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Learning Objectives

1. Summarize the health and functional benefits associated with the use of integrated power standing features
2. Outline the main steps involved in the identification and recommendation of integrated standing, utilizing the ICF model to consider all environments of use
3. List essential features and functionalities of integrated power standing wheelchairs that influence decision-making to optimize long term outcomes for the user

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Paul's Story



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Sitting Comorbidities

☞ Prolonged sitting time has been associated with a graded increase in risk for mortality among sedentary adults. ☞☞



☞ For the able-bodied population, those who spend >8 hours/day sitting are at higher risk for cardiovascular disease, type 2 diabetes, certain cancers, depression and even mortality. ☞☞

(LaBerge et al, 2023)

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Standing in the General Population



Move More and Sit Less

<https://esfdaily.com/2015/06/03/hoggle-stand-reminder-apple-watch/>

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Sitting Comorbidities

Comorbidities and Medical Complexities of Mobility Device Users: A Retrospective Study

(LaBerge et al, 2023)

- 100% of all mobility device users have at least one comorbidity or medical complexity
- 92% (n = 304) had at least 3 medical comorbidities and medical complexities
- Pain was most common reported comorbidity
- 50% of participants had a history of wounds from pressure injuries

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Changing Positions for PWC Users



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Changing Positions for PWC Users



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Health and Functional Benefits of Standing



Permobil White Paper: power standing update 2023

Clinician Task Force and RESNA Position
On the Application of Supported Standing Devices:
Current State of the Literature

Approved by Clinician Task Force: 2/23/2023
Approved by the RESNA Board of Directors: 2/19/2023



RESEARCH ARTICLE

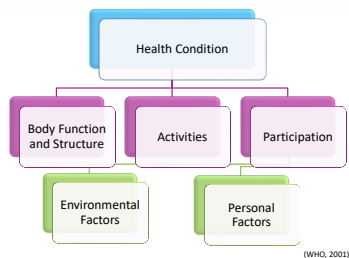
Systematic review and clinical recommendations for dosage of supported home-based standing programs for adults with stroke, spinal cord injury and other neurological conditions

Olivia Taylor, PhD and Robin Longmaid, PhD

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Health and Functional Benefits of Standing



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Body Functions and Structures

- Skin integrity: pressure distribution
- Bladder, bowel, digestion
- ROM
- Bone health
- Spasticity
- Pain
- Strength and balance
- Respiratory function
- Mental health



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Activities and Participation

- Functional Reaching Tasks
 - Office/computer setup
 - Sinks
 - Cupboards
 - Cleaning tasks
- Cooking
 - Stove
 - Microwave
 - Fridge/Freezer
- Mobility
- Independence and Self-Care
- General Tasks and Demands
- Interpersonal Reactions and Relationships/Communication



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Environmental and Personal Factors

- Environments of Use
 - Home, work, school, community, etc
- Elimination of transfer
- Personal preference
- Funding



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Always tie back to the unique goals

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Permobil White Paper Summary

Power Standing WC Benefits

- Higher quality evidence
 - Pressure redistribution
 - Bladder, bowel, digestive functions
 - Ranges of motion and muscle length
 - ADL's, personal/medical care, leisure activities
 - Functional reach
 - Communication
 - Participation in social, work and educational settings
 - Independence
- Lower quality evidence
 - Bone health
 - Spasticity
 - Mental health

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White Paper – Standing dosage

40 mins, 5 x/week

- Positive impact on
 - Self care
 - Standing balance
 - ROM, cardio-respiratory strength
 - Spasticity
 - Pain
 - Skin
 - Bladder and bowel function

“Standing should occur **30 min 5 times a week** for a positive impact on most outcomes while **60 min daily** is suggested for mental function and bone mineral density.”
(Paleg et al, 2015)

60 mins, 4-6 x/week

- Bone health
- Mental health

(Permobil White Paper, 2023)

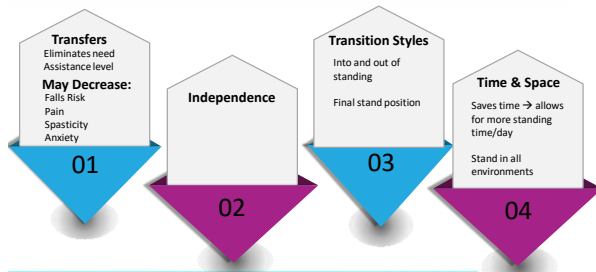
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Separate Versus Integrated Option



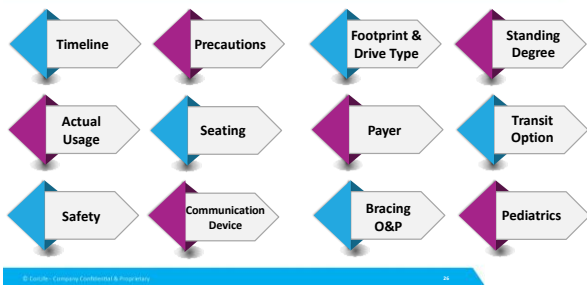
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Decision Making Considerations



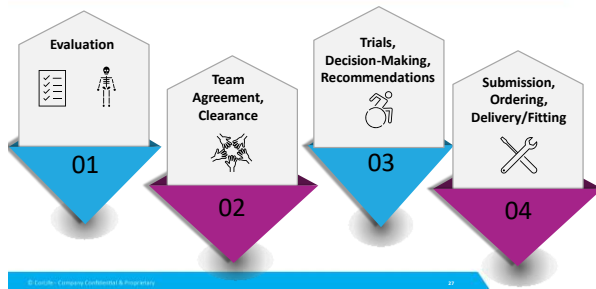
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Decision Making Considerations



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Process



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Trial log

- Standing Goals
 - Specific to reason for request
 - Pressure distribution
 - Functional Independence
 - Timeline

| STANDING GOAL #1 (to identify by PT) | STANDING GOAL #2 (to identify by PT) | | | |
|-------------------------------------------------------------------------------------|--------------------------------------|------|------|------|
| | | DATE | DATE | DATE |
| Vital signs before standing (blood pressure, pulse, and respiratory rate or O2 sat) | | | | |
| Level of assistance needed for transfer and transfer rate | | | | |
| Time spent standing | | | | |
| Degree of upright (90 degrees in fully upright) | | | | |
| Functional activity when standing | | | | |
| Verbal or physical reaction from person standing | | | | |
| Results/changes for Goal #1 | | | | |
| Results/changes for Goal #2 | | | | |
| Other changes/benefits noted | | | | |
| Vital signs after standing | | | | |
| ADDITIONAL COMMENTS: | | | | |

MN DHS Trial Log Example

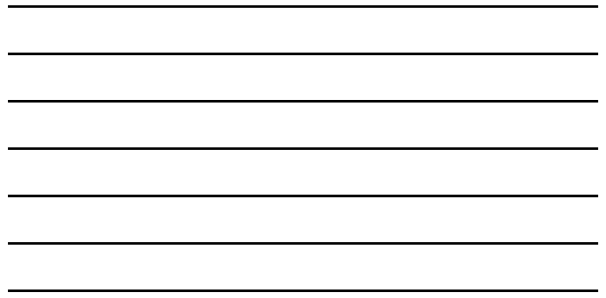
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Manufacturers



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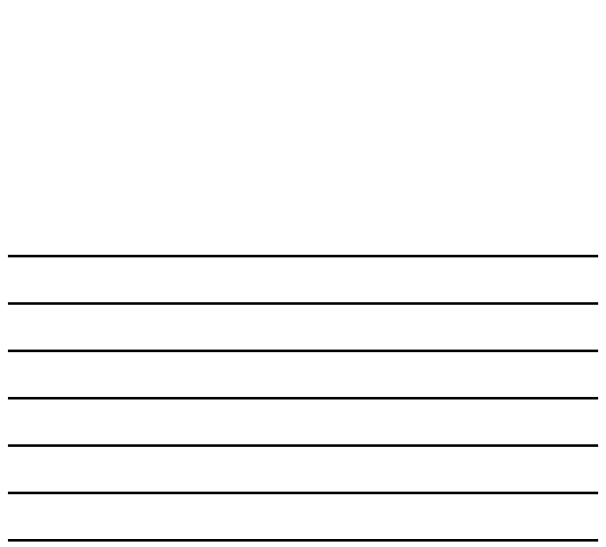
| Group | Permobil FS VS | Permobil M VS | RoVi A3 | RoVi X3 (With Mini-Move) | Auriva FX | Levo C3 | Levo C3MB (S (H) → XL) | Quickie Q700-UP | Amy Systems M3 |
|--------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|---------------------------------------------|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Group | 3 or 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Drive Style | FWD | MWD | MWD | MWD | FWD | Dual Drive: Mid/Front 24.8 | MWD | MWD | MWD |
| Footprint width (in) | 25.5 | 25 | 25.5 | 23.25 | 24.25 | 24.8 | 25 | 24.5 | 25.375 |
| Footprint length (in) | 43 | 36.5 | 36.6 | 36.5 | 42.1 | 43.3 | 43.3 | 36.5 | 35.125 |
| Clearance (in) | 17.5 | 17.5 | 18.5 | 19.5 | 18.5 | 18.9 | 18.9 | 18 | 16.75 (depends on drive tire & seat functions) |
| Seat Width range | 17-23 | 17-23 | 16-21 | 12-17 (mini-max) | 16-20 | 12.6-20.5 | 11.8-19.7 | 16-20 | 15-24 |
| Seat Depth Range | 14-22 | 14-22 | 16-20 (longer kits avail) | 12-17 (mini-max) | 16-20 | 13.8-24.8 | 9.5-20.9 | 15-20 | 15-22 |
| Required Seat Functions for Standing | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Power Center Mount |
| Additional Available Seat Functions | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline ELR Built in elevator | Tilt Recline Seat Elevator ELR | Tilt Recline Power Center Mount Seat Elevator | Tilt Recline Power Center Mount Seat Elevator |
| Max Posture Tilt Degree | 50 | 50 | 45 | 45 | 45 | 35 | 11 | 25 | 50 |
| Seat Elevator Height (in) | 14 | 12 | 7 | 7 | 7 | 10 (Inherent) | 5.9 | 8 | 11 |
| Standing Weight Cap (lb) | 220 (Full stand) | 265 | 250 | 200 | 250 | 310 | 265 | 265 | 250 |

Bases

Standing Programming

Standing Accessories

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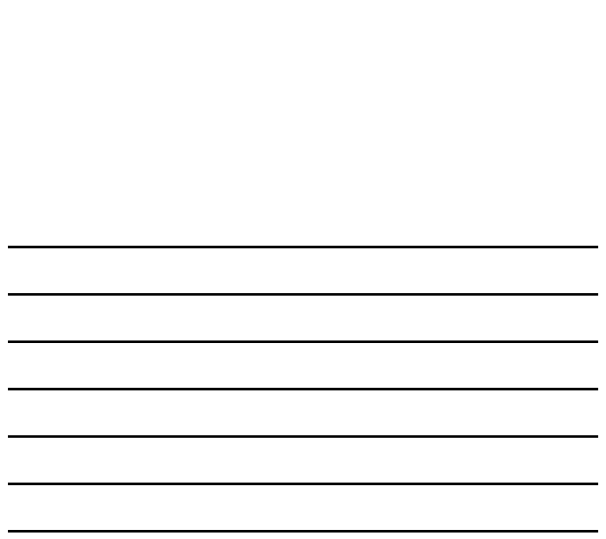
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|--------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|---------------------------------------------|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Group | 3 or 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Drive Style | FWD | MWD | MWD | MWD | FWD | Dual Drive: Mid/Front 24.8 | MWD | MWD | MWD |
| Footprint width (in) | 25.5 | 25 | 25.5 | 23.25 | 24.25 | 24.8 | 25 | 24.5 | 25.375 |
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| Max Posture Tilt Degree | 50 | 50 | 45 | 45 | 45 | 35 | 11 | 25 | 50 |
| Seat Elevator Height (in) | 14 | 12 | 7 | 7 | 7 | 10 (Inherent) | 5.9 | 8 | 11 |
| Standing Weight Cap (lb) | 220 (Full stand) | 265 | 250 | 200 | 250 | 310 | 265 | 265 | 250 |

Bases

Standing Programming

Standing Accessories

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| | Permobil FS VS | Permobil M VS | Rovi A3 | Rovi X2 (With Mini Motor) | Auriva FX | Levo C3 | Levo Combi (55 lbs - 24 h) | Quickie Q700-Lit | Amy Systems MB3 |
|--------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------------|--------------------------------|--------------------------------|------------------------------------------------|
| Group | 3 or 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Drive Style | FWD | MWD | MWD | MWD | FWD | Dual Drive: Mid/Front | MWD | MWD | MWD |
| Footprint width (in) | 25.5 | 25 | 25.5 | 23.25 | 24.25 | 24.8 | 25 | 24.5 | 25.375 |
| Footprint length (in) | 43 | 36.5 | 36.5 | 36.5 | 42.1 | 42.3 | 42.3 | 36.5 | 35.125 |
| Ground clear (in) | 17.5 | 17.5 | 18.5 | 19.5 | 18.5 | 18.9 | 18.9 | 18 | 18.75 (depends on drive tire & seat functions) |
| Seat Width range | 17-23 | 17-23 | 16-21 | 12-17 (mini seats) | 16-20 | 12.6-20.5 | 11.8-19.7 | 16-20 | 15-24 |
| Seat Depth Range | 14-22 | 14-22 | 16-20 | 12-17 (mini seats) | 16-20 | 13.8-24.8 | 9.5-20.9 | 15-20 | 15-22 |
| Required Seat Functions for Standing | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt | Tilt Recline | Tilt Recline | | | Tilt Recline Seat Elevator | Tilt Recline Power Center Mount |
| Additional Available Seat Functions | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline Seat Elevator ELR | Tilt Recline ELR Built in elevator | Tilt Recline ELR Seat Elevator | Tilt Recline Seat Elevator ELR | Tilt Recline Power Center Mount Seat Elevator |
| Max Protractor Tilt Degree | 50 | 50 | 45 | 45 | 45 | 35 | 11 | 25 | 50 |
| Seat Elevator Height (in) | 14 | 12 | 7 | 7 | 7 | 10 (Inherent) | 5.9 | 8 | 11 |
| Standing Weight Cap (lb) | 220 (Full stand), 300 | 265 | 250 | 200 | 250 | 310 | 265 | 265 | 250 |

Bases

Standing Programming

Standing Accessories

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Delivery and Follow Up



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Chris' Story

"I went to college, learned how to weld, and became a business owner in metal fabrication, mobile welding, and sculpture, doing 99% of all the work myself," said Chris. "I built and raced a rally car, SCUBA certified, went sky diving, and 'started' in a couple of independent films. The true list is lengthy, I defy my expectations daily. The main reason I did all of this was to race cars, a passion that didn't exist before my injury. I simply wanted a quality life. My next chapter in life is all about sharing my story and knowledge to encourage others to pursue their passion regardless of circumstances." - Chris



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Summary

- Health and Functional Benefits
- Considerations
- Process
- Importance of Education
- Teamwork and follow up



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Learning Objectives Review

1. Summarize the health and functional benefits associated with the use of integrated power standing features
2. Outline the main steps involved in the identification and recommendation of integrated standing, utilizing the ICF model to consider all environments of use
3. List essential features and functionalities of integrated power standing wheelchairs that influence decision-making to optimize long term outcomes for the user

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Questions?

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