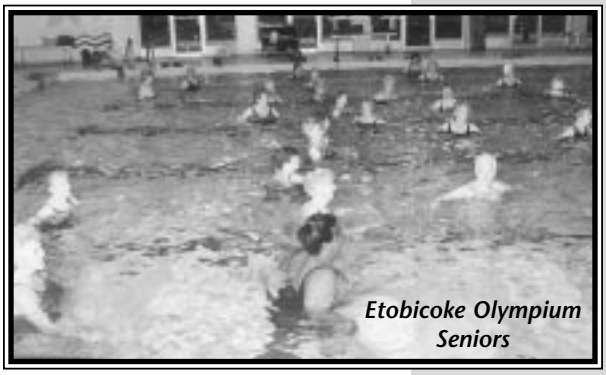
Christmas 2001 - hats and seasonal music. Judy Laughton & her 60+ class.



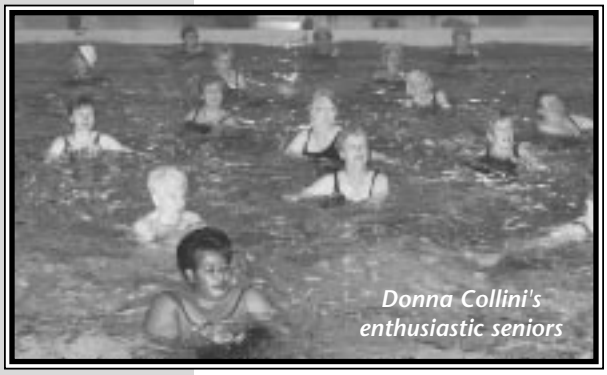
Judy with her "Chippendales" at the 2000 "Forever Fit" event in Kanata.

Bone Density	• Bone loss of 0.3 - 0.5% per year after 3rd and 4th decade • Men only lose 2/3 of bone mass lost by women • Bone loss can develop into Osteoporosis	• Muscular traction provided by water resistance may increase bone density • Buoyancy eliminates high-impact stresses contraindicated for fragile bones but provides low-impact aerobic workout
Cardiovasular Endurance	• VO_2 max decreases ~10% per decade • HRmax decreases approx 1 beat/year • Stroke volume max decreases • Decreased cardiac output occurs as a function of decreased HR and stoke volume	• Water walking HR at min of 147 bpm sufficient to maintain CV fitness in young individuals • Improved VO_2 and HR with water exercise comparable to training effects on land • Increased VO_2 max, HRmax, and work capacity in older adults • Decreased resting HR in older participants

Parameter	*Changes with Aging*	*Effects of Water Exercise*
Balance, Proprioception and Reaction Time	• Neurological changes contribute to muscle atrophy • 35% decreased number of spinal cord axons • 10% decrease in nerve conduction velocity • Sensory and proprioception deficits • Reaction times slows • Osteoarthritis contributes to balance deficits	• Improved static postural sway measures • Dynamic balance may also improve based on improved gait characteristics and speed • Reaction time decreased

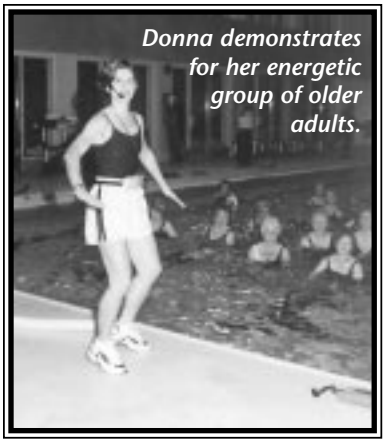


Etobicoke Olympium Seniors



Donna Collini's enthusiastic seniors

Osteoarthritis	• Degenerative changes restrict joint movement, impair balance, cause pain, and restrict activity	• Improved psycho-social well being • Decreased adverse joint reactions • Improved strength and ROM • Improved gait • Decreased pain



Donna demonstrates for her energetic group of older adults.

The information on this table on age-related changes in physical function and the reported benefits of water exercise programs for older people is adapted with permission from Lindsay et al, 2000.
CSA = cross sectional area; HRmax = maximal heart rate; VO_2max = maximal oxygen uptake

References:
1. American college of Sports Medicine. Exercise and physical activity for older adults. Med Sci Sports Exerc 1996: 30(6):992-1008.
2. Krishnathason D, Vandervoort AA. Eccentric training prescription for older adults. Top Geriatr Rehabil 2000: 15:29-40.
3. Lexell J. Aging and human skeletal muscle: observations from Sweden. Can J Appl Physiol 1993: 18:2-18.
4. Porter MM, Vandervoort AA, Lexell J. Aging of human muscle: structure, function and adaptability. Scan J Med Sci Sports 1995: 5:29-142.
5. Ruoti RG. The effects of calisthenic water exercise on selected work, physiological and blood parameters of older adults. Unpublished doctoral dissertation, Temple University, Philadelphia.
6. Sanders ME, Constantino NL,Rippee NE et al. A comparison of results of functional water training on field and laboratory measures in older women [abstract]. Med Sci Sports Exerc 1997: 29(5) Suppl:S110.
7. Sanders ME, Maloney-Hills C. Aquatic exercise for better living on land. ACSM's Health Fitness J 1998: 2(3):16-23.