

STEPS

Sunrise Training & Education Programs

Inches, Angels, & Beyond

Creating the Ideal Fit for Health and Independence

Presented by:
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MANUAL
POWER
ADULT
PEDIATRICS
SEATING
GERIATRICS
CONTROLS
FUNDING

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2

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- This seminar has been awarded 1 contact hours or .1 CEUs by The MED Group.
- It is the participant's responsibility to verify CEU validity for state licensure and/or other entities.

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To Receive CEUs

- In order to be awarded CEUs, the participant must:
 - Participate in the entire two hour seminar.
 - Complete the entire demographics form, which includes contact information and the last 4 digits of the participant's social security number (SSN).
 - Complete the seminar evaluation form.

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Objectives

Upon completion of this two hour course attendees will:

- Identify at least three negative implications for an improperly fit wheelchair on a client's life.
- List at least three factors in the importance of measuring a client's current wheelchair and seating system when evaluating for a new wheelchair.
- Identify three resources or tools that can be utilized to assist with recommending properly sized equipment.

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Quick Quiz....

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Wheelchair Measurements Diagram

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Multiple Choice Answers

- A. Everything you need to order the perfect wheelchair and seating system for a client.
- B. Items to be touched and utilized only by the rehabilitation technology supplier.
- C. Three tiny pieces of the wheelchair and seating provision process.
- D. All of the above.
- E. None of the above.

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Optimizing Health & Independence

The Goal: Matching Person to Technology

- Each client presents with unique needs (e.g. postural, functional, medical, caregiver support, transportation, environmental, personal preferences, etc.)
- Customized configuration and set-up are vital.





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Properly Configured Wheelchair & Seating

<ul style="list-style-type: none"> • <u>Decrease Impact</u> <ul style="list-style-type: none"> – Upper extremity preservation – Repetitive strain injury – Pain • <u>Support postural alignment</u> <ul style="list-style-type: none"> – Provide balance for function – Provide base of support for stability – Reduce or correct flexible deformity – Accommodate fixed deformity – Address tone / spasticity 	<ul style="list-style-type: none"> • <u>Facilitate function</u> <ul style="list-style-type: none"> – Mobility-Related Activities of Daily Living (MRADL's) – Physiological functions • <u>Skin care</u> <ul style="list-style-type: none"> – Protect skin integrity – Decrease moisture – Minimize shearing – Encourage Repositioning
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Potential Implications of Too Much or Too Little

<ul style="list-style-type: none"> • <u>Seat Width</u> <ul style="list-style-type: none"> – Too much <ul style="list-style-type: none"> • Contribute to postural deformities: <ul style="list-style-type: none"> – Pelvic obliquity – Scoliosis • Access to propulsion method: <ul style="list-style-type: none"> – Wheels for manual – Input device for power – Too little <ul style="list-style-type: none"> • Impact on skin health • Postural alignment <ul style="list-style-type: none"> – Pelvic rotation 	<ul style="list-style-type: none"> • <u>Seat Depth</u> <ul style="list-style-type: none"> – Too much <ul style="list-style-type: none"> • Increased likelihood of sliding forward. • Transfers impacted. • Contribute to postural deformities: <ul style="list-style-type: none"> – Posterior pelvic tilt – Kyphosis – Too little <ul style="list-style-type: none"> • Negative impact on skin health <ul style="list-style-type: none"> – Increased pressure on ITs • Decreased stability
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Potential Implications of Too Much or Too Little

<ul style="list-style-type: none"> • <u>Back Height</u> <ul style="list-style-type: none"> – Too much <ul style="list-style-type: none"> • Impaired function • Encourages kyphotic posture • Impairs sitting balance – Too little <ul style="list-style-type: none"> • Impairs sitting balance • Impairs placement of anterior support devices 	<ul style="list-style-type: none"> • <u>Back Width</u> <ul style="list-style-type: none"> – Too much <ul style="list-style-type: none"> • Impede propulsion • Contribute to postural deformities – Too little <ul style="list-style-type: none"> • Discomfort <ul style="list-style-type: none"> – Push handles – Too tight? – Postural Supports • Contribute to postural deformities
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Potential Implications of Too Much or Too Little

<ul style="list-style-type: none"> • <u>Seat slope</u> <ul style="list-style-type: none"> – Too high <ul style="list-style-type: none"> • Decrease function • Decrease balance • Sliding forward – Too low <ul style="list-style-type: none"> • Impact safe and efficient transfers • Decreased balance • Excessive extension at the top of the wheel 	<ul style="list-style-type: none"> • <u>Backrest Angle</u> <ul style="list-style-type: none"> – Too open <ul style="list-style-type: none"> • Sliding forward • Increase kyphosis • Decrease functional reach • Impairs propulsion/access to joystick • Increased cervical strain – Too closed <ul style="list-style-type: none"> • Increased kyphosis • Impaired balance • Increased cervical strain
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Potential Implications of Too Much or Too Little

Everyday Life

- Home
 - Entry/exit
 - Doorways
 - Hallways
 - Bathroom
 - Furniture
 - Kitchen
- Community
 - MRADLs
 - Bathing
 - Dressing
 - Cooking
 - Eating
 - Transportation
 - In chair vs. transfer
 - Driving vs. passenger
 - Equipment fitting

Clinical Best Practice Resources

- RESNA (www.resna.org)
 - Wheelchair Service Provision Guide
 - The Application of Ultralight Manual Wheelchairs
- Paralyzed Veterans of America (www.pva.org)
 - Preservation of Upper Limb Function Following Spinal Cord Injury
- Assistive Technology Partners at the University of Colorado (<http://www.ucdenver.edu/academics/colleges/medicalschool/programs/atp/Pages/AssistiveTechnologyPartners.aspx>)
 - A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces
 - Glossary of Wheelchair Terms and Definitions, Version 1

CRT Industry Resources



www.mobilitymgmt.com



www.ncart.us



www.nrrts.org



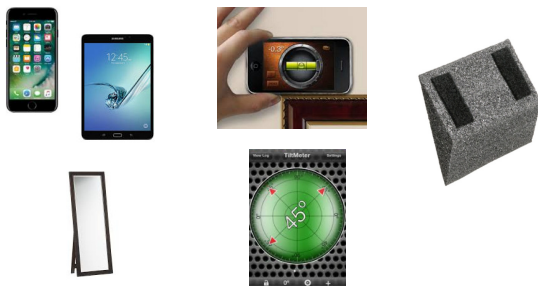
Rehabilitation Engineering and Assistive Technology Society of North America

www.resna.org

Tools for Measuring



What about these?



Client Interview

- Medical History
 - Primary/secondary diagnoses
 - Progressive Condition?
 - Procedures (past & future)
 - Pertinent Medications
 - Height/weight (stable?)
- Mobility Status
 - Independent?
 - Method of Propulsion (UE/LE)
 - Hrs of Daily Use / endurance
- Home Environment
 - Accessibility, layout
 - Furniture (consider transfers)
 - Caregiver support?
- Community
 - Job / School / Leisure Activities
- Transportation
 - Personal vehicle
 - Driver?
 - Wheelchair in/out of vehicle
 - Public Transportation
- Current Equipment
 - Wheelchair & seating
 - Pros/cons of each
 - Other DME to integrate?
 - Assistive Devices
 - Orthotics
- Funding
 - Type / Level of understanding



Inches, Angles, & Beyond: Existing Technology

- Wheelchair & Seating System
 - Overall Length and Width (turning radius & environmental access)
 - Seat Width and Depth
 - Seat to Floor Heights (front and rear)
 - Seat Inclination
 - Back height
 - Cushion details
 - Seat to Back Angle
 - Front Frame Angle / Footrest Hanger Angle
 - Wheel Spacing
 - Camber
 - Positioning Supports



Inches, Angles, & Beyond: Existing Technology

- Standers & Gait trainers
 - Transfer style
- Transfer equipment
 - Lifts, sliding boards, etc.
- Medical bed
 - Surface
 - Height
- Bath equipment
 - Overall dimensions
- Sports and leisure equipment
 - Fit, position



Inches, Angles, & Beyond: Existing Technology

- Respiratory
- Feeding/Nutrition
- Communication
- Work/School
- Home
- Vehicle

Hands-on Evaluation (aka Mat Assessment)

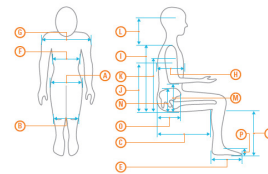
- Team Approach - client, therapist, RTS, caregiver(?)
- Supine & Sitting (firm surface, e.g. mat table)
 - Pelvis is foundation of support
 - Identify flexible versus fixed postures
 - ROM as pertains to SEATED posture
 - Strength as pertains to independent propulsion and transfers

Tips for Measuring Success

- Two people assist with measuring
- Firm surfaces
- Correct tools
 - Calipers or firm measuring stick
 - Stiff measuring tape (metal preferred)
- Client's clothing should not be baggy or thick
- Measure both right and left sides
- Use a measurement form (see next slide)
- Consult order forms (measurement guidelines)
- If there is a long delay between initial evaluation and funding approval, re-measure
 - Especially with pediatric clients and progressive presentations



Measurements



- A. HIP WIDTH _____
- B. WIDTH AT KNEE _____
- C. BUTTOCKS TO POPliteAL: R _____ L _____
- D. POPliteAL TO BOTTOM OF FOOT: WIDE SHOULDER 17 IN _____
- E. FOOT LENGTH _____
- F. CHEST WIDTH _____
- G. SHOULDER WIDTH _____
- H. CHEST DEPTH _____
- I. SEAT TO TOP OF SHOULDER: R _____ L _____
- J. SEAT TO INFERIOR ANGLE OF SCAPULA: R _____ L _____
- K. SEAT TO AXILLA: R _____ L _____
- L. TOP OF SHOULDERS TO OCCIPUT _____
- M. SEAT TO ELBOW: R _____ L _____
- N. SEAT TO PISIS _____
- O. BACK TO ANUS _____
- P. FOOT HEIGHT _____

Measurements

CLIENT NAME _____ DATE _____

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A. SEAT WIDTH _____
 B. BUTTOCKS TO POPLITEAL: R _____ L _____
 C. BUTTOCKS TO BACK (GLUTEAL SHELF) _____
 D. HEIGHT OF GLUTEAL SHELF _____
 E. POPLITEAL TO BOTTOM OF FOOT WITH SHOE: R _____ L _____
 F. FOOT WIDTH _____
 G. CALF WIDTH _____
 H. CHEST WIDTH _____
 I. SHOULDER WIDTH _____
 J. CHEST DEPTH _____
 K. SEAT TO INTERIOR ANGLE OF SCAPULA: R _____ L _____
 L. SEAT TO AXILLA: R _____ L _____
 M. SEAT TO TOP OF SHOULDERS: R _____ L _____
 N. TOP OF SHOULDERS TO OCCIPUT _____
 O. SEAT TO ELBOW: R _____ L _____

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Anatomical Measurements

Hip Width
- Rigid frame: "fit like a ski boot"

Overall Width

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Anatomical Measurements

Popliteal fossa to heel

Back of buttock to popliteal fossa
- Pelvis neutral?
- Leg length Discrepancy?

Seating surface to Inferior Angle of Scapula

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Anatomical Measurements

Seating surface to flexed elbow

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Anatomical Measurements

Seating surface to flexed elbow

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According to RESNA...

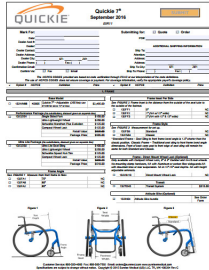
- When used alone, posterior tilt must be at least 25° in order to be effective.
- When used alone, recline can increase shear; however can cause a decrease in pressure at the IT's when angles are greater than 90-100°.
- Recline of 120° combined with elevating leg rests provides a significant amount of pressure reduction.
- Greatest amount of reduced pressure noted when tilt and recline were combined.
 - 25-45° of tilt and 110-115° of recline
- Greater angles of recline and tilt typically provide better pressure relief.
- Length of time is important - 3 minutes of tilt and recline combination provides better results than 1 minute.

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Use Your Resources



QUICKIE
Quickie 17
Standard 17" seat




7 SERIES SPECS
SEAT DIMENSIONS
Height: 20" (Standard)
Support Height: 21" (Standard)
Seat Depth: 16" (Standard)
Seat Width: 16" (Standard)
Footrest Width: 16" (Standard)
Footrest Height: 16" (Standard)
Caster Height: 16" (Standard)
Rear Wheel Height: 20" (Standard)
Rear Wheel Width: 16" (Standard)
Rear Axle Height: 20" (Standard)
Rear Axle Width: 16" (Standard)
Rear Axle Spacing: 16" (Standard)

From Engines
When you want to reach lower than the seat, you can use the 7 Series engines. They are designed to be used with the 7 Series seat. They are designed to be used with the 7 Series seat. They are designed to be used with the 7 Series seat.

Close Rear Axles
When you want to reach lower than the seat, you can use the 7 Series engines. They are designed to be used with the 7 Series seat. They are designed to be used with the 7 Series seat.

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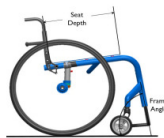
- Close rear axles
- Close rear axles
- Close rear axles




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31

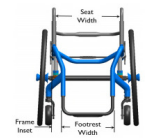
Rigid Frame Considerations



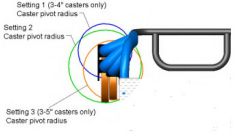
Seat Depth
Frame Angle



Seat Height
(Standard)




Seat Width
Footrest Width



Setting 1 (3-4" casters only)
Caster pivot radius

Setting 2
Caster pivot radius

Setting 3 (2-3" casters only)
Caster pivot radius



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Equipment Considerations








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33

Equipment Considerations

- Rear seat to floor height is **Lower** than the Front seat to floor height
- Achieved via:
 - Rear wheel axle vertical position
 - Rear wheel size
 - Caster size
 - Caster stem bolt/fork length






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34

Equipment Considerations

"Squeezing" the Frame:

- Assists with lower trunk, pelvic support in chair
- Can provide increased stability with propulsion
- Achieved by lowering rear seat height and closing back angle < 90 degrees
- Low back rest allows trunk extension for postural stability, repositioning






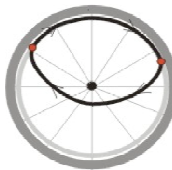
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Stroke Pattern Types




Arc



Semicircular




Double loop



Single Loop

Most Important: long, smooth stroke pattern



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Equipment Considerations







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Equipment Considerations





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Equipment Considerations




Standard Mount




Midline Mount



Midline Mount & Tray



Arm Trough



Swing away mount


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39

Follow-up Plan Suggestions

- Review funding process
- Provide an appointment summary
- Provide contact information
- Make a plan for delivery
- Once delivered
 - Properly set-up
 - Educate end user and caregivers.

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40


Objectives

Upon completion of this two hour course attendees will:

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- Identify three resources or tools that can be utilized to assist with recommending properly sized equipment.

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41




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Thank You For Participating!

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