Walking Aids

1

Walking Aids

2

How to develop a concept

Request/wish of
1.patient and family
2. doctores, therapists, institutions
(Including Target agreement)

Physical Examination

Concept of walking aid

3

Possible additions/support

4

Orthosis when there is too much internal rotation in hip joints

5

Orthosis when legs are crossing

6

bedside support

7

Walking aids

8

Indications

- Physical activation
- Prevention of inactive osteoporosis
- Prevention of hip dislocation
- Prevention of contractures
- Strengthening leg muscles
- Strengthening core muscles
- Support for independence
- Social integration

9

Contraindications

- Pain
- Existing danger to others oder self
- Cardiovascular problems
- Excessive knee or hip flexion contractures (over 30°)
- Medical ban
- Patient refuses

10

Function

- Enlargement of the support area
- Increased stability
- Support for weak muscle groups
- Enabling locomotion

Walking aid concepts




Walking sticks



Stefan Steinebach, LVR Klinik Bonn-Kinderneurologisches Zentrum, International Meeting 25.-27. June 2024

13

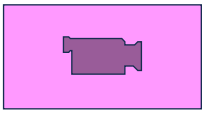
Walking sticks

Pros

- High weight transfer on feet
- Alternating support surface
- Promotion of core muscles
- High demand on balance
- Little space required
- EasyTransition to free walking

Cons

- Changing support surface
- High demand
- Hardly any interception possible
- Higher risk of falling
- No fluid walking pattern with strong support



14

Anterior Walker

15

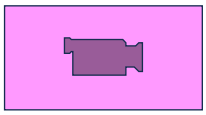
Anterior Walker

Pros

- Light
- Agile
- Consistent support surface
- CSP line of force action outside the USF of the walking aid
- Support for trunk muscles
- High demand on trunk and leg muscles
- Transition to free walking
- Positive psychological aspect due to the possibility of support in the direction of tripping/falling

Cons

- Can roll faster than patient can walk
- No support to the rear
- Upper body posture bent forward
- Therefore more tension on the back thigh muscles
- Therefore shorter stride length
- No possibility of relief when standing



16

Posterior Walker

17

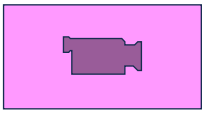
Posterior Walker

Pros

- Relief for trunk muscles
- Consistent support surface
- Promotion of trunk muscles
- Hip extension achievable
- Therefore longer stride length
- Promotion of trunk muscles
- Promotion of support function
- Many equipment options
- Good hip joint extension possible
- Variable muscle activation
- Relief position possible when standing
- Good feeling of safety
- CSP line of force action within the USF of the walking aid

Cons

- Less physical strain than with anterior walker or canes
- supportLine of force action
- MPofB within the SA of the walking aid
- Large folded size
- Hardly possible to catch in case of stumbling

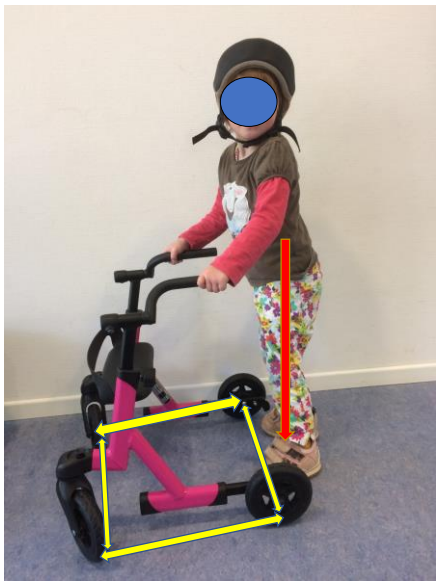


18

Posterior Walker also for adults?

19

Gehhilfe und USF



20

support alternatives

21

holding alternatives

22

for hip extension and pelvis stability

23

for safety

24

gait trainer





25

gait trainer

Pros

- Good hold on the torso
- Safe movement
- No falling
- Relief of the legs possible
- Leg crossing can be prevented
- Many accessories

Cons

- No independent use
- In and out only with an assistant
- Patients sit on seat - if adapted
- No walking with seat, but locomotion
- Large and heavy depending on model and size
- Therefore transportation may be difficult

26

splint-guided walking aids

27

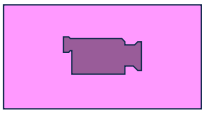
splint-guided walking aids

Pros

- No tripping/falling possible
- Good hold on the trunk
- Guided alternating leg movements possible
- Great feeling of safety
- No crossing of legs possible
- Walking movements of children where you would not expect it

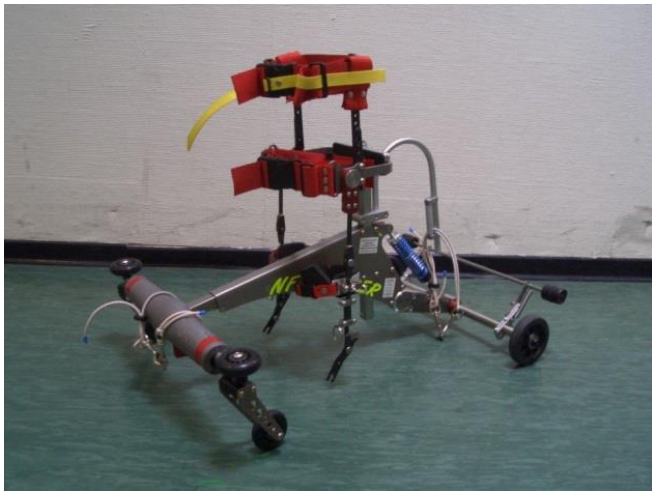
Cons

- Not always body weight on the feet
- High price
- No independent positioning
- Demanding positioning



28

splint-guided walking aids



29

gait training- a different way

30

Scientific evidence

31

Anterior or posterior walkers for children with cerebral palsy? A systematic review
Marilyn Poole , Doug Simkiss , Alice Rose , François-Xavier Li
Disabil Rehabil Assis Techn 2018 May;13(4):422-433

The impact of walking devices on kinematics in patients with spastic bilateral cerebral palsy
Britta K Krautwurst , Thomas Dreher , Sebastian I Wolf
Gait Posture, Disability and Rehabilitation, 2016 May;46:184-7

Anterior or posterior walkers for children with cerebral palsy?
A systematic review
Doug Simkiss , Alice Rose , François-Xavier Li
Disabil Rehabil Assist Technol 2018 May;13(4):422-433.

Trunk and hip muscle activity in early walkers with and without cerebral palsy--a frequency analysis
Laura A Prosser , Samuel C K Lee, Mary F Barbe, Ann F . VanSant, Richard T Lauer
J Electromyogra Kinesiol 2010 Oct;20(5):851-9.

Effect of altering handle position of a rolling walker on gait in children with cerebral palsy
P K Levangie , M F Guihan, P Meyer, K Stuhr
Phys Therap 1989 Feb;69(2):130-4.

Comparison of anterior and posterior walkers with respect to gait parameters and energy expenditure of children with spastic diplegic cerebral palsy
E S Park , C I Park, J Y Kim
Yonsai Med J 2001 Apr;42(2):180-4.

32

Conclusion

33

Supplying with medical aids

- ... is very complex
- ... ist time-consuming
- ... needs continous further training
- ... is not evidence based
- ... means visualisation of physical limitations
- ... that is why there is a big emotional aspect

34

First and important task

- There cannot be a perfect medical device
- because every medical device has advantages and disadvantages
- Lots of different expectations from different parts of the team
- So the goal can only be the best possible compromise
- Include all aspects of the familys life
- accept the limits of the feasible

Main Tasks

Best possible Self-activity

Best possible Participation

Best possible Quality of life

Early consideration of possible orthopaedic problems

When is a medical device the right one?

- When there is a functional benefit
- Benefit is noticable or/and visible
- It fulfills the predetermined goal

37

38

Thank you for your Attention

stefan.Steinebach@lvr.de

39