Early Mobility in the Neuro ICU

Chelsie Dunn, PT, DPT
Heather Hesson, MS, OTR/L
Julia Jones, MS, OTR/L
Emily Sutinis, PT
Objectives

• Discuss the role of Occupational Therapy (OT) and Physical Therapy (PT) at Vanderbilt University Medical Center (VUMC)

• Address the benefits of Early Mobilization in the critical care setting

• Training to maximize safety during patient transfers
“We should think twice before ordering our patients to bed and realize that beneath the comfort of the blanket there lies a host of formidable dangers.”

Asher, R. BJM 1947
What is OT?

Therapy based on engagement in activities of daily living (ADL) to promote recovery and rehabilitation after illness, injury, or disease.
OT in Acute Care

- Provide Discharge recommendations
- Vision screening
- Self-care activities
- Adaptive equipment
- Visual-perceptual skills
- Gross and fine motor skills/coordination
- Cognition
- Therapeutic Activities
- UE range of motion and strength testing

- Assess splint needs
- Assess positioning needs
- Therapeutic Exercise
- Relaxation Techniques
- Energy Conservation
- Balance and mobility related to ADL performance
- Patient and Family Training
What is PT?

Rehabilitation concerned with the restoration of function and prevention of physical disability following disease, injury, or illness
PT in Acute Care

- Provide Discharge Recommendations
- Balance in sitting and standing
- Bed Mobility
- Gait
- Transfer Training
- Patient/Family Training
- Assistive Device Training
- Orthotics for the lower extremities (AFO)
- Exercise
- Posture
- Lower Body strength and range of motion testing
- Stair Training
- Fall Prevention
Discharge Settings

- Inpatient Rehab
- SNF
- LTAC
- Home Health Therapy
- Home with 24 hour care
- Outpatient Therapy
- Pi Beta Phi
OT at VUMC

• Caseload Snapshot 04.04.13
• HOSPITAL WIDE:
  Total number of new evaluations: 65
  Total number of people on caseload: 210
• NEURO
  Total number of new evaluations: 10
  Total number of people on caseload: 34 (including new evaluations)
• Caseload Snapshot 04.04.13
• HOSPITAL WIDE:
  Total number of new evaluations: 67
  Total number of people on caseload: 280
• NEURO
  Total number of new evaluations: 9
  Total number of people on caseload: 35 (including new evaluations)
Obstacles to OT/PT Eval

• Aphasia (expressive, receptive, or both)
• Vision Impairment
• Hearing Impairment
• Emotionally Labile
• Confusion/Delirium
• Medication Side Effects
• Other Tests/Procedures
• Vital Signs/Medical Stability
Early Mobility (EM)

• Intervention aimed at reducing the time from stroke onset to first mobilization and increasing the amount of out of bed physical activity including participating in activities of daily living (ADL)

• Stokelj, D Neuroepidemiology, 2010
EM at Vanderbilt

• N = 60 Neurology stroke patients
• On average patients were evaluated by OT and PT within 1.55 days of admission
• 35 of those patients were evaluated within 24 hours of admission
  *Patients with SAH are not included
General Benefits of EM

• Improved patient morale and sense of well being
• Decreased ICU/hospital LOS
• Decreased delirium
• Decreased healthcare cost
• Fewer bedrest related complications

Complications of Bedrest

• Decreased activity tolerance
• Skeletal muscle atrophy
• Delirium
• Increased Anxiety
• Pressure sores
• Increased risk of secondary infections
• DVT/PE
American Stroke Assoc. (ASA)

• Early mobilization and measures to prevent subacute complications of stroke are strongly recommended.
• ASA recommends mobilization should begin as soon as the patient’s condition is judged to be ‘stable’.
• The literature remains controversial as to the timing of mobilizing patients in the hyperacute phase.
AVERT Phase I, II, & III

• A Very Early Rehabilitation Protocol (AVERT)

• Phase I:
  – Found stroke patients spent 53% of the day in bed, 28% OOB, and 13% doing intentional activity

• Phase II:
  – Randomized controlled trial with blinded outcome assessment (N=71)
  – Found early and frequent mobilization (<24hrs) safe, feasible, and cost effective
  – Promoted early return to unassisted walking
• Phase III
  – Aims to determine efficacy and cost-effectiveness of VEM with sample size of 2,104
  – Approx. 1,200 patients have participated to date from 5 countries
  – Recruitment expected to end 2015
PUMP Plus

- All patients admitted to NICU from 4/10 to 7/11
- Comprehensive mobility initiative utilizing the Progressive Upright Mobility Protocol (PUMP) Plus
- Hospital LOS decreased from 12 days before the mobility protocol to 8.6 days after implementation \(p=.01\)
- NICU LOS decreased 13% from 4.0 days prior to the intervention to 3.46 \(p < 0.004\).
- NICU patient mobility increased 300%
- Resulted in decreased hospital-acquired infections, ventilator-associated PNA, and days in restraints
- No increase in adverse events
Steps to PUMP Plus

- **Step 1:** HOB 45°
- **Step 2:** HOB 45° plus bed in chair position or patient in neuro chair
- **Step 3:** HOB 65° plus bed in chair position or patient in neuro chair
- **Step 4:** Step 3 **and** sitting edge of bed **and** standing in place
- **Step 5:** Initiate stand/pivot and into chair
- **Step 6:** Transfer standing from bed to chair for 2-3 meals with sitting time not to exceed one hour
- **Step 7:** Ambulate in room (goal = 20 feet or door to bathroom and back)
- **Step 8:** Ambulate in hall (goal = 50 feet or 5 rooms down the hall)
- **Step 9:** Ambulate in hall (goal = 100 feet or the length of the unit)
- **Step 10:** Ambulate 150 feet with contact guard or personal supervision/assistance
- **Step 11:** Ambulates without coaching or supervision, may use device if necessary
PUMP Plus Steps

- Physician will order highest level of activity
- Each step must be implemented at least TID and more frequently as tolerated
- Perform each step until patient demonstrates clinical intolerance to stated activity/position
- At next activity period begin with last step patient tolerated and attempt to progress from there
- Intolerance means hemodynamic changes, respiratory difficulty, dizziness, or nausea that do not resolve within 10 minutes
- Coordinate patient mealtime with mobility steps whenever possible.
PUMP Plus Contraindications

All patients will be placed on PUMP protocol unless contraindicated

- Unsecured SAH
- Increased ICP or medical management of ICP
- Hemodynamic instability
- tPA received within 24 hours
- Ischemic stroke for first 24 hours only
- Femoral sheath
- CRRT
- Comfort care
- $\text{FiO}_2 \geq 50\%$ with $\text{PEEP} \geq 10$
- $\text{SaO}_2 \leq 90\%$ at rest or $\leq 88\%$ with activity
- Progressively deteriorating neurological status
- Unstable spines
- Verify EEG placement
• OK to mobilize if:

• Ventilated
• Pressure Lines
• PA Catheters
• EVDs
• LiDCOs
• Myasthenia Gravis dx
• Foley present
**Passive ROM**

**Bedside Exercise Program**

10 repetitions each, once each shift for ICU patients

(May be performed by patient, family member, or nurse)

**Neck**
- Rotate head from side to side
- Bring chin to chest and back to pillow

**Shoulder**
- With the patient’s elbow extended, thumb towards ceiling, raise arm along the body towards the ear; no higher than 90°

**Elbow**
- Flex and extend the elbow holding briefly in complete extension

**Wrist/Hand**
- Hold patient’s wrist in one hand. With your other hand, help them bend their wrist slowly down and then back as far as comfortable
- Flex and extend the fingers pausing briefly in extension
Passive ROM

**Hip**
- With support at heel and behind knee, raise and lower patient’s leg, flexing hip and knee as far as possible
- With knee extended, move patient’s leg out to the side and back
- Place your hands on patient’s ankle and knee and help them slowly roll their leg in and out

**Ankle**
- With leg relaxed, ask patient to bend ankle up and down
- Stretch heel cords by grasping the patient’s heel and using the anterior aspect of your forearm to put pressure on the ball of the patient’s foot
Factors Influencing Decision-making for OOB Activities

- Sitting balance
- Active movement of the involved side
- Cognition
- Safety awareness/insight regarding deficits
- Standing balance
- Activity tolerance
- Hemodynamic Stability
- Sensory and vestibular deficits
• We mobilize as early as possible per discretion of the physicians
• Adhere to blood pressure parameters as determined by physicians
• Currently, patients are NOT mobilized if they are intubated following a stroke
• Intra-arterial tPA – 2 hours bedrest
• Intravenous tPA – 24 hours
• Mobility is not dependent upon size of the damaged vessel from a therapy standpoint
QUESTIONS??
OCCUPATIONAL THERAPIST

What my friends think I do

What my Mom thinks I do

What society thinks I do

What my patients think I do

What I think I do

What I really do
Physical Therapist

What my friends think I do.

What MDs think I do.

What Medicare thinks I do.

What my patients think I do

What I think I do.

What I really do.
ICU Nurse

What my friends think I do.

What my mom thinks I do.

What society thinks I do.

What floor nurses think I do.

What doctors think I do.

What I think I do.

What I actually do.
Cartoon
Practice

• Bed Mobility
• Body Mechanics
• Sitting Balance
• Standing
• Pivot Transfers
• Rocking Techniques
• Bed to Chair
• Ambulation
• When to use Smooth Moves Equipment