



WELCOME TO  
THE 2019 FRPA  
CONFERENCE!



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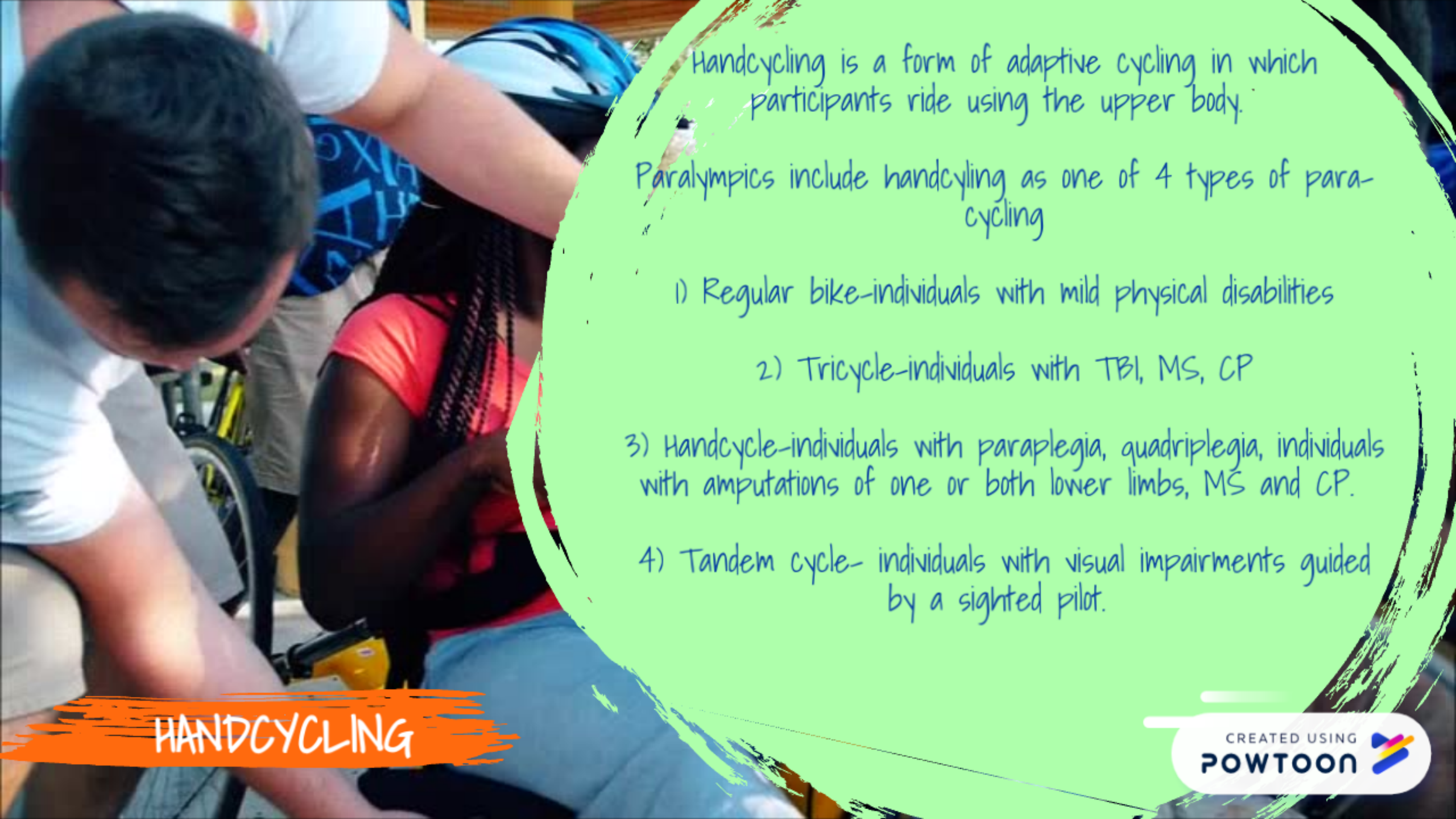
## LEARNING OBJECTIVES

- Identify the basics of handcycling as an adaptive sport, including target disability populations
- Identify some strategies on how to create a successful program involving partnerships, funding, and equipment needed.



## HOW TO START A SUCCESSFUL HANDCYCLING PROGRAM





Handcycling is a form of adaptive cycling in which participants ride using the upper body.

Paralympics include handcycling as one of 4 types of para-cycling

- 1) Regular bike-individuals with mild physical disabilities
- 2) Tricycle-individuals with TBI, MS, CP
- 3) Handcycle-individuals with paraplegia, quadriplegia, individuals with amputations of one or both lower limbs, MS and CP.
- 4) Tandem cycle- individuals with visual impairments guided by a sighted pilot.

HANDCYCLING



# TYPES OF HANDCYCLES



Handcycle with high stance and upright riding position



Level of disability: upright / Fork steer or Recumbent / Lean steer



Handcycle with low stance and recumbent riding position



Wheelchair Conversion



Purpose: Recreational or Racing



Top Wheelchair's Invacare Top End XLT Recreational Handcycle



Top End Invacare Force Rx Racing Handcycle

Terrain: Road, Mountain / off-Road



Invacare Force G Road Handcycle



Bomber Off-Road Handcycle



# OUR PROGRAM

- Community-based handcycling program: Miami-Dade Parks, Recreation and Open Spaces Disability Services in partnership with FLU RT program.
- Each session/season is 8-weeks during Fall or Spring semesters.
- Staff: 1 Recreation Specialist, 1 Disability Program Specialist, 3 Recreation Leaders, 1 Recreational Therapy Faculty, 5-10 recreational therapy students (volunteers).
- Clients: adults with physical disabilities, mainly SCI. We have some participants with CP comorbid with mild ID, and one with TBI.
- Buddy riders system.

## Program Description:

Handcycling for youth and adults with physical disabilities to promote fitness, teach cycling skills and bike safety while encouraging social engagement with other participants and their families through cycling in park and community environments.



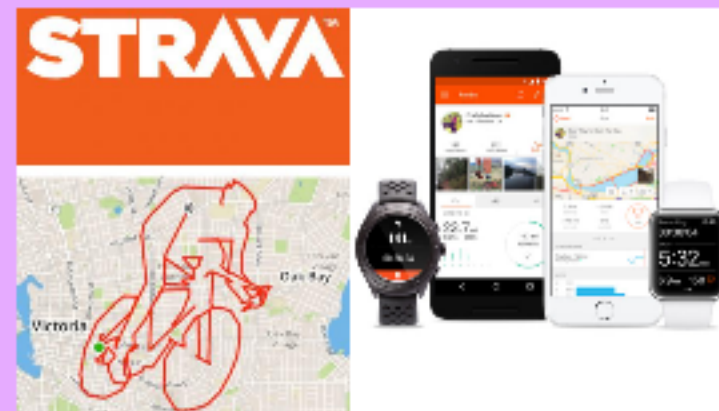
Left to right: road tread; off-road tread for hard surfaces; and off-road tread for good grip on soft and loose terrain



Bike-on handcycle lift

## EQUIPMENT NEEDED

## Cycling Monitoring App



## Bike repair tools



Lube, degreaser,  
cleaner



Water



First-aid kit



Proper clothing: long athletic pants or shorts with high socks to avoid rubbing on legs



# ADAPTATIONS

## Leg Guards



## Proshift (Automatic Gear shifter)



## Padding



## Safety flags



## Hand Gripping Aids



## Crank Extenders



## Trunk Stabilizers



## Quad Grips



## C-5 Hand Grip



## Wrist Wrap



## Cushion





# Fitting Your Bike Helmet

Buy it. Fit it. Wear it.  
**EVERY RIDE!**

## The Proper Helmet Fit

Helmets come in various sizes, just like hats. Size can vary between manufacturers. Follow the steps to fit a helmet properly. It may take time to ensure a proper helmet fit, but your life is worth it. It's usually easier to look in the mirror or have someone else adjust the straps. For the most comprehensive list of helmet sizes according to manufacturers, go the Bicycle Helmet Safety Institute (BHSI) Web site at: [www.bhsi.org/](http://www.bhsi.org/).

### STEP 1

#### Size:

Measure your head to find your size. Try on several helmets in your size until one feels right. Now put the helmet level on your head and adjust the sizing pads or fit ring until the helmet is snug.

### STEP 2



#### Position:

The helmet should sit level on your head and low on your forehead—one or two finger-widths above your eyebrow.

### STEP 5



#### Chin Strap:

Buckle your chin strap. Tighten the strap until it is snug, so that no more than one or two fingers fit under the strap.

### STEP 3



#### Side Straps:

Adjust the slider on both straps to form a "V" shape under, and slightly in front of, the ears. Lock the slider if possible.

### STEP 6



#### Final Fitting:

- A.** Does your helmet fit right? Open your mouth wide...big yawn! The helmet should pull down on your head. If not, refer back to step 5 and tighten the chin strap.
- B.** Does your helmet rock back more than two fingers above the eyebrows? If so, unbuckle and shorten the front strap by moving the slider forward. Buckle and retighten the chin strap, and test again.
- C.** Does your helmet rock forward into your eyes? If so, unbuckle and tighten the back strap by moving the slider back toward the ear. Buckle and retighten the chin strap, and test again.
- D.** Roll the rubber band down to the buckle. All four straps must go through the rubber band and be close to the buckle to prevent the buckle from slipping.

### STEP 4



#### Buckles:

Center the left buckle under the chin. On most helmets, the straps can be pulled from the back of the helmet to lengthen or shorten the chin straps. This task is easier if you take the helmet off to make these adjustments.



# PARTNERSHIPS



## Recommended partnerships:

- Local biking community/clubs.
- Local bike shops/ bike mechanics for maintenance and repairs.
- County or city support.
- Volunteers.
- Achilles local chapter.





# CHALLENGES

- Cost of handcycles and equipment.
- Storage of handcycles.
- Handcycles' maintenance and repairs.
- Transfers and bike fittings.
- Participants sharing handcycles.
- Buddy cyclists.



## RECOMMENDATIONS

1. Do research/ learn about handcycling.
2. Get trained on basic bike mechanics.
3. Learn about grants + funding opportunities.

## RESOURCES

1. Adaptive Cycling Manual by Northeast Passage

Disabled Sports USA: Hand Cycling

U.S Paralympics: Cycling

Handcycling suppliers

2. Professional Bicycle Mechanics Association

Park Tool School

Barnett Bicycle Institute

United Bicycle Institute (UBI)

3. Challenged Athletes Foundation

VA

High Fives

Kelly Brush Foundation





**A. Personal Information**

Name:	Birthday:
Allergies:	Current medication:
Condition/Diagnosis:	
Handcycling experience: ____ First time ____ Beginner ____ Intermediate ____ Advanced	
History of ____ Autonomic Dysreflexia ____ Seizures ____ Skin breakdown ____ Heat stroke ____ High blood pressure ____ Spasms ____ Fainting ____ Bladder/bowel incontinence ____ Heart problems ____ Pressure ulcers ____ Vision problems ____ Back pain ____ Upper body weakness ____ Uses catheter	

**B. Personal needs Assessment**

Transfer ability: ____ Independent ____ Needs 1-person support ____ Needs 2-person support ____ Needs 3 person-support
Preferred transfer method:
Physical limitations: <u>Right</u> <u>Left</u> lower body paralysis (legs) <u>Right</u> <u>Left</u> upper body paralysis (arms)
Upper body strength: ____ Athletic ____ Average ____ Limited
Upper body flexibility: ____ Very flexible ____ Average flexibility ____ Limited flexibility
Trunk stability: ____ Controls trunk ____ Needs some support ____ Needs substantial support
Fine motor skills: ____ Can move fingers and grasp ____ Needs some help grasping ____ Unable to grasp
Vision: ____ Good ____ Limited
Hearing: ____ Good ____ Limited

**C. Individual adaptations requested**

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**D. Additional comments**

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**E. Plan with goals and objectives**

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# CONSIDERATIONS FOR INDIVIDUALS WITH SCI

-Autonomic Dysreflexia: empty bladder prior to riding and check for regularity of bowel movement; wear loose clothing, periodically check blood pressure and skin.

-Orthostatic hypotension: hydration, discourage quick movements, compression stockings and abdominal binder.

-Protect skin with leg guards and padding; monitor body parts throughout ride (friction and pressure).

-Monitor for pressure ulcers; change positions to relieve pressure on weight bearing areas of body.



# CONSIDERATIONS FOR INDIVIDUALS WITH TBI

-Reality orientation test; keep track of alertness and concentration throughout ride.

-Adjust gear and speed based on weaker side to limit overcompensation.

-Alternative forms of communication if speech and language are impaired.

-Ask about seizure history.



-Range of motion, coordination, strengthening, and relaxation exercises.

-Use straps to secure muscles.

-Ask about seizure history and triggers.



CONSIDERATIONS  
FOR INDIVIDUALS  
WITH CP





-Avoid riding in extreme heat;  
allow breaks for cooling off  
body, and provide cooling towels.

-Work on balance and  
coordination

-Work on range of motion and  
strength



## CONSIDERATIONS FOR INDIVIDUALS WITH MS



# CONSIDERATIONS FOR INDIVIDUALS WITH SB

- Latex allergies, use latex-free grips, and be cautious with tubes and tires.
- Shunts are common, be careful to avoid trauma.
- If scoliosis is present, start with upright handcycle.





# CONSIDERATIONS FOR INDIVIDUALS WITH AMPUTATIONS

- Test balance and movement with prosthetic limb and/or residual limb.
- Single foot or leg amputation below the knee usually prefer a two-wheel bike with a prosthetic limb.
- Handcycles are popular among individuals with double feet or double leg amputations.
- Individuals with arm amputations usually ride trikes.





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