How to stay fit in a wheelchair ?

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2 november, 2012,
Noordwijk

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Content boek

(Valent ,Broeksteeg, 2012)

1) What are the effects of a SCI on fitness and health?

2) What options do you have to stay active?

3) Are your (sports)wheelchair and handcycle optimally adapted?

4) How to train and stay motivated?

5) How to prevent or overcome injuries?

6) How to remain on a healthy weight?

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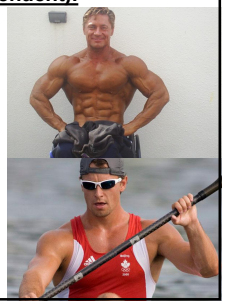
Persons in a wheelchair

are generally less active than ambulatory persons

- **Only arms available (wheelchair dependent):**

Arm muscle mass is generally smaller than leg muscle mass: not always !

VO_{2peak} in arm work is generally lower than in leg work: not always !

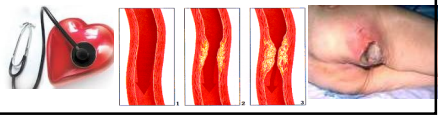


The importance of activity

Inactivity ⟺ **weight gain**
- fat mass ↑
- muscle mass ?

(Chapter 6, healthy weight)

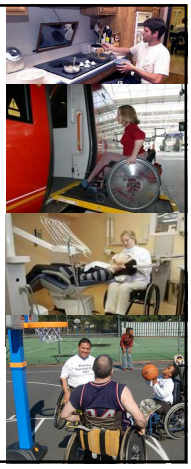
Higher risk of CVD
and other health problems



Why an active lifestyle?

Maintenance of improvement in:

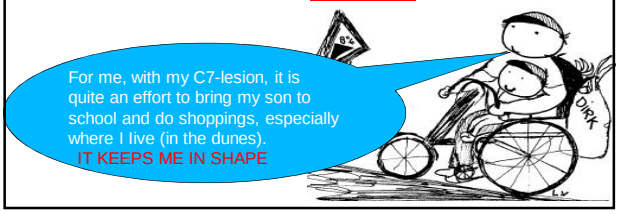
- **Fitness**
  (endurance and strength)
- **Performance of daily activities**
  (making life easier)
- **Participation in society**
- **Health and QOL**



However, for persons in a wheelchair (e.g. SCI)

- **It may be difficult <u>to maintain</u> physical capacity in daily life**

- **Is it enough to be active in daily life?**
  it depends on what you <u>(can) do</u>



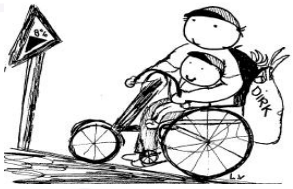
However, for persons in a wheelchair (e.g. SCI)

- **Hand rim wheelchair propulsion is straining:**
  > 50% overload injuries to arms
  (Curtis et al, Sie et al)

- **Exercise options (sports) are generally not easy accesible.**
  Barriers exist *(Scelza et al, 2005):*

Barriers for an active lifestyle

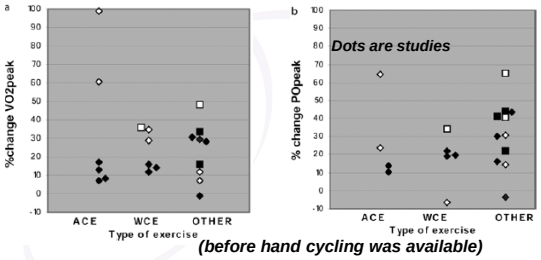
What training options are available in daily life?



Berkelbike **Wheelchair** **Indoor trainer** **handbike**

Strength training/ prevention of injuries (chapter 4/5)

What is the most effective training option to improve fitness?



(before hand cycling was available)

Sport participation in the Netherlands

75 persons with SCI do sports (5 yrs after discharge):

	Persons	hours/wk
Hand cycling:	**49**	**4,5** (0,5 - 30)
Fitness	23	2 (0,5 - 13)
Swimming	12	? (?)
Weelchair tennis	8	1 (0,5 - 4)
Wheelchair training	8	1,5 (0,5 - 4)
Wheelchair basketbal	6	2 (0,5 - 5)
Wheelchair rugby	6	1 (0,5 - 2)

It makes sense to focus on HC during rehabilitation of wheelchair-bound persons

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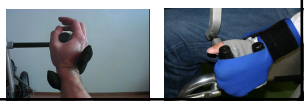
What explains popularity of hand cycling?

An EXERCISE and MOBILITY mode in daily life:

- ***"fun", "good workout", "I use it like my bike"***
- ***attachable to own wheelchair; no transfer needed***
- ***2 to 3 times faster/longer distances (compared to wchair)***
- ***coupling hands is easy (compared to wheelchair)***

Even without hand function:



Results thesis (2009)

Why hand cycling ?

- **Improvements in Physical Capacity:**
  - **Peak Power Output: (PO_{peak})**
  - **Peak Oxygen Uptake (VO_{2peak})**
- **No over-use injuries after HC-training**

(ergonomics !)

Persons with PP and TP are well trainable

- with HC-training
- with **interval**-training

Compared to wheelchair propulsion, hand cycling appears to be less straining for shoulders
(Arnet, 2012)

early start is possible during rehabilitation!

prerequisite for safe HC:

- **Optimal ergonomic set-up**
- **Low gears/ E-bike; low strain**
- **Training principles**
- **Additional strength training and stretching**

Chapters *3, 4 en 5* ***(Valent ,Broeksteeg, 2012)***

How to motivate patients to adopt an active lifestyle

-What physical activity really **suits** you?

-How can you **imply** physical activity **in daily life**?

-How long does it take before you can expect **improvements**?

-Do you really know your **(changed) body** during exercise?

-What **barriers** do you expect (in future) that hinder you to stay active?
-What are your **plans to solve** expected problems?
-What will help you to **stay motivated**? **TO SET GOALS**

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What to tell your patients:

-**Absolute gains** in fitness **may be small** but can make a difference (in daily life)!

-The higher the **physical capacity** (fitness), the lower the **strain** of daily activities

-A **well-trained** body is less vulnerable for overuse-injuries to muscles, tendons etc.

-**Do not expect quick results:** With a relatively low fitness-level (due to low active muscle-mass,age) a **gradual long-term** training period is required.

-**Interval-training** is safe; imply rest during training

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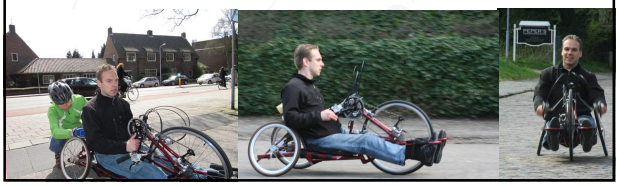
Extreme goal Alpe d'Huez -project

What happens if persons with a paraplegia train to climb the Alpe d'Huez ?



Rijndam revalidatiecentrum

A challenge for persons with SCI; handcycling the Alpe d'Huez

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Results

Handbike-battle juni 2013