

Appropriate wheelchairs and mobility devices

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Wheel-Chair

- Seating needs
- Mobility needs

- Mobility level
- Environments
- Context (inc. family and stigma) •

Mixed methods of mobility

Mobility

independent
locomotion



- Tatlow (1980)
 - Children without independent mobility are more passive and have a vague body image
- Butler (1986)

- PM increases interaction with objects and people
+ exploration
- Anderson et al. (2013)
 - Self-generated mobility and development are
bidirectional

WHO

Table 1. Key steps of wheelchair service delivery:

Step 1	Referral and appointment
Step 2	Assessment
Step 3	Prescription (selection)
Step 4	Funding and ordering
Step 5	Product (wheelchair) preparation
Step 6	Fitting
Step 7	User training
Step 8	Maintenance, repairs and follow up



Referral

- You see the student and know the needs
- Family doctor referral: health fund (kupat holim) for assessment of AT
- MoH accepts forms from registered P/OT who have done a home visit
- Send medical form for parents to fill (nurse and doctor: Tofes Refu'y Siudy)
- Work with health fund therapist ... Next stage..

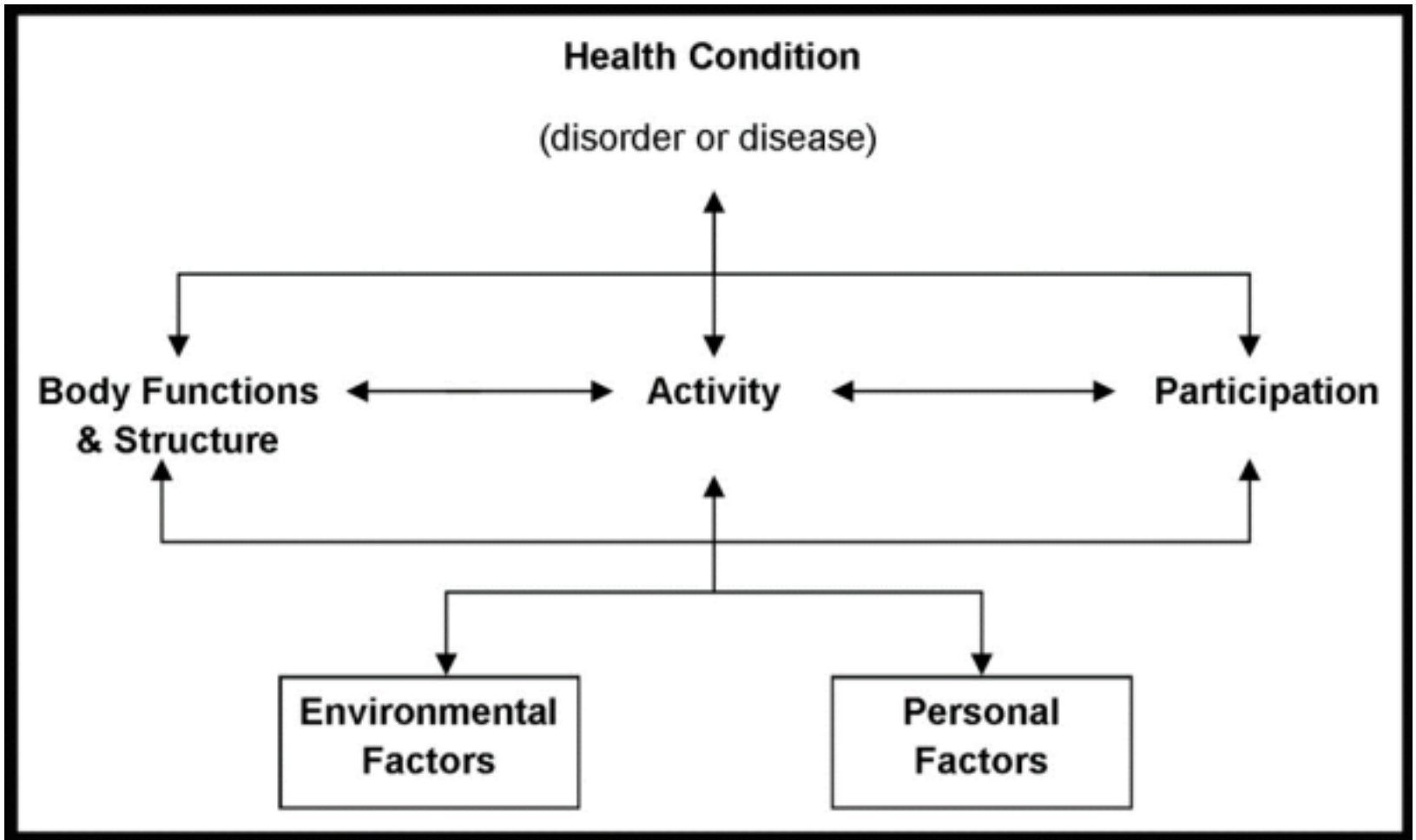
WHO

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WSTP Basic Reference Manual

Holistic assessment



Holistic assessment

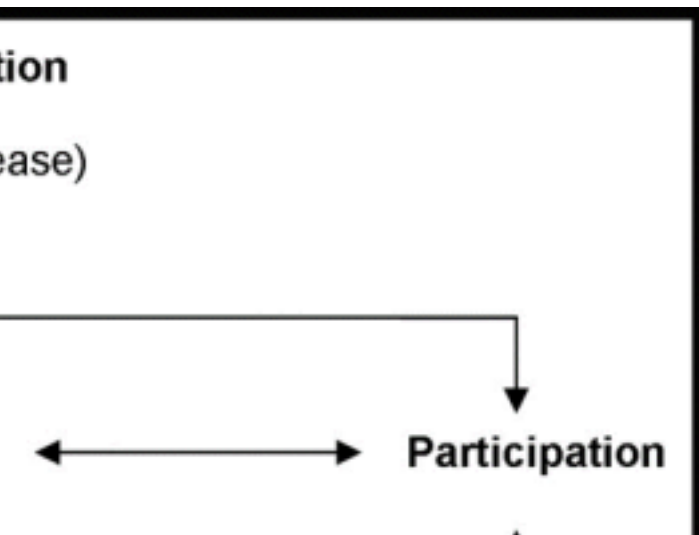
Seating
ROM (A+P)

Tone
Balance
Cognitive
Behavioral
Prognosis
Heart-Lung
Vision
communication

Holistic assessment

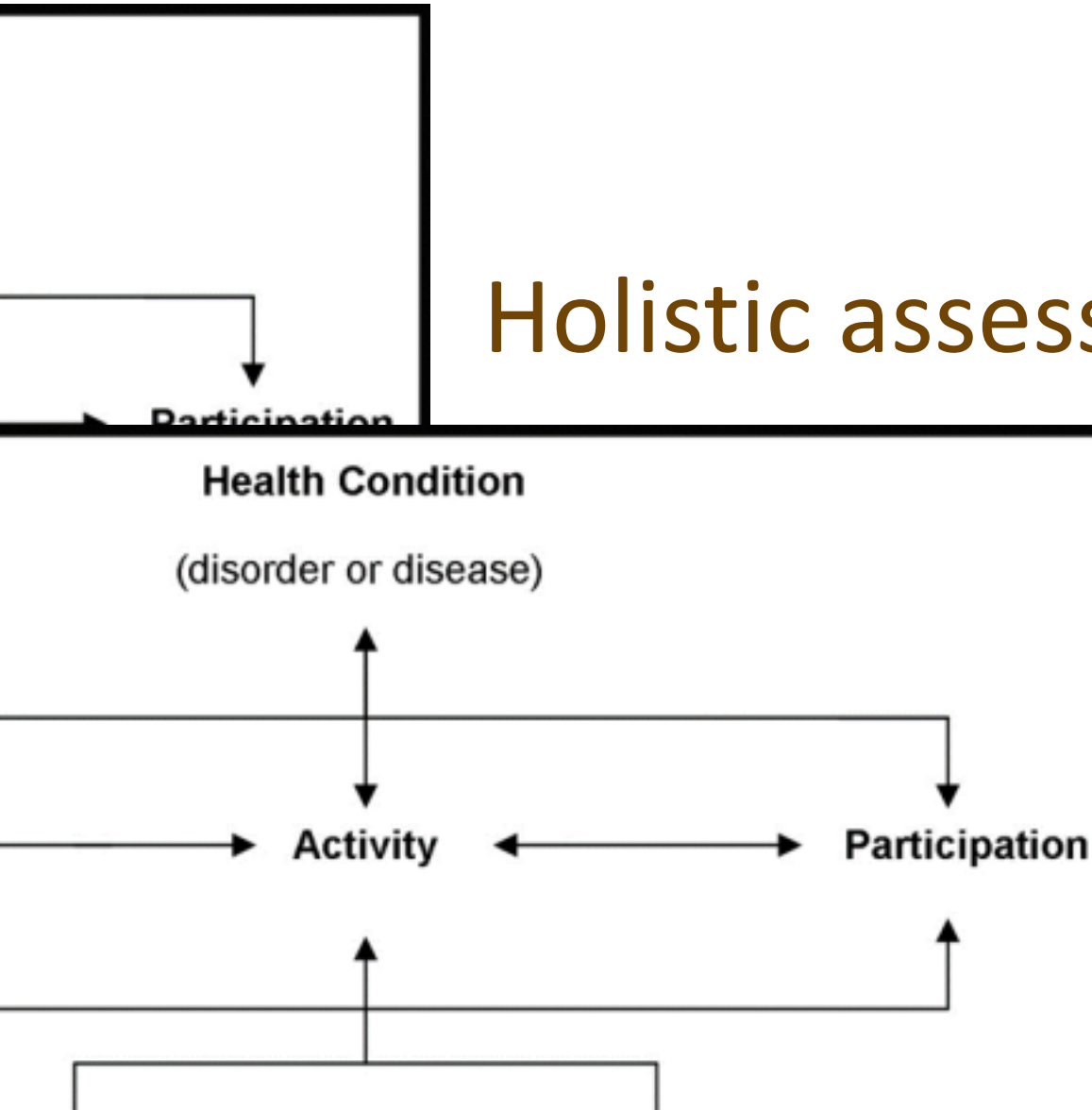
ADL in wheelchair
Transfers
Transportation

Holistic assessment



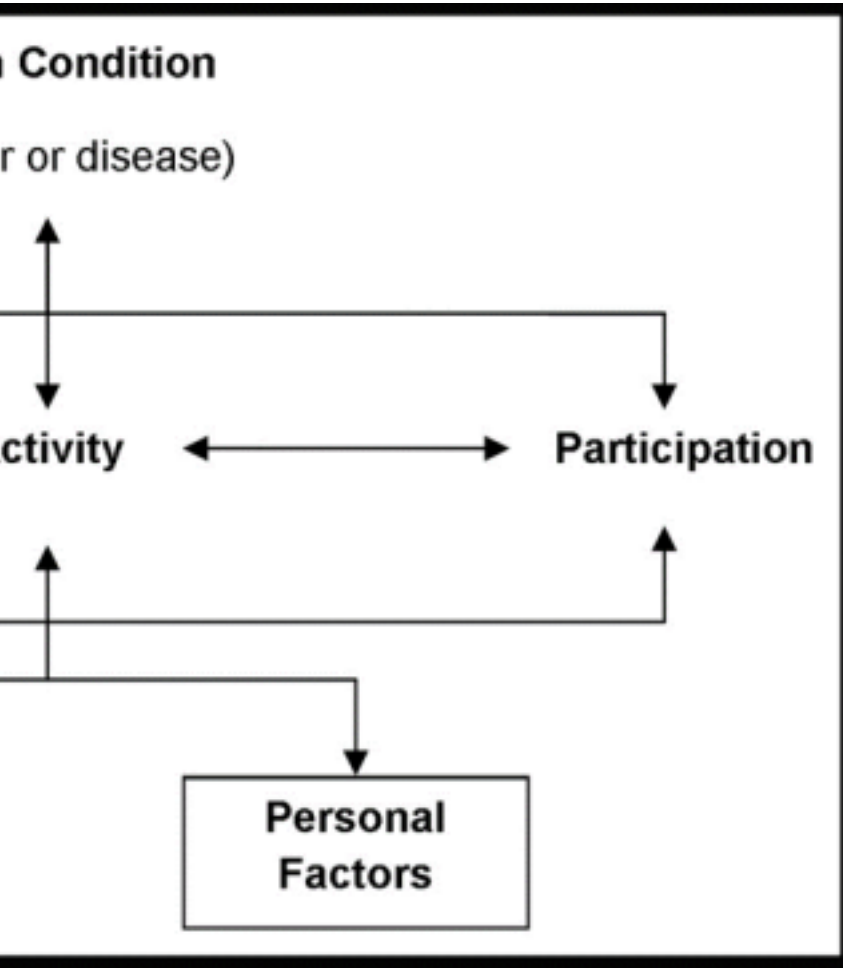
Roles- home and
larger family
Roles- leisure
Goals..

Holistic assessment



- Physical barriers: each environment
- Funding
- Social barriers
- Equipment available
- Maintenance

Holistic assessment



Personal and family view

Acceptance

Independence

Stigma

.....

ATD Selection Framework

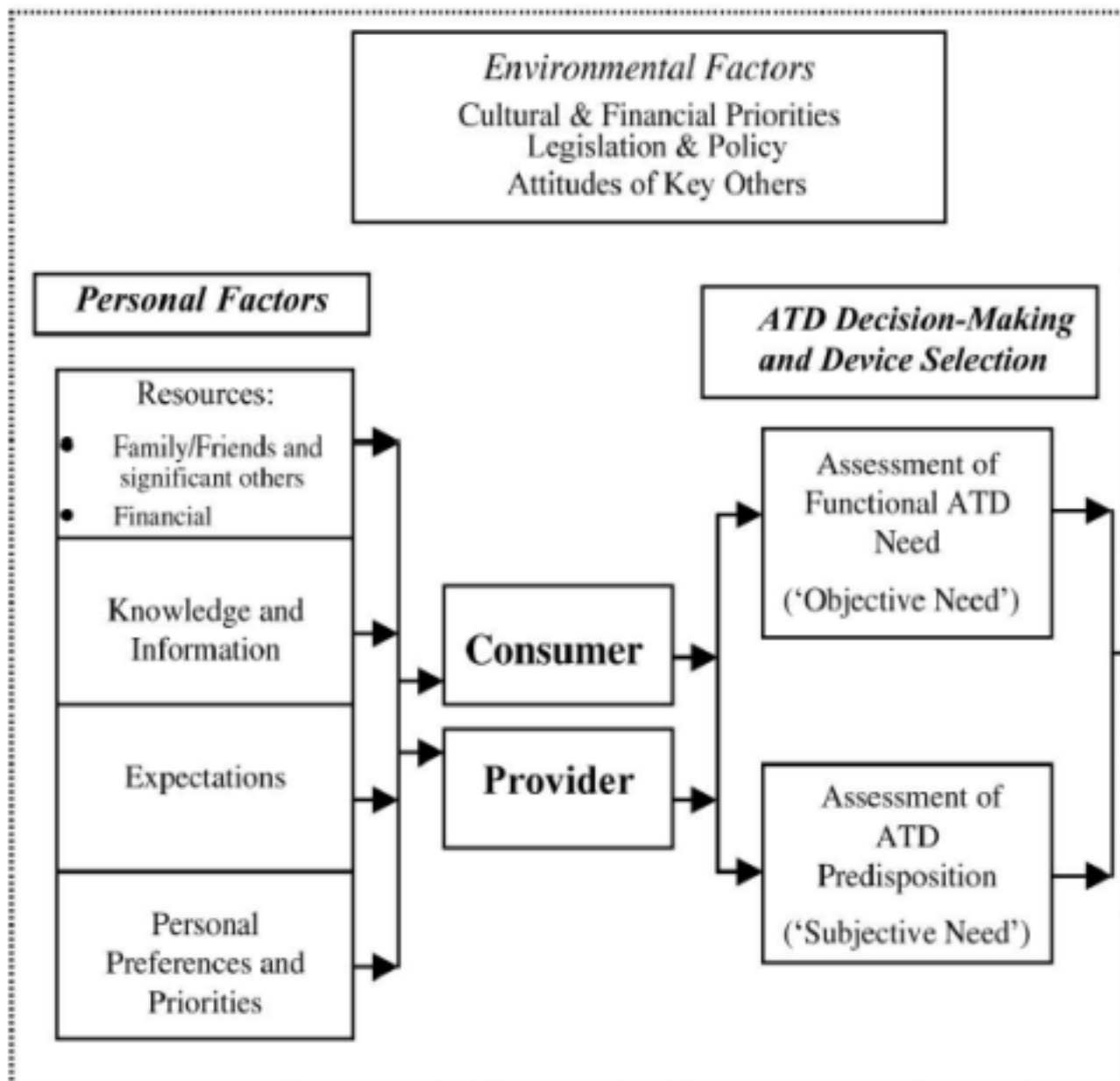
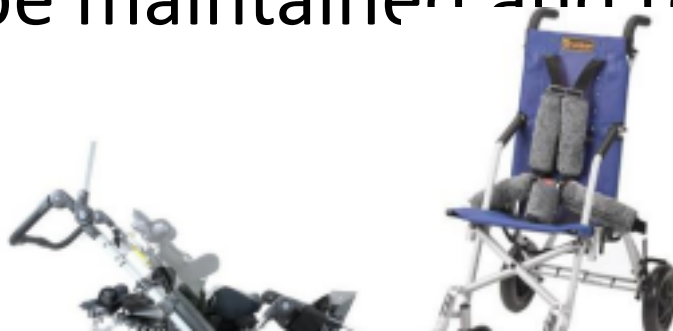


Figure 2. Framework for modelling the selection of assistive technology

Appropriate wheelchair

1. Meets the user's needs
 - Transfer
 - Mobility
 - Transportation
2. Meets the user's environment
3. Ensures postural support (helps the user to sit upright)
4. Can be maintained and repaired locally (safe)

Case



study

Yasmine :

8 years old

Active epilepsy

Mobility:

walks with constant

pushchair

Often needs to lie or rest

Lives on the 3rd floor



supervision

Private family car













Assessment

Wheelchair Outcome Measure-Young person (WhOM-YP)

- Goal for indoor and/or outdoor

- Participation goals similar to COPM
- Self rated or proxy: satisfaction and importance

seating and Comfort—
עצמי לביצוע וחשיבות

<http://millerresearch.osot.ubc.ca/whom-terms-of-service/>



Assessments

Wheelchair Use Confidence Scale

(WheelCon) • Questionnaire for adult wheelchair users • Indoor and outdoor use

- Helps choose goals
- Quick

<https://millerresearch.osot.ubc.ca/tools/mobility-outcome-tools/2/wheelchair-use-confidence-scale-wheelcon/>



Manual

Powered

Assessments

Wheelchair Skills Test /Training

Program • Assessment and training program

- Manual or powered
- Adults

<http://www.wheelchairskillsprogram.ca/eng>

WHO



WSTP Basic Reference Manual

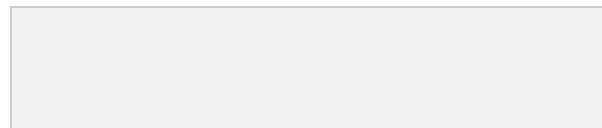
Assessment + prescription

What type of
wheelchair? • Main method of
mobility?

- Active propellers?
- Transfers?
- Stairs?
- Transport?

Level 1 (1+)

Independent in



mobility and ADL (transfers) • lightweight

- Front axis
- Folds

Level 2

Independent mobility, assistance in ADL (transfers)

- Medium weight
- Central axis
- folds

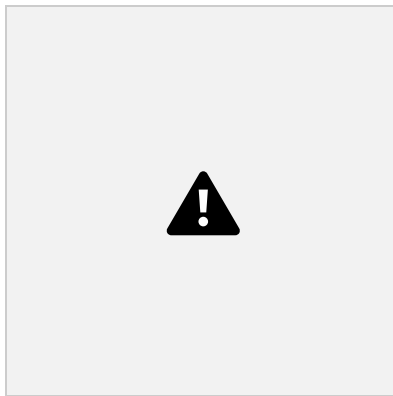
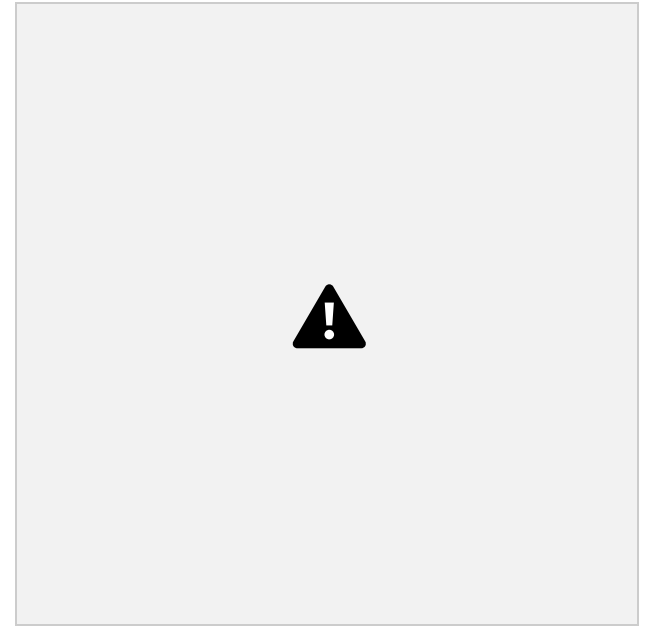
Level 3



Assistance in mobility and
ADL Have a powered chair

- Heavy
- Central axis
- Folds

(can be a transit wheelchair)



Level 4

Can not hold posture against gravity • Wheelchair or stroller • Tilt and/or recline options • Do not fold (or not easily) • Heavy



hard seating surface or supports

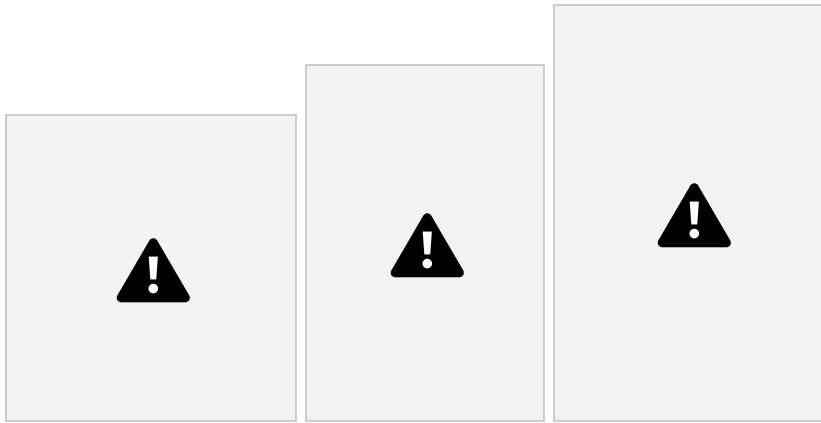
- Large strollers without (much) support

- Small/large with recline and support •

- Small/large with tilt

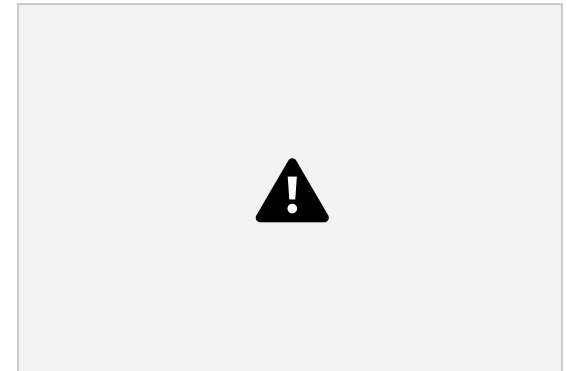
Strollers

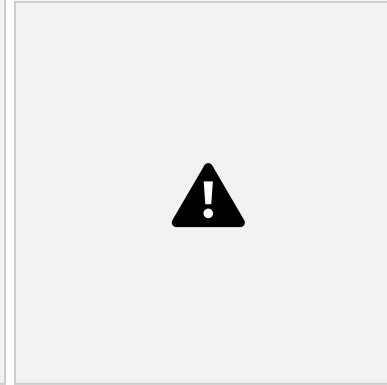
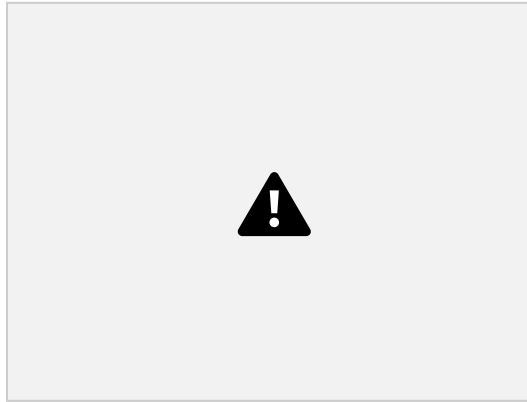
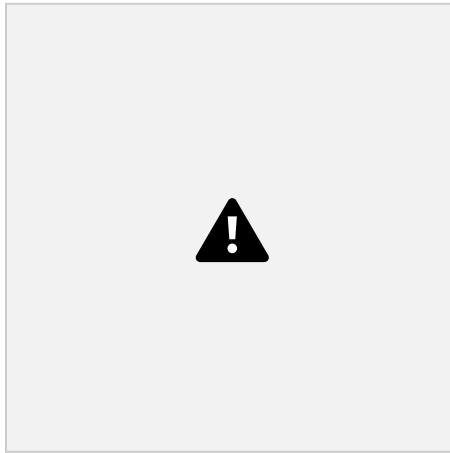
- Standard stroller with (and recline)



Powered mobility

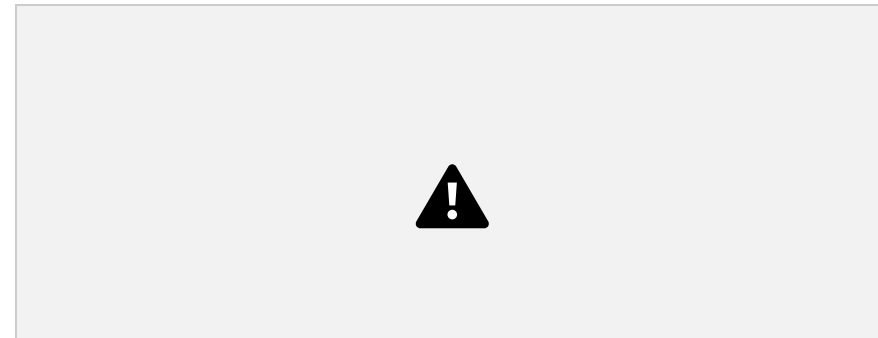
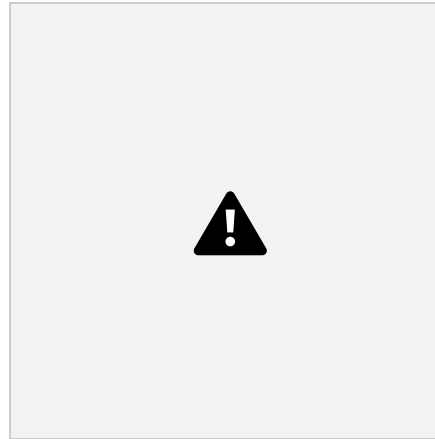
- Can be in addition to walking / manual wheelchair
- To be discussed next lecture





Other options

- Office chair
- Chair on wheels

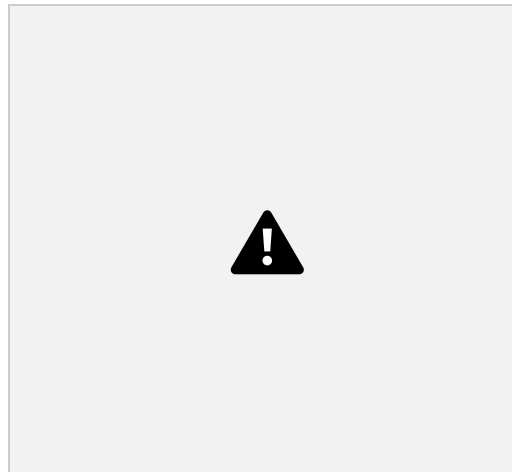


- Scooter



Transfers

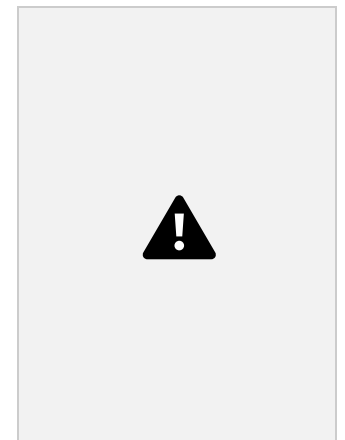
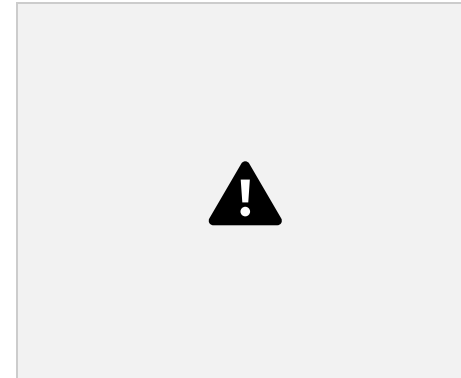
- Via standing
 - Two separate footplates



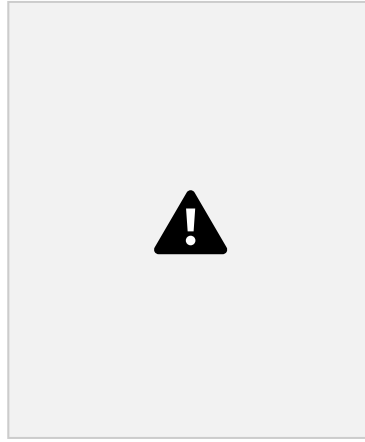
- Seat height
- Side transfers
 - Can have single footplate
 - flip up arm rests (or no armrests)
- Hoist
 - Mobile: 2 footrests

Casters (front wheels)

- Maneuverability
- Smaller
 - better turning
- Larger



– over obstacles



– gravel

Back wheels

Propel the chair

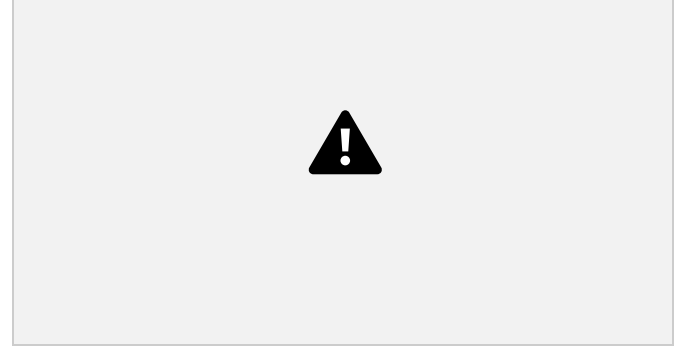
- Larger wheels (61 cm): more efficient
- Smaller wheels (51 cm): child height •

Transit wheels (20 cm): pushed

Other options:

1 handed

Special push rims



Wheel base

Stable

Small base

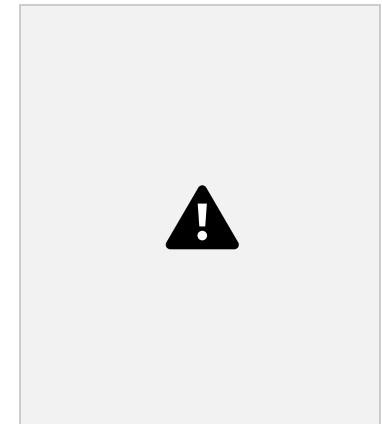
-maneuverable

Large base -



Axis

Rear axis Mid Axis Front Axis Stable - Tippy Hard
to propel Efficient propulsion



Also height of seat-wheel

Higher seat- transfers

Lower seat- foot propellers, transfers

Elbow at 90^0













Axis

Relation between front and back
wheel - Create permanent tilt



- Can lower or raise seat height

Camber

- Angle of rear wheel
- Stability
- Increases width
- 5°



Measurements



Measurements and children

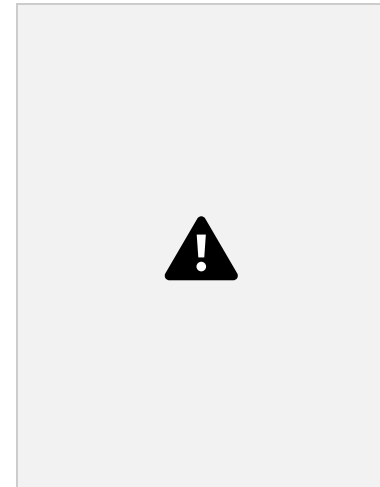
Width:

- Too wide ...
- Growth in width (?)
- Few chairs that expand



Length

- Dangers if too long
- Lengthening chairs
- Fake lengths



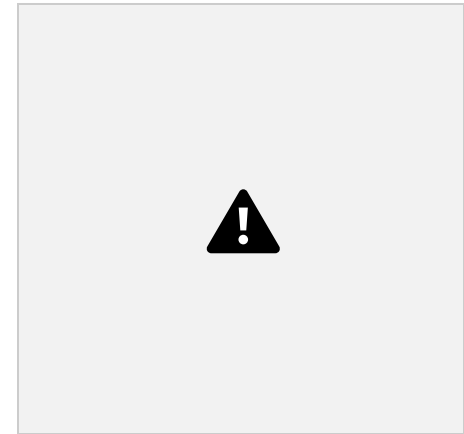


Tension adjustable backrest



Reclining backrest

- Change angle of pelvis-legs
- Allows rest
- Allows pressure distribution •
- Changes gravity pull on trunk •
- Can fold wheelchair
- Large base
- Careful of shearing and slipping •
- Lateral supports can rise to axilla

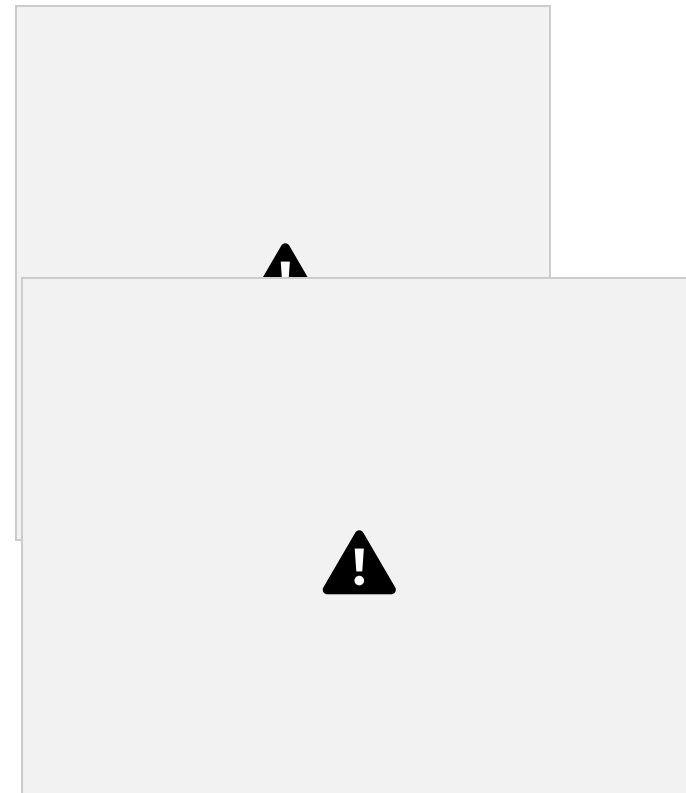


Tilt in space

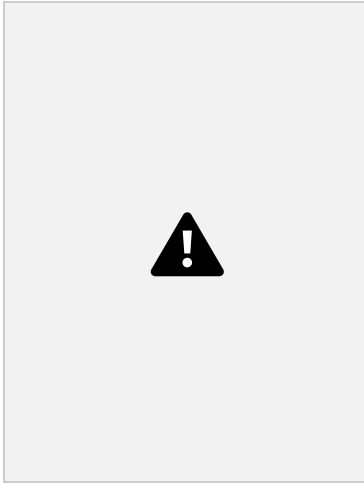
- Changes gravity's pull on body
- Allows rest
- Maintains pelvis- leg angle
- does not effect lateral trunk supports
- Wheelchair does not fold
- Requires heavy, stable base

Leg rests

- Options:
 - Swivel in/out
 - Raising
 - 1 or 2



- Angle :- 70/80/90⁰
- **Important to properly adjust height!!!**



Attached footrests





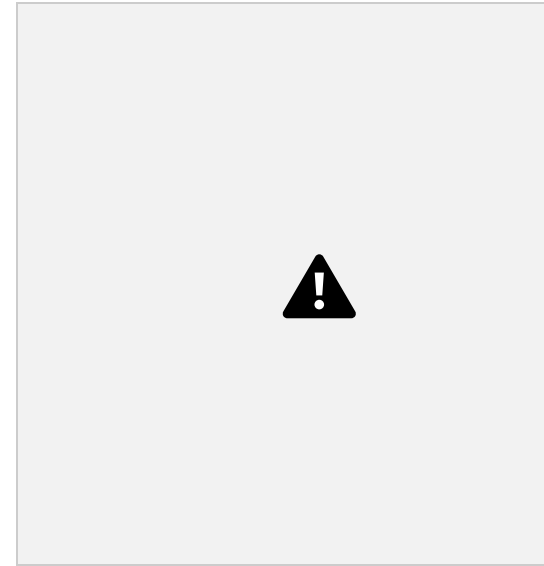
Another option



Arm rests

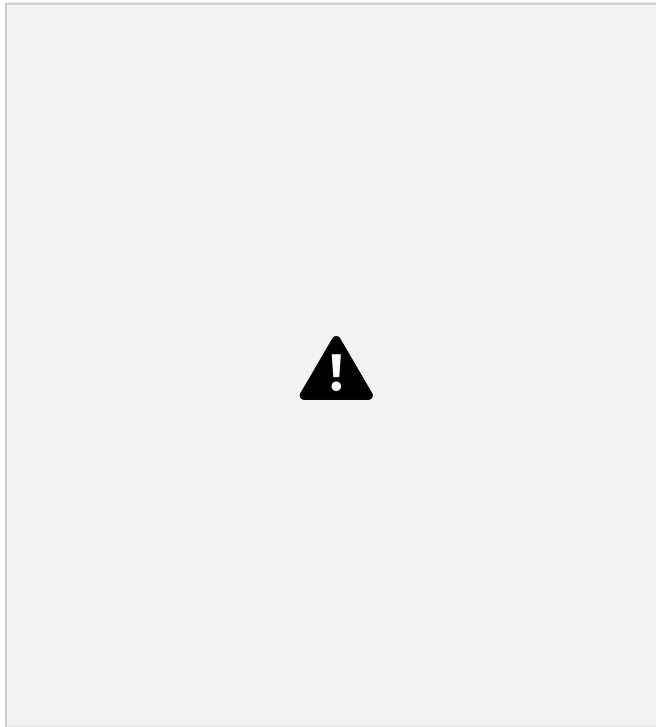
- Full / table / hugging

- Flip Up
- No armrests (mud protector)



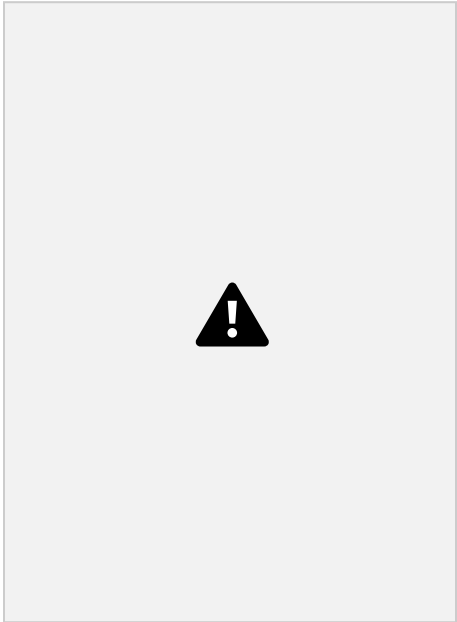
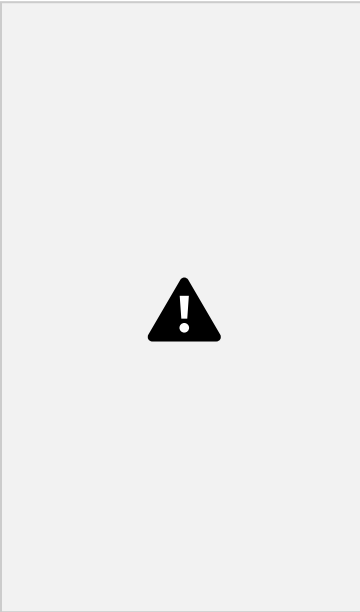
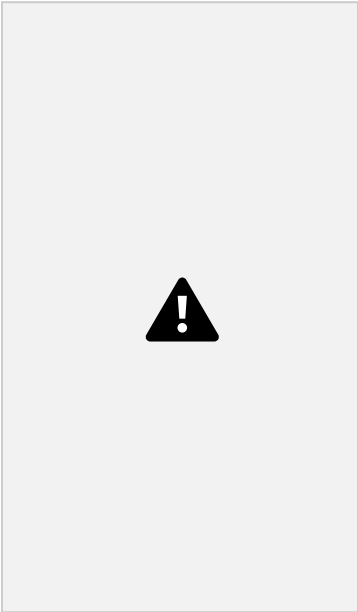
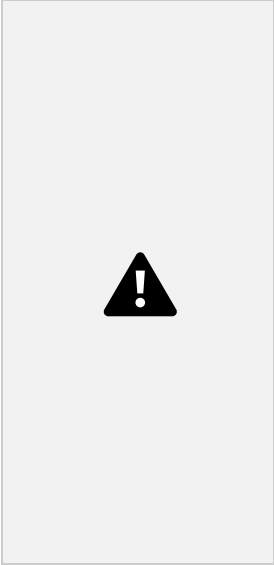
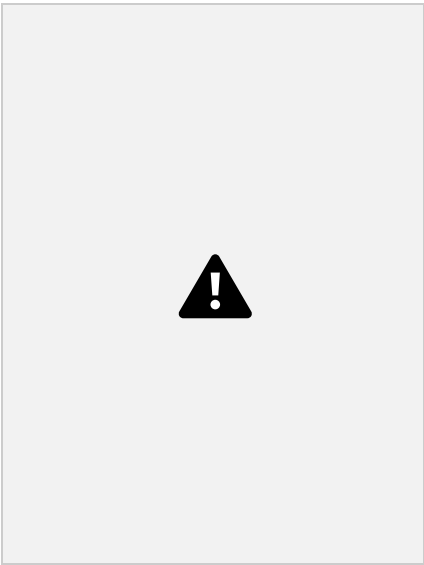
Head rests

- For transport in wheelchair
- To support head (see seating)



Case study

- Amir
 - 13 year old boy
 - Angelman's syndrome
 - Active epilepsy
 - Walks with assistance in walker
 - Can move in school in walker frame
 - Parents want folding stroller as it's easier –
 - Therapist want wheelchair that can self propel







WHO



WSTP Basic Reference Manual

Helping parents

- Receive options from MoH
- How can we **help**?



What does the student need?

- Sizes

- Growth options of chair
- Axis
- Weight
- Tension adjustable back?
- Level 4: how much tilt / recline?

WHO





WSTP Basic Reference Manual

Fitting

Free access
source •

Fitting
wheelchair for •
seating and
mobility



Follow up •

Assessments and •
forms

[http://www.who.int/disabilities/tec
hnology/wheelchairpackage/en/](http://www.who.int/disabilities/technology/wheelchairpackage/en/)

Many •

languages אנגלית,

WHO



WSTP Basic Reference Manual

User training

Details in next class

- Pushing
- Turning
- Up / down hill
- Stairs
- Partial / full Wheelie



https://www.youtube.com/watch?list=PLq7Jn97EpZFbYFQ2GA2-YlwT_-V1b2

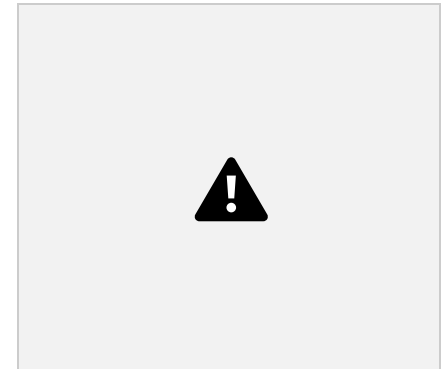
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Bc&time_continue=7&v=juLFv9kmpPs

WHO



Maintenance

- Study of n=216 , half participated in a group about wheelchair maintenance
 - Less accidents
 - Less pressure sores



SCIRE web site

Hansen, R., Tresse, S., & Gunnarsson, R. K. (2004)

Maintenance

Why teach maintenance?

- People who don't do maintenance have 10 times more injuries! (Best, Routhier & Miller, ; Chen, 2011)
- Empowerment
- Responsibility



Maintenance

- Teach children how to take care of their wheelchairs
- What can go wrong
- Who to contacts



Case study

- Rob
 - Diplegic CP ,Mainstreamed
 - Uses walker at home, needs school mobility
 - Level 1
 - 32 cm wide and 40 cm long
 - Lives on the 3rd floor
 - Describe appropriate wheelchair
 - Choose a wheelchair from the list



Safe transport in wheelchairs or strollers

The center for safe transport of
children with special needs

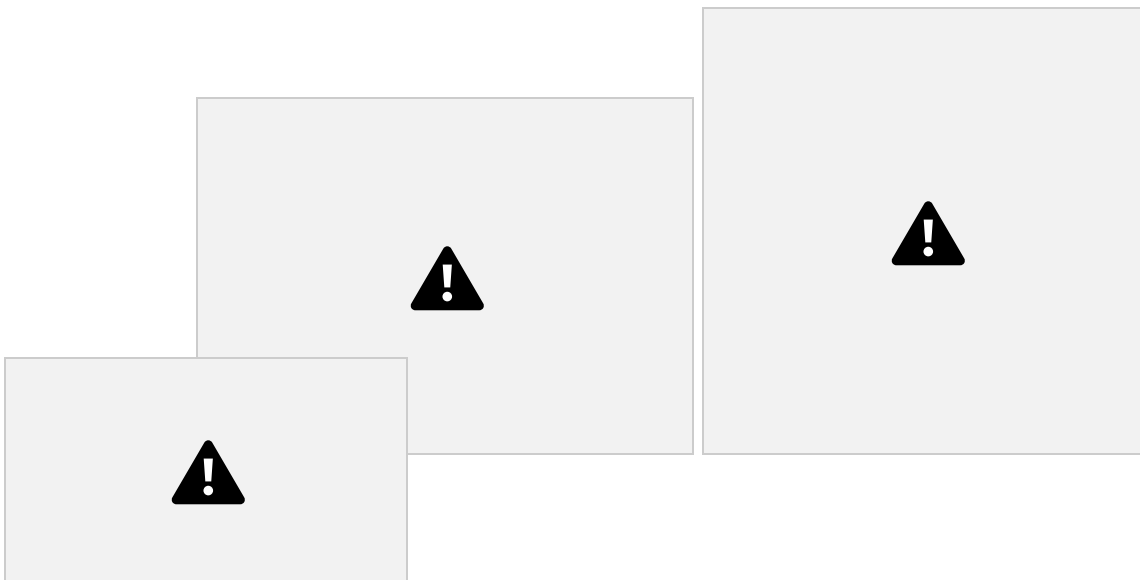
In memory of Tobi Korn

Occupational Therapy, Alyn



Safe transport

- It is safer for child to sit on the car seat, booster or car seat and not in a wheelchair or stroller
- If the child needs to stay seated in their wheelchair/stroller it needs to be tied down and the child as well



נסיעה בטוחה של אדם היושב

בכיסא גלגלים או טיולון

- אם אדם נוסע בכיסא גלגלים או עגלה בתוך הרכב, כיסאו חייב להיות מעוגן לשלדת הרכב ב 4 נקודות או באיזי לוק (מתאים רק לנסיעה ברכב של המשפחה, וחייב אישור של משרד הבריאות לכיסא שמומן דרכו).

- אדם היושב בכיסא או בטיולון חייב להיות מעוגן בחגורה נפרדת לשלדת הרכב.

- ללא עגינה, במצב של תאונה הכסא והאדם יושב בתוכו יעופו.

- יש להשתמש במשענת ראש מחוברת לכיסא גלגלים או

לשל
דת

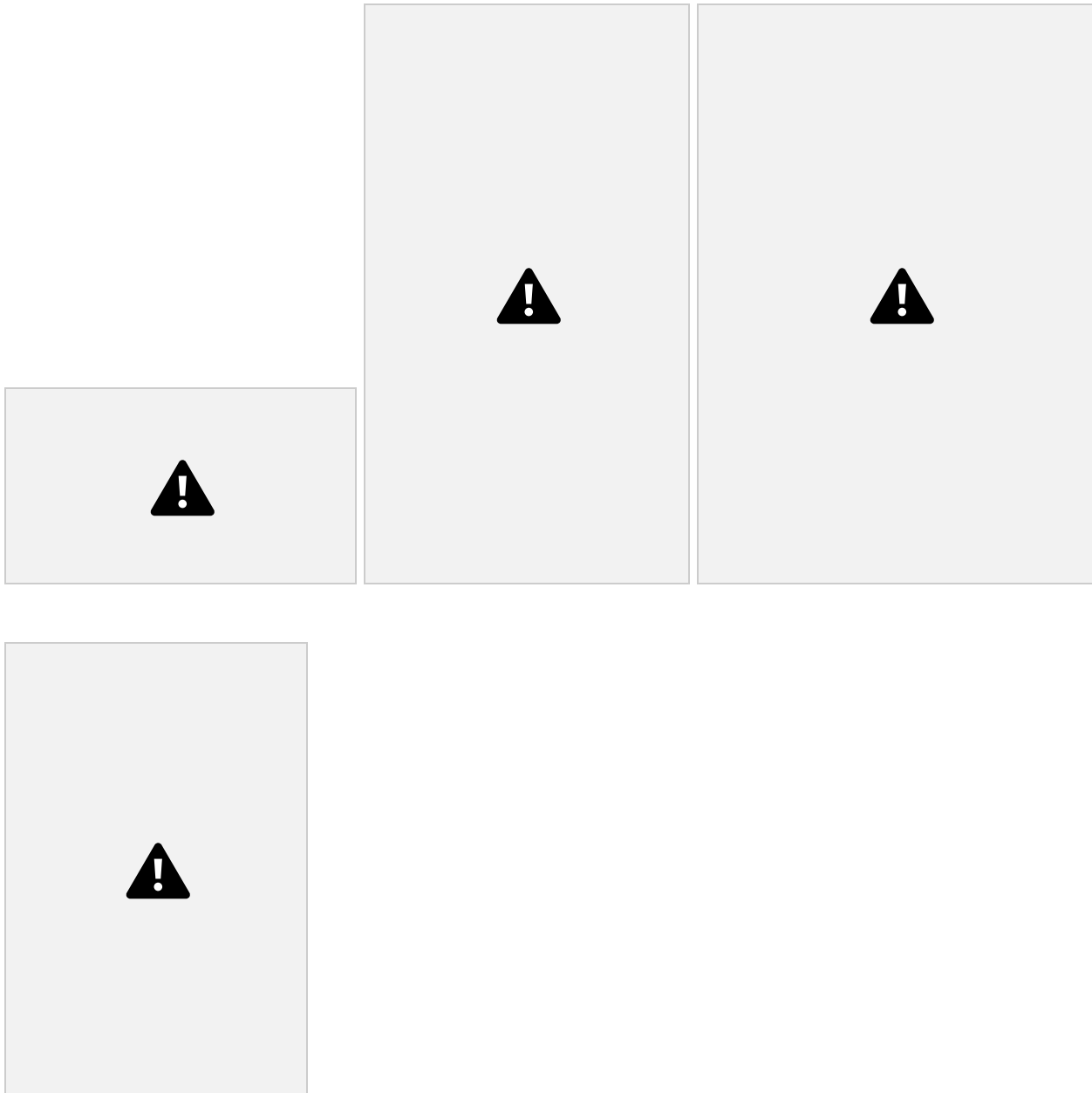


Tie-downs

4 point chair tie

Person tie-down -down





Where's the head rest!