

The ProACTIVE SCI Toolkit

A Physiotherapist's Guide to Promoting
Physical Activity to Clients who have
Spinal Cord Injuries



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Thank you to all of the physiotherapists and participants who contributed their invaluable time and knowledge to inform the development of this toolkit.

This project was funded by the Ontario Neurotrauma Foundation and the Rick Hansen Institute.



The One Page Cheat Sheet

As a quick reference for promoting physical activity, follow these three steps. The rest of the toolkit provides detailed descriptions of each of these strategies and how to use them.

Step 1:

Tailor your intervention by discussing the following questions to understand your client's situation

- 1) Current physical activity levels/readiness for change:
- 2) Goals (how much physical activity and what are the benefits they'd like to gain):
- 3) Types of physical activity they currently enjoy doing:
- 4) Available resources (e.g., equipment, gym, recreation centres near them, funding):
- 5) Barriers to accomplishing their goal:
- 6) Mutually discuss short term goals and strategies (see the following link to download a list of printable resources to help:
https://drive.google.com/drive/folders/13tJaCoGqBlj3nwK3Mykqn6-Ufile5p_w?usp=sharing)

Step 2:

Aim for at least the SCI physical activity guidelines

For fitness benefits: 20 min of moderate to vigorous aerobic activity, 2x/week

AND

Strength training 2x/week

For cardiometabolic health benefits: 30 min of moderate to vigorous aerobic activity, 3x/week

Step 3:

Pick your strategies

Educate

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Steps to Using this Guide (Overview)

1. Familiarize yourself with the safety guidelines and philosophy for promoting physical activity.

2. Gauge your client's interest in physical activity.

2a. Motivated

Move forward with one, two or all three of the following key strategies according to your client's situation and your own practice and skill set.

2b. Not Motivated

If your client isn't interested in physical activity, learn the reasons why. Then move forward with one, two or all three of the following key strategies according to your client's situation and your practice and skill set. If your client becomes motivated, refer to 3a.

3. Key strategies

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Link & Refer

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Tailored Prescription

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Educate:

Safety

Pg. 8

Benefits

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Problem Solving

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Finance & Transportation

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Peer-to-Peer Connections

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Tailored Prescription:

Activity Idea Ladder

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Note: Because hyperlinks are constantly changing and new information is continually emerging online, we've included search terms [underlined and in square brackets] for recommended websites, organizations, programs and concepts.

Steps to Using this Guide (Detailed)

1. Familiarize yourself with the safety guidelines and philosophy for promoting physical activity.

Before beginning a consultation with your client to promote physical activity, take time to understand pre-exercise screening conditions, common risks for people with an SCI who begin an exercise program, and the toolkit's philosophy for promoting physical activity.

Safety

Pg. 8

Philosophy

Pg. 10

2. Gauge your client's interest in physical activity.

This can be achieved by simply asking this question:

“Do you have any plans to start (continue) being active?”

2a. Motivated

- ❖ Actors: clients who have started exercising or have been exercising for a long time.
- ❖ Intenders: clients who have not been exercising but would like to.

2b. Not Motivated

- ❖ Pre-Intenders: clients who have not been exercising and have no intention to do so.

Motivational interviewing is beyond the scope of this toolkit, but may be a useful strategy for resolving ambivalence through a client-centered counselling approach. Proper training requires multiple, in-person sessions with feedback from a trained counsellor. For a quick overview/refresher, see:

<http://learning.bmj.com/learning/module-intro/.html?moduleId=10051582>

[BMJ Motivational Interviewing in Brief Consultations]

Steps to Using this Guide (Detailed)

3a. Motivated

Move forward with one, two or all three of the following key strategies according to your client's situation and your own practice and skill set.

3b. Not Motivated

If your client isn't interested in PA, learn the reasons why.

Potential reasons:

- not understanding the **benefits** of physical activity
- **fear** of activity (e.g., triggering autonomic dysreflexia)
- **barriers** to physical activity
- a lack of **confidence** to exercise

If your client is willing to address these issues or learn more, move forward with one, two or all three of the following key strategies according to your client's situation and your own practice and skill set :

3. Key strategies

See the table of contents and decide which of the key strategies are most appropriate to start, maintain, or improve your client's exercise program.

Educate

Pg. 7

Link & Refer

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Tailored Prescription

Pg. 33

If your client identifies any of the above potential reasons for not exercising, here are some recommended key strategies:

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Benefits	Pg. 13
Problem Solving	Pg. 19

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Finance and Transportation	Pg. 26
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Activity Idea Ladder

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To Address...

Benefits,
Fear, Barriers

Barriers,
Confidence

Barriers,
Confidence

Table of Contents

If you are already familiar with the content, quickly navigate the toolkit by completing The Interview (Pg. 35) with your client and choose the appropriate intervention strategy/ies below:

Educate

Teach your client the basic ways and benefits of being physically active and provide them with the tools to start and maintain exercise on their own.

Link & Refer

Link your client to resources, or refer to peers, programs or other professionals to help them start or continue physical activity.

Tailored Prescription

Use your background as a physiotherapist, along with some new tools, to design physical activity programs that are tailored specifically for your client with SCI.

Educate

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Tailored Prescription

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Educate Overview

Teach your clients the basics of being physically active and provide them with tools to start and maintain an exercise program on their own.

	1	Safety	Learning about the common risks of exercise for people with SCI will help your clients prevent injury and feel more confident that risks can be mitigated.
	2	Philosophy	Make your physical activity promotion strategy effective by basing it on key guiding principles developed by physiotherapists, people with SCI, and behaviour change specialists.
	3	ABCs of Physical activity	<p>Become comfortable with the basics of physical activity, specifically:</p> <ul style="list-style-type: none">• Basic definitions: defining physical activity and the key terms used to prescribe exercise• The SCI Physical Activity Guidelines: evidence-based recommendations for minimum levels of physical activity necessary for people with SCI to experience fitness benefits• Benefits of Physical Activity: research-supported positive outcomes from participating in physical activity experienced by people with SCI
	4	Behaviour Change Techniques	<p>Strategies that have been shown to change physical activity behaviour in people with SCI, including:</p> <ul style="list-style-type: none">• action planning• SMART goal setting• problem solving• prompts & cues• graded tasks• follow-up• self-monitoring• commitment• reward
	Bonus	Lived Experience/Educational Videos	Utilize videos featuring experts in the exercise field and those with lived experience.

Educate Safety

We recommend that people with SCI check with a physician before starting a physical activity program. If you're unsure whether a physician needs to be consulted before your client starts an exercise program, use the PAR-Q+ guidelines (back of this guide) to inform your decision.

To find a medical doctor who might be appropriate and qualified to assess a client prior to exercise participation, contact CASEM [[Canadian Academy of Sport and Exercise Medicine](#)] or CAPMR [[Canadian Association of Physical Medicine & Rehabilitation](#)].

Safety should be considered for all clients. Understanding and teaching common safety concerns can help to prevent injury for your clients, and allow them to feel more confident that risks can be mitigated. Below are a list of common safety issues and strategies to mitigate risk.

PAR-Q+

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Overuse Injury	<p>Shoulders and wrists are particularly susceptible to overuse, but overuse injuries can also happen in other areas of the body. When prescribing exercise programs, don't forget the importance of upper body function for everyday life and activities for clients who have an SCI.</p> <ul style="list-style-type: none">➤ Progress slowly: aim for a little muscle soreness, not intense pain.➤ Vary exercises.➤ Prescribe rest days.
Pressure ulcers	<p>People with SCI are vulnerable to pressure ulcers or pressure sores—damage to the skin and underlying tissue, which is typically caused by sitting or lying on one part of the body for too long or a combination of pressure and shearing forces.</p> <ul style="list-style-type: none">➤ Encourage shifting body weight every 10 to 15 minutes.➤ Recommend equipping wheelchair with a higher quality cushion to better relieve pressure.➤ For more information on pressure ulcer management, see www.onf.org [ONF Pressure Ulcer Guide].
Temperature Dysregulation	<p>Sweating may be inhibited below the level of a client's injury and impair their ability to regulate their temperature.</p> <ul style="list-style-type: none">➤ Have clients cool down with a water bottle, spray bottle, or cold wet towel when exercising outdoors in the heat.➤ Submersing hands or feet in cold water or using ice vests can cool core temperature➤ When indoors, use a fan (and a spray bottle for better results).

Educate Safety

Autonomic Dysreflexia (AD)

AD is a sudden and very large increase in blood pressure which is often accompanied by severe headaches. Know the signs of AD (e.g., severe headache, feelings of anxiety, profuse sweating and/or flushing above the level of injury, blurred vision).

- Emptying the bladder before exercise can help prevent AD.
- If you think your client is experiencing AD, keep them sitting up.
- Deal with any suspected causes (e.g., kinked catheter, tight clothing, full bladder).
- Ask if the client has medication to manage their blood pressure.
- If you deal with the suspected cause but symptoms persist, get medical assistance (i.e. if no improvement in five minutes, seek a physician; safest option may be the ER if you have no access to blood pressure monitoring).
- For more training on AD, take the free online course at www.abcofad.jibc.ca [JIBC ABC of AD in spinal cord injury].

Orthostatic Hypotension

Orthostatic hypotension is a dangerous drop in blood pressure. The 30-20-10 rule is used to determine orthostatic hypotension. When a client moves from lying position to an upright posture (e.g., sitting or standing) and experiences an increase in heart rate by more than 30 beats per minute, a decrease in systolic blood pressure of 20mmHg, or a decrease in diastolic blood pressure of 10mmHg (or any combination of these), orthostatic hypotension should be suspected. Other symptoms may include lightheadedness, dizziness, nausea, and fatigue. Typically, individuals with tetraplegia are at a greater risk than individuals with paraplegia.

- Lie the client back down until symptoms subside. You can also elevate the client's feet and apply pressure to the abdomen.

Fracture

A fracture, or break in the bone, is typically the result of trauma, overuse, or decreased bone mineral density (osteoporosis). Fractures are more common in limbs affected by paralysis.

- Those who experience severe muscle spasms and have osteoporosis should take precautions such as engaging in lower impact exercise to prevent fractures from occurring.

Spasticity

Spasticity, or high muscle tone, can be a sign of pain and can be worsened by medical issues such as skin breakdown or infection.

- Certain exercises might exacerbate spasticity—assess on a case-by-case basis. If spasticity continues to worsen, avoid the problematic exercise.
- Doing a warm up and stretching may help alleviate spasticity.

Sunburn

Sunburn is damage to the skin as a result of exposure to the sun's ultraviolet rays.

- Use of sunscreen, shade, or light coloured and lightweight clothing to protect skin from the sun is important for everyone who exercises outside, but especially for those with no or limited sensation in the skin.

Educate Philosophy

Guidelines at a Glance

SCI Action Canada, in conjunction with the Rick Hansen Institute, has developed the *Physical Activity Guidelines for Adults with Spinal Cord Injury*. Adults with SCI should engage in at least:

For fitness benefits:

**20 min of moderate to vigorous aerobic activity, 2x/week AND
Strength training 2x/week**

For cardiometabolic health benefits:

30 min of moderate to vigorous aerobic activity, 3x/week

Small Steps

- The SCI Physical Activity Guidelines are the minimum amount of activity required to obtain fitness benefits (although other benefits may be achieved at lower doses). However, not everyone is ready to meet those guidelines.
- Some will be ready to set goals for meeting the guidelines or even exceeding them. Others will need to start with more modest goals (e.g., doing range-of-motion exercises while watching TV) and work up to meeting the guidelines. Tailor your approach based on your client's situation.

Instill a Culture of Physical Activity as Part of Everyday Life

- Physical activity is important for reducing the risk of prevalent chronic diseases. But it's also critical to your clients' quality of life. Experts continually emphasize the importance of connecting physical activity to improvements in everyday function.
- For example, you could explain to your clients how a particular exercise can help make toilet transfers easier, or spell out how building strength and endurance will allow them to play longer with their kids.

Tailor to the Individual

- Your advice is much more effective and meaningful when you consider the environment, functional level, personality, barriers, family situation, and motivation of your clients. Be prepared to challenge your clients if they're willing and eager to introduce physical activity into their lives. You may have to take smaller, more modest steps if they're not fully confident.
- Integrate your clients into community centres if they're interested in exercising in a setting with a variety of individuals, or refer them specifically to adapted programming if that's their preference or comfort level. There's no such thing as a blanket strategy; each client is unique.

Educate

Physical Activity Basic Definitions

Physical Activity

The focus of this toolkit extends outside of rehabilitative exercises to the broader category of physical activity. In accordance with up-to-date literature and research, the types of physical activity recommended to promote to clients in order to have them experience fitness benefits are leisure time physical activity and wheeling/active transportation.

- A leisure time physical activity is something that a client **CHOOSES** to do in their free time (e.g., going to the gym, playing sports, taking the dog for a walk).
- Wheeling/active transportation can be encouraged as an alternative to driving or taking public transit to a destination (e.g., wheeling to work or the grocery store).

Aerobic Exercise

Aerobic exercise, commonly referred to as cardio, involves an activity that typically increases heart rate and breathing (e.g., wheeling, basketball, dancing).

Strength/Resistance Exercise

This type of exercise makes use of resistance to improve muscular strength and function (e.g., lifting weights, using resistance bands, using body weight exercises).

Intensity

Intensity refers to how hard the individual is working. Below are intensity descriptions that have been determined to be appropriate for clients who have an SCI:

	Mild	Moderate	Vigorous
In General	This includes physical activities that require clients to do very light work. They should feel like they're working a little bit, but overall, they shouldn't find themselves working too hard.	This includes physical activities that require some physical effort. Clients should feel like they're working somewhat hard but can keep going for a long time.	This includes physical activities that require a lot of physical effort. Clients should feel like they're working really hard (almost at their maximum) and can only do the activity for a short time before getting tired. These activities can be exhausting.
Breathing and Heart Rate	These stay normal or are only a little bit elevated than normal.	Breathing is harder and heart rate is faster than normal, but not to the extreme.	Breathing is fairly hard, and both are much faster than normal.
Muscles	Muscles are loose, warmed-up and relaxed; they feel normal temperature or a little bit warmer and not tired at all.	Muscles feel pumped and worked. They're warmer than normal and start to get tired after awhile.	Muscles burn, are tight and tense, feel a lot warmer than normal, and feel tired quickly.
Skin	Skin is normal temperature or only a little bit warmer, and not sweaty.	Skin is a little bit warmer than normal, and might be a little sweaty.	Skin is much warmer than normal and might be sweaty.
Mind	Clients might feel very alert, but there's no effect on concentration.	Clients require some concentration to complete.	Clients require a lot of concentration (almost full) to complete.

Educate

The SCI Physical Activity Guidelines

Quick Version for Explaining the Guidelines to Your Clients:

(For more detail, see [\[scientific exercise guidelines for adults with spinal cord injury at SCIActionCanada.ca\]](#))

Fitness

For **cardiorespiratory fitness and muscle strength benefits**, adults with SCI should engage in at least:

20 minutes of moderate to vigorous intensity aerobic exercise **2** times a week
+
3 sets of strength-training exercises for each major functioning muscle group, at a moderate to vigorous intensity **2** times a week

Cardiometabolic health

For **cardiometabolic health benefits**, adults with SCI are suggested to engage in at least:

30 minutes of moderate to vigorous intensity aerobic exercise **3** times a week

These guidelines were developed by an international group led by Prof Kathleen Martin Ginis (University of British Columbia, Canada) and Prof Victoria Goosey-Tolfrey (Loughborough University, UK).

For **FITNESS** benefits, aim for: 20 minutes of moderate to vigorous intensity aerobic activity (e.g., wheeling, arm cycling, sports, swimming) at least 2 times per week

AND

3 sets of 8-10 repetitions of strength training exercises (e.g. free weights, elastic resistance bands, cable pulleys, weight machines) for each major functioning muscle group, 2 times per week.

For **CARDIOMETABOLIC HEALTH** benefits, aim for: 30 minutes of moderate to vigorous intensity aerobic activity at least 3 times per week

Moderate means somewhat hard, and you feel like you could continue for a long time. During the activity, you are able to talk, but not sing a song.

Vigorous is really hard; you feel like you can only continue for a short time before getting tired. You will not be able to say more than a few words without pausing for a breath.

STRENGTHENING ACTIVITY

You should feel quite challenged (without hurting yourself) by the end of the three sets and eight to ten repetitions. Take a one to two minute rest break between each set. Work each muscle group on alternate days.

Educate

Benefits of Physical Activity

Following the guidelines can help improve your client's fitness and strength. When choosing which benefits to emphasize to your client, consider what's important to them. For example, is your client seeking to improve their health, or maintain their functional independence? Some benefits your client may expect (but are not limited to):

Everyday Benefits

- better endurance for wheeling longer distances
- easier transfers in and out of a wheelchair
- enhanced self-care and mobility
- better overall health and quality of life
- more energy
- more social interaction opportunities
- improved ability to play with children
- more time spent with family when activities are done together

Health Benefits

- reduced cholesterol and fats in the blood, which can lower the risk of developing several chronic diseases
- less pain
- lower risk of stress
- lower risk of depression
- improved ability to regulate blood glucose, decreasing risk for type ii diabetes
- better sleep quality



Educate Behaviour Change Techniques: Overview

If your client wants to begin a physical activity program, or has been exercising but needs some help reaching their goals, consider the following behavioural strategies that may help them transform their intentions into action.

Note that these strategies not only apply when promoting an active lifestyle, but can also be used to help your clients adhere to their rehabilitative exercises.

Each of these techniques have been supported in the literature as methods to improve physical activity specifically in people who have an SCI.

SMART Goal
Setting

Action
Planning

Self-
Monitoring

Follow-Up/
Monitoring

Problem
Solving

Prompts/ Cues

Graded Tasks

Commitment

Reward



Educate

Behaviour Change Techniques: SMART Goals

SMART Goals

Create goals that are:

Specific
Measurable
Attainable
Realistic
Time-based

Example of a SMART goal:

“I will go for a moderate to vigorous intensity wheel of at least 20 minutes duration, twice per week, every week, for one month.”

Why this a good example of a SMART goal:

- ✓ **Specific:** The type of exercise (wheeling) is well-defined.
- ✓ **Measurable:** You and your client can easily keep track of whether the goal is being met (two times per week, at least 20 minutes, every week).
- ✓ **Attainable/Realistic:** The goal is realistically attainable. What constitutes “realistic” will vary from person to person. Review each individual client’s exercise history and current level of fitness in order to set appropriate, realistic goals.
- ✓ **Time-Based:** The goal has an achievement end date (one month).

Educate

Behaviour Change Techniques: Planning

Action Planning

Have your client make a detailed, day-by-day action plan for their physical activity at the beginning of each week. It should include the **activity type, location, time and duration, and exercise intensity**. Below is an example of an action plan.

EXAMPLE ACTION PLAN:

	SUN	MON	TUES	WED	THURS	FRI	SAT
Activity	frisbee/catch with kids	off	resistance band	off	go for a wheel	off	off
Where	park or backyard		home		trail		
When	2 pm		8 am		7 pm		
How long	10 min.		10 min.		10-15 min.		
Intensity	moderate		moderate		moderate		

Below is an example of a blank action plan that you can use with your clients.

	SUN	MON	TUES	WED	THURS	FRI	SAT
Activity							
Where							
When							
How long							
Intensity							

Educate Behaviour Change Techniques: Self-Monitoring

Having your client monitor their own progress is important for preparing them to independently manage their physical activity program. Encourage your clients to write down the activity they've done at the end of each day (or check off whether they followed their action plan if they've made one). Distribute these calendars to help your clients self-monitor.

For clients who prefer to record activities in detail:

	SUN	MON	TUES	WED	THURS	FRI	SAT
Activity							
Where							
When							
How long							
Intensity							

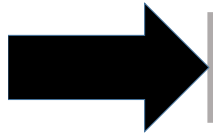
For clients who prefer a simple monitoring approach:

Please record the duration, intensity, and type of any physical activity that you did each day. Have fun!

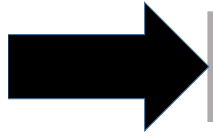
Goal

Educate Behaviour Change Techniques: Follow-up

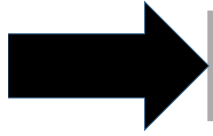
Following up and monitoring your clients can make your clients more accountable to their goal. It can be done in addition to self- monitoring and can be achieved in many ways:



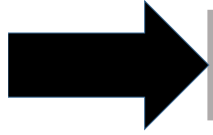
Monitor your client's progress in achieving their goals.
(see Goal Setting)



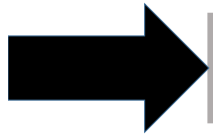
Monitor how well your client's action plan is working for them.
(see Planning)



Provide feedback and encouragement on clients' progress.



Provide suggestions to help clients overcome obstacles.
(see Problem Solving)



Follow-up with your client post-discharge—even a quick email or phone call can be meaningful.

Physical activity logs can be helpful to keep track of your client's progress. Here's a sample calendar for your client to record and share with you the days they were active:

Please record the duration, intensity, and type of any physical activity that you did each day. I will check on your progress at your next visit. Have fun!

Goal

Educate

Behaviour Change Techniques: Problem Solving

Identify your client's perceived barriers to participating in physical activity and accomplishing goals, and discuss potential solutions. Below are a few examples of common barriers and potential solutions you can recommend to your client:

No Time

- Make an action plan.
- Spend more time with family and friends by exercising with them.
- Use active transportation and count it as part of your exercise for the day (e.g., wheel to work).

Physical Barriers

- If pain is a barrier, exercise may actually be effective in reducing pain.
- Starting exercise can be difficult when you feel fatigued, but it's worth it in the end. Often you'll feel more energized after a workout.
- Be creative to maximize all abilities (see Adapting Common Exercise Equipment).

Lack of Support or Access

- Find an exercise partner.
- Connect with your community recreation centre or municipal recreation department to learn about options.
- Make good use of resources such as the Canadian Wheelchair Sport Association's Bridging the Gap Program, Active Living Alliance, and the Canadian Paralympic Committee portal (See Link to Facilities & Resources: Examples).
- In poor weather, try exercising with a video—for example, the *Active Homes* videos on the SCI Action Canada website.

"I Can't."

- Start with what you know and build your skills. Work what works, and focus on what you can do.
- Take a tour of a facility that offers an activity that interests you.
- If equipment is too expensive to purchase on your own, there may be community-based programs and facilities that have adapted equipment available for you to use (see Locate Local Resources: Tips and Tricks, and Finance & Transportation).

Educate Behaviour Change Techniques: Graded Tasks

➡ Set tasks and goals that are easily achievable, and then increase their difficulty.

➡ Why? Setting tasks and goals that are more achievable helps build your clients' confidence and increases their likelihood to maintain their exercise program.

➡ For some, meeting the guidelines may not be an appropriate first goal. For ideas on how to grade the types of activities your client can strive to do based on what goal is appropriate for them, see:

Tailored Prescription
Activity Idea Ladder

Pg 37



Educate

Behaviour Change Techniques: Prompts & Cues

Use environmental or social stimuli to help trigger a planned behaviour. Below are a few examples of useful prompts and cues you can recommend:

Behaviour	Prompt/Cue
Go for a wheel to break up the work day	Program reminders into phone
Go for a swim after work	Place goggles beside computer
Exercise first thing in the morning	Set gym clothes beside bed
Go for a wheel after getting ready in the morning	Put a sticky note on the bathroom mirror
Ensure you get daily exercise	Have someone text you to ask if you've exercised before the end of the day
Decrease long periods of time working at a desk without moving	Set timers on your phone or computer to remind you to move every hour or so
Meet the guidelines for exercise	Keep a calendar by your desk with the days you want to exercise circled
Go for a workout after lunch	Pack gym clothes under lunch bag
Go for a bike ride after reading	Put a sticky note reminder on a page a couple chapters ahead

Educate Behaviour Change Techniques: Commitment

Have your client sign a commitment contract or make a verbal promise to achieve their goals. (See Goal Setting for making SMART goals.)

Below is a blank commitment contract:

I am committed to achieving the following goal:

Name _____

Signature _____

Date _____

Educate

Behaviour Change Techniques: Reward

Rewards can be used to motivate your clients to engage in physical activity and reach their goals. These rewards may be helpful when a client is starting an exercise program, but remember that all clients should be encouraged to ultimately understand that the real payoffs for exercising are enjoyment, fun, satisfaction, and significant and long-lasting health benefits.

Examples of rewards:

If your client achieves a physical activity goal, you could suggest they reward themselves with:

- a hot bath
- a manicure
- relaxing and watching a favourite TV show
- verbal encouragement
- new exercise gear
- a dinner outing
- a healthy smoothie



Educate

Additional Materials: Important Information Hubs

There are many videos available online that feature physical activity for people with an SCI. Some offer inspiring exercise ideas, information on the SCI-specific benefits of exercise, and details on adaptive sports. Others provide information on related topics (e.g., social life, caregiving, and finances). These videos feature experts in the field and those with lived experience. Here are a few examples:

[Northwest Regional Spinal Cord Injury System: SCI Forum Videos]

http://sci.washington.edu/info/forums/reports/universal_fitness.asp#

[Facing Disability Videos]

<http://www.facingdisability.com/videos/>

[Active Homes: Home Strength Training Guide for People with SCI]

<http://sciactioncanada.ca/paraplegia-strength-training-videos>

<http://sciactioncanada.ca/tetraplegia-strength-training-videos>

[National Center on Health, Physical Activity and Disability Videos]

<http://www.nchpad.org/Videos>

[Spinal Cord Injury Research Evidence]

<https://scireproject.com>



Educate

Additional Materials: Seating

The Basics:

- Each individual has his or her own specific needs for seating depending on the level of lesion and lifestyle.
- Proper seating should follow the natural contours of the body, providing postural support and increased functionality as much as possible to enhance the overall quality of life.

Why Proper Seating is Important:

- Prevention of muscle imbalance and contracture from prolonged improper posture
- Proper redistribution of pressure
- Protection of skin integrity by minimizing unnecessary shear forces
- Provide comfort and reduce pain
- Help maintain eye contact, increase self-esteem and confidence

What You Can Do:

1) Ask Questions: Does comfort, stability, shearing, fatigue, or other issues related to your chair affect your day-to-day living?

2) Refer to a seating specialist: Have a proper assessment done by a qualified therapist or seating and mobility specialist.

3) Follow Up: Provide ongoing assessment and make adjustments or referrals as needed.

Want to learn more?

[Postural assessment and seating systems- Spinal Outreach Team]

https://www.health.qld.gov.au/_data/assets/pdf_file/0019/423433/seating.pdf

[Rehabilitation Engineering and Assistive Technology Society of North America- Expert Position Papers]

<http://www.resna.org/knowledge-center/position-papers-and-provision-guides>

Watch this video for tips for choosing the right wheelchair [NRSCIS Tips for Choosing the Right Wheelchair]:

http://sci.washington.edu/info/forums/reports/wheelchair_choosing.asp

Don't have an OT?

<https://www.find-an-ot.ca>

Link & Refer Overview & Checklist

To help your clients start and continue physical activity, link them to resources, or refer them to peers, programs and other professionals.

	1	Finance & Transportation	Remember that lack of transportation and finances are two of the most commonly cited barriers to participation in physical activity. Refer to other professionals and organizations to help remove these barriers.
	2	Tips and Tricks to Locate Local Resources and Facilities	Research and develop strategies to quickly locate local resources, programs and facilities suitable for your clients. Connect with the recreation sector for assistance with your clients' transition from the clinic into the community.
	3	Examples of Facilities and Resources	Learn about the key facilities to refer clients to in each province, and key resources that can be distributed to your clients.
	4	Peer-to-Peer Connections	Link your clients with other peers for invaluable insights gained from the lived experience.
	5	Other Professionals, Supports, and Organizations	Establish connections and networks with other professionals, supports, and organizations for a more comprehensive physical activity promotion strategy.
	Bonus	Discussion Community to Share Exercises and Resources	Share your research and knowledge of exercise programs, resources, and other information with your colleagues; learn from their knowledge.

Link & Refer Finance & Transportation

Two of the most common barriers to participating in physical activity are lack of access to transportation and finances. Finding strategies to overcome these barriers may require some internet research, a phone call or two, and perhaps making your client's family members, occupational therapist, or other health professionals aware of the barriers so they can play a role in finding solutions. As you work to set your client up for success, considering the following considerations and resources:

Transportation Considerations:

- accessible transportation services with assistance, taxis, parking
- accessible public transportation options (low-floor buses, accessible subway/train stops)
- parking permits
- personal vehicle adaptations

Organizations that may be able to provide or finance equipment to support to your clients:

- March of Dimes
- Bridging the Gap
- For kids: **[Easter Seals]** and **[Canadian Tire Jumpstart]**

Organizations or agencies that may be able to offer support and advice:

- provincial SCI organizations (e.g., SCI Ontario, SCI PEI, Canadian Paraplegic Association Manitoba, SCI BC) [See Examples of Facilities/Resources to Connect to Facilities]
- provincial ministries of transportation
- For a compilation of different funding agencies see **[Advanced Mobility Alternative Funding Agencies]**

For more advice on reducing costs for sports equipment see:

Tailored Prescription: Adapted Sports

Pg. 40

For lived experience advice and tips on navigating transportation and finance barriers see:

Link & Refer: Peer-to-Peer Connections

Pg. 31

For ideas on what your client can do at home when transportation is unavailable, see:

Tailored Prescription:

Everyday Active Pg. 38

Adapting Common Pg. 46

Exercise Equipment

Locate Local Facilities and Resources: Tips & Tricks

You can set your clients up with the best of intentions when they leave the clinic, but if there's nowhere to go to exercise, it's going to be difficult for them to act on their intentions. Here are two suggestions to help ensure your clients are connected with resources/facilities:



Find local accessible options

Familiarize yourself with the local accessible exercise options within the community and refer your clients to these options.

Conduct your own search

Search terms on Google can include:

- 1) [Your town or region]
- 2) [Accessible/inclusive/spinal cord injury/SCI/adapted/wheelchair]
- 3) [Sport/exercise/programs/physical activity/facility]



Establish connections with the recreation sector

If you want to take it one step further, connect with programs and facilities that offer adapted fitness opportunities. Seek their assistance on how to smooth your clients' transition from rehab to the community. For example, upon a client's discharge, contact a facility you've established a relationship with, and the facility can follow up with the client from that point on. Making this connection can make for a smoother transition, with the result being a win for you, your client, and the facility. However, be sure to give your clients a list of options so the choice is ultimately theirs.

Note that, if your client lives in a rural area, it may be difficult to locate accessible local resources. If this is the case, search for local programs and facilities available to the general public and make a quick phone call to see if they're wheelchair accessible and have programs or services geared toward meeting your client's needs.

If you're located in a larger city, these resources may be helpful:

[Canadian Wheelchair Sport Association Programs]: www.cwsa.ca/programs

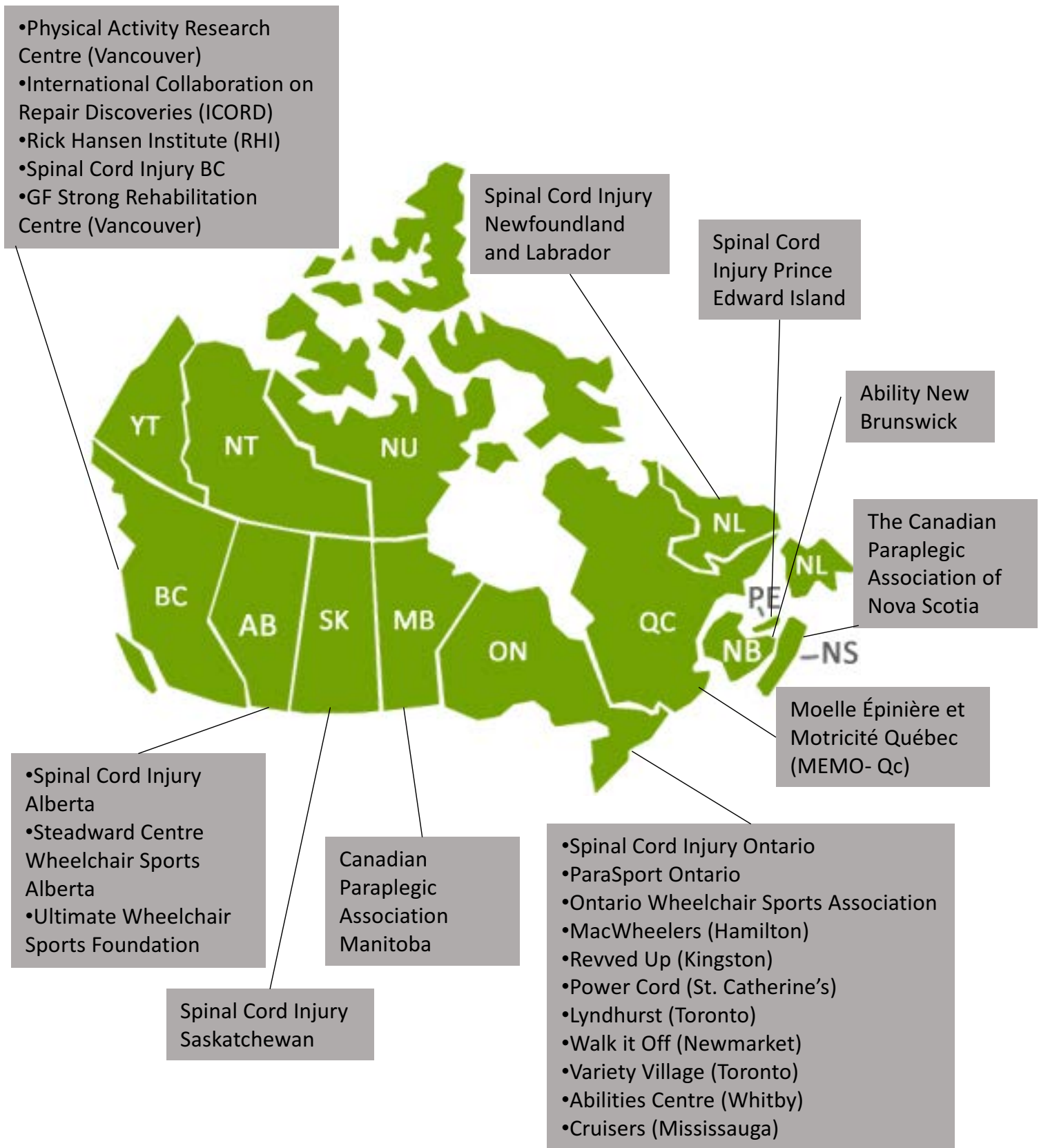
[Canadian Paralympic Committee Find a Club]: www.paralympic.ca

[Physical Activity, Active Living, and Sport Resource Catalogue for Canadians Living with Physical Disability]: www.cdpp.ca

[Bridging the Gap Canada Wheelchair Sports]: www.btgcanada.ca

Link & Refer

Link to Facilities and Resources: Examples



National

SCI Action Canada

Canadian Paralympic Committee

Bridging the Gap Canada

Canadian Wheelchair Sport Association

SCI Canada

Link & Refer

Link to Facilities and Resources: Examples

For a comprehensive and quick handout that includes information on safety, the basics of physical activity, adaptive activities, and tips on how to make a plan to include physical activity as a regular part of your client's life, download the [SCI Get Fit Toolkit]: www.sciactioncanada.ca



SCI GET FIT TOOLKIT 

A CANADIAN RESOURCE TO HELP ADULTS WITH SPINAL CORD INJURY MEET PHYSICAL ACTIVITY GUIDELINES

Experts recommend that all healthy adults with spinal cord injury set aside time to be physically active. This part of your day should be enjoyable, so choose activities that you like to do, and make it fun.

Try to incorporate both:

- 1 - AEROBIC ACTIVITY
- 2 - STRENGTHENING ACTIVITY

GUIDELINES AT A GLANCE

FOR IMPORTANT FITNESS BENEFITS, ADULTS WITH A SPINAL CORD INJURY SHOULD ENGAGE IN:

- At least 20 minutes of moderate- to vigorous-intensity AEROBIC activity 2 times per week, AND
- 3 sets of 8-10 repetitions of STRENGTHENING activity for each muscle group 2 times per week.

AIM FOR:

AEROBIC ACTIVITY
From Moderate to Vigorous.

Moderate means somewhat hard, and you feel like you could continue for a long time. You can talk, but not sing your favourite song, during the activity. Using a 0 to 10 scale, moderate-intensity physical activity is usually a 5 or 6.

Vigorous is really hard, and you feel like you can only continue for a short time before getting tired. You will not be able to say more than a few words without pausing for a breath. Using a 0 to 10 scale, vigorous-intensity physical activity is usually a 7 or 8.

STRENGTHENING ACTIVITY
You should feel quite challenged (without hurting yourself) by the end of the 3 sets. Take a 1-2 minute rest/break between each set. Work each muscle group on alternate days.

ACTIVITY IDEAS

Wheeling, arm cycling, sports, swimming

Free weights, elastic resistance bands, cable pulleys, weight machines

If you are newly injured, are pregnant, prone to autonomic dysreflexia, or have other medical conditions, you should talk to your health professional to find out what types and amount of physical activity are right for you. A health professional might include a doctor, a physiotherapist, or a qualified exercise professional.

For a more detailed look at the guidelines and how you can get started, go to www.sciactioncanada.ca



**DISCOVER
ACCESSIBLE
FITNESS**

A Wheelchair User's Guide for Using Fitness Equipment

For a comprehensive guide on safety, stability, adaptive equipment, accessibility, exercise precautions, and a full overview of the components of fitness including cardiovascular, strength and flexibility for wheelchair users, see the [National Center on Health, Physical Activity and Disability Discover Accessible Fitness] resource: <http://www.nchpad.org/discoverfitness/index.html>
You can also visit the NCHPAD website for nutrition information: [NCHPAD life on wheels].

Link & Refer

Peer-to-Peer Connections



Rob experienced a C5/C6 SCI as a result of a diving accident in 2011. Prior to his injury, Rob was the local tennis pro and owned his own tennis company. He taught wheelchair tennis before his injury, but had never instructed someone with quadriplegia and limited hand function. In rehab, Rob met Gary, an SCI Ontario peer mentor who had been using a wheelchair for eight years and regularly played wheelchair tennis. Gary invited Rob to play a game and showed Rob how he could tape his hand to his racquet. Today, Rob is a world class tennis athlete and shares his knowledge and experience with other people with SCI around the world who are interested in playing the game. This is just one example of how a simple peer-to-peer connection can result in the sharing of priceless firsthand experience and perhaps even be a turning point in a client's desire to live an active lifestyle.

Examples of Ways to Connect Peers

- 1) Getting a peer-to-peer interaction started could be as simple as asking your client the question, "Would you be interested in connecting with a peer?"
- 2) Encourage your client to talk to others with a disability or meet other peers through group exercise classes. This could open the door to excellent experiential knowledge about physical activity—insider tips about where to go, adaptive strategies, overcoming hurdles, and avoiding safety and health issues.
- 3) Accompany and introduce your client to coaches or members of a local adapted facility or program.
- 4) Invite a champion or mentor to engage with your client.

Note that the context and readiness of the client should be considered before inviting them to engage with a peer.

Peer Mentoring Programs

If you're unaware of any peers for your clients to connect with locally, these organizations offer peer mentoring programs, regular peer events and an extensive database that make it easier to find an ideal peer match:

[Facing Disability Peer Counselling]: www.facingdisability.com

[ConnecTra Society Peer Support]: <http://www.connectra.org>

Provincial SCI Organizations:

[Peer Support: SCI BC, Canadian Paraplegic Association Manitoba, SCI Ontario, Moelle Épinière et Motricité Québec, Ability New Brunswick, Canadian Paraplegic Association Nova Scotia, SCI Prince Edward Island, SCI Newfoundland and Labrador]

Link & Refer

Other Professionals, Supports and Organizations

Helping your client adopt a physically active lifestyle often requires a team, just as rehabilitation for your client post-injury requires a team (e.g., doctors, occupational therapists, respiratory therapists, etc.). Developing and maintaining a network of potential team members is a great first step. Your network can include other healthcare providers and support workers, other physiotherapists, and community organizations. Establishing these connections can be as simple as reaching out with a call, sending an introductory email, or connecting in person. Three key ways to engage with your network are to:

Advocate

Work with facilities and programs to create a better understanding of the needs of your client and others with mobility disabilities. For example, challenge recreation and exercise facilities to become more accessible, and lobby for programs to become more affordable.

Collaborate

Work with other healthcare providers, support workers, programs, and your client's family to improve care in the clinic, community, and the home. For example, reach out to your client's family and support network and work collectively to help achieve your client's goals, negotiate a coordinated process to move clients from the clinic to community-based programs, and relay knowledge of your client's progress, preferences, and goals to their occupational therapist or personal support worker, who can help your client continue and maintain an active lifestyle in the community and the home.

Learn






Seek advice from centres, physiotherapists, or other healthcare providers (e.g. recreation therapists) who have experience working with people with SCI. Ask if they're willing to share their resources.

Example of Members to Include in Your Network

Healthcare & Support Providers	Other Physiotherapists	Organizations
Rehab and personal support workers	Private neuro clinics	Physiotherapy schools
Kinesiologists, personal trainers	GF Strong	College of Kinesiologists
Family members/caregivers	Blusson Spinal Cord Centre	Recreation centres
Recreation therapists	Toronto Rehab (Lyndhurst)	College of Physiotherapists
Physiatrists	Hamilton Health Sciences Spine Unit	Canadian Physiotherapy Association

Tailored Prescription Overview and Checklist

Design exercise prescriptions tailored specifically for your client.

	1	The Interview	Ask the right questions to determine your client's motivation, goals, and preferences to lay the foundation for a tailored and effective physical activity program.
	2	Activity Idea Ladder	<p>Determine the level of activity that's right for your client. The activities below, which have increasing levels of commitment and organization, can be used as a guide to organize activity options based on your client's readiness.</p> <ol style="list-style-type: none">3. Adapted Sports: For your clients who are interested in competition and are willing to seek more organized forms of activity.2. Accessible Activities: Typically require greater commitment and organization than everyday active activities, but may not require commitment to a team or organization.1. Everyday Active: Flexible, easy, and a good starting point for new exercisers or even clients who are already active, but short on time to do their typical workout.
	3	Basic Physical Activity Prescription	Basic steps, tips, and resources to help you design a tailored physical activity prescription for your client.
	4	Sample Programs	Example programs for the athlete, recreational exerciser, and the non-exerciser.
	5	Adapting Common Exercise Equipment	A list of adapted equipment and ideas for modifying existing or mainstream equipment.

Tailored Prescription

The Interview: Worksheet

Initial Interview Session

Name:

Date:

1) Current physical activity levels/readiness for change:

2) Goals (how much physical activity and what are the benefits they'd like to gain):

3) Types of physical activity they currently enjoy doing:

4) Available resources (e.g., equipment, gym, recreation centres near them, funding):

5) Barriers to accomplishing their goal:

6) Mutually discuss short term goals and strategies (or see Pg. 16 for alternative goal setting and action planning formats):

	Option 1	Option 2	Option 3
Activity			
When			
Where			
How long			
How often			

Tailored Prescription

The Interview

Here are some sample questions to ask your client to help you move forward with a tailored physical activity plan:

1) Gauge your client's current physical activity levels and readiness for change

- Do you currently play a sport or have a history of sport participation?
- Have you been exercising regularly during the past six months?
- Would you like to begin exercising or continue exercising?

2) Identify your client's goals

- What sort of goals are you working towards in your home or your daily life?
- Is there anything that you have difficulty doing that you'd like to be able to do better or with greater independence?
- How much physical activity would you like to see yourself doing a week?

3) Learn what your client enjoys doing

- What sorts of activities have you done in the past, before and after your injury?
- What sorts of activities would you like to try right now?

4) Understand what resources your client has available to them

- Do you have any exercise equipment at home?
- Is there a gym that you know of that is accessible or is there a gym in your neighbourhood that we could inquire about their accessibility?
- Do you have anyone to help you exercise or help keep you on track?

5) Identify your client's barriers

- Can you think of anything that you could foresee getting in the way of your program?
- Are there any obstacles that have come up in the past that have prevented you from being physically active?

6) Develop a physical activity goal as a team

- What do you think is a reasonable goal for how much exercise you'll do in a week
- Based on what you told me, does __ x/week for about __ minutes each session seem like a reasonable goal?

Tailored Prescription

The Interview

Here are the detailed steps to tailoring your exercise prescription by getting an in-depth picture of your client's situation (refer to the worksheet and sample questions on Pg. 34):

1) Gauge your client's current physical activity levels and readiness for change

Ask your client how much physical activity they are currently doing (if any). Understand their stage of motivation (pre-intender, intender, actor)

- ❖ Actors: Clients who have started exercise or have been exercising for a long time
- ❖ Intenders: Clients who have not been exercising but would like to
- ❖ Pre-Intenders: Clients who have not been exercising and have no intention to do so. In this case, understand why they're not interested in being physically active. You may consider the following resources to address potential barriers to wanting to exercise:
 - Safety Pg. 8
 - Benefits Pg. 13
 - Finance and Transportation Pg. 27
 - Link to Facilities/Resources: Examples Pg. 29
 - Peer-to-Peer Connections Pg. 31
 - Activity Idea Ladder Pg. 37

2) If your client is an actor or intender, identify your client's goals.

Educate your client on the physical activity guidelines (Pg. 12) and identify:

- 1) How often and how much physical activity your client would like to do a week.
- 2) What sort of benefits they would like to see from being physically active (e.g. transferring independently, playing and being more involved with their kids) . Linking how exercise can help them accomplish everyday life goals may be more meaningful for some clients.

3) Learn what your client enjoys doing

Physical activity participation is more likely to be maintained when the activity is enjoyable. Trial and error may be necessary to find the activities, sports, and modalities that appeal to your client.

4) Understand what resources your client has available to them

Ask what equipment, facilities, and help they have available to facilitate their exercise. For example, whether there are appropriate gyms, park, tracks nearby, equipment at home, potential exercise buddies or exercise assistants available to them.

5) Identify your client's barriers

Identify whether they foresee any barriers to participating in physical activity such as transportation, confidence, access to facilities, pain, knowledge, etc.

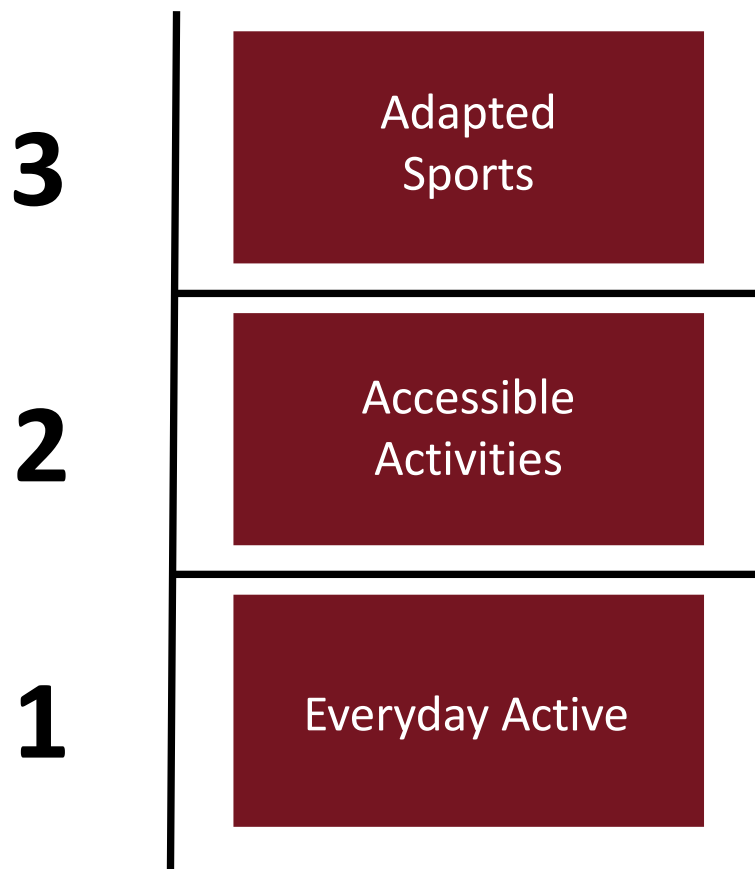
6) Develop an action plan as a team

Taking all the information gathered, decide upon an action plan together (Pg. 16). If appropriate, proceed to developing a tailored exercise prescription.

Tailored Prescription Activity Idea Ladder

Small Steps Approach:

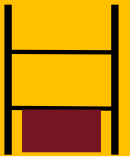
The different types of activities on this activity ladder require an increase in commitment and organization as you climb the ladder. Not all steps of the ladder need to be taken. The ladder is simply a guide to help organize activities based on your client's needs.



Ensure your client has been cleared for activities. If you're unsure, refer to the safety section, PAR-Q, ACSM guidelines, or contact your client's physician.

Tailored Prescription

Activity Idea Ladder: Everyday Active



These activities are meant to be flexible, easy, and a good starting point for new exercisers or even experienced exercisers who are short on time to do their typical workout routine. Many of these activities have the added benefit of being able to be done at home.

Walk or wheel to:

- school
- work
- run errands to:
 - grocery store
 - bank
 - convenience store
 - post office
 - pharmacy

Resistance band and range of motion exercises (can be done while watching TV, doing computer work, or reading):

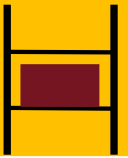
- ankle flexion/dorsiflexion
- squeeze object for grip
- bicep curls
- knee raises
- leg extension
- hip adduction/abduction
- lean forward and backward for core strength
- lean side to side for core strength (clients with low trunk activation can support themselves by holding the wheel opposite the direction leaning)

Everyday activities:

- standing
- calf raises at the sink while doing dishes
- taking the dog out for a walk or roll
- playing with your kids
- parking further away from your destination and walking or wheeling the rest of the way
- wheeling or walking at the mall, an indoor track, or an arena during bad weather
- holding walking or wheeling meetings

Tailored Prescription

Activity Idea Ladder: Accessible Activities



These activities are typically higher in intensity and may bring greater fitness and health benefits than everyday active activities, but may not require commitment to a team or organization.

Aerobic Activities:

- wheel for fun and endurance
- cycle using a handcycle or stationary bike
- arm ergometer (arm bike)
- swim (with assistance if needed)
- follow along with an exercise video
- play recreational sports
- standing frame exercises
- dance
- curling
- bocce

Strengthening Activities:

- resistance bands
- lift weights (clients without weights can use cans, bottles, or other household items)
- use cable pulleys
- body weight exercises
- Yoga, Pilates or Tai Chi

LOOKING FOR MORE STRENGTH-TRAINING IDEAS?

Check out the Active Homes resource manuals and instructional videos on the SCI Action Canada website. [Active Homes SCI Action Canada]: www.sciactioncanada.ca

Looking for something outside of the box? Try high intensity interval training.

If your client doesn't enjoy doing continuous exercise (e.g., cycling an arm ergometer at moderate intensity for 20 minutes), high intensity interval training (HIIT) may be an alternative. HIIT consists of periods of high intensity exercise, interspersed with periods of rest or low intensity.

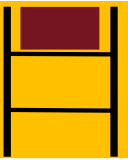
While more SCI-specific research is needed to test the benefits of this type of training, some clients report this type of activity can be engaging, help maintain adherence when pain or fatigue are barriers to exercise, and be completed in a shorter period of time. Some examples of HIIT protocols that have been studied in people with SCI include:

- 60 seconds of moderate to vigorous intensity, 90 seconds active rest, for 8 sets
- four minutes at vigorous intensity, three minutes active rest, with increases in sets as appropriate
- four minutes moderate intensity, one minute vigorous activity, with five sets

Tailor the number of sets and intensity based on the individual's level of fitness.

Tailored Prescription

Activity Idea Ladder: Adapted Sports



These activities are for your client who might be looking for competition and is willing to seek more organized forms of activity.

Can Be Low Cost

- table tennis
 - athletics*
 - swimming
 - basketball*
 - bocchia
 - curling
 - bowling
 - dance
 - golf*
 - boxing
 - martial arts
 - softball
 - tennis*
 - sitting volleyball
- *can require specialty chair

Typically Require Specialized Equipment

- fencing
- power lifting
- Nordic and alpine skiing
- waterskiing
- cycling
- sledge hockey
- sailing
- rugby (murderball)
- horseback riding
- rock climbing
- hiking
- canoeing
- surfing
- kayaking
- rowing

Getting your clients involved in sport:

Connect them with peers involved in sport, who can create enthusiasm and educate:

- See [Peer-to-Peer Connections]
- The [Canadian Wheelchair Sports Association] can personally link your client to wheelchair rugby or other sport programs across Canada: www.cwsa.ca

Research which local adapted sports are available in your area:

- See [Tips and Tricks for Locating Local Resources]
- [Bridging the Gap Canada's 'Have a Go Days'] are an opportunity to try wheelchair sport in a fun and supportive environment: www.btgcanada.ca
- Try the [Canadian Paralympic Committee Find a Club] function : www.paralympic.ca

Funding for equipment:

- [Bridging the Gap Canada Wheelchair Loans] can connect your client with provincial coordinators who can often subsidize rental fees for sport wheelchairs: www.btgcanada.ca
- [ParaSport Ontario Equipment Rental] can arrange various sport equipment rentals: www.parasportontario.ca
- [March of Dimes Assistive Devices Program] can help provide funding for equipment: www.marchofdimes.ca

Tailored Prescription

Basic Physical Activity Prescription

After conducting the interview and determining physical activities that are interesting and appropriate for your client, a physical activity prescription can be created. **Aim** to have your client at least meet the SCI physical activity guidelines (**fitness benefits: 2 x 20 minutes of moderate to vigorous physical activity/wk AND strength training 2x/wk, cardiometabolic health benefits: 3 x 30 minutes of moderate to vigorous physical activity/wk**). However, not every client will be ready to meet the guidelines. **Tailor** the exercise goal to your client to ensure it's attainable. There's no blanket strategy for designing an exercise prescription; your approach may be different for each client. See the following resources for more help:

Educate:
SMART Goal Setting

Educate:
Action Planning

Tailoring:
Sample Program

For a quick and easy way to build exercise programs online, see:

[PhysiotherapyExercises.com](https://www.physiotherapyexercises.com)

This website is continually updated and based on the best available evidence. With more than 1,000 strength and flexibility exercises, you can easily build a program appropriate for a client with SCI (or other disabilities). You can search for exercises by different categories including condition, exercise type, body part, equipment available, and age. Each exercise has an accompanying illustration, along with instructions, goals and precautions, all written in two formats—one appropriate for the client, the other for the physiotherapist.

For sample programs and free online fitness and nutrition training, see:

[NCHPAD.org](https://www.nchpad.org)

The National Center on Health, Physical Activity and Disability (NCHPAD) offers many resources for people with physical disabilities, including videos, weekly high intensity training programs [[NCHPAD Champion's Rx](#)], and 14 weeks of free online, individualized physical activity and nutrition coaching sessions [[NCHPAD 14 Weeks to a Healthier You](#)].

Tailored Prescription

Basic Physical Activity Prescription

12 Quick Tips & Tricks of the Trade

Equipment

1. If grip assistance gloves or straps are unavailable, use tensor bandages to provide grip assistance.
2. Consider which exercises require the use of grip assistance and group those exercises together to save time and avoid taking grip assistance gloves on and off.
3. Try to use as few transfers as possible (e.g., do all exercises that require transferring to a plinth together).
4. Wedge weights between the floor and the wheel to keep the wheelchair in place.
5. Use elastic resistance bands or straps around the legs to avoid excessive abduction while using equipment such as a recumbent bike, or around the chest to stabilize the core.
6. With resistance bands, exercise can be done anywhere. They are an inexpensive, easily transportable, and can be used at home, on the plane or bus, in the car, etc.

Exercise Prescription

1. Work what works. Don't get bogged down by functional limitations. Instead, focus on what your client can do, and progress from there.
2. This is your wheelhouse, so prescribe physical activity to extend beyond typical rehab exercises.
3. Safety comes first, but don't be afraid to challenge your client if they're ready and willing.
4. Be mindful of preventing overuse injuries to the upper body (e.g., shoulder, elbows, and wrists). Damage to joints and muscles in the upper body can severely limit a client's independence when it comes to transferring and wheeling.
5. Your client wheels throughout the day, working the push motion regularly. Incorporate postural exercises (e.g., scapular retractions) and emphasize pulling movements.
6. If your client has spasticity, focus on antagonist movements.
7. Circuit training (i.e. a series of resistance exercises interspersed with brief aerobic exercise) is an effective way to increase fitness for people with SCI.

Tailored Prescription

Sample Program: Athlete



Andrea became paraplegic after developing transverse myelitis, a neurological condition that affects the spinal cord, at the age of 12. Today, she's a world-class waterskier and enjoys being competitive with her partner in all aspects of their lives. She's been exercising for a long time and enjoys challenging herself, but she gets bored easily with her workouts and needs variety. Andrea lives in a city with an excellent adapted gym facility. Her goals are weight loss and general conditioning. Here's a sample of Andrea's typical workout that she does on one of her three days at the gym (sometimes in competition with her partner):

KINGSTON REVVED UP - WORK-OUT TRAINING					Day 1
St. Mary's of the Lake Hospital and Queen's Kinesiology Building					
Client's Name:	Andrea			Date	20-Jun
Duration of Training:	1 hour			Check	
WARM-UP: Aerobic- NuStep- 5-10 min					X
Exercises	Instructions	Equip.	Lbs	SxR	
Arm Ergometer	30s hard, 30s active rest, repeat 5 times	Arm Erg			
Int/ Ext Rotation		Pulley	10/7.5 lbs	3x10	
Single Arm Seated Row	Single arm, try to use core to stabilize, otherwise stabilize with opposite hand on wheel	Pulley	10lbs	3x10	
Med Ball Figure 8's		Med Ball	6lbs	3x10	
Vita Glide	5 minutes continuous	Arm Erg			
Lat Pull Down		Pulley	70lbs	3x10	
Cross Body Pull		Pulley	12.5 lbs	3x10	
Med Ball Overhead Rotations		Med Ball	8lbs	3x10	
Arm Ergometer	20 s hard, 10 s active rest, repeat 8 times	Arm Erg			
Shoulder Abduction		Free Weight	5lbs	3x10	
Knee Raise and Leg Extension	MAKE SURE SHE DOES THEM! :)	Ankle Weights	3lbs	3x10	
Ab Crunch		Pulley	37.5 lbs	3x10	
COOL-DOWN: Cardio- Wheelchair treadmill or arm ergometer, her choice					
Special Instructions					
Shaded exercises are to be done in circuit					

Tailored Prescription

Sample Program: Recreational Exerciser



Marney has a T5 complete spinal cord injury. She enjoys spending time with her dog, Dude, woodworking, and socializing. Her goal is to keep moving and maintain her independence so that she can do the activities that she enjoys. Marney likes to go to the gym, but prefers to have variety in her activities. Here's a sample of Marney's typical activity schedule for the week:

EXAMPLE ACTION PLAN:

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Activity	Walk the dog		Resistance training		Skills training with her dog		Spin class
Where	Trail		Gym		Park		Gym
When	9 am		2 pm		2 pm		10 am
How long	30 min.		30 min.		20 min.		30 min.
Intensity	Mild		Moderate		Mild		Moderate to Vigorous

Tailored Prescription

Sample Program: Non-Exerciser



Anyone who doesn't take part in any physical activity may have a number of barriers preventing them from exercising. If clients are willing to work with you to identify and address these barriers, you can structure a program that can accommodate their situation. For example, clients may tell you that they'd like to exercise but find it difficult to find transportation and get out of the home without assistance. Or they may not have much exercise experience and lack the ability to exercise for anything longer than a few minutes. Here's a sample program that can help begin to remove these barriers by prescribing easy-to-start exercises that can be done at home.

Exercise Prescription

Client Name: _____

Next Visit: _____

If watching TV, do three sets of:

- 10 bicep curls with a resistance band
- 10 knee raises
- 10 body weight lifts off the chair

Every Saturday morning, put on an exercise video and follow along. Start by doing 10 minutes of the video, and then adding a couple minutes each time.

Progress will be reviewed during the next visit.

Signature: _____

Rx

Tailored Prescription

Adapting Common Exercise Equipment

If traditional exercise equipment is not suitable or available, here are some alternatives:

Weights

- cans
- large/small bottles (add liquid for more weight)
- body weight
- resistance bands [e.g. www.treadmillfactory.ca 14 piece power pack]



Stretching Aids

- resistance band
- towel
- wall
- cane



Common Adapted Exercise Equipment

- grip aids
- tensors (for tensoring hand for grip assistance)
- wrist weights
- wheelchair push gloves
- medicine balls (if it has handles, can utilize tensors for grip assistance)
- pulleys/cables (can tensor in hand or use a grip aid)
- free weights (utilize tensor for grip assistance)



Specialty Equipment

- boxing gloves
- arm ergometer (arm bike)
- Vita Glide
- Nu Step
- rickshaw
- wheelchair treadmill
- functional electrical stimulation (FES)
- motorized recumbent bike
- seated elliptical
- body weight supported treadmill
- body weight supported treadmill
- Lite-gait
- passive range of motion equipment (e.g. Motomed)



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The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.	YES	NO
1) Has your doctor ever said that you have a heart condition <input type="checkbox"/> OR high blood pressure <input type="checkbox"/> ?	<input type="checkbox"/>	<input type="checkbox"/>
2) Do you feel pain in your chest at rest, during your daily activities of living, OR when you do physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
3) Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months? Please answer NO if your dizziness was associated with over-breathing (including during vigorous exercise).	<input type="checkbox"/>	<input type="checkbox"/>
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? PLEASE LIST CONDITION(S) HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
5) Are you currently taking prescribed medications for a chronic medical condition? PLEASE LIST CONDITION(S) AND MEDICATIONS HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
6) Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer NO if you had a problem in the past, but it <i>does not limit your current ability</i> to be physically active. PLEASE LIST CONDITION(S) HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
7) Has your doctor ever said that you should only do medically supervised physical activity?	<input type="checkbox"/>	<input type="checkbox"/>



If you answered NO to all of the questions above, you are cleared for physical activity.

Go to Page 4 to sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.

- Start becoming much more physically active – start slowly and build up gradually.
- Follow International Physical Activity Guidelines for your age (www.who.int/dietphysicalactivity/en/).
- You may take part in a health and fitness appraisal.
- If you are over the age of 45 yr and **NOT** accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.
- If you have any further questions, contact a qualified exercise professional.



If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.



Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at www.eparmedx.com before becoming more physically active.
- Your health changes - answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.



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FOLLOW-UP QUESTIONS ABOUT YOUR MEDICAL CONDITION(S)

1. Do you have Arthritis, Osteoporosis, or Back Problems?

If the above condition(s) is/are present, answer questions 1a-1c

If **NO** ☐ go to question 2

- 1a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 1b. Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)? YES ☐ NO ☐
- 1c. Have you had steroid injections or taken steroid tablets regularly for more than 3 months? YES ☐ NO ☐

2. Do you have Cancer of any kind?

If the above condition(s) is/are present, answer questions 2a-2b

If **NO** ☐ go to question 3

- 2a. Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and neck? YES ☐ NO ☐
- 2b. Are you currently receiving cancer therapy (such as chemotherapy or radiotherapy)? YES ☐ NO ☐

3. Do you have a Heart or Cardiovascular Condition? *This includes Coronary Artery Disease, Heart Failure, Diagnosed Abnormality of Heart Rhythm*

If the above condition(s) is/are present, answer questions 3a-3d

If **NO** ☐ go to question 4

- 3a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 3b. Do you have an irregular heart beat that requires medical management? (e.g., atrial fibrillation, premature ventricular contraction) YES ☐ NO ☐
- 3c. Do you have chronic heart failure? YES ☐ NO ☐
- 3d. Do you have diagnosed coronary artery (cardiovascular) disease and have not participated in regular physical activity in the last 2 months? YES ☐ NO ☐

4. Do you have High Blood Pressure?

If the above condition(s) is/are present, answer questions 4a-4b

If **NO** ☐ go to question 5

- 4a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 4b. Do you have a resting blood pressure equal to or greater than 160/90 mmHg with or without medication? (Answer **YES** if you do not know your resting blood pressure) YES ☐ NO ☐

5. Do you have any Metabolic Conditions? *This includes Type 1 Diabetes, Type 2 Diabetes, Pre-Diabetes*

If the above condition(s) is/are present, answer questions 5a-5e

If **NO** ☐ go to question 6

- 5a. Do you often have difficulty controlling your blood sugar levels with foods, medications, or other physician-prescribed therapies? YES ☐ NO ☐
- 5b. Do you often suffer from signs and symptoms of low blood sugar (hypoglycemia) following exercise and/or during activities of daily living? Signs of hypoglycemia may include shakiness, nervousness, unusual irritability, abnormal sweating, dizziness or light-headedness, mental confusion, difficulty speaking, weakness, or sleepiness. YES ☐ NO ☐
- 5c. Do you have any signs or symptoms of diabetes complications such as heart or vascular disease and/or complications affecting your eyes, kidneys, **OR** the sensation in your toes and feet? YES ☐ NO ☐
- 5d. Do you have other metabolic conditions (such as current pregnancy-related diabetes, chronic kidney disease, or liver problems)? YES ☐ NO ☐
- 5e. Are you planning to engage in what for you is unusually high (or vigorous) intensity exercise in the near future? YES ☐ NO ☐



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6. Do you have any Mental Health Problems or Learning Difficulties? *This includes Alzheimer's, Dementia, Depression, Anxiety Disorder, Eating Disorder, Psychotic Disorder, Intellectual Disability, Down Syndrome*

If the above condition(s) is/are present, answer questions 6a-6b

If **NO** ☐ go to question 7

6a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

6b. Do you **ALSO** have back problems affecting nerves or muscles? YES ☐ NO ☐

7. Do you have a Respiratory Disease? *This includes Chronic Obstructive Pulmonary Disease, Asthma, Pulmonary High Blood Pressure*

If the above condition(s) is/are present, answer questions 7a-7d

If **NO** ☐ go to question 8

7a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

7b. Has your doctor ever said your blood oxygen level is low at rest or during exercise and/or that you require supplemental oxygen therapy? YES ☐ NO ☐

7c. If asthmatic, do you currently have symptoms of chest tightness, wheezing, laboured breathing, consistent cough (more than 2 days/week), or have you used your rescue medication more than twice in the last week? YES ☐ NO ☐

7d. Has your doctor ever said you have high blood pressure in the blood vessels of your lungs? YES ☐ NO ☐

8. Do you have a Spinal Cord Injury? *This includes Tetraplegia and Paraplegia*

If the above condition(s) is/are present, answer questions 8a-8c

If **NO** ☐ go to question 9

8a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

8b. Do you commonly exhibit low resting blood pressure significant enough to cause dizziness, light-headedness, and/or fainting? YES ☐ NO ☐

8c. Has your physician indicated that you exhibit sudden bouts of high blood pressure (known as Autonomic Dysreflexia)? YES ☐ NO ☐

9. Have you had a Stroke? *This includes Transient Ischemic Attack (TIA) or Cerebrovascular Event*

If the above condition(s) is/are present, answer questions 9a-9c

If **NO** ☐ go to question 10

9a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

9b. Do you have any impairment in walking or mobility? YES ☐ NO ☐

9c. Have you experienced a stroke or impairment in nerves or muscles in the past 6 months? YES ☐ NO ☐

10. Do you have any other medical condition not listed above or do you have two or more medical conditions?

If you have other medical conditions, answer questions 10a-10c

If **NO** ☐ read the Page 4 recommendations

10a. Have you experienced a blackout, fainted, or lost consciousness as a result of a head injury within the last 12 months **OR** have you had a diagnosed concussion within the last 12 months? YES ☐ NO ☐

10b. Do you have a medical condition that is not listed (such as epilepsy, neurological conditions, kidney problems)? YES ☐ NO ☐

10c. Do you currently live with two or more medical conditions? YES ☐ NO ☐

**PLEASE LIST YOUR MEDICAL CONDITION(S)
AND ANY RELATED MEDICATIONS HERE:**

GO to Page 4 for recommendations about your current medical condition(s) and sign the PARTICIPANT DECLARATION.



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If you answered NO to all of the follow-up questions about your medical condition, you are ready to become more physically active - sign the PARTICIPANT DECLARATION below:



It is advised that you consult a qualified exercise professional to help you develop a safe and effective physical activity plan to meet your health needs.



You are encouraged to start slowly and build up gradually - 20 to 60 minutes of low to moderate intensity exercise, 3-5 days per week including aerobic and muscle strengthening exercises.



As you progress, you should aim to accumulate 150 minutes or more of moderate intensity physical activity per week.



If you are over the age of 45 yr and **NOT** accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.



If you answered YES to one or more of the follow-up questions about your medical condition:

You should seek further information before becoming more physically active or engaging in a fitness appraisal. You should complete the specially designed online screening and exercise recommendations program - the **ePARmed-X+** at www.eparmedx.com and/or visit a qualified exercise professional to work through the ePARmed-X+ and for further information.



Delay becoming more active if:



You have a temporary illness such as a cold or fever; it is best to wait until you feel better.



You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at www.eparmedx.com before becoming more physically active.



Your health changes - talk to your doctor or qualified exercise professional before continuing with any physical activity program.

- You are encouraged to photocopy the PAR-Q+. You must use the entire questionnaire and NO changes are permitted.
- The authors, the PAR-Q+ Collaboration, partner organizations, and their agents assume no liability for persons who undertake physical activity and/or make use of the PAR-Q+ or ePARmed-X+. If in doubt after completing the questionnaire, consult your doctor prior to physical activity.

PARTICIPANT DECLARATION

- All persons who have completed the PAR-Q+ please read and sign the declaration below.
- If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that a Trustee (such as my employer, community/fitness centre, health care provider, or other designate) may retain a copy of this form for their records. In these instances, the Trustee will be required to adhere to local, national, and international guidelines regarding the storage of personal health information ensuring that the Trustee maintains the privacy of the information and does not misuse or wrongfully disclose such information.

NAME _____

DATE _____

SIGNATURE _____

WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

For more information, please contact

www.eparmedx.com
Email: eparmedx@gmail.com

Citation for PAR-Q+

Warburton DER, Jamnik VK, Bredin SSD, and Gledhill N on behalf of the PAR-Q+ Collaboration.
The Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) and Electronic Physical Activity Readiness Medical Examination (ePARmed-X+). *Health & Fitness Journal of Canada* 4(2):3-23, 2011.

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The PAR-Q+ was created using the evidence-based AGREE process (1) by the PAR-Q+ Collaboration chaired by Dr. Darren E. R. Warburton with Dr. Norman Gledhill, Dr. Veronica Jamnik, and Dr. Donald C. McKenzie (2). Production of this document has been made possible through financial contributions from the Public Health Agency of Canada and the BC Ministry of Health Services. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada or the BC Ministry of Health Services.



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