Funding

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This resource is licenced under the Creative Commons license terms CC BY-NC-ND requiring attribution to the original authors, non-commercial use, and with no derivative work without the explicit written consent of the named authors or funders.
The Manual Wheelchair Skills Guide is a resource to guide clinicians and engage their clients (hereafter referred to as wheelers) in a graded approach to wheelchair skills acquisition. It is a quick reference for clinicians who have completed foundational training and have some experience teaching wheelchair skills. This guide is not meant to replace clinician demonstration of each skill, but rather supplement demonstration by acting as a reference before, during or in-between skill practice attempts.

For a more comprehensive approach to the theory and practical application of wheelchair skills development, please refer to the Wheelchair Skills Program by Dalhousie University and Manual Wheelchair Skills: Guidelines for Instructing (2013) by Ian Denison.

This guide combines visual and written information to describe the steps involved in learning beginner and intermediate skills for both the wheeler and the clinician, as well as a brief introduction to advanced skills.

This resource was designed to support the transfer of knowledge between clinician and wheeler, ultimately seeking to improve wheelchair users’ safety, efficiency and overall independence with manual wheelchair mobility.

Why these cards were developed

The average person has not experienced using a wheelchair in their daily life. Clinicians are often tasked with prescribing a wheelchair and teaching a person how to use it safely and efficiently. Unfortunately, in a fast-paced health care system, precisely which skills a wheeler is taught (and how well) is often dependent on clinician experience, time and available resources.

There are many excellent accessible resources and programs dedicated to teaching wheelchair skills. However, most are lengthy and written for clinicians. Useful information is rarely designed for quick reference or to be easily shared in practice. This resource aims to address that gap by serving as a quick reference tool while complementing existing literature more suited for in-depth learning.

Disclaimer

Using this resource without prior training, in an unsafe environment, or without necessary equipment (such as a spotter strap) can result in serious injury to wheeler, clinician, and/or helpers. Do not attempt these skills without clinical support.

It is the responsibility of the clinician to explain the risks associated with practicing wheelchair skills and to obtain wheeler consent prior to attempting any new wheelchair skills.
How to use this Guide

Key features

- **Two-sided cards:** The cards are meant to be used in a flip book style with wheeler and clinician sitting across from one another.

  - **Wheeler side:** wheeler cards feature larger fonts and images—as well as a numbering or naming structure (a)—to make it easier to follow along. In order to optimize learning and retention, each step features only the most important points (b). Emphasis in the form of arrows and other visual cues have been added to the photos to clarify actions where relevant (c).

  - **Clinician side:** Clinician cards provide additional details for each skill, while maintaining the same numbering or naming structure as on the wheelers’ side to make it easy to follow along (d). This side also highlights potential uses of each skill (e), key safety considerations (f), grading opportunities (g), and additional notes, where relevant.

- **Difficulty levels:** Cards are arranged by level of difficulty: basics (grey), beginner (blue), intermediate (yellow), advanced (purple), and emergency (red).
Parts of a Wheelchair

- Push handles
- Back cane
- Rigidizer bar
- Anti-tippers
- Armrest
- Rear wheel
- Tire
- Handrim
- Spoke
- Axle
- Wheel locks
- Wheelchair frame
- Footrest
- Caster wheel (see next page)
Caster Positions

Wheeling backward

Casters OUT
(Fork and caster are ahead of stem bolt)

Wheeling forward

Casters IN
(Fork and caster are behind stem bolt)
Spotter Strap

Introduction

Uses

When learning a skill, the spotter strap is used by the spotter to help reduce the danger of a rear tip or runaway wheelchair.

The spotter strap also reduces risk of injury by allowing spotter to use proper body mechanics.

Thread strap between rigidizer bar and backrest

Attach to axle bar

Rigid frame chair

Attach to cross brace

Folding frame chair
Why a clock?

Thinking about the wheel as a clock is helpful when talking about hand position on the handrim.

When wheeling, use hand positions between 11 and 2 o’clock.
**Stroke Patterns**

**ARC**  
(Arcing)  
- Small spaces  
- Most control  
- Slow speeds

**SEMI-CIRCLE**  
(Semicircular or SC)  
- Longer distances  
- Steady speeds

**SLOP**  
(Single Looping Over Propulsion)  
- Short distances on soft surfaces

**DLOP**  
(Double Looping Over Propulsion)  
- Longer distances  
- Faster speeds
Stroke Patterns

Observe
Observe before teaching; let wheeler choose own natural stroke pattern, then provide feedback to refine their technique, efficiency, and introduce alternatives.

Demonstrate
Demonstrate and have wheeler return demo each style.

Educate
- Discuss all four styles and when to use them.
- Listen for drag while wheeling (watch for fingers contacting handrims), which causes braking effect.
- No one “correct” style; each stroke pattern can be used for a different task, skill, or environment (e.g. bedside versus hallway). Each is a different “tool” in wheeler’s toolkit.
- Wheeling a wheelchair is not a form of exercise, just like walking from the kitchen to the bathroom is not “exercise”; it is mobility requiring the least amount of effort. Emphasize importance of efficiency and resting shoulders between strokes.
- Wheeler is not limited to these four stroke patterns if they find a method that is safe, efficient and comfortable.

Safety
- Protect hands – Point thumbs forward, not under handrim
- Monitor shoulder integrity
- Forward tip warning – Caution not to load front casters during DLOP style

Grading
Switch: Move between different styles.
Grip: Improve friction by grasping tires and handrim (to initiate start), or by using gloves, plastic-coated handrims, or an alternative commercial product on handrims (e.g. surgical tubing). Wheelers without active hand function can apply a modified technique by using their palms to grip the handrims with their wrists extended (palm-based wheeling gloves recommended).
Reduce strokes: Practice taking fewer strokes between point A and B. Count strokes out loud or give stroke allowance between two points. May need to build endurance.

Wheeler-side preview

ARC
SEMI-CIRCLE
SLOP
DLOP

Push
Recovery
# Stroke Pattern: ARC

<table>
<thead>
<tr>
<th>11 o'clock</th>
<th>2 o'clock</th>
<th>Recovery</th>
<th>Reset</th>
</tr>
</thead>
</table>

## Key points
- Small spaces
- Most control
- Slow speeds

---

**Basics**
Stroke Patterns: ARC (Arcing)

**Potential uses:** Small spaces, most control (e.g. ramps), slow speeds (e.g. crowded areas)

**Push phase (from 11 to 2 o'clock)**
Initiate stroke far back on the wheel [11 o'clock] to maximize the “push” phase. Release handrim [2 o'clock].

**Recovery phase**
Recovery occurs along the handrim, keeping hands close or in contact with the handrim.

**Reset**
Grasp wheels again at 11 o'clock (start of push phase) and the repeat pattern.

**Notes**
- Wheeler moves hands back and forth along the top portion of the handrim (between 11 and 2 o'clock).
- Most common pattern initially adopted by new wheelchair users.
- May cause repetitive strain to shoulders if used over longer distances.

Wheeler-side preview
Stroke Pattern: Semi-Circle

Key points
- Long distances
- Steady speeds
- Push-rest pattern
Stroke Patterns: Semi-Circle

Potential uses: Long distances (e.g. hallways), steady speeds

<table>
<thead>
<tr>
<th>Push phase (from 11 to 2 o’clock)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiate stroke far back on the wheel [11 o’clock] to maximize the “push” phase. Release handrim [2 o’clock].</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recovery phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery occurs below the handrim. Emphasize rest by letting go of handrim [2 o’clock] and dropping hands down and back.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasp wheels again at 11 o’clock (start of push phase) and then repeat pattern.</td>
</tr>
</tbody>
</table>

Notes

- Protect shoulders by “resting” between each push; encourage coasting between each push.
- Goal is to preserve shoulder integrity and reduce repetitive strain over long distances.

Wheeler-side preview
Stroke Pattern: SLOP

11 o’clock  2 o’clock  Recovery  Reset

Key points
• Short distances on soft surfaces

Push  Recovery
Stroke Patterns: SLOP (Single Looping Over Propulsion)

**Potential uses:** Short distances on soft surfaces

**Push phase (from 11 to 2 o’clock)**
Initiate stroke far back on the wheel [11 o’clock] to maximize the “push” phase. Release handrim [2 o’clock].

**Recovery phase**
After release, bring hands up and back over the handrim. Recovery occurs above the handrim.

**Reset**
Grasp wheels again at 11 o’clock (start of push phase) and then repeat pattern.

**Notes**
- Requires better coordination.
- Not efficient; hard on shoulders over longer distances.

Wheeler-side preview
Stroke Pattern: DLOP

Key points
• Long distances
• Fast speeds
Stroke Patterns: DLOP (Double Looping Over Propulsion)

Potential uses: Long distances and fast speeds

Push phase (from 11 to 2 o’clock)

Recovery phase
Following wrist flick, allow arms to drop-down and use natural pendulum swing of arms to swing up, back and below handrim, in a figure eight motion.

Reset
Grasp wheels again at 11 o’clock (start of push phase) and then repeat pattern.

Notes
- Lean forward when pushing forward to develop a body momentum. Pushing down hard and flicking wrists when letting go helps push trunk back into sitting.
- Requires good coordination.

Wheeler-side preview
# Wheeling Forward

<table>
<thead>
<tr>
<th>01</th>
<th>02</th>
<th>03</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Push</strong></td>
<td><strong>Release</strong></td>
<td><strong>Stop</strong></td>
</tr>
<tr>
<td>Hands in starting position on handrims at 11 o’clock</td>
<td>Release hands at 2 o’clock</td>
<td>Gently grip handrim at 1 o’clock</td>
</tr>
<tr>
<td>Push hands forward evenly</td>
<td>Return hands to starting position (based on chosen stroke pattern)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Push-release (short distances)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Push-release-coast (longer distances)</td>
<td></td>
</tr>
</tbody>
</table>
Wheeling Forward

Potential uses: Wheeling short or long distances

Starting position
Place hands on handrims just behind axle (at 11 o’clock). Starting is easier if casters are IN (see page 5) and wheeler leans forward.

01 Push
Use equal strength to push hands evenly. If not already, cue wheeler to lean forward slightly.

Can provide feedback by counting strokes out loud (e.g. 1 Mississippi, 2 Mississippi...) to reinforce average rate of one stroke per second.

02 Release
Let go of handrims at 2 o’clock, relax shoulders, and return hands to starting position.

Repeat
Short distances = Push, release
Long distances = Push, release, coast

Goals
Wheel with your head up, scan environment, plan route, watch spacing in hallways, and control speed.

03 Stop
Apply pressure on handrim at 1 o’clock.

Safety
- Head up
- Forward tip warning – Avoid sudden braking
- Rear tip warning – Avoid quick accelerating pushes
- Obey traffic rules (stay to the right)

Grading

Short distances: Use ARC stroke pattern to maintain better control of wheelchair. Review Stroke Patterns once wheeler has demonstrated basic forward wheeling and stopping.

Long distances: Push with long semi-circle strokes and coast in between strokes to utilize forward momentum.

Stopping: Start slow and gradual and progress to quick and sudden stops. Practice at different speeds with varying pressure.

Control stop: Control the speed of slowing by gripping the handrim with varying tightness at 1 o’clock. Stop at designated obstacles without contacting them.

Flooring: Progress from smooth, level indoor surfaces to uneven, outdoor surfaces.
Wheeling Backward

01  Get ready
    Grasp handrim at 1 o’clock

02  Shoulder check
    Scan for obstacles in both directions

03  Pull rear wheels back evenly
    Use short strokes
    Repeat

04  Stop
    Lean forward and brake gently to stop
Wheeling Backward

Potential uses: Setting up for a transfer, backing out of an elevator

01 Get ready
Grasp handrim at 1 o’clock.

02 Shoulder check
Scan for obstacles in both directions. Look around frequently and go slowly to avoid obstacles and collisions.

03 Pull rear wheels back evenly
- Use short strokes – making it easier to coast backward evenly without deviating to one side.
- Recommend using ARC or SLOP stroke pattern.
- Lean slightly forward to guard against rear tip.
- If backing up immediately after moving forward, educate about how the casters swivel from casters IN to casters OUT (see page 5).

04 Stop
- Lean forward and brake gently to stop.
- Keep hands on handrim at 1 o’clock to brake.
- Lean forward and avoid gripping too hard or suddenly to avoid rear tip.
- Cue wheeler to stop as close as possible to object without contacting it.

⚠ Safety
- Shoulder check
- Rear tip warning
- Avoid sudden braking

⚠️ Grading
Steer backward: Push backward on right rear wheel to direct wheelchair left and vice versa.

Notes
- For wheelers with limited grip or triceps strength, the following modified techniques can be used.
- Hook arms behind push handles and push down on the back of rear wheels at 11 o’clock; uses biceps vs triceps.
- Straighten arms and shrug shoulders, leaning back to use body weight to push down on the rear wheels at 11 o’clock to move backward.
- Place hands under handrim and use wrist extension/biceps to pull back on the handrim using top of hand, or palms up.
Turning on the Spot

Side you are turning to
Pull wheel backward

Other side
Push wheel forward

Hands move at the same time in opposite directions

Key points
Practice turning in both directions

For wider turns:
Hold the wheel still on the side you are turning to and push the other wheel forward

Repeat as needed
Turning on the Spot

Potential uses: Setting-up transfers, turning around in tight spaces (e.g. bathroom stall), turning around to greet someone

<table>
<thead>
<tr>
<th>Set-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician standing in front of wheeler; or have wheeler position in centre of a circle painted or taped on floor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tight turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand position: One hand on handrim at 1 o’clock and other backward on handrim at 11 o’clock.</td>
</tr>
<tr>
<td>Instructions: Push one wheel forward while pulling the other wheel backward. Hands move at the same time in opposite directions. Repeat, as needed, until wheeler has turned all the way around.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wider turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold one wheel still while pushing the opposite handrim forward.</td>
</tr>
</tbody>
</table>

Safety

- Protect hands – Ensure digits do not get caught between wheel and handrim.

Grading

Vary speed: Start with slow turns and increase to faster turns.

Reduce cycles: Start with 3 to 4 cycles to turn 180°; decrease cycles.

Reduce space: Turn in place in a larger area (e.g. open hallway) and progress to smaller spaces (e.g. elevator).

Snap turn: Place one hand as far forward on the handrim as possible, and the other hand as far back as possible on the opposite handrim. In a single, uninterrupted motion, sharply turn the wheelchair while letting the handrims slide through fingers until wheelchair reaches desired position.

Notes

- Side wheeler pulls back on is the direction they will turn. During turn, make sure wheeler keeps hands close to handrims for control.
- Practice turning in both directions. Observe if wheeler finds it easier to turn one direction than the other. Note the impact of uneven arm strength.
Approach
Approach the turn with medium speed

Time the turn
Axle of the rear wheel should line up midline or past the object you are turning around

Turn
Slow down the inside wheel (sharper turn) or speed up the outside wheel (gradual turn)
Turning while Wheeling Forward

Potential uses: Turning into an elevator or around corners

Set-up
Place an object on floor (e.g. pylon) for wheeler to turn around; or turn around a corner in a hallway

01 Approach
Approach the turn with medium speed. It is helpful to coast when approaching the turn to keep hands in a ready position.

02 Time the turn
- Observe the wheeler turn first with no instruction, then provide feedback about timing of turn (example: too early/late)
- Axle of the rear wheel should line up midline or past the object you are turning around
- If wheeler is turning too early (before axle lines up with pylon) they risk collision. Turning too late causes a wide turn.

03 Turn
- Slow down the inside wheel (sharper turn), or speed up the outside wheel (gradual turn).
- Practice applying varying pressure to inside handrim; the greater pressure, the tighter the turn.
- Tight turns work at faster speeds.
- Gradual turns are easier to do at slower speeds

⚠️ Safety
- Loss of control – Caution slowing inside wheel at fast speed

⏰ Grading
Obstacles: Set-up chairs or pylons in a zigzag pattern for wheeler to practice turning.

Spacing: Start with pylons spaced wide apart, and progress to more closely spaced pylons.

Floor surface: Start on even, smooth ground and progress to rougher environments with more roll resistance (e.g. carpet).

Momentum turn (see picture to the right): Coast forward and swing both arms outstretched to the right, causing wheelchair to the turn to the left and vice versa.
Turning while Wheeling Backward

01 - Backing up
Approach
Shoulder check to scan for obstacles in both directions
Pull back evenly
Go slow

02 - Turn
Inside wheel
Use to steer

Outside wheel
Use to keep moving

03 - Stop
Brake
Lean forward and brake gently
Turning while Wheeling Backward

Potential uses: Backing out of tight spaces such as an elevator or alongside a bed

<table>
<thead>
<tr>
<th>01</th>
<th>Backing up</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Shoulder check to scan for obstacles in both directions.</td>
<td></td>
</tr>
<tr>
<td>• Pull back evenly.</td>
<td></td>
</tr>
<tr>
<td>• Go slow.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>02</th>
<th>Turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>As wheeler is backing up:</td>
<td></td>
</tr>
<tr>
<td>• The inside wheel is used to steer the wheelchair (by slowing).</td>
<td></td>
</tr>
<tr>
<td>• The outside wheel keeps moving with stronger strokes backward (pulling from 2 o'clock to 11 o'clock).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>03</th>
<th>Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lean forward and brake gently to stop.</td>
<td></td>
</tr>
</tbody>
</table>

⚠ Safety
- Shoulder check

🔍 Grading

Right angle turns: Practice turning backward at a right angle (e.g. out of an elevator).

Zigzags: Practice turning backward zigzagging through chairs or pylons.

Spacing: Decrease space between pylons or chairs.

Soft surface: Compare turning backward versus forward on a softer surface (e.g. carpet).

Notes
- Skill should be done while wheeling at slow speed.
- Practice skill on even ground with minimal rolling resistance (e.g. flat, hard flooring).
- Focus on technique for use in small spaces.
## Drag Turns

<table>
<thead>
<tr>
<th>01</th>
<th>Approach</th>
<th>Wheel at medium speed next to wall (close enough to touch it)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Drag</td>
<td>Drag outstretched arm against the wall behind the rear wheel</td>
</tr>
<tr>
<td>03</td>
<td>Apply pressure</td>
<td>Once the rear wheel axle is at or past the corner, press against wall to start the turn</td>
</tr>
<tr>
<td>04</td>
<td>Stop</td>
<td>Keep opposite hand close to handrim to stop quickly, if needed</td>
</tr>
</tbody>
</table>
Drag Turns

Potential uses: Turning in a hallway, faster and easier turns

Set-up / Demo
Skill requires an empty hallway, and hallway corner. Best taught by demonstrating correct and incorrect drag turn techniques.

01 Approach
Wheel at medium speed next to wall (close enough to touch it). Skill requires momentum.

02 Drag
Drag outstretched arm against the wall behind rear wheel at shoulder height. Observe spacing between wheeler and wall, just under an arms length away.

03 Apply pressure
Once axle of rear wheel is at or past corner, press against the wall to initiate the turn.

04 Stop
Keep opposite hand close to handrim to stop quickly, if needed.

Safety
- Loss of balance
- Monitor shoulder integrity
- Collision risk – Watch around corners

Grading
Speed: Need momentum to complete this turn. Start slow to refine timing and technique, then increase speed.

Practice stopping: Set-up obstacles around corner of drag turn to practice stopping or slowing.

Note
- Observe timing of drag turns: Watch wheeler’s hand placement on the wall relative to axle; they should apply pressure to initiate turn when rear wheel axle is at the corner. Dragging too early will cause turning into the wall; dragging too late will cause a wide gradual turn or lost contact with the wall.

Wheeler-side preview
Push off Turns

**Approach**
Wheel at medium speed next to wall (close enough to touch it)

**Push off**
Place outstretched hand in front of your rear wheel to push off and turn away from wall

**Stop**
Keep hands close to handrim to stop quickly, if needed

**Key point**
The more pressure applied, the sharper the turn
Push off Turns

**Potential uses:** Turning in a hallway, faster and easier turns

---

**Set-up / Demo**

Skill requires an empty hallway, and hallway corner.

**01 Approach**

Wheel at medium speed next to wall (close enough to touch it). Skill requires momentum.

**02 Push off**

Place outstretched hand in front of rear wheel to push off and turn away from the wall. The more pressure applied, the sharper the turn.

**05 Stop**

Keep opposite hand close to handrim to stop quickly, if needed.

---

**Safety**

- Loss of balance
- Monitor shoulder integrity
- Collision risk – Watch around corners

---

**Grading**

**Speed:** Need momentum to complete this turn. Start slow to refine timing and technique, then increase speed.

**Adjust pressure:** Challenge wheeler to “push-off” turn to a desired angle by adjusting their applied pressure. Set-up pylons as targets to refine technique.

**Practice stopping:** Set-up obstacles in the path of the push off turn and practice stopping or slowing.
Wheeling up Ramps

**Approach**
Wheel toward ramp with speed and momentum

**On ramp**
Lean forward
Use short strong strokes (ARC stroke pattern)
Keep forward momentum

**Stay centred**
Keep wheelchair in the middle of ramp

To stop or rest, turn sideways
Wheeling up Ramps

Potential uses: Threshold ramps, curb cuts, ramps, and negotiating outdoor inclined obstacles

01 Approach
Wheel toward ramp with speed and momentum. Use the area in front of ramp to build speed and momentum.

02 On ramp
- **Lean forward:** Taking weight off back wheels and applying more force to the handrims to prevent rear tip.
- **Use short strong strokes:** Recommend ARC stroke pattern to keep hands close to handrim and avoid rolling backward.
- **Keep Forward momentum:** Slowing or stopping will make it harder to get going again.

03 Stay centred
Keep wheelchair in middle of ramp. Avoid edges and drop-offs at the sides of inclines to prevent tipping wheelchair.

To stop or rest, turn sideways
If tired, grip one handrim to turn sideways (perpendicular to ramp) to rest. Gripping both handrims may cause backward tip.

Safety
- Spotter required – Behind wheeler
- Forward tip warning – Watch transitions between floor and ramp
- Rear tip warning – Wheeling on ramp
- Move bags – From back canes to lap
- Check – Anti-tipper and footrest heights

Grading

**Backward:** Have wheeler ascend backward using foot/feet (if able).

**Zigzag:** Diagonal moves up a ramp decrease slope, but add distance.

**Handrails:** Use to pull up ramp with two hands, or use one rail and one wheel.

**Increase slope:** As degree of slope increases, lean farther forward and use faster recovery strokes.
Wheeling down Ramps

LEAN BACK
To prevent forward tip

CONTROL SPEED
Slide handrims through hands at 1 o’clock

Stay in the middle of the ramp

To stop or rest, turn sideways
Wheeling down Ramps

Potential uses: Ramps, curb cuts, and outdoor inclined terrain

Safety
- Spotter required – Behind wheeler with one hand in front of shoulder
- Collision risk - Keep head up
- Checks – Anti-tipper and footrest heights
- Forward tip warning – Watch transitions between floor and ramp
- Protect hands – Use gloves

Grading

Zigzag: Diagonal moves down a ramp decrease slope, but add distance.

Handrails: Slow descent using two handrails, or one handrail and one wheel.

Increase slope: As slope increases, lean farther back and maintain grip on handrims to slow descent.

Lean back
Keeping weight over rear wheels and preventing forward tip.

Control speed
Slide handrims through hands at 1 o’clock. Speed of descent is controlled by how tightly wheeler grips and brakes the handrim.

Stay in the middle of the ramp

To stop or rest, turn sideways
Grab one handrim to stop perpendicular to slope.
Wheeling on Side Slopes

**LEAN**
Uphill and backward

**UPPER HAND**
Only push a little

**LOWER HAND**
Short strong strokes

**KEEP AWAY**
From the downhill edge

Lean forward at end to exit slope
Wheeling on Side Slopes

Potential uses: Curb cuts, sidewalks, and driveways

Set-up
Skill requires a side slope obstacle, or sloped sidewalk.

Lean uphill and backward
To take weight off casters and prevent wheelchair from rolling down incline.

Lower hand
Provides short, strong strokes.

Upper hand
Only pushes a little.

Keep away from the downhill edge
To avoid veering off slope.

Lean forward at end to exit slope
Use downward pull to help turn off slope.

Safety

- Spotter required – On wheeler’s downhill side
- Tipping hazard – Lean uphill

Grading

Switch directions: Practice both directions. Observe if wheeler finds it easier to wheel in one direction vs. the other. Note the impact of uneven arm strength.
Shuffling Sideways

**Setup**
Both hands at 11 o’clock to begin
Keep hands on handrim
Sequence should be fluid

**Push outside wheel**
Push outside wheel forward to point diagonally toward the desired direction

**Push inside wheel**
Push inside wheel forward to square the wheelchair
At the same time, opposite hand pulls slightly back to maintain position in space (pivot)

**Pull outside wheel**
Pull outside wheel backward
At the same time, opposite hand pushes slightly forward to maintain position in space (pivot)

**Pull inside wheel**
Pull inside wheel backward
Repeat series of back and forth manoeuvres as needed
Faster speed results in a tighter shuffle
Shuffling Sideways

Potential uses: Shuffling closer to transfer surface, getting in between parked cars

01 Setup/Demo
Create a narrow space, have wheeler face object (bed or wall) to maneuver laterally. Demo skill for wheeler; maneuver laterally in small area. Teach awareness of wheelchair footprint and length.

Wheeler starts with both hands positioned at 11 o’clock to begin. Recommend keeping hands in contact with handrim for entire sequence.

Sequence
Skill requires a series of back and forth maneuvers. Move hands one at a time, while keeping both of them in contact with the handrim throughout the sequence. Complete the following sequence.

02 Push outside wheel
03 Push inside wheel
04 Pull outside wheel
05 Pull inside wheel

Safety
- Head up
- Collision risk
- Watch for traffic

Grading
Space: Start with lots of forward-backward room and gradually decrease area.

Speed: Start at lower speed to focus on accuracy and progress to faster speed and fluidity of movement.

Side hop: For wheelers with good upper body strength and when minimal space is available—shift weight towards the direction of hop, while pulling up on the rear wheels. Place hands at top centre of rear wheel (12 o’clock) or put wheel locks on. Start hopping up and down, then add lateral movement.

Rock side-to-side: For wheelers with good trunk balance – Shift weight back and forth laterally to get wheelchair to move sideways.

Notes
- Requires good coordination as sequence should be fluid.
- Analogy: Picture drawing circles with your casters.
- Completing sequence at a faster speed results in a tighter shuffle.
Picking an Object off the Floor

Set-up
Position rear wheel or caster as close as possible to object
Lengthen footprint (put casters out—see images at right)
Remove armrest if needed
Wheel locks on

Reach
For stability, hold opposite armrest, back cane, or rear wheel
Lean and reach with pickup hand

Return
Pull on opposite armrest, back cane or rear wheel to return upright
Picking an Object off the Floor

Potential uses:
Picking up an object from floor, reaching item off low shelf

01 Set-up

- Position rear wheel or caster as close to the object as possible.
- Lengthen the wheelchair footprint (casters OUT – see page 5). This can be quickly achieved by wheeling backward.
- If needed, remove armrest on the same side as object to increase room to bend sideways to reach floor.
- Wheel locks on.

02 Reach

- For stability, hold opposite armrest, back cane or rear wheel.
- Lean and reach with pickup hand.
- For more stability, hook opposite arm on back cane, armrest or rear wheel.

03 Return

- Pull on opposite armrest, back cane or rear wheel to return upright.

⚠ Safety

- Forward tip warning
- Monitor body mechanics

🔄 Grading

Use aides: Try with and without long handled reacher.

Weight and size of object: Vary size, shape, and weight of object.

Reach: Increase or decrease height, distance, and position of object.

Picking item up in motion: Press object against rear wheel as wheeler wheels by to roll the object up to lap.

Notes

- Teach wheeler how to swivel casters by making a series of forward/back or right/left turns on handrim. For an exercise, have wheeler practice moving caster wheel around a coin on the floor.
- For stability, wheelers with limited hand function can hook an arm on the opposite back cane. May need to adjust back cane height.
Popping Casters

**Approach**
If already moving forward, coast briefly
If stationary, place hands at 11 o'clock

**Pop**
Short quick push forward on handrims (from 11 o'clock)
Lean back at same time

**Land**
Let go to land

**Key point**
Focus on control, timing, and soft landing
Popping Casters

Potential uses: Lifting caster wheels off the ground on command. Prerequisite skill for getting over obstacle, up curbs, and stationary wheelie.

01 Approach
- If already moving forward, coast briefly. Prepare wheeler to place hands at 11 o’clock.
- If stationary, place hands at 11 o’clock.

02 Pop
- Short, quick push forward. The quick push needs to be faster than rear wheel speed, making this more difficult to do at faster speeds.
- Lean back at the same time, as able, to take weight off the casters.

03 Land
- Let go to land. Emphasize a soft and controlled landing by, letting the handrim go but still maintaining contact to slow the decent.

Safety
- Maintain line of sight – Keep head up
- Spotter required – Behind wheeler with one hand in front of shoulder
- Check – Anti-tipper height. Shorten or remove anti-tippers, as needed. Remember to replace anti-tippers.

Grading

Variation: Practice low pop/high pop, quick pop/long pop. This variation depends on the amount and/or time applied to the handrim during the “pop.” For higher pop, use more forward force on handrims. For longer pop, keep hands on handrims as long as possible (11 o’clock – 2 o’clock).

Timing: Pop casters over a line on the floor to learn how to time pop at a designated spot. This can be practiced from a stop or in motion.

Add motion: Start from stationary, then progress to popping casters while moving.

Speed: Start slowly, then progressively speed up.

Weight shift pop (at higher speeds): Practice pushing and popping casters without touching handrims by shifting centre of gravity to lift and lighten casters (regardless of speed). While in motion, swing arms back; or quickly extend trunk against seat back.
Wheeling over Obstacles

**Approach**
From a stop or brief coast, prepare to pop casters 2-4 inches before the obstacle.

**Pop casters**
Using enough force to clear obstacle, pop casters and lean back.
For higher obstacles, use more forward force for a higher pop.
For wider obstacles, keep hands on handrims as long as possible for more hangtime.

**Land casters**
Using forward momentum, land casters on other side of obstacle.

**Push forward**
Lean forward while pushing rear wheels over obstacle.

**Sit up**
When over obstacle, sit up and continue wheeling.

**Key point**
Sequence should be fluid.
Wheeling over Obstacles

Potential uses: Doorway thresholds, uneven sidewalk/patios, gaps at elevator doors

Safety
- Spotter required – Behind wheeler with one hand in front of shoulder
- Collision risk - Keep head up
- Forward tip warning – May occur if casters hit the obstacle or drop in gap
- Rear tip warning – Careful not to over pop casters in step 2
- Check – Anti-tipper height

Grading
Plan route: Avoid obstacle if alternative route is available.

Timing: Pop casters over a line on the floor while moving to learn position of casters and proper timing.

Break down into smaller skills: Before practicing sequence, work on popping casters over obstacle, or wheeling rear wheels over obstacle in isolation.

Speed: Start with stationary approach then gradually increase speed. High speed is not necessary when proper technique used.

Height and width: Increase the vertical and horizontal distances that the casters need to clear. However, only pop casters as high as required by obstacle.
- For higher obstacles, use more forward force on handrims for a higher pop.
- For wider obstacles, keep hands on handrims as long as possible (11 o’clock – 2 o’clock) for more hangtime.

Note
- Entire sequence should be fluid.
Wheeling over Soft Surfaces

Plan the easiest route

LEAN BACK
Take weight off casters

KEEP FORWARD MOMENTUM

LONG, SLOW STROKES
SLOP wheeling style

To make it easier, pop casters repeatedly or go backward
Wheeling over Soft Surfaces

**Potential uses:** Wheeling on carpet, grass, gravel, snow, or sand

---

**Plan your route**
Minimize difficulty negotiating soft terrain by choosing path of least resistance.

**Lean back**
Take weight off casters to prevent immersing them into soft surface.

**Keep forward momentum**
Starting from a stop on a soft surface is much more difficult once you’ve lost momentum.

**Use long, slow strokes**
Start hands at 11 o’clock to maximize length of each stroke. Recommend using SLOP stroke pattern.

**To make it easier**
Pop casters repeatedly while moving forward to minimize how much casters sink into surface.

---

**Safety**
- Check – Anti-tipper height
- Monitor shoulder integrity

**Grading**

**Go backward:** Lead with larger rear wheels if unable to complete skill in forward direction.

**Surface:** Pop casters on firm surface and progress to soft surfaces.
# Using Doorways that Swing Out

<table>
<thead>
<tr>
<th>Step</th>
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<tbody>
<tr>
<td>Approach</td>
<td>Open door</td>
<td>Apply force</td>
<td>Pass through</td>
<td>Close door</td>
</tr>
<tr>
<td>Position wheelchair in front of door, facing door</td>
<td>Push door open with one hand</td>
<td>Continue applying force with same hand or footrest to keep door open</td>
<td>Two options:</td>
<td>Two options:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. Use swimming method: Lean forward, grab door frame and side of the door, then pull with both hands</td>
<td>a. Turn around, push door closed with hands or footrest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Push handrim on the opposite side of the door</td>
<td>b. Swing door behind you</td>
</tr>
</tbody>
</table>
Using Doorways that Swing Out

Potential uses:
Opening, passing through, and closing doors and gates

01 Approach
Position wheelchair in front of door, facing door.

02 Open door
- Push door open with one hand.
- May brace other hand on wall or handrim to prevent wheelchair from moving.

03 Apply force
Continue applying force with same hand or footrest to keep door open.

04 Pass through
Two options:
   a. Swimming method: Lean forward, grab door frame and side of the door, then pull with both hands.
   b. Push handrim on the opposite side of the door.

05 Close door
Two options:
   a. Turn around, push door closed with hands or footrest.
   b. Swing door behind you.

Safety
- Protect feet – Avoid injury to feet if using footrests to open a door. Angle wheelchair towards door so that edge of footrest is contacting door instead of foot.
- Protect hands – Caution through door frames. Never place fingers between the door and the door frame.

Grading
Add threshold: Navigate low to high thresholds while maneuvering through doorways.

Weight of door: Start with doors that are not self closing. Self-closing doors are typically heavier.
Using Doorways that Swing In

Approach
Position wheelchair at side of door nearest doorknob, facing door

Open door
Pull the door open

Prop
Use hand or footrest to prop door open once it swings past

Pass through
Two options:
- a. Push handrim on the opposite side of the door
- b. Use swimming method: Lean forward, grab either side of door frame, then pull with both hands

Close door
Two options:
- a. Turn around and pull door
- b. Reach behind to close door while passing through
Using Doorways that Swing In

Potential uses:
Opening, passing through, and closing doors and gates

01 Approach
Face the door. Position wheelchair at side of door nearest doorknob to allow room for door to swing open and past the wheelchair.

02 Open door
Pull the door open. May brace other hand on wall or handrim to prevent wheelchair from moving.

03 Prop
Use hand or footrest to prop the door open once it swings past.

04 Pass through
Two options:
  a. Push handrim on the opposite side as the door and propel wheelchair through doorway.
  b. Use swimming method: Once door swings past wheelchair and is propped open, lean forward. Grab either side of door frame, then pull with both hands to move through doorway.

05 Close door
Two options:
  a. Turn around and pull door closed.
  b. Reach behind to close door while passing through.

⚠️ Safety
- Protect hands – Caution through door frames. Never place fingers between the door and the door frame.

⏰ Grading

Adaptive equipment: Attach a string or rope to the handle to make closing door easier by extending reach.

Add threshold: Navigate low to high thresholds while maneuvering through doorways.

Weight of door: Start with doors that are not self closing. Self-closing doors are typically heavier.
Avoiding Collisions

Quick turn

GRAB HANDRIM
Firmly on turn side to move out of the way

LEAN
Towards turn

Quick stop

To let object/person pass:
- Grab handrims firmly
- Lean back
Avoiding Collisions

Potential uses: Persons walking out in front of wheeler, dodging crowds, and moving out of the way of obstacles

Set-up
While the wheeler is wheeling forward down a hallway, introduce an unpredictable obstacle (e.g. rolling ball, walking person, pushing empty wheelchair). Introduce object perpendicular to the path of the wheeler.

Quick turn – to move out of the way
- Lean in direction of turn.
- Grab handrim firmly on turn side to move out of the way.

Quick stop – to let the object/person pass
- Grab handrims firmly at 1 o’clock to stop.
- Lean back to avoid falling forward.

Safety
- Head up – Watch for foot and vehicular traffic
- Collision risk

Grading
Angle: Change angle of object approach.
Speed: Increase wheeling speed.
Reaction time: Introduce obstacle with less time to react, slow versus sudden stops.
Bumping up a Curb with Help

**Set-up**
- Face curb
- Starting roughly 4” away from curb, helper tips/tilts wheelchair back to raise casters onto curb
- Helper pushes wheelchair forward until rear wheels touch the curb

**Roll up**
- Wheeler leans forward
- Helper pushes wheelchair up and onto curb
- Wheeler helps if able

**Sit up**
- Wheeler sits upright on top of the curb

**Key point**
Look for a more accessible option first (curb cut)
Bumping up a Curb with Help

Potential uses: Street Curbs, high doorway thresholds

01 Set-up
- Approach forward, wheeler facing curb.
- Be aware of surroundings (if on street, or in parking lot).
- Starting approximately 4" away from curb, helper tips/tilts wheelchair back to raise casters onto curb.
- Helper pushes wheelchair forward until rear wheels touch the curb, ensuring rear wheels contact curb at the same time.

02 Roll up
- Wheeler leans forward.
- Helper uses push handles to roll wheelchair forward, up, and onto curb.
- Observe helper’s body mechanics and ensure they are bending knees and rolling, not lifting, wheelchair up onto curb.
- Wheeler may help, if able, by pushing handrims forward while helper pushes up and forward, at the same time.

03 Sit up
Wheeler sits upright on top of the curb.

Safety
- Rear tip warning – Caution when helper tilts wheelchair back to raise casters (Step 1)
- Forward tip warning – Caution while helper pushes wheelchair up onto curb (Step 2)
- Check – Footrest and anti-tipper interference
- Impact warning
- Monitor body mechanics

Grading
Curb cut: Look for accessible option first.
Threshold ramps: If helper struggles with bumping up/down, explore threshold ramps (temporary and permanent).
Height: Start with low curbs and progress to higher curbs.

Bump up with minimal assistance: Wheeler pops casters and pushes rear wheels forward over curb while helper provides minimal assist to roll wheels up curb using push handles.

Go backward: If wheeler is unable to lean forward or assist on handrims, go backward up curb – wheeler facing away from curb. (See Bumping Up Stairs, with help on page 60).
Bumping down a Curb with Help

**For lower curbs ≤2”**

Approach edge facing forward
Wheeler leans back
Helper lowers casters and rear wheels evenly off edge
Wheeler helps with descent on handrims, as able

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**01 Set-up**
Go backward
Helper stands on lower level
Wheeler leans forward

**02 Roll down**
Helper guides rear and caster wheels straight back off curb evenly
Watch footrests for clearance

**03 Sit up**
Wheeler sits upright once all four wheels are off curb
Bumping down a Curb with Help

Potential uses: Curbs, high doorway thresholds

01 Set-up
- Go backward.
- Helper stands on lower level, staying close to wheelchair.
- Wheeler leans forward.
- Be aware of surroundings (if on street, or in parking lot, potentially backing up into traffic).

02 Roll down
- Holding the push handles, helper guides rear and casters wheels straight back off the curb, slowly and evenly. Wheeler leans forward the entire time.
- Watch for footrest clearance – Helper and wheeler may maintain wheelie until footrests have cleared curb.
- Alternatively, instead of rolling caster wheels straight back off curb, helper may turn wheelchair sideways to turn each caster wheel off curb, once the rear wheels have made contact with lower level.

03 Sit up
Wheeler may sit up once all four wheels are in contact with lower level.

Low curbs (≤2”)
- Face forward, towards the curb.
- Slowly bring wheelchair to curb edge.
- Helper lowers casters and rear wheels evenly off edge.
- Wheeler assists with control of descent through handrims.

Safety
- Rear tip warning – high curbs, going backward
- Forward tip warning – low curbs, going forward
- Check – Footrest and anti-tipper interference
- Impact warning
- Shoulder check – When going backward
- Monitor body mechanics

Grading
Curb cut: Look for accessible option first.

Threshold ramps: If helper struggles with bumping up/down, explore threshold ramps (temporary and permanent).

Height: Start with low curbs (≤2”) and progress to higher curbs.
Bumping up/down Stairs: 3 helpers

2 BOTTOM HELPERS
Face stairs on either side of wheelchair
Hold inside hand on part of wheelchair frame and outside hand on the handrim

TOP HELPER
Behind wheeler on upper step with staggered stance, holding push handles

Bumping up

Set-up
Assign top helper as leader/counter and back up wheelchair to the first step.

“On three”
Top helper controls degree of tip/tilt and guides wheelchair using push handles to roll up to next step.
Bottom helpers push frame and handrim forward at the same time (starting at wheel lock) to roll (not lift) wheelchair up each step.

Wheel up step by step
Wheel back step by step until at top of stairs and its safe to lower casters. Replace anti-tippers.

Bumping down

• Same as bumping up but reverse actions
• Assign bottom helper as leader/counter
• Wheelchair faces forwards, looking down stairs
• Replace anti-tippers

Remove or flip up anti-tippers
Bumping up/down Stairs: 3 Helpers

Potential uses: Indoor/outdoor stairs where ramp is not available

Intermediate Skill

Set-up
- Remove or flip-up anti-tippers. If removing, may place anti-tippers in wheelers lap to help remember to replace once at top of stairs.
- Assign roles (Top helper, 2 bottom helpers).
- Top helper is the leader/counter.
- Each helper takes position:
  - Top Helper: behind wheeler on upper stair with staggered stance, holding onto push handles.
  - Bottom Helpers: Face stairs on either side of wheelchair. Hold inside hand on part of wheelchair frame and outside hand on the handrim.
- Back up wheelchair to the first step.
- When ready, leader counts out loud 1, 2, 3... On three, each helper completes their role. Each new step requires a new count.

“On three”

Top helper
- Controls degree of rear tip/tilt of wheelchair and guides wheelchair through push handles to roll up to the next step.
- Bends knees so that power to roll wheelchair up and back each step should come from legs, not back/arms.
- Readjusts staggered stance after each step.

2 Bottom helpers
- Bend knees to roll (not lift) wheelchair up onto each step. Start with hands on handrim at wheel lock. Push handrim forward to roll up each step.
- Steady wheelchair on each stair, while top helper readjusts stance. Readjusts own stance after each step.

Wheel up step by step
- Wheel back step by step until at the top of the stairs and its safe to lower casters. Top helper may roll wheelchair back (in wheelie position) until casters clear the stairs.

Bumping down
- Same as bumping up but reverse actions.
- Bottom helper becomes leader/counter.
- Wheelchair faces forward, looking down the stairs.
- Replace anti-tippers at bottom.

Grading

Plan ahead: Set-up environment prior to navigating stairs (unlock and open door, and make sure wheelchair will fit through doorway).

Rests: Stop on steps as much as needed. Bottom helpers need to provide forward force on stairs to avoid slipping out while resting.
Getting up Curbs

01 Set-up
Check anti-tipper height
Have a spotter in place

02 Approach
Coast with speed up to curb

03 Pop
Pop casters and land on top of curb

04 Roll up
Use momentum, lean forward and push rear wheels up curb

05 Sit up
Sit up and brake gently to stop momentum
Getting up Curbs

Potential uses: Accessing sidewalks from streets, when curb cut is not available

01 Set-up
Check anti-tipper height (and remove if need). Have a spotter in place.

02 Approach
- Approach straight-on, with momentum. Rear wheels must contact curb at same time.
- Higher curbs require more momentum, but wheelchair must be coasting when approaching curb to time pop and roll up onto curb.
- Make sure there is adequate space (straightaway leading up to curb) for wheeler to get up to speed.

03 Pop
- Pop casters (2-4” before curb) and land them on top of the curb.

04 Roll up
- Use continued momentum to then lean forward and push rear wheels to roll up onto curb.
- The “Pop” and “roll up” are two separate steps but should be done as a continuous, fluid sequence.

05 Sit up
Once on top of curb, sit up and brake gently to stop forward momentum.

Safety
- Check – Tire pressure should be fully inflated, anti-tipper height
- Rear tip warning
- Spotter required – Behind wheeler

Grading

Practice the pop: Practice popping casters on and off the curb while stationary, then add momentum. Practice timing to get casters up first at speed and add lean to roll rear wheels up.

Curb height: Start with low curbs (≤2”) and continue to increase height to higher curbs. Higher heights require more momentum.

Weight shift pop (on low height curbs only): Acceleration is difficult at higher speeds therefore wheeler must learn to pop casters using weight shifts when attempting at high speed. While in motion, shift centre of gravity to pop casters. Continue to wheel and lean forward to roll up onto curb.
## Getting down Curbs

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Set-up</strong></td>
<td>Shoulder check and go backward, rear wheels first</td>
</tr>
<tr>
<td><strong>Lean forward</strong></td>
<td>Aim to have chest against thighs the entire time. Square to the curb, find the edge with rear wheels</td>
</tr>
<tr>
<td><strong>Roll down</strong></td>
<td>Pull back straight, slow, and evenly on handrims to control rear wheel drop off curb</td>
</tr>
<tr>
<td><strong>Pause</strong></td>
<td>Stop gently when rear wheels are down, casters still up on curb</td>
</tr>
<tr>
<td><strong>Turn off edge</strong></td>
<td>Turn casters off curb one at a time (pivot). Do not sit up until both casters have landed</td>
</tr>
</tbody>
</table>
Getting down Curbs

Potential uses: To access street when curb cut is not available e.g. In the middle of a city block

01 Set-up
Shoulder check and go backward, rear wheels first.

02 Lean forward
- Lean far forward, aiming to have chest against thighs (as able) the entire time.
- Square to the curb, find the edge with rear wheels. Practice getting feel of both wheels teetering at the edge.
- Leaning far forward increases stability and safety; sitting up early could cause rear tip as casters are above rear wheels.

03 Roll down
Pull back straight, slow, and evenly on handrims (while still leaning forward) to control rear wheel drop off curb.

04 Pause
- Stop gently when rear wheels are down, casters still up on curb.
- Wheeler can continue to slightly roll back to facilitate a slow stop, still while keeping casters up.
- Stopping wheelchair slowly and gently before casters roll off the curb is important for safety. Stopping too suddenly after drop might cause rear tip.

05 Turn off edge
Turn wheelchair to take casters off curb one at a time (pivot). Do not sit up until both casters have landed.

Safety
- Rear tip warning – Don’t sit up until casters are off the curb
- Spotter required – Behind wheeler
- Shoulder check
- Check – Anti-tipper height
- Impact warning

Grading
Curb height: Start small (2") and advance skill by increasing height of curb up to 6”.

Notes
- Face forward (Low curbs only ≤2"): Getting down curb can be done in the forward direction (facing curb). Facing forward, lean slightly back and wheel straight forward off curb; this allows wheeler to watch for traffic.
- Straight backward: In the event there is no room to turn off the curb (as described in step 5), wheeler may continue straight back but must keep wheels moving while leaning forward. Avoid sitting up too soon before casters hit ground and causing rear tip.
Holding a Wheelie

01 Set-up
Remove anti-tippers
Have spotter
Ensure spotter strap is secured

02 Communicate
Wait until spotter says “Ready” before every attempt

03 Getting into wheelie
Hands starting at 11 o’clock, lean back and firmly push forward

04 Holding wheelie
Rock rear wheels back and forth to find balance point (hands between 12 and 1 o’clock)

05 Landing
Pull back on rear wheels and lean forward to return upright

If falling back, pull back
If falling forward, push forward
Holding a Wheelie

Potential uses: Precursor to using wheelie to roll on soft surfaces, downhill, or over low obstacles

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**Advanced Skill**

Master before attempting further wheelie skills

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**01 Set-up**

- Remove anti-tippers (discuss joint responsibility and importance of remembering to replace anti-tippers once finished practicing skill).
- Secure spotter strap to wheelchair axle bar or cross brace (see “Spotter Strap” on page 8). Test spotter strap.

**02 Communicate**

- Disclose risk of rear tip and explain spotting technique. Shape expectations by explaining the skill typically requires several sessions to learn.
- Say “Ready” when spotter is in position.
- Tell wheeler when spotter is helping vs. solo attempt.
- Goal is to hold balance point for 30 seconds.

**03 Getting into Wheelie**

Lean back and firm push forward (hands at 11 o’clock) to pop up into wheelie. Describe it as a sustained caster pop. Little effort required if wheelchair set-up ideal.

**04 Holding Wheelie**

- Find balance point: Tip wheeler past balance point, then move into balance so wheeler can feel the difference.
- Maintain Balance point.
  - Proactive Balance: Rock rear wheels back and forth (hands between 12 and 1 o’clock).
- Relaxed hand is key; watch for tight grip.
- If possible, leaning forward can help maintain balance.
- May be helpful to count the amount of time wheeler is holding the wheelie without assistance out loud, or silently time the skill, to provide feedback.

**05 Landing**

- Pull back gently and lean forward to return upright.
- Land casters softly.
- Replace anti-tippers and remove spotter strap.

---

**Safety**

- Rear tip warning
- Spotter required

**Grading**

- Celebrate small wins: Early on, assist wheeler to land before they fall to increase confidence.
- Break it down: Work on each phase separately (not necessarily in order).
- Grade floor resistance: Blocking in front and behind rear wheels, (deflated tires will make easier to start); Soft surface (carpet, gym mat); Hard flooring surface (tile, sidewalk).
Bumping up/down Stairs: 2 Helpers

Caution: Authors always recommend 3 helpers on stairs; any less is a risk accepted by wheeler and assigned helpers.

TOP HELPER
Behind wheeler on upper step with staggered stance, holding push handles.

BOTTOM HELPER
Faces stairs, hands hold both sides of front wheelchair frame.

Bumping up

Set-up
Assign top helper as leader/counter and back up wheelchair to the first step.

“On three”
Top helper controls degree of tip/tilt and guides wheelchair using push handles to roll up to next step.
Bottom helper guides (not lifts) wheelchair as it is rolled up and onto the next step.
Wheeler pulls handrims back (starting at 3 o’clock) to assist rolling wheelchair up to the next step.

Wheel up step by step
Wheel back step by step until at top of stairs and its safe to lower casters. Replace anti-tippers.

Bumping down

• Same as bumping up but reverse actions
• Assign bottom helper as leader/counter
• Wheelchair faces forwards, looking down stairs
Bumping up/down Stairs: 2 Helpers

Potential uses: Indoor/outdoor stairs where ramp is not available

NOTE: AUTHORS ALWAYS RECOMMEND 3 HELPERS ON STAIRS; HOWEVER RECOGNIZE THERE ARE SOME EMERGENCY SITUATIONS WHERE 3 PERSONS MAY NOT BE AVAILABLE. ANY LESS THAN 3 PERSONS IS A RISK ACCEPTED BY WHEELER AND ASSIGNED HELPERS

Set-up

- Remove or flip up anti-tippers. If removing, may place anti-tippers in wheelers lap to help remember to replace once at top of stairs.
- Assign roles (top helper, bottom helper).
- Top helper is the leader/counter.
- Each helper takes position:
  - Top Helper: behind wheeler on upper stair with staggered stance, holding onto push handles.
  - Bottom Helper: Faces stairs, hands hold both sides of front wheelchair frame.
  - Wheeler: Ready to assist on handrims. Start position 3 o’clock. Wheeler will use arc wheeling style to maintain contact with handrim.
- Back up wheelchair to the first step.
- When ready, leader counts out loud 1, 2, 3... On three, each helper completes their role. Each new step requires a new count.

“On Three”

Top helper

- Controls degree of rear tip/tilt of wheelchair and guides wheelchair through push handles to roll up to the next step.
- Bends knees so that power to roll wheelchair up and back each step should come from legs, not back/arms.
- Readjusts staggered stance after each step.

Bottom helper

- Bends knees to guide (not lift) wheelchair up onto each step.
- Steadies wheelchair on each step by applying forward force, while top helper readjusts stance. Readjusts own stance after each step.

Wheeler – pulls back on handrims (from 3 o’clock to 12 o’clock) to assist rolling wheelchair up and onto each next step.

Wheel up step by step

Wheel back step by step until at the top of the stairs and its safe to lower casters. Top helper may roll wheelchair back (in wheelie position) until casters clear the stairs and can lower them onto ground. Replace anti-tippers.

Bumping down

- Same as bumping up but reverse actions.
- Bottom helper becomes leader/counter.
- Wheelchair faces forward, looking down the stairs.
- Replace anti-tippers at bottom.

Safety

- Monitor body mechanics – Helpers should bend knees, keep back straight, and guide (not lift) wheelchair up each step
- Avoid holding removable parts (e.g. swing away footrests)
- Home access – Bumping should only be a temporary solution
- Limit stairs – Bumping more than four stairs is not recommended

Grading

Plan ahead: Set-up environment prior to navigating stairs (unlock and open door, and make sure wheelchair will fit through doorway).

Rests: Stop on steps as much as needed. Bottom helper needs to provide forward force on stairs to avoid slipping out while resting.
Falling Backward

Rear tips are preventable but do happen. If you find yourself falling backward, here are some key tips to minimize injury:

Option A: Tuck
- Tuck head by putting chin to chest
- Hold handrims to stop wheelchair from rolling

Option B: Grab
- Put one hand on rear wheel/handrim
- Put opposite hand across lap to grab seat or armrest to prevent knees from hitting face
Falling Backward (rear tip)

Instruction for practicing simulated falls is not recommended as part of this guide. However, these pointers could minimize injury to the wheeler should they find themselves falling backwards into a rear tip and unable to prevent a fall.

Prevention

Through practicing the skills within this document, educate wheelers to scenarios where a rear tip may occur to guard against and prevent rear tips from happening.

Recommend assist

If the wheeler does not graduate to be independent at performing a skill without a spotter, recommendations for assistance should be made (eg. Requires standby assist or contact assist going up ramps).

Rescue

If the wheeler is falling back, they may pull back on the handrims to return the wheelchair upright. When possible try to right the centre of gravity by returning the wheelchair upright. This can be practiced while learning the “Holding a wheelie” skill.

Floor transfers

If a wheeler finds themselves on the ground, please assess for injury and refer to your site’s protocols and policies for getting a wheeler up off the ground. As part of the Rehab setting, floor transfers may be taught but are beyond the scope of this resource.

Minimize injury

In the event the rear tip cannot be rescued, the following pointers could help to minimize injury:

- Tuck head by flexing head forward, chin to chest. This will protect the wheeler’s head and the allow wheelchair push handles to take the impact of the fall.

  Option A: Wheeler holds onto both handrims to prevent wheelchair from rolling away; OR

  Option B: Wheeler places one hand on rear wheel/ handrim and opposite hand across lap to grab seat or armrest to prevent knees hitting face (more preferred option, but more difficult to do).
Glossary of Terms

Centre of Gravity
The balance point of the wheelchair. It is the position where the majority of the mass of the wheeler is concentrated, typically in line with the wheeler’s shoulders and rear wheel axle. Can be adjusted based on how far forward or backward the axle is set on the manual wheelchair. If the axle is more forward, the wheelchair will be more responsive but less stable. If the axle is further back, the wheelchair will be less responsive but more stable.

Coasting
Using the momentum of the wheelchair to continue rolling forward without applying force to the hand rim.

Curb Cut
An accessibility ramp that allows wheelers to go from the street to/from sidewalk without needing to navigate a curb.

Forward Tip
Undesired action where wheeler falls forward, out of wheelchair. This is often caused by a sudden stop of forward momentum. It also occurs when too much weight is transferred to the front of the wheelchair, resulting in a loss of balance.

Rear Tip
Undesired action where wheeler falls backward in their wheelchair. This occurs when more weight is placed onto the rear wheels of the wheelchair and the caster wheels come off the ground without maintaining balance point.

Spotter
While practicing wheelchair skills, wheelers should be accompanied by a spotter—a person who remains in a constant ready position using a spotter strap to catch the wheeler in order to prevent loss of balance, loss of control on inclines, and/or falls.

Threshold
Vertical obstacle less than 2” high. Most often located between transitions in flooring surfaces, doorways and inclines.

Threshold Ramp
Small rubber, metal or wooden inclined platform that is placed over a threshold to allow wheelchair to roll over it without needing to pop casters.
A graduate of the University of Manitoba Masters of Occupational Therapy program, Allison has spent over a decade specializing in spinal cord injury, amputee and neuromusculoskeletal rehabilitation. She has seen first hand how powerful client-centred instruction and adaptations can be in growing a person’s independence and quality of life. Allison is always looking for new ways to improve rehab service delivery at both the client and systems levels. Her areas of interest include: upper extremity rehabilitation, pressure management, seating and mobility, wheelchair skills, and improving collaboration throughout the continuum of care.

Emerald has specialized in spinal cord injury and amputee rehabilitation for most of her decade-long career. She has been honing expertise in seating and wheeled mobility since obtaining her Masters of Occupational Therapy from the University of Manitoba. Along with her undergraduate degree in Kinesiology, manual wheelchair skills naturally became a passion to maximizing clients’ independence at a wheelchair level. Other areas of interest within rehabilitation practice include management of the upper limb post spinal cord injury and helping clients achieve independence through the use of assistive technology.
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