

# DYNAMIC SEATING

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# What we are covering today:

- What is Dynamic Seating?
- Hips
- Legs
- Head



# Dynamic Seating – a definition

- Dynamic Seating is movement which occurs within the seat and/or wheelchair frame in response to force from the client. Dynamic components absorb force which in turn assists the client back to a starting position.



# Dynamic Seating – Goals

- Primary Goals:
  1. To allow movement
  2. To diffuse force
  3. To protect the client, seating system, mounting hardware, and mobility base
  4. To improve postural control



# Goal #1: To Allow Movement

- What are the benefits of movement in the wheelchair?
  - To increase sitting tolerance and compliance
  - To provide vestibular input
  - To increase alertness
  - To decrease agitation
  - To increase function
  - To provide active range of motion



## Goal #2: To Diffuse Force

- By diffusing force, we achieve these goals:
  - \*To reduce active extension
  - To reduce energy exertion
- Which in turn, may also help:
  - To increase sitting tolerance and compliance
  - To decrease agitation
  - To increase function





# Goal #3: To Protect

- To protect the client
  - If the client is exerting enough force to break components, injury is very possible
  - Micro-concussions
  - Other injuries
- To protect the seating system, mounting hardware, mobility base frame



## Goal #4: Postural Control

- By providing movement against light force, strength may build
- This can lead to improved trunk and head control
- **Warning:** the primary purpose of dynamic seating is not therapeutic





# Dynamic vs. Static Seating

- Static seating may be required for some clients
  - To prevent injury
    - i.e. foot catching
  - To promote function
    - i.e. access a switch (maintaining alignment)



# Dynamic Product Options

## Category #1

- Options to prevent breakage of the wheelchair frame and seating system by diffusing force
  - Often little movement
  - Appropriate for clients who lack range or tolerance for more movement



## Category #2

- Options to provide client movement to:
  - Diffuse force and reduce tone
  - Provide active movement for increased sitting tolerance, vestibular input, increased alertness, decreased agitation, etc.



# Dynamic Products

- Many dynamic seating products options are available
- Assessment is completed by a team who specializes in seating and mobility and who can trial equipment with the client



# Dynamic Seating: the hips

- Allowing movement at the hips has advantages and disadvantages



# Pelvic Dynamic Seating: advantages

- If pelvic movement is blocked, this force can be transferred to other body areas, resulting in increased extension. Providing movement at the pelvis reduces overall extension.
- Movement of the pelvis shifts weight which provides pressure relief and comfort



# Pelvic Dynamic Seating: disadvantages

- Movement may open seat to back angle which could result in a posterior pelvic tilt
  - This may be acceptable if the pelvis returns to neutral upon return to upright





# Pelvic Dynamic Seating: disadvantages

- Allowing movement of the pelvis can lead to **assumption of a destructive posture**
- Allowing movement of the pelvis into posterior pelvic tilt can lead to **increased extension and spasms**
- The client may not be able to **return to a neutral position**





# Dynamic Backs

- Movement occurs only at the back
- Can often be combined with other dynamic options to provide movement in other areas
- Here are a few examples...

# Miller's Dynamic Backrest Interface

- Extends at level of biangular back
- 40 degrees
- 20 lb gas spring



# Seating Dynamics Dynamic Back

- Seating Dynamics
  - Dynamic rocker back
  - Resistance is adjustable through a set of elastomers



# Seating Dynamics Dynamic Back

- Seating Dynamics
  - Dynamic rocker back
  - \*Videos

# Sunrise Medical Dynamic Back

- Mono Back or Dual Cane
- Available on Quickie manual wheelchairs
- Locks out
- Dynamic option
- 4 levels of resistance



# Questions?

# Dynamic Seating: the lower extremities





# LE Dynamic Seating: advantages

- Many clients will not tolerate having their feet restrained
- Stability is often required at the feet, however, to improve function
- Dynamic seating may improve tolerance and compliance, while providing function
- Limiting lower extremity movement may protect the feet from injury



# LE Dynamic Seating: disadvantages

- Restricting the feet in any way will prevent independent transfers
- Some clients will continue to fight any restraint of the feet



# LE Dynamic Stability: product options

- Dynamic components
- Possible movement:
  - Knee extension
  - Telescoping
  - Plantar dorsi flexion
- Examples

# Dynamic Footrests

- Miller's Dynamic, Articulating Footrest Hanger
- Gas springs: 4 levels of resistance
- Telescopes downward and elevates at knee
- \*video

# Dynamic Footrests

- Seating Dynamics
  - Dynamic footrest
  - Telescopes 1 ½”
    - 3 springs, varying resistance
    - Use alone for clients who may otherwise lose the position of their pelvis
      - Tight hamstrings
  - Optional knee extension 30 degrees
  - Optional dynamic dorsi/plantar flexion, 10 degrees each direction



# Dynamic Footrests

- Seating Dynamics
  - Dynamic footrest
  - \*video

# Questions?



# Funding

- Can I get this stuff paid for?
- Yes!
- Depends on Funding Source, of course
- Documentation critical!
- Resource:
  - Dynamic Seating Sample Medical Justification Wording
  - [www.SeatingDynamics.com](http://www.SeatingDynamics.com) under Resources, Downloadable Information

# Dynamic Seating: the head



# Head Dynamic Seating: advantages

- Providing some movement can:
  - Absorb force and protect the neck and brain
  - Reduce breakage of head support mounting hardware
  - Reduce loss of alignment of head support
  - Diffuse force



# Head Dynamic Seating: disadvantages

- Movement can lead to postural insecurity
- Excessive movement can trigger reflexive response
  - Moro
  - Tonic neck



# Dynamic Headrest Options

- Miller's Dynamic Headrest Horizontal Adjustment Bar
- Shrouded to protect hair
- 2" posterior movement



# Dynamic Headrest Options

- Seating Dynamics Dynamic Headrest
  - Single Axis moves along midline or the Y Axis, 10 degrees
    - Resistance can be changed using different elastomers
  - Multi-Axis moves in both X and Y Axis and anywhere in between (10 degrees)
    - Capturing posterior and rotational movements
- \*video



# Dynamic Posterior Head Supports

- Stealth Tone Deflector
  - 10 degrees any direction
    - Works well for clients who do not tolerate a larger degree of movement
    - Protects hardware
  - Absorb and Avert!





# Dynamic Headrest Options

- Symmetric Designs Axion Rotary Interface
  - Friction knob to add resistance or lock out
  - 30 or 45 degrees in each direction





# Head Pod



# Questions?

# Combination Approach

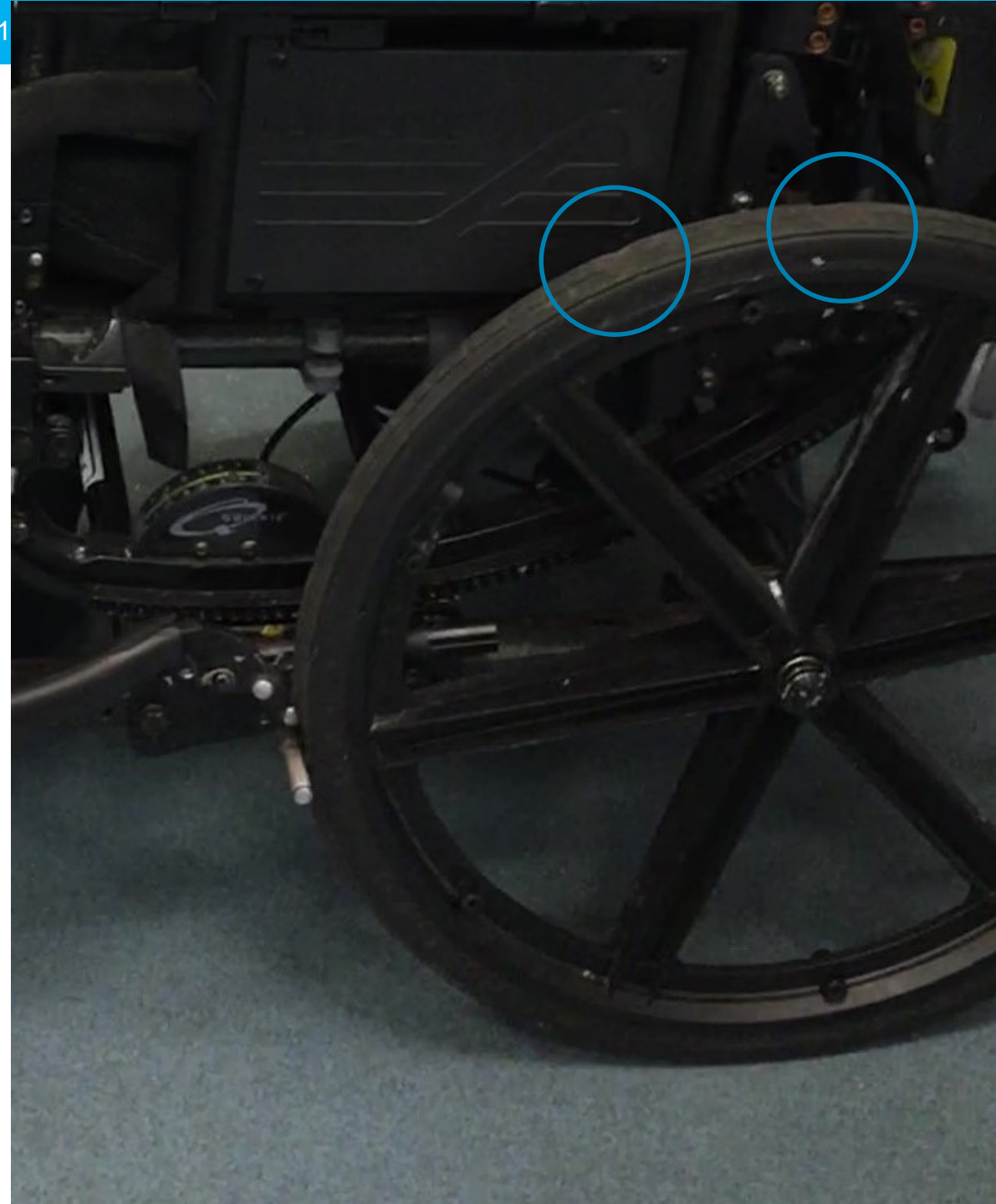
- Remember, these components can be used in combination
- \*video

# Case Study

- Phillip
- Adult with Developmental Disabilities
- Seeks out movement
- Quickie IRIS with linear seating system
- \*video

# Case Study

- The Problem:
  - Phillip rocks with such force that the wheelchair moves across the room and is at risk of tipping
  - The team locks his wheels to prevent the chair from rolling
  - He rocks with such force that he has 'broken' pieces of the tires off where these contact the wheel locks!



# Case Study

- Another Problem:
  - Phillip actually had a Quickie Dynamic Back
  - This Back failed under his forceful movements
    - The team replaced the worn elastomers with another manufacturer's elastomers (Seating Dynamics)
  - He had worn the wheelchair frame and this dynamic back so much, he could rock without actually compressing the elastomer!



# Case Study

- The Final Problem:
  - Phillip was banging against the head support with so much force, he had worn off all the hair on the back of his head!
  - \*video



# Case Study

- We recommended a Seating Dynamics Dynamic Rocker Back Interface
  - Provides movement
  - Can be locked out for transport
  - Durable!





# Case Study

- We recommended Dynamic Head Support Hardware
- To move with Phillip
- To diffuse force



# Case Study

- The Results:
  - I spoke to Phillip's therapist recently and she reports that he is doing very well with the new components
  - He enjoys the increased movement
  - They are looking forward to less damage to the wheelchair!
  
- He is moving the Dynamic Footrests, just not during this clip
- The head support needs to be adjusted forward
- \*video

# Questions?

# Case Study

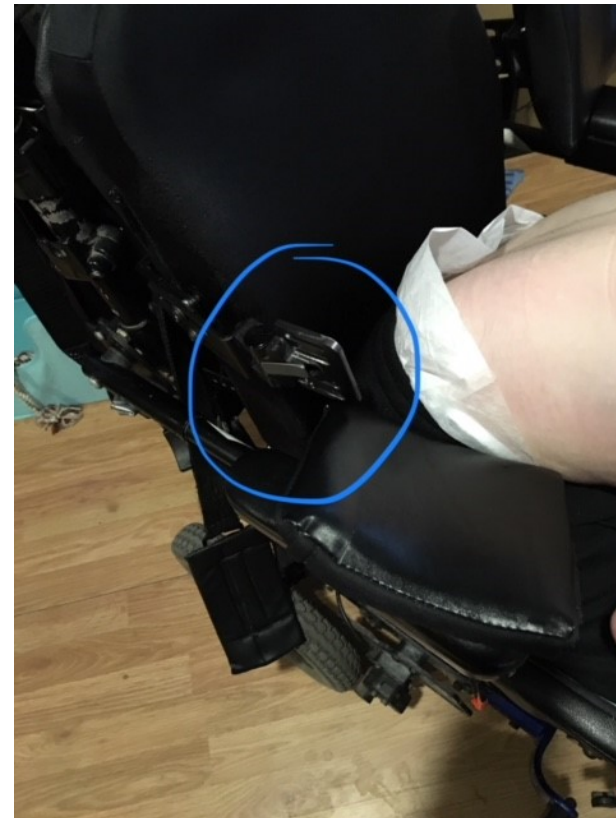
- Eddie
- Teen with cerebral palsy and seizures
- Very strong extension
- History of equipment breakage



What a great photo!

# Case Study

- Eddie had a linear seating system in a tilt in space manual wheelchair
- He repeatedly extended against the back and broke components



Lateral chest  
support pad  
broken off

# Case Study

- As the seating system did not move, Eddie would extend against it with significant force
- Significant energy exertion
- Little function, as a result

# Case Study

- With a Dynamic Rocker Back interface:
  - No more broken components
  - Greatly reduced movement...
    - Many clients, once they are aware the system can move, do not continue to extend against it
    - He does move, but with smaller, less explosive movements
    - Just enough to ensure there is not that point of resistance!
- “When he first got the Dynamic Back, he rocked all the time. He doesn’t move as much now – I think it is because he knows he can if he needs to.” Mom

# Case Study

- Eddie started in a Kid Kart years ago and then moved into a Zippie IRIS
- He is now in a PDG Stellar manual tilt wheelchair with a Ride Designs back
- He has been using a Seating Dynamics Dynamic Rocker Back interface for approximately 2 years





# Case Study

- The Results:
- Mom reports the following:
  - “Because the dynamic back provides the movement Eddie needs, he no longer leans forward and throws himself back, instead he just rocks with the back movement.”
  - “Rather than standing in the chair when he is upset, the back moves and Eddie doesn’t lose his posture. There is definitely less force to his extension.”
  - “He enjoys life more now.”
- \*video

# Questions?

# Resources

- SeatingDynamics.com
  - Resources
    - Upcoming/Past Courses
    - Upcoming/On-Demand Webinars
    - Blogs
    - Downloadable Information



## Take home message:

- Dynamic Seating can either allow movement of the client within the seating system or provide movement of the seating component and/or frame
- Dynamic Seating can protect the seat and frame from damage by diffusing force
- Dynamic Seating can protect the client from undue forces and reduce tone and posturing by diffusing force
- Dynamic Seating can provide active movement

Thanks!

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# Dynamic Seating Decision Making Tree

