Optimizing Rehab:
It’s a matter of time (and more)

Denise Taylor
Coordinator, North West LHIN Regional Rehabilitative Care Program,
Physiotherapy Professional Practice Leader, St. Joseph’s Care Group

Esmé French
Regional Stroke Rehabilitation Specialist, Northwestern Ontario Regional
Stroke Network, Thunder Bay Regional Health Sciences Centre
Learning Objectives: Aerobic Exercise

At the end of this presentation, participants will be able to:

Apply tools to support the provision of individualized aerobic exercise prescription after stroke or TIA
People with stroke should be screened, prescribed and doing aerobic exercise as soon as medically stable.

Canadian Stroke Best Practice Recommendations (Hebert et al, 2016); AEROBICS: Aerobic Exercise Recommendations to Optimize Best Practices in Care after Stroke (Mackay-Lyons et al., 2013)
a. A medical history and physical examination should be performed to identify factors requiring consideration or contraindication to exercise

b. **Exercise stress test** with ECG, HR and BP monitoring should be considered for those with cardiovascular disease.

Canadian Stroke Best Practice Recommendations (Hebert et al, 2016); AEROBICS: Aerobic Exercise Recommendations to Optimize Best Practices in Care after Stroke (Mackay-Lyons et al., 2013)
Background

- Aerobic training is a part of PT programming when time permits, often “non-standardized”, informal prescription.
- Typically stress tests in Thunder Bay are for cardiac disease screening NOT for safe aerobic exercise prescription.
- Timely access to stress tests is limited (Typical inpatient stroke LOS 4 weeks).
- 120 inpatient stroke rehab admissions/ year.
- ~1/3 (~40 ppl) require stress testing
  - ~1/3 (~40 ppl) requiring cycle ergometry
  - ¼ (~10 ppl) requiring treadmill stress testing requires high level of mobility.
Mrs. Rally

- 80y/o, 8 days post-ischemic stroke
- Atrial fibrillation, stable INR
- Resting HR 82
- Rehab goals include neighbourhood walking group
The Problem

1. Safe aerobic training with “formal” exercise prescription currently not consistent, and

2. Timely access to stress testing for stroke exercise prescription currently not available ....

REQUIRING A PRACTICE SHIFT
**Aim**
To consistently include aerobic training for all appropriate clients (inpatient and outpatient).

**Goal**
In 1 year, there will be a process and tools for safe aerobic exercise prescription including stress test screening as appropriate.
Stakeholders:

- Physiotherapy Professional Practice Leader
- Regional Stroke Rehabilitation Specialist
- Frontline physiotherapists at SJCG
- Healthy Lifestyles Coordinator at TBRHSC
- Manager Cardiorespiratory Services at TBRHSC
- Physiatrists at SJCG
- Partnership with Toronto Rehab
  - UHN Mobility Innovations Centre (PROPEL study)
Reflective Question

What are the barriers you have for evidence-based aerobic training with your clients?
### Client Information

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR rest</td>
<td>82</td>
</tr>
<tr>
<td>Gender (M=1, F=0)</td>
<td>0</td>
</tr>
<tr>
<td>6MWD (m)</td>
<td>0</td>
</tr>
<tr>
<td>Height (m)</td>
<td>0</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0</td>
</tr>
<tr>
<td>YMCA HR(end)</td>
<td>0</td>
</tr>
<tr>
<td>YMCA Watts(end)</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Subaerobic sub max Option 1

<table>
<thead>
<tr>
<th>No Beta Blockers</th>
<th>Beta Blockers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted HR max</td>
<td>153.3</td>
</tr>
<tr>
<td>Heart Rate Reserve</td>
<td>71.3</td>
</tr>
<tr>
<td>40% HRR</td>
<td>110.52</td>
</tr>
<tr>
<td>45% HRR</td>
<td>114.085</td>
</tr>
<tr>
<td>50% HRR</td>
<td>117.65</td>
</tr>
<tr>
<td>60% HRR</td>
<td>124.78</td>
</tr>
<tr>
<td>70% HRR</td>
<td>131.91</td>
</tr>
<tr>
<td>80% HRR</td>
<td>139.04</td>
</tr>
</tbody>
</table>

Excel calculator for HR predictions
Aerobic Exercise Screening Stratification Tool

- A working document currently used within the Stroke Rehabilitation Service of St. Joseph’s Care Group-Thunder Bay, adapted from and in partnership with Toronto Rehabilitation Institute – University Health Network (UHN).
Inpatient Rehabilitation
Aerobic Training Flow Sheet

- Decision making guide to help determine if stress testing is warranted
Mrs. Rally’s results....
Mrs. Rally

B. IS CLIENT APPROPRIATE FOR AEROBIC EXERCISE?
- consult physician (see stratification tool)

NO AEROBIC EXERCISE
- reassess if client status changes

NO

YES

D. FOLLOW PHYSICIAN RECOMMENDATIONS

STRESS TEST IS REQUIRED:
- Complete GRADED CV TRAINING REFERRAL (Form CF-0319) for physician to sign
- Include details on reason why stress test is recommended e.g. recent MI
- Leave on chart to be faxed with referral

STRESS TEST NOT REQUIRED:
- PERFORM SUB-MAX GRADED EXERCISE ASSESSMENT

C. DID CLIENT RESPOND NORMALLY TO EXERCISE?

NO

YES

- Place sub-max form (CF-0317) on chart
- Complete GRADED CV
### Submaximal Graded Exercise Assessment

**Place Patient Label with Barcode Here**

#### Instructions for Conducting the Test

- **Patient Engagement:** Ensure the patient engages in an activity 4-6 hours prior to the test.
- **Medical History:** Review patient’s medical history 2 days prior to the test.
- **Exercise Equipment:** Use appropriate exercise equipment (e.g., treadmill, cycle ergometer).
- **Physical Exam:** Conduct a physical exam before commencing the test.

#### Test Details

<table>
<thead>
<tr>
<th>Stage</th>
<th>Time</th>
<th>Heart Rate (bpm)</th>
<th>BP (mm Hg)</th>
<th>Workload</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>0:00</td>
<td>100</td>
<td>120/80</td>
<td>Easy</td>
</tr>
<tr>
<td>Stage 2</td>
<td>0:30</td>
<td>120</td>
<td>140/90</td>
<td>Moderate</td>
</tr>
<tr>
<td>Stage 3</td>
<td>1:00</td>
<td>140</td>
<td>160/100</td>
<td>Hard</td>
</tr>
</tbody>
</table>

**Additional Information:*

- **Heart Rate:** Monitor heart rate continuously during the test.
- **Blood Pressure:** Measure blood pressure at the beginning and end of each stage.
- **Workload:** Adjust workload based on patient’s ability to tolerate the test.

#### Precautionary Measures

- **No Daytime Testing:** Avoid conducting the test during daylight hours.
- **Proper Supervision:** Ensure proper supervision throughout the test.
- **Emergency Kit:** Carry an emergency kit with necessary medical supplies.

**Patient Feedback:**

- **Satisfaction Survey:** Administer a satisfaction survey at the end of the test.
- **Follow-up:** Schedule a follow-up appointment with the patient within 2 weeks.

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**Date:**

**Time:**

**Signature:**

**Notes:**

**Additional Information:**

- **Medical History:** Review patient’s medical history 2 days prior to the test.
- **Exercise Equipment:** Use appropriate exercise equipment (e.g., treadmill, cycle ergometer).
- **Physical Exam:** Conduct a physical exam before commencing the test.

**Test Completion:**

- **Signatures:** Obtain signatures from the patient and the healthcare provider.
- **Follow-up:** Schedule a follow-up appointment with the patient within 2 weeks.

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**Additional Instructions:**

- **Rest Period:** Allow the patient to rest for 5 minutes before commencing the next stage.
- **Maximal Heart Rate:** Calculate maximal heart rate using the formula: 220 - age.
B. IS CLIENT APPROPRIATE FOR AEROBIC EXERCISE?  
- consult physician (see stratification tool)

NO AEROBIC EXERCISE  
- reassess if client status changes

D. FOLLOW PHYSICIAN RECOMMENDATIONS

STRESS TEST IS REQUIRED:
- Complete GRADED CV TRAINING REFERRAL (Form CF-0319) for physician to sign
- Include details on reason why stress test is recommended e.g. recent MI
- Leave on chart to be faxed with referral

C. DID CLIENT RESPOND NORMALLY TO EXERCISE?

STRESS TEST NOT REQUIRED:
- PERFORM SUB-MAX GRADED EXERCISE ASSESSMENT

E. IS CLIENT ABLE TO...
Mrs. Rally

B. IS CLIENT APPROPRIATE FOR AEROBIC EXERCISE?

- consult physician (see stratification tool)

NO AEROBIC EXERCISE - reassess if client status changes

C. DID CLIENT RESPOND NORMALLY TO EXERCISE?

STRESS TEST NOT REQUIRED:
- PERFORM SUB-MAX GRADED EXERCISE ASSESSMENT

D. FOLLOW PHYSICIAN RECOMMENDATIONS

STRESS TEST IS REQUIRED:
- Complete GRADED CV TRAINING REFERRAL (Form CF-0319) for physician to sign
- Include details on reason why stress test is recommended e.g. recent MI
- Leave on chart to be faxed with referral

E. IS CLIENT ABLE TO...
Mrs. Rally

F. IS CLIENT ABLE TO WALK ON TREADMILL FOR UP TO 15 MIN. WITH SUPERVISION?

F. CAN CLIENT CYCLE ON A STATIONARY BIKE?

PROCEED WITH EXERCISE AT A LIGHT INTENSITY (RPE 1-2)
- Monitor HR & BP
- Begin with 3-5 min. intervals
- Progress frequency or time rather than intensity
- Maximum HR = rest HR +20 bpm

REFER FOR CYCLE ERGOMETRY STRESS TEST WITH ECG
- Suggest “Cycle ergometry for Stroke Rehabilitation” (increases priority of referral)
- Fax referral to Curran’s with GRADED CV TRAINING REFERRAL
- Results faxed, not on EMR

REFER FOR TREADMILL STRESS TEST
- Suggest “Modified Bruce protocol for Stroke Rehabilitation” (increases priority of referral)
- FAX referral with GRADED CV TRAINING REFERRAL form to TBRHSC
- Results will be on EMR

TRAINING REFERRAL (Form CF-0315) for physician to sign
- Include details on HR and BP response to exercise, and initial prescription

CLIENT’S CONTINUING TO OUT-PT REHAB?
- On d/c, provide copy of sub-max and Curran’s cycle ergometry stress test if done
- Provide target HR and last exercise prescription, e.g. 20 min., NuStep level 2

• Return to B.
Mrs. Rally had abnormal response to sub-max testing therefore the physician recommended stress testing on the treadmill.

Her stress test resulted in a safe training zone prescription of 115 - 125 bpm.

She was able to do 2-5 minute bouts on the treadmill, progressing to a total of 20 minutes over her admission with set up and monitoring by the Rehab Assistant and progressing weekly by the PT.

Rehab Assistant and family supported walking during evening and weekends.
INFORMATION SHARING:

- Tools reviewed are all available on www.nwostroke.ca - in Rehabilitation section, under Resources tab.
Challenges / Successes
CHALLENGES

- Communication with stakeholders
- Time to do sub-max testing vs. functional training priorities
- Clients going off-site for tests = lost therapy time
- Timely access to stress tests for post-stroke exercise prescription
SUCCESSES

- Competency with Sub-max testing
- Process to access Stress Tests for post-stroke exercise prescription
- Communication with ALL stakeholders
- Ongoing support and partnership with Toronto Rehab staff
- Unintended positive consequence: Improved transfer of care to Neurology OP services
Reflective Question

What are the supports or tools that you need to embed this into your practice?
Thank You & Questions?
For More Information...

Denise Taylor
Email: taylord@tbh.net

Esmé French
Email: frenche@tbh.net

Aerobic Exercise Tools: Liz Inness, Lead – Mobility Innovations Centre (formerly the Balance, Mobility & Falls Clinic), Toronto Rehabilitation Institute-UHN, liz.inness@uhn.ca
REFERENCES


