

# AQUAFITNESS FOR OLDER ADULTS? YOU BET!

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

Parameter	Changes with Aging	Effects of Water Exercise
<b>Muscular Strength</b>	<ul style="list-style-type: none"> <li>• Declines by ~1.5% per decade after age 60</li> <li>• Number of motor units and muscle fibres decrease</li> <li>• Type II (fast twitch) fibre size decreases</li> <li>• Total muscle CSA decreases by ~10% after age 50</li> </ul>	<ul style="list-style-type: none"> <li>• Isometric and isokinetic strength gains</li> <li>• Functional ability improves</li> </ul>
<b>Muscular Endurance</b>	<ul style="list-style-type: none"> <li>• Muscular endurance capacity similar to young adults</li> <li>• Ability to carry absolute load over time decreased</li> <li>• Post-exercise recovery time increased</li> </ul>	<ul style="list-style-type: none"> <li>• Improved capacity to perform repeated joint actions per second</li> </ul>



<b>Bone Density</b>	<ul style="list-style-type: none"> <li>• Bone loss of 0.3 - 0.5% per year after 3rd and 4th decade</li> <li>• Men only lose 2/3 of bone mass lost by women</li> <li>• Bone loss can develop into Osteoporosis</li> </ul>	<ul style="list-style-type: none"> <li>• Muscular traction provided by water resistance may increase bone density</li> <li>• Buoyancy eliminates high-impact stresses contraindicated for fragile bones but provides low-impact aerobic workout</li> </ul>
<b>Cardiovascular Endurance</b>	<ul style="list-style-type: none"> <li>• VO<sub>2</sub> max decreases ~10% per decade</li> <li>• HRmax decreases approx 1 beat/year</li> <li>• Stroke volume max decreases</li> <li>• Decreased cardiac output occurs as a function of decreased HR and stroke volume</li> </ul>	<ul style="list-style-type: none"> <li>• Water walking HR at min of 147 bpm sufficient to maintain CV fitness in young individuals</li> <li>• Improved VO<sub>2</sub> and HR with water exercise comparable to training effects on land</li> <li>• Increased VO<sub>2</sub> max, HRmax, and work capacity in older adults</li> <li>• Decreased resting HR in older participants</li> </ul>

## Parameter

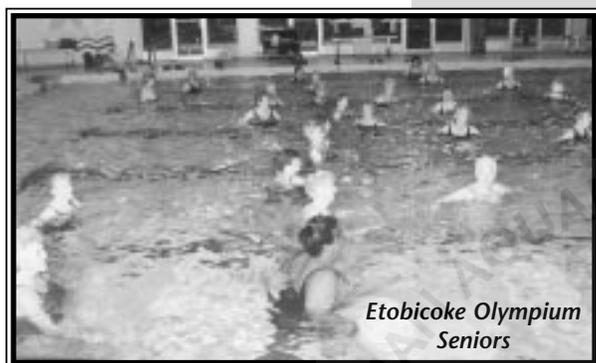
### Balance, Proprioception and Reaction Time

### Changes with Aging

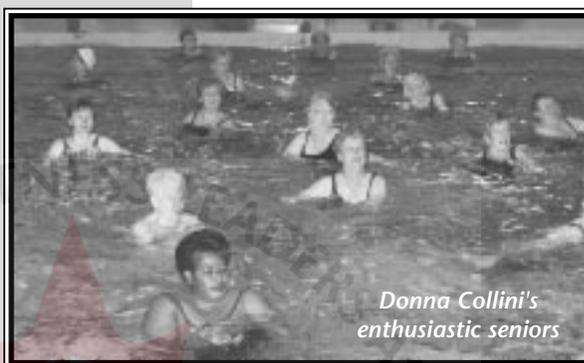
- Neurological changes contribute to muscle atrophy
- 35% decreased number of spinal cord axons
- 10% decrease in nerve conduction velocity
- Sensory and proprioception deficits
- Reaction times slows
- Osteoarthritis contributes to balance deficits

### Effects of Water Exercise

- Improved static postural sway measures
- Dynamic balance may also improve based on improved gait characteristics and speed
- Reaction time decreased



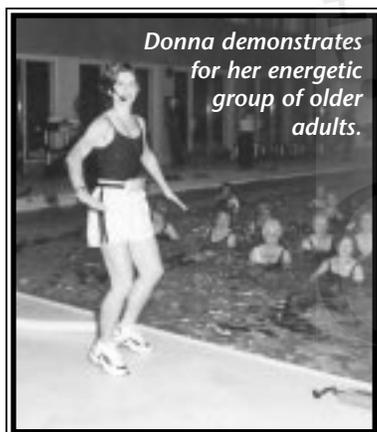
*Etobicoke Olympium Seniors*



*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<sub>2</sub>max = maximal oxygen uptake

### References:

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