Optimizing Independence in Self care for Patient with Tetraplegia.

Liza Criswell, OTR, ATP
Objectives

• The learner will be able to synthesize knowledge gained to optimize independence in self care for patient with tetraplegia.

• The learner will be able to identify the role of Occupational Therapy in focusing key considerations in preparation for self care re-training for patient with tetraplegia.
Objectives

• The learner will be able to identify different assistive and/or adaptive devices to help optimize independence of patient with tetraplegia

• The learner will be able to identify barriers and/or challenges in achieving independence for patient with tetraplegia
Trivia

- Quadriplegia vs Tetraplegia; paraplegia
- Which word is Greek and which is Latin?
- When did it become officially Tetraplegia?
- Who decided the name change?

-www.apparelyzed.com
• C1-C5 Tetra- requiring assistance in performing majority of self care. Power wheelchair mobility varies from set up to Modified Ind.

• C6- C8 Tetra- high potential for achieving modified independence in self care, IADLs and wheelchair mobility (manual or power). Potential of living independently.
C6 Complete Tetraplegia

- Highest level of complete injury which patient can still function independently without the aid of an attendant, although it is uncommon
  - (McKinley et al. 2013)
- Body type and gender can affect ability to perform self care (i.e. dressing and self catheterization)
- Co morbidity can also influence functional outcomes
LTG vs STG

• LTG can take as long as 1-3 years, educate patient with progression of skills, weaning self of use of assistive/adaptive devices (i.e. feeding devices, slide board, writing devices/adaptation)

• STG- realistic inpatient goals, varies from mod assist to set/up supervision with self care using adaptive/assistive devices
Role of Occupational Therapy

- Thorough assessment—an ongoing process from day 1 to day before discharge
- Setting of goals with patient and family. Phase I vs Phase II
- Plan of care/Focus of admission/ Discharge plan
- Collaborate with the Rehab team
- Identify DME. Rental vs Purchase
- Educate, educate, educate
Key Concepts for OT Treatment

• Restore/Maintain
• Prevent
• Facilitate
• Strengthen
• Compensate (assistive/adaptive devices)
• Skill building
• Identify appropriate DME (i.e. seating and mobility)
• Environmental Adaptation
Managing UE issues of Patient with Tetraplegia

• Shoulder subluxation
  - taping and NMES subluxation protocol (Peterson, 2004)
  - bed and wheelchair positioning (lap tray)
  - shoulder support/neoprene sleeve/Giv Mohr sling

• Hypertonicity
  - splinting, casting (with or without neurolytics)
  - weight bearing activities

• Soft tissue/Muscular/Joint tightness
  - shoulder/scapular rhythm 2:1
  - sternoclavicular joint (most neglected)
  - ROM ex., stretching, cruciate positioning
  - soft tissue massage, joint mobilization
Managing UE issues of Patient with Tetraplegia

- Soft tissue contractures
  - serial casting, splinting, dynamic orthoses
- Winged scapula
  - mobilization (scapulothoracic joint)
  - taping (positioning vs cues)
  - strengthening exercises
- Weak/immerging wrist extension/tenodeses grip
  - NMES
  - splints (resting hand splint, short opponens)
  - functional motor task/Mass practice
Cruciate position
Cruciate position
Innervations for shoulder musculatures
(Rafferty Laredo, OTR, ATP)

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Key Muscles

• Shoulder girdle muscles
• Rotator Cuff muscles
• Wrist extensors
Shoulder girdle muscles

1. Trapezius
   - C1, C2, C3
   - Elevation of scapula (upper fibers);
     retraction of scapula (middle fibers);
     depression of scapula (inferior fibers);
     rotation of glenoid cavity upward

2. Serratus Anterior
   - C5, C6, C7
   - Protraction of scapula; upward rotation of glenoid cavity; holds medial border against thoracic wall
Shoulder girdle muscles

3. Rhomboids
   - C5
   - Elevation and retraction of scapula; downward rotation of glenoid cavity

Holy Scapula!!!
Holy Scapula!!!
Rotator cuff muscles

- **External rotators**
  - Infraspinatus (C5-C6) and Teres Minor (C5)

Strengthening exercises for scapular muscles

- Scapular ABCs
- Rows
- Diagonal rows
- Airplane
- Superman
- Ironman (reverse superman)
- Scarecrow
- Butterfly
- Chicken wings
Airplane and Scarecrow
Superman and Ironman
Butterfly and Chicken wings
Prone on elbows
Progression of skills
Level surface transfers
Wrist extensors

- Extensor carpi radialis longus
- Extensor carpi radialis brevis,
- Extensor pollicis brevis
- C5-C6

http://www.eorthoped.com/content/intersection-syndrome
Resting hand Splint
Short opponens splint
Tenodeses grip
Tenodeses pinch
1. Feeding
   - U cuff/utensil holder
   - cylindrical foam
   - plate guard
   - Dining with dignity utensils
2. Grooming and hygiene
   - U cuff/utensil holder
   - built up handles
   - electric razor/electric toothbrush holder
3. Dressing
   - adaptive button hooks/zipper pull
   - velcro
Assistive/Adaptive devices

4. **Bathing**
   - mitten wash clothe
   - soap on a rope
   - automatic soap dispenser
   - adapted long handled sponge
   - hand held shower head

5. **Bowel and Bladder management**
   - pant holder
   - catheter inserter
   - household
   - adaptive suppository inserter
   - adaptive digital stimulator
6. Writing devices
   - short wanchik
   - U cuff with right angle splint
   - built up handle
   - commercially available thick handled/rubber pen
7. Telecommunication
   - adapted handle
   - touch screen devices/smart phones
8. Manual wheelchair
   - gloves
   - friction coated hand rims

More assistive/adaptive devices available for self care and IADLs:
• Sammons Preston catalog
• Abledata.com
Bare necessities
Custom manual/power wheelchair (including power assist wheels)
Hospital bed
Rolling shower commode chair
Padded transfer tub bench with commode cutout
Portable ramps
Progression of skills
Progression of skills
Progression of skills
Dressing at bed level
Dressing at bed level
Dressing at wheelchair level
Self cathing at wheelchair level
(positioning and clothing management)
Self cathing at wheelchair level
(object manipulation/positioning)
Object manipulation for bowel management
Barriers and Challenges

- Physical Factor
  - body frame
  - co morbidities
  - age
  - gender (i.e. self cathing for female)
- Motivation and level of acceptance
- Family Support (double edged sword)
- Socio-economics
- Culture
- Lack of funds for Therapy and DME
- Architectural barrier/Environment
Questions?
Ideas?
References:


• Muscle Database by nerve root. https://www.msu.edu/user/vosskurt/Miscellaneous%20pages/musnvrt.htm

• http://www.apparelyzed.com/
Illustrations

- http://www.eorthopod.com/content/intersection-syndrome
“I cried because I had no shoes, until I met a man who had no feet” – Mahatma Gandhi