Rehabilitating Pre- and Post-liver transplant Patients

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Objectives

- Understand the role of physical therapy with pre- and post-liver transplant patients
- Understand the role of occupational therapy with pre- and post-liver transplant patients
- Understand common physical therapy interventions
- Understand common occupational therapy interventions
- Identify when to consult therapy services

Role of Therapy in Acute Care

Physical Therapists (PT) and Occupational Therapists (OT) are trained in the medical model to provide detail assessments and interventions (activity modifications, strengthening, neuromuscular re-education, trunk stabilization, balance activities) after illness and injury.

Disclosures

I have nothing to disclose
Physical Therapists are...

Biomechanical experts

Assess and promote proper movement strategies and safety with bed mobility, transfers, gait and stairs.

Provide Interventions that will maximize performance of the oxygen transport system, musculoskeletal and neuromuscular systems; titration of activity in response to changes in physiological status

Occupational Therapist are...

- Experts in assessing and promoting independence with activities of daily living (ADLs) and daily life roles
- Experts in assessing cognition and perception as it relates to safety in ADLs and mobility
- Interventions focus on adapting the environment, modifying the task, and educating the client/family
- Goal: to increase participation in and performance of ADLs and iADLs (instrumental activities of daily living)
- Model of Human Occupation (MOHO) explains how human occupation is motivated (VOLITION), organized (HABITUATION), performed (PERFORMANCE) and influenced by the environment

Areas of Occupation

<table>
<thead>
<tr>
<th>ADLs</th>
<th>IADLs</th>
<th>Work</th>
<th>Leisure</th>
<th>Social Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel &amp; bladder management</td>
<td>Safety procedures/emergency response</td>
<td>Employment seeking</td>
<td>Leisure participation</td>
<td>Community</td>
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<tr>
<td>Bathing, showering</td>
<td>Care of others/pets</td>
<td>Employment interest/pruuisis</td>
<td>Leisur exploration</td>
<td>Family</td>
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<tr>
<td>Dressing</td>
<td>Community mobility</td>
<td>Job performance</td>
<td>Leisure participation</td>
<td>Peer, friend</td>
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<tr>
<td>Feeding</td>
<td>Financial management</td>
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<tr>
<td>Functional mobility</td>
<td>Health maintenance</td>
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<tr>
<td>Hygiene and Grooming</td>
<td>Home management</td>
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<tr>
<td>Sleep/rest</td>
<td>Meal prep</td>
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<td></td>
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<tr>
<td>Sexual activity</td>
<td>Shopping</td>
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</tbody>
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Complications of immobility

- Gastrointestinal
- Musculoskeletal
- Psychological
- Integumentary
- Inflammation
- Respiratory
- Cardiovascular
- Hematologic

References:
Impairments

- Deconditioning
- Hepatic encephalopathy
- Pain/discomfort
- Ascites
- Balance
- Sleep deficiency
- Depression/apathy
- Frailty

Ascites and Edema

- Makes sitting up uncomfortable
- Difficulty getting center of gravity over base of support to achieve standing
- With extra weight and fluid status will see fluctuation in activity tolerance
- Lower extremity edema makes legs heavier to move, rub together, and patients more uncomfortable

Malnutrition, Cachexia and Sarcopenia

- Sarcopenia - loss of muscle mass
- Cachexia - loss of both fat and muscle mass
- Sarcopenic obesity - disproportionate loss of muscle mass in the presence of increased adipose tissue mass
- Adversely affects survival and quality of life

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Fried’s Frailty Index

- Unintentional weight loss
- Self-reported exhaustion
- Low physical activity
- Weakness (grip strength)
- Atrophy, overall physical activity

- ≥3/5 = frail
- Each 1 unit increase associated with 50% increased risk of waitlist mortality


Impact of Frailty

- Decreased physiologic reserve and resistance to stressors
- Increased risk of post-surgical complications and the need for extended care
- More than doubles the risk of morbidity and mortality from surgery and cardiovascular conditions
- Strongly predicts waitlist mortality in liver transplant candidates


Short Physical Performance Battery

- Balance Test
  - Feet Side by Side
  - Semi-Tandem Stand
  - Tandem Stand

- Gait Speed Test
- Chair Stand Test
  - 5 x sit to stand with arms across chest


Physical Therapy Objectives in Pre-Transplant Patients

- Daily functional assessments, activity tolerance information correlated to vitals, lab values, medications
- Providing psycho-social orientation, motivation, self-efficacy
- Family education
- Environment management
  - Identify and minimize barriers to mobility
- Preventative medicine - Carefully monitored activity
  - Sleep disorders
  - Steroids osteopenia, hyperglycemia, and muscle wasting
  - Pneumonia
  - Delirium, mood affect
  - Endurance, fatigue
  - Balance

Treating Patients with ESLD

Assessment Questions:
- Patient physiologic reserve- past and present
- Ambulatory enough to be listed?
  - patient’s MELD score does not always correlate with function
- Family able to realistically continue care for the patient?
- Is patient already listed and will stay admitted until organ available?
- What is the patient’s hemodynamic and O2 response to activity?
- Motivation
- Discharge Options

Interventions

- Bed mobility
- Transfer training
- Gait training
- Stair training
- Balance exercises
- Therapeutic exercises
- Education re: energy conservation and safety
- Caregiver training
- Equipment recommendations

Exercise

- Can increase skeletal muscle volume and strength
- Increase physical activity
- Increase exercise capacity
- Improve insulin resistance
- Can prevent or minimize sarcopenia

Occupational Therapy Pre-transplant

- Ascites and Edema
  - Impaired lower body dressing/bathing
  - Impaired bed mobility
  - Impaired toileting
  - Back pain
  - Shortness of breath
  - Skin breakdown

- Encephalopathy
  - Attention deficits
  - Hyporeflexia/Impaired motor planning
  - Impaired sleep patterns
  - Inability to manage medications
  - Inability to manage finances
  - Unable to work
  - Unable to drive

- Frailty and weakness
  - Impaired balance
  - Impaired functional mobility
  - Poor endurance/activity tolerance
  - Falls and injuries
  - Loss of independence in ADLs
  - Loss of independence in iADLs
  - Loss of meaningful roles

- Lactulose
  - Frequent bathroom trips
  - Accidents
  - Skin breakdown
  - Loss of freedom to leave home

References:

Impact of Liver Disease on ADLs and Participation


Treating Patients with ESLD

- Assessment questions:
  - Baseline and current level of ADL/iADL function
  - Baseline and current cognitive functioning
  - Home environment setup/barriers
  - Access to durable medical and adaptive equipment
  - Motivation
  - Meaningful roles, routines, hobbies
  - Discharge options

Occupational Therapy Objectives in Pre-transplant Patients

“individuals in the prolonged transplant pipeline must learn either independently or with assistance, to cope with the serious limitations and restrictions to performance of ADLs and participation in valued occupations”

- Education about changes in role performance
- Adapting ADL/AIDS tasks
- Conserving energy
- Durable medical equipment
- Adaptive equipment
- Medication management
- Caregiver education
- Education and preparation for later stage disease and potential transplant
- Recommendations for home and out patient services


So you had a liver transplant...
Physical Therapy Considerations Specific to Liver Transplant OLT

- Delayed cognitive recovery, malnutrition, delayed liver function
- Complications from cardiopulmonary impact of disease and prolonged surgery
- Central nervous system complications, seizures
- Large abdominal incision
- Balance, coordination
- Endurance
- Expectations - patient, family, clinicians

Considerations

- Abdominal guidelines
  - Logroll for bed mobility
- Splinting for cough/laughing to assist with pain control
- Post-op orthostasis
- Steroids

Immunosuppression Side Effects

- Corticosteroids, prednisone
  - Muscle wasting, steroid myopathy
  - Osteopenia
  - Weight gain
  - Delayed wound healing
  - Mood swings
  - Hyperglycemia
  - HTN
  - Peptic ulcer

Transplant Recovery

- Support for exercise training post-transplant
  - Fitness and strength 40 to 50% less than age related normal pre-transplant
  - Exercise capacity still low 1 year post-transplant
  - Active recipients have higher HRQOL
  - Most symptoms relate to weakness, fatigue, joint discomfort

Occupational Therapy
Post Transplant

Abdominal incision
- Abdominal guidelines
- Bed mobility
- Pain management

Returning to Independence in ADLs
- Lower body dressing
- Bathing
- Toileting
- Grooming and hygiene

Frailty and Weakness
- Activity modification
- Pacing
- Energy conservation
- Safe progression of activity

Post-op confusion
- Prevention/management of delirium
- Cognitive testing
- Family and caregiver training

Post op medications
- Education on side effects
- Strategies for management
- Family caregiver education

Returning to work
- Cognition, endurance, pacing

Returning to meaningful roles and routines
- Leisure and hobbies, family, social

Barriers?
- NONE other than if the patient is not stable
- CVVH - standing orders to disconnect CVVH for up to 2 hrs for therapy
- Mobilize patients who are intubated
- Our patients will not get transplanted if they do not demonstrate that they are able to mobilize out of bed

When to Consult
Consult PT
- Anytime
- Mobility impairment
- Frailty
- Home exercise program
- Patient family education

Consult OT
- Anytime
- ADL deficits
- Medication management
- Cognitive deficits
- Patient and family education
Summary

- Physical therapist are the biomechanical and exercise experts
- Occupational therapist are the ADL/iADLs/cognition and participation in meaningful tasks experts
- Both PT and OT assess and treat the patients physiological state
- Both PT and OT assess for proper minimal lift equipment
- Frailty is a major factor in pre- and post op exercise and ADL performance
- PT and OT work with patients both pre- and post op to maximize function, participation and outcomes

References

- Scott, P., (2011). Occupational therapy services to enable liver patients to thrive following transplantation. Occupational Therapy in Health Care, 25(3), 240-256.

Thank you

- Young Na Lee OT
- Jamie Krueger PT
- Cate McDonough OT
- Heidi Engel PT DPT
- Shin Tatabe PT