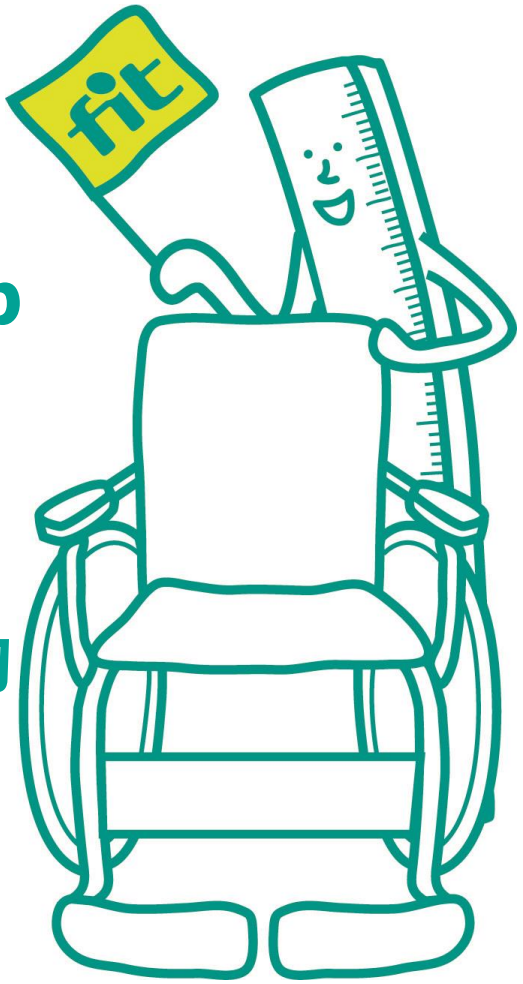
Pathologies & their relationship with Wheelchairs & Seating solutions …

病理學及其與輪椅和座椅解決方案的關係…



… What do you know about everything we already do?

你對我們已經在做的事情了解多少？

The pathological conditions in which the wheelchair is most often useful
輪椅最常用於哪些病理狀況？

- Important features for posture and mobility in a wheelchair
- Frequent needs
- Possible solutions

- 輪椅姿勢和移動的重要特徵
- 常見需求
- 可能的解決方案

Cerebral palsy 腦性麻痺

- It results from brain damage
- The damage can be due to illness or trauma during pregnancy, during childbirth or in the first two years
- It is generally not progressive, but often creates long-term complications
- It affects 2-4 children out of a thousand
- There are several forms. The most common are:
  - Spastic tetraparesis
  - Dystonic tetraparesis
  - Diplegia
  - Hemiplegia
- It can be very severe from person to person
- 它是由腦損傷引起。
- 損傷可能由懷孕期間、分娩期間或出生後頭兩年內的疾病或創傷造成。
- 它通常不會進行性加重，但常常會引發長期併發症。
- 每千名兒童中約有 2-4 名患有此病。
- 它有幾種類型，最常見的有：
  - 痙攣性四肢癱瘓
  - 肌張力失調性四肢癱瘓
  - 雙側癱瘓
  - 偏癱
- 病情嚴重程度因人而異。

In infantile cerebral palsy 嬰兒腦性麻痺

- Often, both posture and movement control and mental abilities are affected, in very different combinations.
- Sometimes the ability to speak is much more affected than mental faculties
- There are often deformities, related to movement disorders, and preventing them is fundamental for the life of the user with PCI.
- The path becomes more difficult as you grow older.
- The wheelchair is often opposed by family members, sometimes even by operators
- The psychological growth of the child is greatly influenced by the possibilities of moving and "doing"

- 通常，姿勢、運動控制和認知能力都會受到影響，而且影響的組合方式各不相同。
- 有時，語言能力受到的影響遠大於認知能力。
- 常常會出現與運動障礙相關的畸形，預防這些畸形對於PCI患者的生活至關重要。
- 隨著年齡的增長，復原之路會變得更加艱難。
- 輪椅的使用常常遭到家人的反對，有時甚至遭到工作人員的反對。
- 兒童的心理成長很大程度取決於他們能否自由活動和「做事」。

The user with cerebral palsy 患有腦性麻痺的用戶

Wheelchair needs:

- Feeling **stable**
- Have passable comfort
- Facilitating functional mobility
- Having an orientation suitable for relational life
- Prevent deformities
- Present a dignified image of oneself
- **Enable autonomous locomotion**
- Using wheelchair-mounted devices
- Accompanying growth and change

輪椅需求：

- 穩定性
- 舒適度
- 便於功能性活動
- 方向感適合人際關係
- 防止畸形
- 展現尊嚴形象
- 實現自主行走
- 使用輪椅配套設備
- 伴隨成長與變化

The user with cerebral palsy 患有腦性麻痺的用戶

Some solutions to consider:

- **Highly stabilizing** support surfaces
- Components to contain involuntary mobility and to center the *proximal segments*
- As needed, modeled systems and corsets
- Generous support, care of the areas of application of forces
- Segmental positioning and orientation to optimize function
- Tilting, non-reclining systems
- Autonomous locomotion on an electric wheelchair
- Solutions that can "grow" and evolve

一些可考慮的解決方案：

- 高度穩定的支撐面
- 用於控制非自主活動並使近端節段居中的組件
- 根據需要，使用模型系統和矯正器
- 提供充足的支撐，並注意受力區域
- 優化節段定位和方向以提升功能
- 可傾斜、不可傾斜的系統
- 電動輪椅上的自主移動功能
- 可「擴展」和演進的解決方案

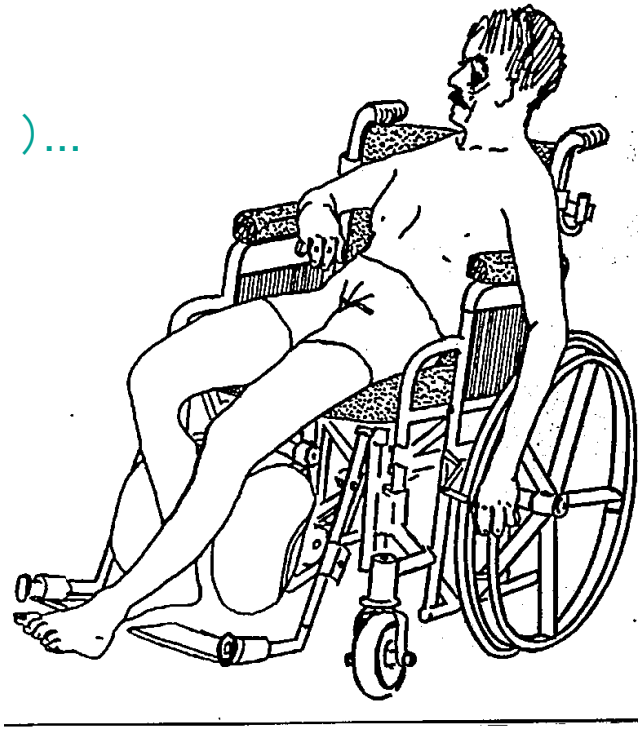
Elderly people with disabilities 殘障老年人

They are the largest segment of wheelchair users (2/3 of the total!)…
…and they are the most "mistreated"

他們是輪椅使用者中人數最多的群體(佔總數的2/3！)…
……而且他們也是最受「不公平對待」的族群。

They lose their way for various reasons

他們迷路的原因有很多。



Common causes of walking disability in the elderly
老年人行走障礙的常見原因

- Nervous system problems:
  - Stroke
  - Tremors
  - Balance defects
  - Rigidity
  - Loss of strength
  - Dementia
- 神經系統問題：
  - 中風
  - 震顫
  - 平衡障礙
  - 僵硬
  - 肌力下降
  - 癡呆

- Joint and bone problems
  - Serious joint diseases
  - Osteoporosis
- Breathing problems
  - Chronic respiratory failure
- Circulatory problems
  - Severe heart disease
  - Peripheral arterial disease
- 關節和骨骼問題
  - 嚴重關節疾病
  - 骨質疏鬆症
- 呼吸問題
  - 慢性呼吸衰竭
- 循環系統問題
  - 嚴重心臟病
  - 週邊動脈疾病

Note: Often these problems – and others – are present together
注意：這些問題以及其他一些問題通常會同時出現。

The elderly 老年人

they are the largest group of users (2/3 are over 60 years old and more than half are guests of institutions: Shaw, 1991)

…and they are probably *the worst served* :

- 8 out of 10 complain about problems with the wheelchair
- 3 out of 10 (among those able to express themselves!) feel *very* uncomfortable (Shaw & Taylor, 1992)
- Problems increase with time spent in wheelchairs, with half of them spending at least 12 hours a day in them (Shaw, 1991).
- Few people use other chairs or armchairs
- Poor comfort (60%) and difficult mobility (56%) are the most common problems (Shaw, 1991, Perks et al., 1994)

"the dangerous wheelchair" (Hartigan, 1982)

他們是最大的使用者群體(三分之二超過60歲, 超過一半是機構的客人:Shaw, 1991)

……但他們的服務可能最差:

十分之八的人抱怨輪椅有問題

十分之三的人(在能夠表達自己想法的人中!)感到非常不舒服(Shaw & Taylor, 1992)

使用輪椅的時間越長, 問題就越多, 其中一半人每天至少使用12小時(Shaw, 1991)。

很少人使用其他椅子或扶手椅

舒適度差(60%)和行動不便(56%)是最常見的問題(Shaw, 1991;Perks等人, 1994)

「危險的輪椅」(Hartigan, 1982)

For an elderly person... 對老年人來說...

an uncomfortable and difficult to drive wheelchair:

- ✓ ...encourages people ***not to*** use it; it also makes care more difficult ⇨ leads to bed rest
- ✓ takes away valuable physical resources
- ✓ eases depression and aggression
- ✓ leads to postures that discourage interaction with others
- ✓ inhibits mobility
- ✓ facilitates falls and encourages the use of restraints

Hinders social relationships ⇨ causes suffering and accelerates decay

不舒適且難以操控的輪椅:

.....導致人們不願意使用;也使護理更加困難 ⇨ 導致臥床休息

消耗寶貴的體力資源

加劇憂鬱和攻擊性

導致不良姿勢, 阻礙與他人互動

限制行動能力

增加跌倒風險, 促使使用約束帶

阻礙社交關係 ⇨ 造成痛苦並加速衰老

The “active” elderly person with a disability
有殘疾的「活躍」老年人

Wheelchair needs:

- Have good **comfort** (to rest physically but not mentally)
- Feeling **safe**
- Protect your skin
- Have a decent posture
- Facilitating autonomous locomotion
- Making it easier to stand up
- Making mobility management easy
- Making incontinence management easy

輪椅需求：

- 舒適度高（身體休息，精神不受影響）
- 安全感
- 保護皮膚
- 保持良好的姿勢
- 便於自主行走
- 方便站立
- 便於行動管理
- 便於失禁管理

- So, we ask the elderly person or the person who cares for him:
- Is he comfortable? Does he complain? Does he get agitated often? Does he often ask to be moved?
  - If he's uncomfortable, what do we do? We try to understand why. We evaluate the wheelchair and him.
  - We check the following about the wheelchair:
    - Cushion?
    - Measures
    - Backrest shape
    - Armrests (when adjustable, the user appreciates the difference between different positions!)
  - Let's examine your joint mobility to understand if there are any limitations that may interfere with sitting posture:

- 所以，我們會詢問老人或他的照顧者：
- 他感覺舒適嗎？他會抱怨嗎？他常常煩躁不安嗎？他常要求挪動身體嗎？
  - 如果他感到不舒服，我們該怎麼辦？我們會嘗試了解原因。我們會評估輪椅和老人的狀況。
  - 我們會檢查輪椅的以下幾個方面：
    - 坐墊？
    - 尺寸
    - 靠背形狀
    - 扶手（如果扶手可調節，使用者會感受到不同位置帶來的差異！）
- 我們會檢查您的關節活動度，以了解是否有任何可能影響坐姿的限制：

The “active ” elderly person with disabilities
有殘疾的「活躍」老年人

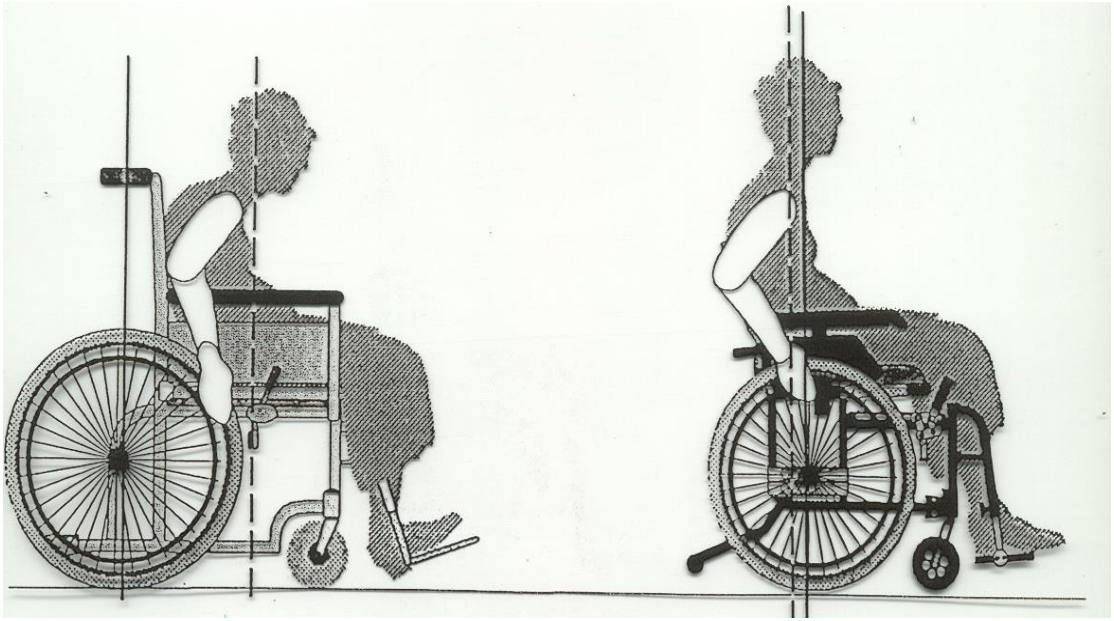
Some solutions to consider:

- Wheelchair configured to easily place the feet on the ground and sliding, for the posture and mobility of those who use the lower limbs
- Or: tilted rear set-up, for the posture and mobility of those who push themselves on wheels
- Full wheels and wheels, especially in institutions
- Long, adjustable armrests for the those who stand up
- Cushion with soft ischial support, more or less shaped according to control capabilities; easy to wash
- Easy to reach and use leg rests and brakes
- Backrest that can be adjusted to the shape of the trunk, possibly rigid with soft padding

一些可考慮的解決方案:

- 專為下肢使用者設計的輪椅，方便雙腳著地並可滑動，以改善其姿勢和行動能力。
- 或:後傾式輪椅，專為自行推動輪椅的使用者設計，以改善其姿勢和行動能力。
- 全輪輪椅，尤其適用於機構。
- 長款可調整扶手，方便站立使用者。
- 帶有柔軟坐骨支撐的坐墊，可根據使用者的控制能力進行一定程度的形狀調整;易於清洗。
- 易於觸及和使用的腿托和煞車。
- 可依軀幹形狀調節的靠背，可以是硬質靠背，但帶有柔軟的襯墊。

a standard wheelchair is often uncomfortable and difficult to drive!普通輪椅通常既不舒服又難以操控！



Older people who can push a standard wheelchair push themselves very little (4% of the total time) : Simmons et al., wheelchairs as mobility restraints, J am geriatr soc 1995 384-8)

能夠推動標準輪椅的老年人很少自己推動輪椅（僅佔總時間的 4%）：Simmons 等人，《輪椅作為行動限制》，《美國老年醫學會雜誌》1995 年 384-8 頁。

Keep your feet on the ground…保持腳踏實地…

… is suitable for many users, especially the elderly (but not only), because:

- Allows for greater postural variability
- Makes standing up easier
- Facilitates self-propulsion with the lower limbs. Pushing with the lower limbs:
  - *it is much more efficient than with the upper limbs* – (Arch Phys Med Rehabil 2001 Sep:1198-1203: Improved efficiency with a wheelchair propelled by the legs using voluntary activity or electric stimulation .)
  - *It uses a larger body area and more robust anatomical structures*
  - *leave your hands free*

……適合眾多用戶，尤其適合老年人（但不僅限於此），原因如下：

- 允許更大的姿勢靈活性
- 讓站立更容易
- 便於用下肢進行自主推進。用下肢推：
  - 比用上肢推動效率更高－（Arch Phys Med Rehabil 2001 Sep:1198-1203: Improved efficiency with a wheelchair of drive by the legs using sponsive activity or electric stimulation. ）
  - 它利用了更大的身體面積和更強壯的解剖結構
  - 解放雙手

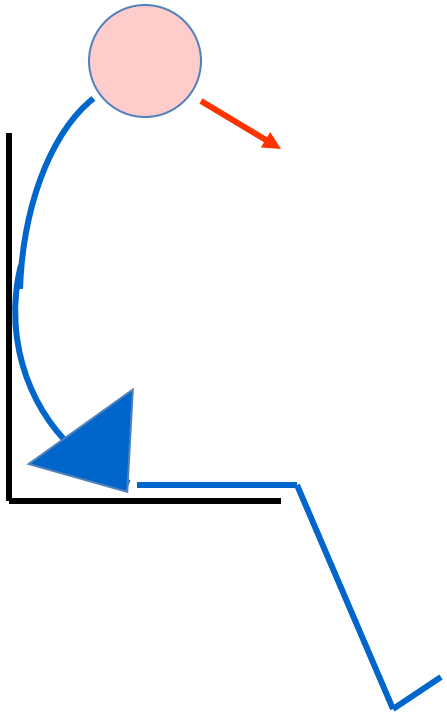
Pushing off with your feet (the foot) is functional if:
用腳蹬地發力在下列情況下是有效的:

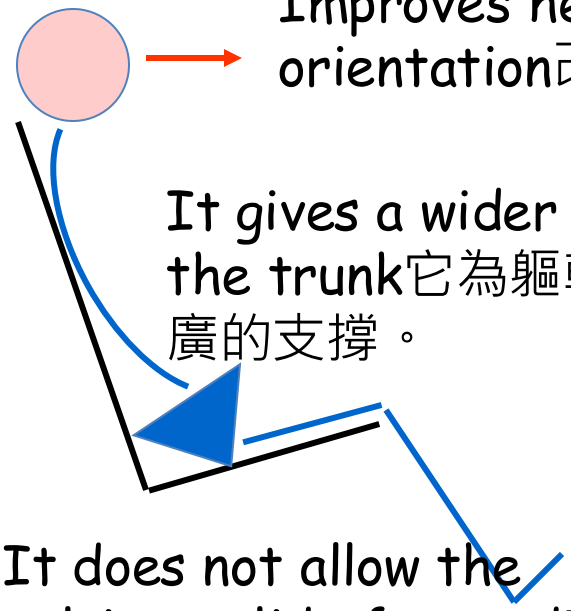
- The wheelchair is the right height
- The wheelchair has detachable footrest supports
- The seat is horizontal or slightly inclined forward (setup!)
- the wheelchair is smooth (setup!)
- The wheels are small and moved outwards
- The pillow is well fixed
- The pillow is thin and has a soft front
- The pillow is a little shorter than standard
- The occupant learns to flex the trunk when pushing

- 輪椅高度合適
- 輪椅配有可拆式腳踏
- 座椅水平或略微前傾(已設定！)
- 輪椅運轉平穩(已設定！)
- 輪子小巧且向外傾斜
- 靠枕固定牢固
- 靠枕較薄, 前端柔軟
- 靠枕比標準尺寸略短
- 使用者在推動輪椅時需要學習彎曲軀幹

If there is a hyperkyphosis , tilting back (adjusting the setup or using a wheelchair tilting):

如果存在脊椎後凸，則向後傾斜（調整座椅設定或使用輪椅傾斜功能）：



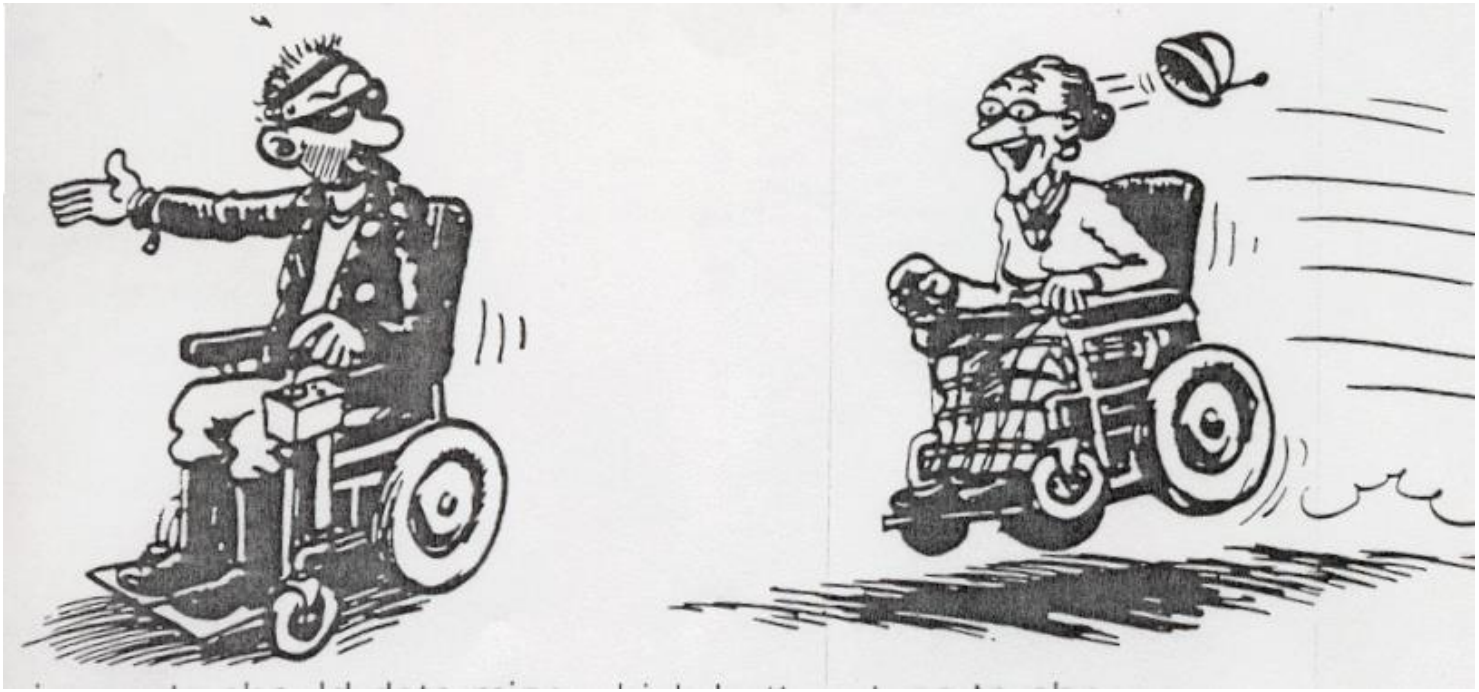


Improves head orientation改善頭部方向

It gives a wider support to the trunk它為軀幹提供了更寬廣的支撐。

It does not allow the pelvis to slide forward它不允許骨盆向前滑動。

A power wheelchair: why not? 電動輪椅：為什麼不呢？

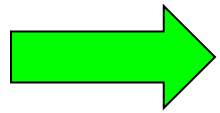


Older people's use of powered wheelchairs for activity and participation . Brandt A, et al; J Rehabil Med., 2004 Mar

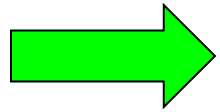
老年人使用電動輪椅進行活動和參與的情況。 Brandt A 等；復健醫學雜誌，2004 年 3 月

If the elderly person is no longer "active"
如果老年人不再“活躍”

- Let's give him a postural wheelchair, which can also "act as an armchair"...
- ...and not a commode, which is an aid that conflicts with well-being and dignity. Let's replace it with:



- 讓我們給他一輛姿勢矯正輪椅，它也可以「充當扶手椅」...
- .....而不是便椅，便椅這種輔助工具有損他的健康和尊嚴。
  讓我們用以下方式來取代它：



A "postural" wheelchair一種「姿勢矯正」輪椅

- They combine tilt and recline
- They are comfortable and stabilizing, thanks also to the padding and the many accessories for posture
- Wheelchairs *with only a reclining backrest are often more suitable* , to provide a lot of support and to alternate "work" and rest postures.

- 它們兼具傾斜和後仰功能。
- 它們舒適且穩定，這也要歸功於襯墊和眾多姿勢矯正配件。
- 僅配備後仰靠背的輪椅通常更合適，因為它們能提供足夠的支撐，並方便交替進行「工作」和休息姿勢。

A good postural wheelchair:一款合適的姿勢輪椅:

- It is available in different sizes or has adjustable sizes (for use by multiple users)
- It has a variety of setups and accessories
- It allows for quick and easy adjustment of:
  - tilt (essential) and recline (in institutions, quick adjustment may not be recommended)
  - headrest
  - armrests
  - leg rest elevation (if necessary!);

    NOTE: The leg rest should allow you to keep your knees bent at least 90°
- It has adjustable footrest angle
- Allows you to easily place an anti-decubitus cushion
- 它有多種尺寸可供選擇，或配備可調節尺寸（供多人使用）。
- 它擁有多種配置和配件。
- 它可以快速且方便地調整:
  - 傾斜度（必備）和後仰角度（在機構中，可能不建議快速調整）
  - 頭枕
  - 扶手
  - 腿靠高度（如有需要！）
- 注意:腿托應使您的膝蓋保持至少 90° 的彎曲角度。
- 它具有可調節的腳踏角度。
- 方便您放置褥瘡墊。

Hemiplegia from stroke 中風引起的偏癱

- It is due to a sudden lack of blood to a part of the brain
- It is especially widespread among the elderly (4-6 per 1000)
- It can affect (more or less seriously):
  - *The movement of one side of the body*
  - *Sensitivity on one side of the body*
  - *Language (understanding and/or expression)*
  - *The ability to "understand space"*
  - *The view*
  - *Intellectual abilities*
- It usually gets better for a few months after the stroke.

- 它是由於大腦某一部分突然缺乏血液供應所造成的。
- 它在高齡族群中特別常見（每 1000 人中約有 4–6 人）。
- 它可能影響（程度不一）：
  - 身體一側的動作
  - 身體一側的感覺
  - 語言（理解和／或表達）
  - 「空間理解」的能力
  - 視覺
  - 智力能力
- 通常在中風後的幾個月內會有所改善。

If the elderly person has hemiplegia…
如果這位老年人患有偏癱…

…has similar needs and solutions regarding the wheelchair as other elderly people, ***and in addition*** :

- It often tends to tilt the trunk to the side (especially in the acute phase)
  - Seat not too wide
  - Shaped backrest or with lateral supports

……在輪椅需求與解決方案方面，與其他高齡者相似，另外還包括：

- 軀幹常會傾向一側（尤其是在急性期）
  -座椅不可太寬
  -需要有造型的靠背，或附有側邊支撐的靠背

- Needs a lot of support for the upper limb, if paralyzed
  –Shaped armrest or coffee table/half-coffee table
- Under stress, it radiates hypertonicity to the lower limb
  –Easy to move wheelchair
  –Power wheelchair, if indicated

- 需要大量的上肢支撐（若上肢癱瘓）
  -造型扶手，或使用咖啡桌 / 半咖啡桌式支撐面
- 在壓力下，肌張力會向下肢擴散（張力輻射）
  -需使用容易移動的輪椅
  -若合適，則需使用電動輪椅

Notes on the wheelchair for hemiplegia
輪椅使用於偏癱患者的注意事項

Single-guide systems: 單側導向系統:

– They are difficult to use for many users 對許多使用者而言不易操作

– They weigh down and "complicate" the wheelchair 會使輪椅變得更重且更複雜

– They are sometimes very (and unnecessarily) expensive – 有時價格非常高(而且不一定有必要)

The wheelchair for hemiplegia
偏癱患者專用輪椅

A lightweight wheelchair designed for self-propulsion by foot:

以腳來自行推進所設計的輕量化輪椅：

- It often allows for much easier locomotion, both autonomous and assisted 無論是自主移動或在協助下移動，都通常更加容易
- It has a normal structure 它具有一般標準輪椅的結構

NOTE: Early self-propulsion does not hinder walking learning

備註：早期自行推進並不會妨礙步行能力的學習

(A hypothesis: self-propulsion in a wheelchair early after stroke might not be harmful – Clin Rehabil 2003 Mar;17(2):174-80)

（假設：中風後早期使用輪椅自行推進可能並無害處 ——《Clin Rehabil》2003 年 3 月；17(2):174-80）

Spinal cord injuries 脊髓損傷

- They cause paraplegia or tetraplegia
- They are a consequence:
  - of spinal trauma ("myelic vertebral lesions")
  - of diseases
  - of severe osteoarthritis of the spine
- They affect 20-30 "new" people per million inhabitants every year
- They affect approximately 1 person in every 1000 inhabitants
- 80% of spinal cord injuries affect people between the ages of 15 and 30.
- Life expectancy is a few years lower than normal
- 9 out of 10 use a wheelchair

- 可能造成 截癱或四肢癱瘓
- 其成因可能包括:
  -脊柱外傷(「脊髓–椎骨損傷」)
  -疾病 引起的脊髓損傷
  -嚴重的脊柱退化性關節炎

- 每年，每百萬人口中約有 20–30 位「新發」脊髓損傷患者。
- 整體而言，每 1000 名居民中約有 1 人受到脊髓損傷的影響。
- 80% 的脊髓損傷發生在 15 至 30 歲之間的人群。
- 脊髓損傷患者的 預期壽命略低於一般人。
- 10 個患者中有 9 位需要使用輪椅。

In paraplegia and tetraplegia
在下肢癱瘓與四肢癱瘓的情況下

- In paraplegia (thoracic or lumbar injury) only the lower limbs and part of the trunk are affected
- In tetraplegia (cervical injury) the upper limbs are *also affected, more or less extensively.*
- Paralysis can be more or less severe depending on the *level of injury* and the *completeness* of the lesion
- In addition to paralysis, there are often:
  - Spasticity
  - Loss of sensitivity, more or less severe
  - Bladder, bowel, and genital dysfunctions
- Normally, the brain is intact!
- Usually, the psychological reaction to trauma is good.

- 在截癱(胸椎或腰椎損傷)中，只有下肢及部分軀幹受到影響。
- 在四肢癱瘓(頸椎損傷)中，上肢也會受到影響，程度可能不同。
- 麻痺的嚴重程度取決於損傷的高低位置以及損傷是否完全。

- 除了麻痺之外，常見的還有：
  -痙攣
  -不同程度的感覺喪失
  -膀胱、腸道及生殖功能障礙

- 大腦通常是完好的！
- 通常，對於創傷的心理反應是良好的。

The user with spinal cord injury
脊髓損傷的使用者

Wheelchair needs:

- Facilitating autonomous locomotion
- Facilitating transfers
- Facilitate access
- Make loading into the car easier
- Facilitate the use of the upper limbs
- Prevent bedsores
- Prevent overload-related pathologies
- Provide comfort and prevent chronic postural pain

輪椅需求:

- 促進自主移動
- 促進轉移(如床椅轉換)
- 協助提升可近性
- 使裝載進汽車更容易
- 促進上肢的使用
- 預防壓瘡
- 預防因過度負荷造成的相關病理
- 提供舒適度並預防慢性姿勢性疼痛通常，對於創傷的心理反應是良好的。

The user with spinal cord injury
脊髓損傷用戶

Some solutions to consider:

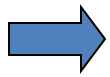
- **good quality** wheelchair
- Power wheelchair (to be offered more often)
- **Taking care of the setup** to optimize self-propulsion
- Provide evidence of transfers and loading into cars
- Stabilize *proximally* with posture and system to optimize upper limb mobility
- Apply an anti-decubitus cushion ***tried*** effectiveness;
- possibly, configure the wheelchair to reduce ischial pressure or choose a wheelchair with a motorized posture system
- Provide adequate posterior support to the spine

可考慮的解決方案:

- 一台高品質的輪椅
- 電動輪椅(應更常被納入選項)
- 重視輪椅設定以最佳化自我推進效率
- 評估個案在轉移及將輪椅裝載進汽車時的能力與證據
- 透過良好姿勢與支撐系統近端穩定，以提升上肢活動度
- 使用經測試有效的防褥瘡坐墊
- 若有需要，可調整輪椅以降低坐骨壓力，或選擇具電動姿勢調整系統的輪椅
- 提供足夠的脊椎後方支撐

Multiple sclerosis
多發性硬化症

- It is a disease of the nervous system that can cause various impairments, different from person to person.
- It is progressive, but in different ways from person to person and not entirely predictable.
- It strikes:
  - about one person in a thousand
  - adults, especially those aged 20 to 40
  - twice as many women as men
- Often leaves a normal life expectancy



- 這是一種影響神經系統的疾病，可能造成各種不同的功能障礙，且每個人的症狀都不盡相同。
- 它是一種會逐漸進展的疾病，但進展方式因人而異，也無法完全預測。
- 它的罹患族群特徵包括：
  -大約每一千人中會有一人受到影響
  -主要發生在成人，尤其是 20 至 40 歲的人
  -女性患者約為男性的兩倍
- 多數患者的壽命仍然接近正常

In multiple sclerosis
在多發性硬化症中

You may experience problems:

- Movement (general weakness, paralysis, balance problems, tremors, spasticity); one in three people loses their way
- Sensitivity (lack of sensation, hypersensitive areas)
- Vision (diplopia, scotomas, nystagmus)
- Mental in nature (memory difficulties, attention difficulties, emotional problems)
- urinary and fecal continence

Note: the condition often varies from day to day

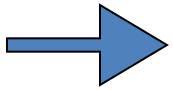
你可能會經歷以下問題:

- 動作功能(全身無力、癱瘓、平衡問題、顫抖、痙攣);大約三分之一的患者會失去行走能力
- 感覺功能（感覺缺失、局部過度敏感）
- 視覺問題（複視、暗點、眼球震顫）
- 心理或認知相關問題（記憶困難、注意力下降、情緒問題）
- 尿失禁與大便失禁
- 注意:病況常常每天都會有所不同

The user with multiple sclerosis
患有多發性硬化症的使用者

Wheelchair needs (*very variable*):

- Adapt to changes in postural control, locomotion ability, and lifestyle habits
- Requiring little strength to move
- Offer comfort , even in severe cases with a lot of postural support
- Inhibit and contain any involuntary mobility
- Protect: prevent bumps, sores and falls in cases of ataxia and perceptual/cognitive disorders
- "forgive" incontinence
- Facilitate standing transfers



輪椅需求(差異非常大):

- 適應姿勢控制、移動能力與生活習慣的變化
- 需要很小的力量即可移動
- 提供舒適性，即使在嚴重個案中也需具備充分的姿勢支撐
- 抑制並控制任何不自主動作
- 保護功能:在有共濟失調或知覺／認知障礙的情況下，預防碰撞、褥瘡和跌倒
- 能**「容許」失禁**(座椅材質或設計能應對失禁狀況)
- 促進站立式轉移

The user with multiple sclerosis
患有多發性硬化症的使用者

Some solutions to consider (if necessary!):

- Lightweight or super-lightweight wheelchair * *of good quality and* * *with customised set-up*
- Electric wheelchair
- Posture system that provides the desired stability
- Postural wheelchair, for those most affected
- Anti-decubitus cushion, in case of perceptual deficits
- Protections for less sensitive parts
- Tips to prevent falls
- Strong colors for the less visible parts
- Easily washable cushion
- Details to facilitate standing transfers

可考慮的部分解決方案(若有需要！):

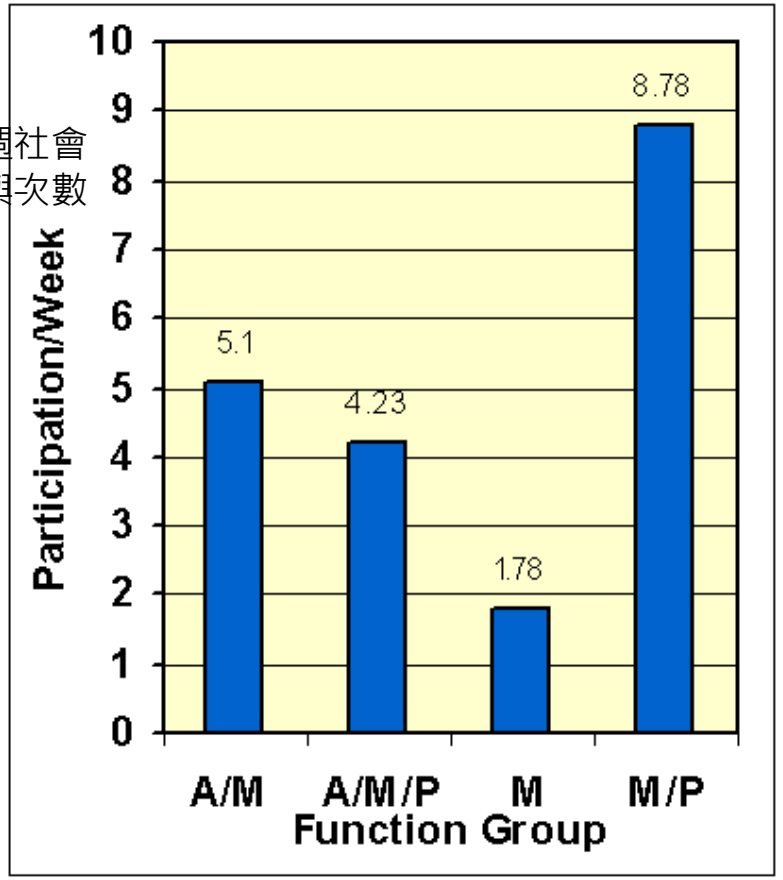
- 輕量或超輕量的輪椅，具良好品質且具備客製化設定
- 電動輪椅
- 提供所需穩定性的姿勢支撐系統
- 姿勢型輪椅，適用於受影響較嚴重的使用者
- 防褥瘡坐墊(若有感覺／知覺缺損時尤為需要)
- 對較不敏感的部位進行保護措施
- 預防跌倒的小技巧
- 對於視覺不佳的部位使用高對比亮色
- 易清洗的坐墊
- 協助站立式轉移的細部設計

Wheelchair type and social participation in multiple sclerosis
多發性硬化症中的輪椅類型與社會參與

- The use of the electric wheelchair coincides with a more assiduous participation in social events *(Ambrosio et al., RESNA Congress 2003)* .
- 使用電動輪椅與更積極參與社交活動有關根據 Ambrosio 等人在 RESNA 大會 2003 的研究，電動輪椅的使用與較頻繁的社交活動參與呈現同步關係。

Facilitate mobility and reduce fatigue (*one of the main culprits of the loss of autonomy)* broadens the possibility of socializing, and can thus give a better life

促進行動能力並減少疲勞（疲勞是導致自主性喪失的主要因素之一）能擴大社交的可能性，進而提升生活品質。



不同功能群組的人

Traumatic brain injuries
外傷性腦損傷

- They cause approximately 200 deaths and 300 new disabilities per million inhabitants every year.
- They are mostly due to road accidents and falls
- They mainly affect young people (they are the main cause of death)
- They can cause various physical, intellectual and behavioral damages
- Damages can be of a very different type and extent from person to person

NB: It often takes years and years for the condition to stabilize

- 每年每百萬人口約 200 人死亡、300 人出現新的失能
- 多數由 交通事故 和 跌倒 所造成
- 主要影響 年輕族群（亦是此年齡層的主要死亡原因）
- 可能導致多種 身體、認知及行為上的損害
- 不同個案的損害類型與嚴重程度差異極大

注意：病情往往需要多年才能趨於穩定

In traumatic brain injury
外傷性腦損傷

You may experience problems:

Of a physical nature

- Difficulty controlling movement and balance, spasticity
- Fatigue
- Vision problems
- Epileptic seizures

Intellectual and behavioral

- Difficulty concentrating and maintaining attention
- Disorientation in space and time
- Memory and reasoning difficulties
- Language problems (not just mental ones!)
- Mood disorders

你可能會遇到一些問題:

身體層面(Physical)

- 難以控制動作與平衡、痙攣
- 容易疲勞
- 視力問題
- 癲癇發作

認知與行為層面(Intellectual and behavioral)

- 專注力下降、難以維持注意力
- 在時間與空間上的定向感不佳
- 記憶與推理能力困難
- 語言問題(不僅是理解上的，也可能是表達上的)
- 情緒障礙(如焦慮、易怒、情緒不穩等)

The user with traumatic brain injury
創傷性腦損傷使用者

Wheelchair needs:

- Allow for early disengagement
- Accompanying the evolution in the early stages after the trauma, and also afterwards
- Adopt a posture that inhibits hypertonia…
- … especially paying attention to stability and comfort
- Protect in case of psychomotor agitation
- …not to break easily…
- Encourage autonomous mobility, where appropriate
- Host communication/environmental control systems

N.B .: the frameworks - and therefore the needs - can be very different

輪椅需求:

- 允許在早期就能脫離依賴(早期自主)
- 陪伴並因應創傷後早期階段的變化，也要在之後持續調整
- 採用能抑制高張力(肌張力過高)的姿勢
- ……特別需要注意穩定性與舒適性
- 在出現精神動作性激躁(psychomotor agitation)時提供保護
- ……同時輪椅本體不容易損壞
- 在適當情況下，鼓勵自主移動
- 可搭載溝通／環境控制系統(如溝通輔具、環控系統)
- 注意:不同的情況和背景 —— 因此需求 —— 可能差異非常大。

The user with traumatic brain injury
創傷性腦損傷使用者

Some solutions to consider:

- Postural wheelchair (not only reclining, as a rule), temporary or - rarely - permanent
- sturdy and modifiable wheelchairs (light or super-light *of good quality*)
- ***Modify or replace promptly to support improvements ("more upright, freer, more mobile")***
- Self-propelled by foot and single-guide systems
- Electronic wheelchair, possibly with alternative controls
- Posture systems that stabilize against involuntary mobility *(including of the head, if necessary)*
- Integrate communication and environmental control systems

可考慮的部分解決方案:

- 姿勢型輪椅(通常不僅是可後仰的那種)，可作為暫時性使用，或——較少見地——永久使用
- 堅固且可調整的輪椅(輕量或超輕量，且具良好品質)
- 及時修改或更換輪椅以支持功能進步（讓使用者「更直立、更自由、更能活動」）
- 以雙腳或單側導向系統進行自我推進
- 電動輪椅，必要時搭配替代性控制介面
- 姿勢支撐系統，能穩定控制不自主動作
- 若有需要，也包括頭部的穩定
- 整合溝通系統與環境控制系統

Duchenne muscular dystrophy
杜興氏肌肉萎縮症

- It is a genetic disease that causes muscle weakness.
- In a third of affected children it also causes mental retardation, which is rarely severe
- It is progressive
- It manifests itself around the age of three
- It affects 2-3 male children in 10,000
- It leaves a life expectancy of around 25-30 years, constantly increasing thanks to improved treatment of respiratory complications

- 這是一種會造成肌肉無力的遺傳性疾病。
- 大約三分之一受影響的兒童也會出現智能遲緩，但情況很少嚴重。
- 這是一種會隨時間進展惡化的疾病。
- 通常在三歲左右開始出現症狀。
- 每一萬名男性兒童中約有 2～3 名受到影響。
- 患者的平均壽命約為 25～30 歲，但隨著呼吸系統併發症治療的改善，其壽命正不斷延長。

In Duchenne muscular dystrophy
杜興氏肌肉萎縮症

- The only impairment that is always present is the progressive loss of muscle strength, including of the respiratory muscles and the heart.
- Muscles also lose "elasticity"
- Loss of strength and elasticity causes deformity
- In the limbs, the muscles near the trunk are more affected than those of the hands and feet
- Intense muscle exercise worsens paralysis
- Walking is usually lost around age 10-12
- The transition to a wheelchair is sometimes difficult
- Almost always (9/10) a vertebral deformity develops

- 唯一一定會出現的損害，是肌肉力量的持續、漸進性喪失，包括呼吸肌與心肌的無力。
- 肌肉也會失去「彈性」。
- 肌肉力量與彈性的喪失會造成變形。
- 在四肢中，靠近軀幹的肌肉比手部和腳部的肌肉受影響更嚴重。
- 高強度的肌肉運動會使癱瘓情況惡化。
- 通常在 10–12 歲之間會喪失行走能力。
- 轉換到使用輪椅的階段有時會很困難。
- 幾乎總是(9/10 的機率)會出現脊椎變形。

The user with muscular dystrophy
肌肉萎縮症使用者

Wheelchair needs:

- Compensate ***as soon as possible*** the limitation of walking (a need not always shared)
- Allowing mobility with little effort
- Give comfort in a state of immobility
- Promote symmetrical alignment…
- …while still maintaining functionality
- Adapting to the growth and progression of the disease
- Provide safety: most fractures are due to falls from wheelchairs!

輪椅需求:

- 盡可能及早彌補行走能力的限制(雖然這個需求不一定被所有人接受)。
- 讓使用者能夠以最小的力氣達到移動能力。
- 在無法動彈的狀態下提供舒適性。
- 促進身體 對稱對齊 ……
- ……同時仍要 維持功能性。
- 配合疾病的成長變化與進展而調整。
- 提供安全性:大多數骨折其實是因為從輪椅跌落造成的！

The user with muscular dystrophy
肌肉萎縮症使用者

Some solutions to consider:

- Provide adaptable wheelchairs and seating systems *and adapt them in a timely manner*
- Propose soon a posture system that makes compensations for stabilization unnecessary
- Propose an electric wheelchair soon
- Carefully select and position the joystick or alternative controls
- Thinking about a dynamic posture system
- Recommend one or more seat belts
- Provide accommodation for a fan
- Offer anti-decubitus cushions when prolonged support causes pain

可考慮的一些解決方案:

- 提供可調整的輪椅與坐姿系統，並及時進行調整。
- 及早建議使用一套姿勢系統，使穩定性所需的代償動作變得不再必要。
- 儘早提出使用電動輪椅的建議。
- 仔細選擇並調整操縱桿(joystick)或其他替代控制裝置的位置。
- 思考使用動態姿勢系統的可能性。
- 建議使用一條或多條安全帶。
- 為電風扇預留安裝空間。
- 當長時間坐姿造成疼痛時，提供防褥瘡坐墊。

More ideas for posture
更多姿勢方面的想法

Let's try **from the beginning** a postural backrest, instead of the normal canvas backrest:

- To adjust the height and inclination of the backrest, and the depth of the seat
- To apply lumbar support (if useful)
- For timely and effective application of side supports, front supports, head restraints

Let's try to contain pelvic obliquity and lateral flexion of the trunk as soon as possible, **compatible with functionality.**

We use armrests:

- Adjust the height according to the user's instructions
- If necessary, widen to support your entire forearm

You need a headrest:

- With tilting and/or reclining wheelchairs
- When the neck muscles are weak
- To everyone, for car transport

我們一開始就使用姿勢調整型靠背，而不是一般的帆布靠背：

- 用來調整靠背的高度與傾斜角度，以及座椅的深度
- 用來提供腰部支撐（如果有用）
- 用來及時且有效地加裝側邊支撐、前方支撐、頭部支撐

讓我們儘可能及早控制骨盆傾斜與軀幹側彎，同時仍要兼顧功能性。

- **我們使用扶手：**
- 依照使用者的指示調整高度
- 若有需要，可加寬以支撐整個前臂
- **你需要頭靠：**
- 用於可傾斜和／或可後仰的輪椅
- 當頸部肌肉較弱時
- 在車輛運輸中，每個人都需要

Spina bifida or myelomeningocele
脊髓裂或脊髓膨出

- It causes damage to the spinal cord: the vertebrae do not close posteriorly during the first month of gestation and the spinal cord comes out
- It is not progressive but often creates long-term complications
- It affects 1-2 children in a thousand.
- It often has complications affecting the brain (hydrocephalus (80%), Arnold Chiari malformation, birth trauma, spinal cord tethering with stretching, meningoencephalitis)

- 它會造成脊髓受損：在胚胎發育的第一個月，椎骨無法在後方閉合，導致脊髓外露。
- 它不是進行性的疾病，但常會造成長期併發症。
- 它影響每一千名兒童中的 1–2 名。
- 它常伴隨影響大腦的併發症（如：水腦症[80%]、Arnold–Chiari 畸形、出生時外傷、脊髓牽拉症候群、腦膜腦炎）。

In spina bifida:
在脊髓裂中：

- Damage to the spinal cord causes:
  - Flaccid and/or spastic paralysis of the lower limbs, more or less severe depending on the level of injury
  - Loss of sensation in the lower limbs, more or less severe depending on the level of injury
  - Bladder, bowel and genital dysfunction
  - Primary malformations and secondary deformities
- Any damage to the brain causes:
  - Mental retardation
  - Movement disorders due to cerebral palsy
- Often the path is lost in the transition to adolescence

脊髓損傷會造成:

- 下肢鬆弛性和／或痙攣性癱瘓，其嚴重程度取決於受損的脊髓節段位置
- 下肢感覺喪失，其嚴重程度也取決於受損的脊髓節段位置
- 膀胱、腸道與生殖系統功能障礙
- 原發性畸形與次發性變形

任何大腦損傷會造成:

- 智能發展遲緩
- 由腦性麻痺引起的動作障礙

在進入青春期的過渡階段中，發展方向常常會迷失或出現倒退。

The user with spina bifida
脊髓裂使用者

Wheelchair needs:

- Facilitating independent mobility **early**
- Facilitate standing and transfers
- Support in the presence of deformities
- Protect from lack of sensitivity
- Protect against latex allergy
- Preventing pathologies caused by overloading residual muscles
- Adapting to growth and change

輪椅需求:

- 及早促進自主移動
- 促進站立與移位(轉換姿勢)
- 在存在變形時提供支撐
- 保護使用者免於因缺乏感覺而受傷
- 避免接觸乳膠以防乳膠過敏
- 預防因殘餘肌肉過度使用而引起的病變
- 能隨著成長與變化進行調整

The user with spina bifida
脊髓裂(脊柱裂)使用者

Some solutions to consider:

- Electric wheelchair
- wheelchair with custom setup
- Adequate ground clearance for standing and sitting
- Removable footrest supports
- High protection anti-decubitus cushion
- With scoliosis, postural back or corset
- Laterally adjustable footrests
- Absence of latex components
- Modular systems

可考慮的一些解決方案:

- 電動輪椅
- 客製化設定的輪椅
- 站立與坐姿時皆具備適當離地高度
- 可拆卸的腳踏板支撐
- 高防護等級的防褥瘡坐墊
- 若有脊柱側彎，使用姿勢調整型靠背或支架(護具)
- 可左右調整的腳踏板
- 無乳膠成分的零件
- 模組化系統