

How do community exercise programs support stroke recovery?

LESSONS FROM THE YMCAS OF CAMBRIDGE & KITCHENER-WATERLOO

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Central South Regional Stroke Network Workshop
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Background



- Grand River Hospital staff approached YMCA in 2010
- Need for community-based program after in-patient stroke rehabilitation
- Bridging gap between hospital rehabilitation and community resources

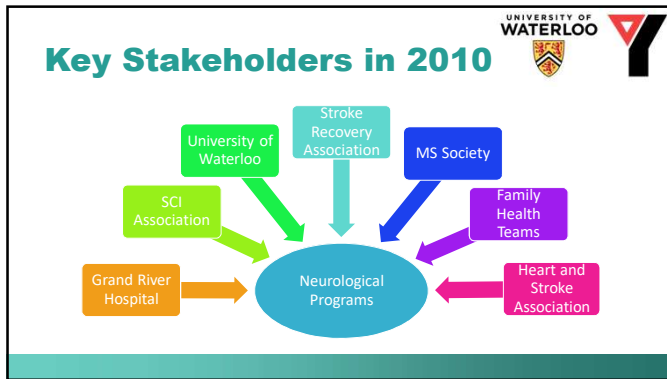
Target Neurological Conditions

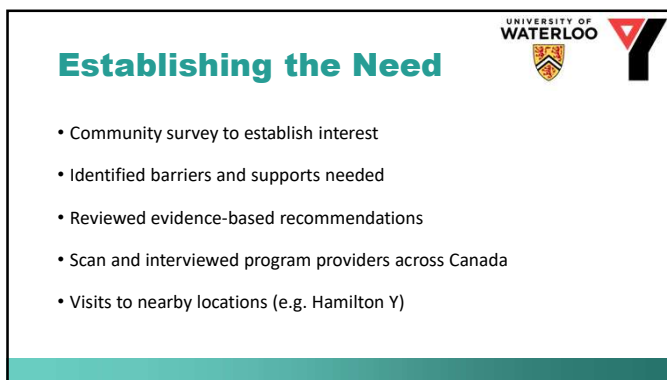


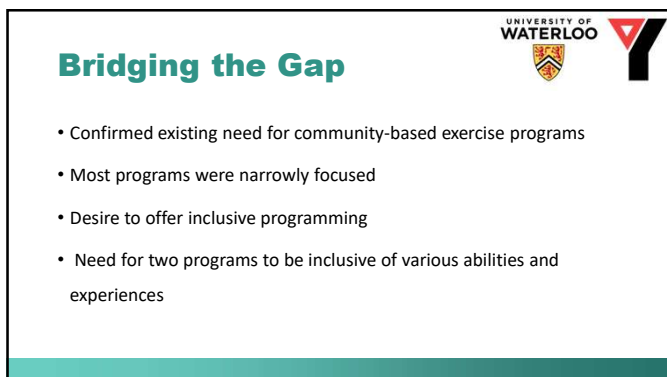
Initial Neurological Conditions Identified:


- Stroke
- Multiple Sclerosis
- Parkinson's Disease
- Spinal Cord Injury












Neuro Fit

- 8 weeks
- 12 participants
- Small group based
- 4 participants:1 Instructor
- Ambulate 10m

Fitness for Function

- 12 weeks
- 15 participants
- Individualized exercise prescription
- 5 participants:1 instructor
- No mobility requirements



Neuro Fit

Strength

- Upper and lower extremity strength
- Muscle recruitment
- Bilateral symmetry


Balance

- Static and dynamic balance
- Activities of daily living

Mobility


- Gait
- Upper extremity mobility

Group warm up and cool down included





Strength

- **Goal of Exercises**
 - Improve strength
 - Range of motion
 - Major muscle groups
 - Activities of daily living
 - Bilateral symmetry
- **Equipment**
 - Bodyweight
 - Resistance bands
 - Dumbbells (1-8lbs)
 - Steps
 - Weighted balls
 - Gliders, bender balls



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Balance

Static Balance

- Centre of balance
- Weight shifting
- Weight transfer
- Hip hinge
- Single leg stand
- Seated balance on stability ball


Dynamic Balance


- Calf raise
- Stepping forward/sideways/backwards
- Lunges
- Activities of daily living

Incorporating equipment

- Yoga blocks
- Foam pads
- Yoga straps
- Stability balls


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Gait

- Establish movement patterns
- Using prescribed gait aids
- Reciprocal gait patterns
- Trunk and stabilizing muscles
- Core and posture recruitment
- "Funny walks"




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Fitness for Function


- Each participant receives individualized exercise prescription
- Cardio machines
 - Recumbent stepper
 - Arm ergometer
 - Treadmill
 - Recumbent bikes
 - Rower
 - Arm and leg ergometer




Fitness for Function


- Strength exercises
 - Bodyweight
 - Dumbbells
 - Resistance tubing
 - Weight machines
 - TRX
- Balance/Posture
 - Standing exercises
 - Movement based
- Gait
 - Dynamic balance
 - Agility
- Group stretch






Assessments






Strength
Grip Strength
Sit to Stand





Balance
Four Stage Balance Test
10 sec stance:
• feet together
• semi-tandem
• tandem
• single-leg




Mobility
6-minute walk test
2-minute walk test
Arm ergometer

Assessments






Self-Efficacy
Ability to exercise (5pt scale)
Understanding of appropriate exercise (5pt scale)
Functional abilities (3pt scale)





Physical Activity

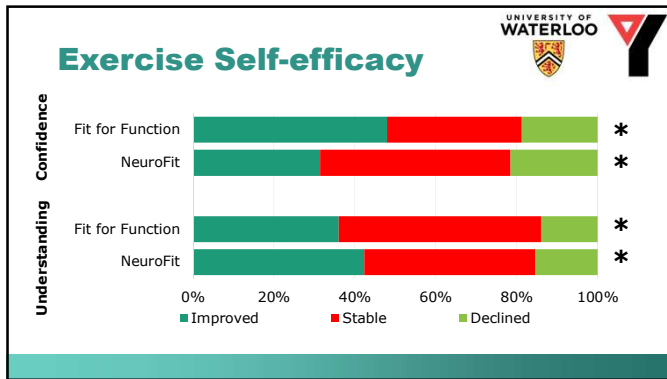
Aerobic Exercise
Frequency, duration
Volume calculated
Strength Training & Stretching
Frequency only

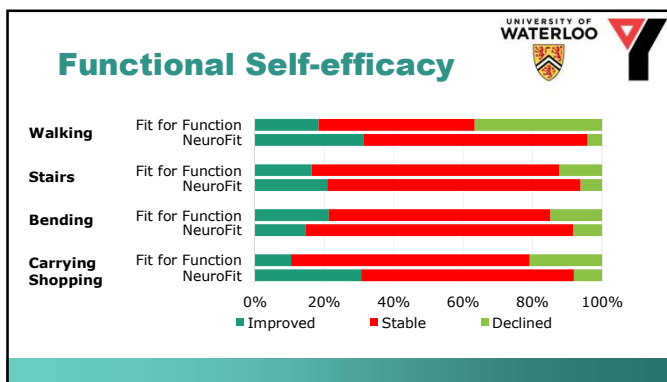
Physical activity also assessed at 3-months post-program by telephone interview

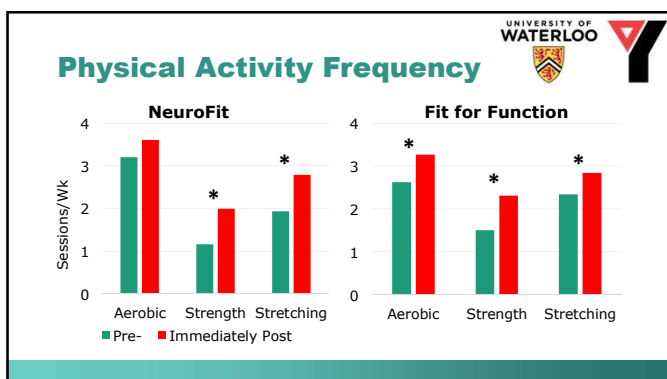
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Participants		
Characteristic	Neuro Fit (n=53)	Fitness for Function (n=50)
Age (yrs)	64.7 (13.6)	66.9 (13.1)
Sex (% f)	32.1% (17)	18.0% (9)
Self-rated Health (%vg/e)	27.5% (14)	30.0% (15)
Days Post-stroke (n=15, 9 recorded)	344 (34 – 2870)	214 (88 – 2460)
Stroke Rehabilitation (%y)	45.3% (24)	28.6% (6)
Stroke Severity		
Mobility aid	52.8% (28)	60.0% (30)
No 6-min walk	26.4% (14)	36.0% (18)
No grip strength one/both sides	26.4% (14)	26.0% (13)

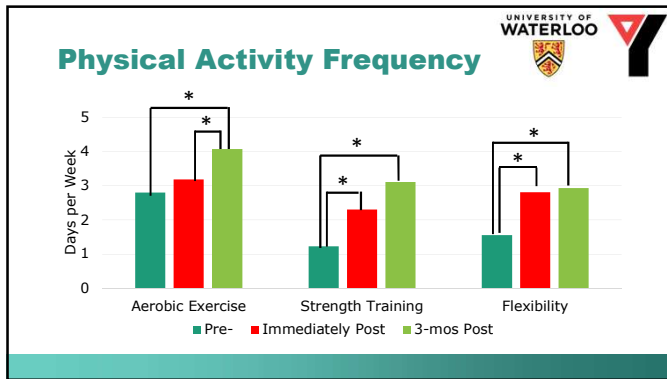
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Baseline Physical Function		
Measure	NeuroFit	Fit for Function
Fitness (mean [sd])		
6min Walk Test	354.9 (165.7)	429.2 (172.2)
Strength (mean [sd])		
Chair Sit to Stand	9.3 (3.8)	11.1 (3.5)
Grip Strength (Strongest arm)	60.6 (26.6)	65.1 (23.1)
Balance (% Can Hold Stance for 10s)		
Feet Together	98.1% (52)	90.0% (45)
Semi-Tandem	92.5% (49)	88.0% (44)
Full Tandem	73.5% (39)	70.0% (35)
Single Leg Stand	37.7% (20)	40.0% (20)

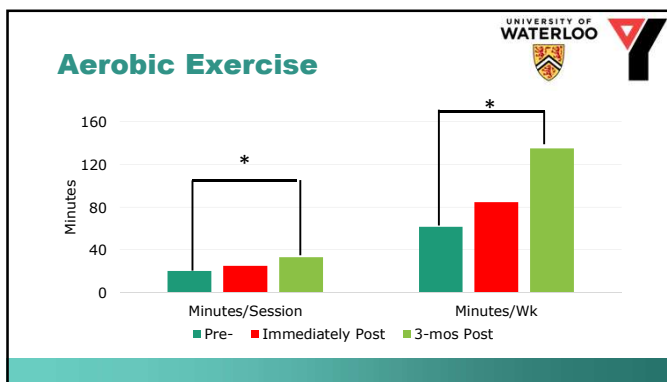
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Change in Physical Function		
Measure	NeuroFit	Fit for Function
Fitness (mean [sd])		
6min Walk Test	56.1 (64.1)***	38.8 (73.9)**
Strength (mean [sd])		
Chair Sit to Stand	2.1 (2.1)***	1.3 (2.2)***
Grip Strength (Strongest arm)	3.3 (9.5)**	0.3 (6.5)
Balance (% Can Hold Stance for 10s)		
Feet Together	+1 (to 100%)	+1 (to 92.0%)
Semi-Tandem	+2 (to 100%)	NC (88.0%)
Full Tandem	+4 (to 77.4%)	+4 (to 78.0%)
Single Leg Stand	+5 (to 47.2%)	+3 (to 46.0%)











Evaluation Summary

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- Both NeuroFit and Fit for Function are promising program options for people after stroke, with improvements in:
 - Functional fitness and lower body strength
 - Exercise-related self-efficacy
 - Sustained physical activity
- Adaptations to Evaluation:
 - Balance measures may not be sensitive, and have undergone iterative change
 - Functional self-efficacy may need wider (5-pt) scale

Evolving Programs

Expansion of eligibility

- Need



Adaptation of gym session

- Demand

Graduate program

- Demand

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Target Neurological Conditions




Original:

- Stroke
- Multiple Sclerosis
- Parkinson's Disease
- Spinal Cord Injury

Added:

- Limited Mobility
- TBI/ABI
- Cerebral Palsy
- Other neurological conditions

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Gym Session

30-Minute Activity Session

- Sports, cognitive games, team building
- Focused towards current participants



30-Minute Social Session

- Guest speakers
- Weekly Topics
- Brain games


30-Minute Pool Session

- 5 participants max
- Gait, balance, strength
- Neuro Fit participants

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Adapted Gym Session

- 45-minute Adapted Gym Session**
 - Sport-based
 - Monthly tournaments
 - Hockey, pickle ball, soccer baseball, baseball
- 30-Minute Social held beforehand**
 - Group driven
 - Social interaction
- Broader Group Experience**
 - Open to both graduates and current participants
 - Normalize activities and sports

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Graduate Programs

- Informal discussion held in May 2018**
- Feedback on existing options/services:**
 - Not aware of program update services
 - Transportation barriers
 - Don't remember until they see Wellness Staff
- Opportunity to brainstorm supports/services:**
 - Want to be pushed and challenged
 - Accountability
 - Motivation
 - Group environment
 - Staff support
 - Opportunity for updates/assessments

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Functional Circuit: Trial Program Nov 26, 2018 – Dec 21, 2018



- 45 minute, moderate-intensity group-based circuit
- Focused on strength, balance, and endurance


Adaptations:

- Using existing equipment in a new way
- Incorporate "mainstream" exercises in adapted form
- 3 options per station
- Supervision and cueing provided
- Autonomy to self-select exercise
- Increase independence



Adapted Functional Circuit Jan 2019

- Response to need by graduates for on-going support to be active
- Looking for higher intensity workouts that provided a challenge
- 2 groups: 30 minutes and 45 minutes (2 levels)
- Variety of upper body, lower body, agility, balance, core moves
- Designed to be a moderate-intensity, circuit based class
- Middle point between supervised, instructional exercise program and mainstream group based fitness



What's Next?

- Continue to evolve graduate program
 - Look at other programming opportunities
 - Graduate cycling program
 - Rock Steady Boxing
- Y-Guide buddy system
 - Linking new graduates with existing graduates
 - Foster social connectedness
- Single "Neurofit" branding
 - Reduce confusion
 - Streamline program offerings

