



---

---

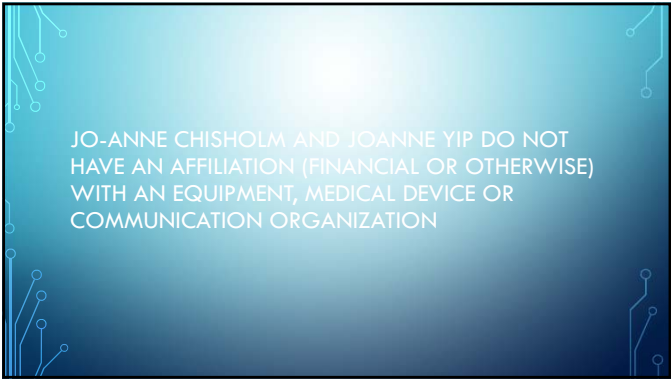
---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---

WHAT IS TONE?

- muscle tone
- (mŭs'ĕl tŏn)1. The internal state of muscle-fiber tension within individual muscles and muscle groups.
- 2. Degree of muscle tension or resistance during rest or in response to stretching.
  - Hypertonia – abnormally increased muscle tone or strength, increased resistance of muscles to passive stretching
  - Hypotonia – condition in which there is a loss of muscular tonicity, and muscles can be stretched beyond their normal limits
- Medical Dictionary for the Health Professions and Nursing © Farlex 2012

---

---

---

---

---

---

---

ABNORMAL TONE

Hypotonic Low Floppy

Mixed Fluctuating

Spastic High Hypertonia

---

---

---

---

---

---

---

COMMON ADULT DIAGNOSES

Cerebral Palsy

Traumatic Brain Injury

Stroke (Acquired Brain Injury)

Spinal Cord Injury

Neurologic Disorders (MS, Parkinson's)

Abnormal Tone

---

---

---

---

---

---

---

ABNORMAL HIGH TONE CAN BE HELPFUL

Transfer, standing, turning in bed,  
weight shifting and repositioning



---

---

---

---

---

---

---

ABNORMAL LOW TONE = FLEXIBILITY



---

---

---

---

---

---

---

ABNORMAL TONE OFTEN PROBLEMATIC

HIGH TONE      LOW TONE



---

---

---

---

---

---

---

SEATING AND POSITIONING CHALLENGES

- Difficulty staying in position in the wheelchair
- Pressure, friction, shear
- Injury to self
- Damage to equipment
- Postural deformity



---

---

---

---

---

---

---

---

PAIN AND LOSS OF FUNCTION



---

---

---

---

---

---

---

---

WHERE TO START?  
OPTIONS FOR SPASTICITY MANAGEMENT

<div>Botulinum Toxin Type A, Phenol/Alcohol, stretching/ splinting/c</div>	FOCAL	<div>Soft tissue release, tendon lengthening, joint stabilization</div>
REVERSIBLE		PERMANENT
<div>Intrathecal Baclofen, oral therapy</div>	GENERAL	<div>Selective Dorsal Rhizotomy</div>

Wheelchair seating and positioning

Include in  
seating  
plan

---

---

---

---

---

---

---

---

ALWAYS DO A SEATING ASSESSMENT



Wheelchair Scan      Supine Assessment      Simulation      Simulation

---

---

---

---

---

---

---

---

SET UP AND TRY IN EQUIPMENT



---

---

---

---

---

---

---

---

HIGH TONE - BROCK



---

---

---

---

---

---

---

---

HOW BROCK MOVES:



---

---

---

---

---

---

---

BROCK – SUPINE ASSESSMENT



---

---

---

---

---

---

---

BROCK – SITTING SIMULATION



Key points: Hip flexion, abduction, left internal rotation, control left hip forward thrust, anterior trunk pressure, arm support in flexion

---

---

---

---

---

---

---



BROCK – COMPLETED SEATING



Key Parameters:

- Rigid pelvic control
- Full contact system
- Dynamic components
- Abdominal support
- Arm support

---

---

---

---

---

---

---

---

LOW TONE - JEFF

- Young man with high paraplegia
- Injured as toddler
- Wants to live independently
- Would like to drive a vehicle



---

---

---

---

---

---

---

---

JEFF – SUPINE ASSESSMENT



---

---

---

---


---

---

---

---

JEFF – SITTING SIMULATION



Key Points:

- Anterior trunk control
- Accommodate pelvic obliquity
- Accommodate lack of hip extension
- Accommodate tight hamstring length
- Orientation in space

---

---

---

---

---

---

---

---

JEFF – EQUIPMENT SIMULATION



---

---

---

---

---

---

---

---

JEFF – COMPLETED SYSTEM



Key Parameters:

- Dynamic tilt
- Reverse recline
- Abdominal support
- Accommodate deformities

---

---

---

---

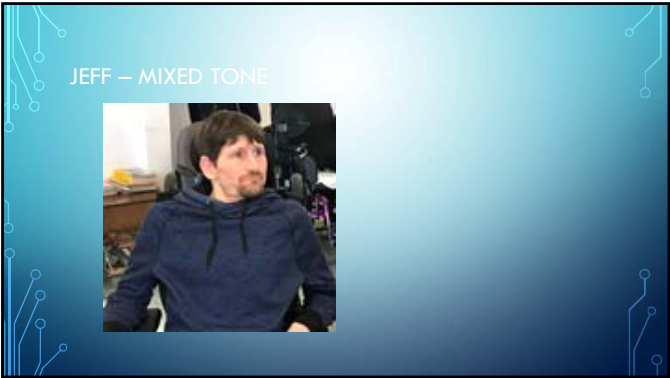
---

---

---

---





---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

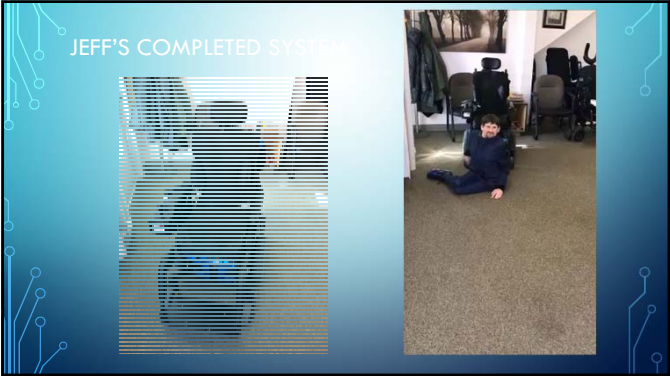
---

---

---

---

---



---

---

---

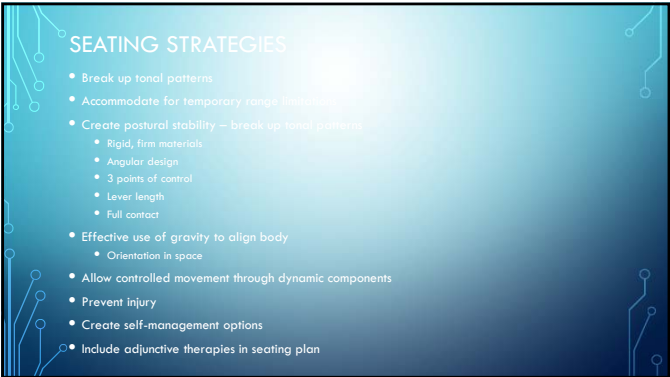
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

BREAK UP TONAL PATTERN



---

---

---

---

---

---

---

BREAK UP TONAL PATTERN



---

---

---


---

---

---

---

ACCOMMODATE TEMPORARY RANGE LIMITATIONS



Determine range that spasticity "kicks in" – accommodate shortest range

---

---

---


---

---

---

---

CREATE POSTURAL STABILITY



- Rigid
- Firm
- Angular
- Long lever
- Full contact

---

---

---

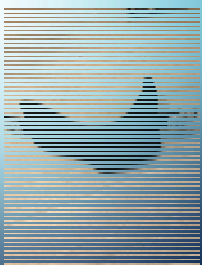
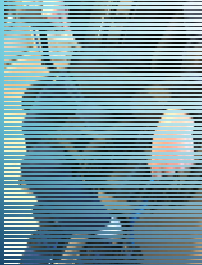
---

---

---

---

CREATE POSTURAL STABILITY – HIGH TONE



---

---

---

---

---

---

---

CREATE POSTURAL STABILITY – LOW TONE



---

---

---


---

---

---

---

CREATE POSTURAL STABILITY – HIGH TONE  
3 POINTS OF CONTROL



---

---

---

---

---

---

---

---

EFFECTIVE USE OF GRAVITY –  
ORIENTATION IN SPACE WITH  
DYNAMIC TRUNK SUPPORT



---

---

---

---

---

---

---

---

EFFECTIVE USE OF GRAVITY



---

---

---

---


---

---

---

---

USE GRAVITY FOR POSTURAL ADVANTAGE



Bring head in line with gravity

---

---

---

---

---

---

---

USE DYNAMIC COMPONENTS



---

---

---

---

---

---

---

PREVENT INJURY OR HARM  
○ PROVIDE POSTURAL STABILITY  
○ PROVIDE PADDING OVER PAD COMPONENTS, ALLOW MOVEMENT



---

---

---

---

---

---

---



CREATE SELF-MANAGEMENT OPTIONS – HIGH TONE



---

---

---

---

---

---

---

SELF MANAGEMENT  
OPTIONS – LOW TONE



---

---

---

---

---

---

---

SELF MANAGEMENT – MIXED TONE



- Flush mounted on seat
- Footplate
- Low seat to floor height
- Full contact seat base – planar, strong
- Tall contoured backrest
- Lower armrest hold
- Belt loop holds
- Wide armrest – adding right trough
- Sturdy controls – monster joystick, sturdy tilt switch
- Crosse lower legs to stabilize on footplate



---

---

---

---

---

---

---

SELF MANAGEMENT – ADJUSTABLE STRAPS LIMITING MOVEMENT



---

---

---

---

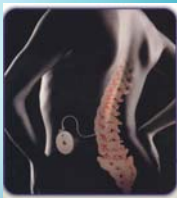
---

---

---

TONE MANAGEMENT ADJUNCTS TO SEATING

- Medication
- Injections (Botox)
- Intrathecal Baclofen Pump
- Surgery; tenotomies/lengthenings, rhizotomy, other
- Alternative therapies – transcranial magnetic stimulation, whole body vibration, shockwave therapy, acupuncture etc.
- Other interventions – behavioural approaches for anxiety, ensuring underlying conditions that increase/decrease tone are managed (bowel and bladder issues, dysphagia, pressure injuries, medications, etc.)



---

---

---

---

---

---

---

INCLUDE ADJUNCTIVE THERAPY IN SEATING PLAN



2 months post-injection – combination of Botox, bracing and seating

---

---

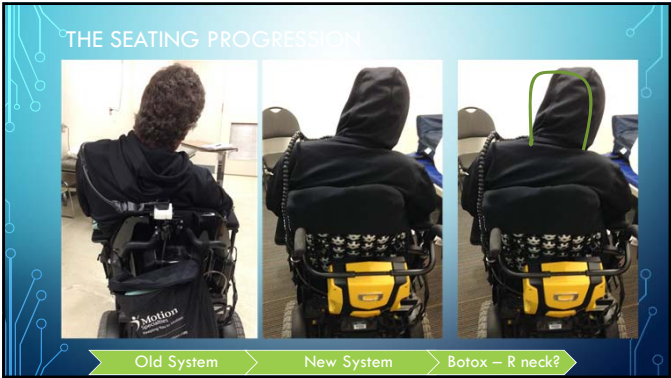
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---