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Welcome to the Journal of Acute Care Physical Therapy! The first issue of JACPT has been in development since our strategic planning retreat at this time last year. At this retreat, we were challenged with ways of supporting our Section’s mission and vision. Among those aspects of the mission and vision, elevating the practice of acute care physical therapy and making ourselves more visible to the health care community were particularly instrumental in the decision to create a journal dedicated specifically to the science and practice of acute care physical therapy.

A successful Journal is only one avenue for promoting the mission and vision of the Acute Care Section. The Board of Directors and Editorial Board of JACPT will continue to work closely to achieve three basic missions for JACPT. 1. Demonstrating a unique body of knowledge that distinguishes the acute care physical therapist from other physical therapists; 2. Defining the role of the acute care physical therapist within health care; 3. Demonstrating a growing evidence-base to the practice of acute care physical therapy.

To distinguish ourselves, we need a repository for the body of knowledge that defines our role in health care. This body of knowledge should be sufficiently different from other physical therapy practices that we become recognized as the experts in practice of physical therapy for those with acute care needs. It also needs to define our place in health care such that practitioners outside physical therapy seek out the acute care physical therapist. A third aspect is the continued growth of this area of practice. Thus, the emphasis of JACPT on the science and practice of acute care physical therapy.

I have been fortunate that the Editorial Advisory Board members for JACPT have taken on new roles as Associate Editors. Scott LaRaus, Kevin Brueilly, and Jane Wetzel have the important task of overseeing the resubmissions/revisions of submitted manuscripts to ensure required revisions meet the standards of publication in JACPT. The development of JACPT has added several tasks beyond those of Acute Care Perspectives. I am happy to announce the appointment of Beth Smith as Deputy Editor. She adds another pair of hands and eyes to make JACPT the publication that I had hoped it would be. Input from the Associate Editors and Deputy Editor have proved invaluable as we have put this first issue of JACPT into a physical form. We have been fortunate to have so many individuals volunteer to become peer reviewers. The efforts of Scott Arnold, Stephen Carp, Lee Ann Eagler, Barbara Ehrmann, Karen Holtgreve, Diane Madras, Stephen Morris, Barbara Smith, Beth Smith, Bonnie Swafford, and Patricia Ohtake have provided the kind of feedback necessary to elevate the scientific value of the manuscripts submitted thus far. This level of critique has been beneficial for the authors as well as preparing JACPT for consideration for indexing in MEDLINE®. Inclusion in MEDLINE is critical for the recognition of acute care physical therapy as a unique health care entity. We are required to submit an entire year’s worth of issues to be considered and our plan is to apply for inclusion as soon as we have this first year of issues completed.

Finally, the efforts of Lieve Monnens and Judy Oiler of our management company, APTANJ, have been critical in making this transformation into a fully-fledged, standalone journal for acute care physical therapy. Lieve and Judy have been responsible for the physical design as well as keeping us all connected and on track.

Getting this first issue to press—and trying to make it perfect—has been a huge undertaking and I hope all reading this will both celebrate this accomplishment and seek ways to add to our journal. We are particularly in need of individuals who will find advertisers and promote our journal beyond the members of the Section. Please send comments or questions to girion@jaguar1.usouthal.edu.
CASE REPORT

Chronic Inflammatory Demyelinating Polyradiculoneuropathy from a Physical Therapist’s Perspective: A Case Report

Doris Y. Chong, Leslie B. Glickman, Paz Susan Cabanero-Johnson

ABSTRACT

Purpose: Although the literature describes several medical interventions for chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), no evidenced-based approaches to rehabilitation specific to CIDP can be found. This case report reviews key background information on CIDP, and describes an interdisciplinary approach to rehabilitation in an acute care setting. It illustrates the use of medical knowledge, clinical reasoning, and evidence in selecting outcome measures, formulating a plan of care, and guiding clinical decisions.

Methods: This case describes a 59-year-old man with multiple significant co-morbidities during a six-month period characterized by significant pain, sensory changes, and progressive weakness. He deteriorated dramatically from independent ambulation to requiring a wheelchair. Symptom progression attributed to end-stage liver disease led to further diagnostic tests and eventually, a definitive diagnosis of CIDP. Initial findings included significant major muscle disease led to further diagnostic tests and eventually, a definitive diagnosis of CIDP. Methods led to rehabilitation specific to CIDP can be found. This case report reviews key background information on CIDP, and describes an interdisciplinary approach to rehabilitation in an acute care setting. It illustrates the use of medical knowledge, clinical reasoning, and evidence in selecting outcome measures, formulating a plan of care, and guiding clinical decisions.

Conclusion: For this patient with CIDP, effective collaborative team communication and interdisciplinary management worked to optimize clinical decision making and recovery.

Key words: Chronic inflammatory demyelinating polyneuropathy/polyradiculoneuropathy, demyelinating conditions, rehabilitation.
Chronic inflammatory demyelinating polyneuropathy or polyradiculopathy (CIDP) is a relatively uncommon autoimmune disorder of peripheral nerves that leads to progressive and significant weakness, sensory loss, and areflexia.1 Due to its heterogeneous presentation, distinguishing this condition from other neurological diseases and treating it in the early stages can be difficult. Yet early medical and rehabilitation intervention is crucial to functional recovery in spite of the lack of a definitive diagnosis and functional progress.

Several medical interventions for CIDP are described in the literature, but no evidence-based approaches to rehabilitation specific to CIDP can be found. This case report reviews key background information on CIDP and describes an interdisciplinary approach between medical and physical therapy (PT) providers in an acute care setting. It illustrates the use of medical knowledge, clinical reasoning, and evidence in selecting outcome measures, formulating a plan of care, and assisting with clinical decisions.

The prevalence of CIDP ranges from 1.24 to 7.7 per 100,000 in many regions of the world including Australia, Japan, the United Kingdom, Norway, and Italy.2,3 It affects people of all ages but is most prevalent in those between 40 to 60 year old regardless of gender.4 In the US, incidence was reported to be 1.6 per 100,000 people per year to a high of 8.9 per 100,000.5 As many as about 300,000 patients could have active CIDP at a given time6 and CIDP could represent 10-30% of previously undiagnosed neuropathies.7

The pathogenesis of CIDP begins with an autoimmune response to an unknown trigger. The trigger leads to lymphokine-induced damage to myelin sheaths and axons of peripheral nerves.8,9 Proposed triggers include influenza vaccination, tetanus toxoid immunization and hepatitis B.10-12 Viral infection is more likely to trigger an autoimmune response in individuals who have immune-compromised conditions. Clinical, laboratory, and electrodiagnostic features are used to diagnose CIDP. Based on these criteria, the diagnosis of CIDP may be categorized as possible, probable, or definite categories (See Table 1).13,14 Laboratory and electrodiagnostic criteria for a definitive diagnosis vary between institutions in level of sensitivity and specificity.15 A successful treatment trial in the absence of clinical, laboratory, and electrodiagnostic features may also help confirm a diagnosis of demyelinating neuropathy.16,17

Since CIDP is an extremely heterogeneous condition, the exact clinical manifestations differ from person to person. Diagnosis depends on which structures are involved such as cranial nerves or central nervous system18,19 and its clinical presentation such as distal versus proximal and symmetrical versus asymmetrical.20,21 Differential diagnosis may include polynuropathy associated with monoclonal gammopathy of undetermined significance (MGUS), polynuropathy-organomegaly-splenomegaly syndrome (POEMS), Charcot-Marie-Tooth disease (CMT), and CIDP.22-24

Due to its heterogeneous presentation, the condition from others, and therapies to assist in differentiating differential diagnoses, and varying symptoms, clinical variants, or an NCS.25

Facilitating medical referral and 1. Patients improved significantly in their cardiovascular fitness, muscle strength, and quality of life. Despite the high intensity training, patients also reported a twenty percent (20%) reduction in fatigue severity and impact of fatigue, SSF, pre- to post-intervention. Although impairments, activity limitations, and participation restrictions resulting from CIDP fall under the physical therapist’s scope of practice and the Guide to Physical Therapy Practice includes a practice pattern on GBS or CIDP (Pattern 5). Impaired motor function and sensory integrity associated with acute or chronic polyneuropathies, evidence supporting PT as an integral part of the functional recovery of CIDP is anecdotal.

Based on available literature, the physical therapist’s roles include:

1. Facilitating medical referral and need for further diagnostic tests when suspecting an unconfirmed case of CIDP. For example, patients with clinical presentations suggestive of CIDP but with an unknown etiology or diagnosis may trigger a referral to physicians and suggestions for a lumbar puncture or an NCS.

2. Using knowledge of atypical symptoms, clinical variants, differential diagnoses, and varying responses related to medical therapies to assist in differentiating the condition from others, and formulating a more accurate rehabilitation prognosis and plan of care. For example, the physical therapist needs to communicate with physicians if patients with preliminary diagnoses of CIDP do not show functional improvement with traditional medical therapies. Differential diagnoses or change in medical therapy may need to be considered. Rehabilitation prognosis and plan of care may need to be revised if a differential diagnosis results.

3. Applying knowledge of the side effects of prednisone therapy to family choice of exercise options. For example, in the presence of osteoporosis where high-impact exercise may increase the risk for falls and fractures, the physical

### Table 1. Diagnostic Criteria for CIDP13-15

<table>
<thead>
<tr>
<th>Clinical Presentation</th>
<th>Definite</th>
<th>Probable</th>
<th>Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2 months progressive onset of symptoms</td>
<td>All clinical presentation must be present</td>
<td>All clinical presentation must be present</td>
<td>All clinical presentation must be present</td>
</tr>
<tr>
<td>Majority of motor dysfunction</td>
<td>All laboratory features must be present</td>
<td>CF result must be positive or 2 positive results out of 3 (CF, biopsy, NCS)</td>
<td>1 positive result out of 3 (CF, biopsy, NCS)</td>
</tr>
<tr>
<td>Symmetrical and proximal + distal weakness</td>
<td>All laboratory features must be present</td>
<td>2 positive results out of 3 (CF, biopsy, NCS)</td>
<td>1 positive result out of 3 (CF, biopsy, NCS)</td>
</tr>
<tr>
<td>Areflexia or hyporeflexia</td>
<td>All laboratory features must be present</td>
<td>2 positive results out of 3 (CF, biopsy, NCS)</td>
<td>1 positive result out of 3 (CF, biopsy, NCS)</td>
</tr>
</tbody>
</table>

### Laboratory Features

- Protein level of >45 mg/dL
- Nerve biopsy = demyelination

### Electrodiagnostic Features (NCS)

- Reduction in CV in >2 motor nerves
- Abnormal CB/TD in >1 motor nerves
- Prolonged DL in >2 motor nerves
- Absent FW or prolonged minimum FW latencies in >2 motor nerves

Abbreviations: CF, cerebrospinal fluid; NCS, nerve conduction study; CV, conduction velocity; CB/TD, conduction block/temporal dispersion; DL, distal latency; FW, F-wave.
Chronic Inflammatory Demyelinating Polyradiculoneuropathy from a Physical Therapist’s Perspective

therapist needs to adjust activity accordingly.

4. Observing the patient for possible side effects by closely monitoring vital signs and reporting these effects. For example, hypotension and cardiac arrhythmia may occur during IVIG and plasmapheresis therapies and mobility may be contraindicated.

5. Communicating observations in a timely and objective manner to other health care providers to facilitate better plan of care. For example, alert them to important signs and symptoms as well as key patient responses to functional activities and therapeutic interventions.

CASE DESCRIPTION

History

The patient was a 59-year-old man with a past medical history of non-Hodgkin’s lymphoma, papillary thyroid cancer, hepatitis C, and liver cirrhosis. His surgical history included thyroidectomy, nonmalignant allogeneic stem cell transplant, and transjugular intrahepatic portosystemic shunt (TIPS) placement. His general health was otherwise noncontributory.

The patient worked as a civil engineer during the six months prior to his hospital admission, is married and lives with his wife in a single-story home. Approximately six months prior to this hospital admission, the patient had worsening lid function and underwent TIPS placement with subsequent improvement. Two months later, he again experienced worsened lid function and developed low back pain, and lower extremity weakness.

Symptoms progressed to include headaches, fatigue, and bouts of pneumonia. The patient’s functional ability decreased over a four-month period leading to wheelchair use for mobility. Multiple acute care hospital admissions followed and eventually he was admitted to a skilled nursing facility (SNF). Despite continued rehabilitation, his functional status continued to decline. This was initially attributed to end-stage liver disease, leading to discharge to home hospice care. Eventually, during an acute care admission for respiratory distress, further diagnostic tests revealed demyelinating features in the upper and lower extremities, most prominent in the distal regions, compatible with CIDP. A definitive diagnosis of CIDP was made one week after this hospital admission.

Systems Review & Examination

At the initial PT examination, the patient reported a 50-pound weight loss over the last several months. Table 2 shows the results of the cardiovascular/pulmonary, integumentary, neuromuscular, musculoskeletal, and internal organs systems review. Both the patient and his wife’s goal was to obtain a definitive diagnosis of his condition with the ultimate hope that his condition was treatable. The patient also wanted to regain the ability to ambulate.

Physical examination included:

1. Pain: The patient reported 8-10/10 pain in the low back and bilateral hips on the numeric pain rating scale (NPRS), where zero = no pain and 10 = worst possible pain. NPRS is a responsive measure in patients with low back pain. His pain increased with cough or any gentle leg movements, and eased with rest and intravenous (IV) morphine.

2. Passive range of motion (PROM): Bilateral upper extremity PROM was within functional limits (WFL). Therapists were unable to test PROM of the lower extremities secondary to pain. Pain from observation during functional mobility, he showed bilateral passive hip and knee flexion to 90° in sitting, bilateral hips and knees reached full extension in supine, and ankle dorsiflexion to a neutral position.

3. Coordination: He demonstrated diminished finger-nose-finger coordination and rapid alternating movements (RAM) tests of his upper extremities. The tests did not reveal any gross dysmetria. Coordination and RAM of his lower extremities were not available due to severe weakness and pain.

4. Sensory System: Proprioception, vibration, and pinprick sensation were decreased on both lower limbs and bilateral C3-4 dermatome sensation.

5. Tone: Muscle tone in the upper extremities was grade one (1) on the Modified Ashworth Scale, but did not limit functional ROM. Pain on both lower extremities prevented the examination of muscle tone. Deep tendon reflexes (DTRs) were absent at the Achilles tendons and diminished (1+) at biceps, triceps, and patellar tendons bilaterally.

6. Muscle strength: Weakness was more severe in both lower extremities than the upper extremities and in distal versus proximal regions (Table 3).

7. Functional abilities: Based on the Functional Independence Measure (FIM),6 impaired bed mobility, feeding, grooming, and bathing required total assistance; problem solving and attention to task required moderate assistance (Table 4).

While the Guide to Physical Therapist Practice24 also suggested other tests and measures, they were not included at the initial examination due to the patient’s low functional level, pain, and activity tolerance.

Evaluation and Diagnosis

This patient was totally dependent for all activities (ADLs) and functional mobility with the inability to continue his previous role as an engineer. He presented with significant pain, impaired sensation, impaired DTR, significant weakness in all extremities, impaired sphincter control, and impaired social cognition. His impairments, activity limitations, and participation restrictions were consistent with Practice Pattern 5G, and a fair response to initial steroid therapy. Due to a chronic onset of CIDP, expectations were for a slow and incomplete functional recovery with the patient requiring assistive devices and perhaps orthoses for future functional mobility. On a positive note, this patient was very motivated and had a supportive family.

Plan of Care and Interventions

Physical therapy short-term goals (one week) included:

1. Decreased pain level at low back and bilateral hips from 8-10/10 to 7/10 on NPRS to enable participation in bed mobility, transfer, and seated ADLs.

2. Improved static sitting balance from dependent assistance to maximal assistance to enable participation in seated ADLs and prevent adverse effects from prolonged bed rest.

3. Improved bed mobility from dependent assistance to maximal assistance of two persons to prevent pressure ulcer development. Bed mobility activities include rolling, scooting, bridging, and supine to and from sitting.

4. Increased bed to wheelchair transfer from unable (limited by pain) to dependent assistance of two persons. This would increase sitting tolerance for pneumonia prevention.

Physical therapy long-term goals (three weeks) included:

1. Decreased pain level at low back and bilateral hips to 5/10 on NPRS to enable participation in transfer, seated ADLs, and wheelchair transfer.

2. Improved overall muscle strength by one grade on MMT to facilitate use of extremities for functional mobility.

3. Improved static sitting balance with dependent assistance to dynamic sitting balance with stand-by assistance to facilitate independence in seated ADLs using upper extremities.

<table>
<thead>
<tr>
<th>Table 2. System Reviews</th>
<th>Systems</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular/Pulmonary</td>
<td>Temperature: 37.1°C</td>
<td>Blood pressure: 115/73 mmHg in supine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heart Rate: 95 beats per minute (bpm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Respiration: 18 bpm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxygen saturation: 93% on two liters of oxygen</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Symmetrical weakness, lower extremities weaker than upper extremities</td>
<td></td>
</tr>
<tr>
<td>Neuromuscular</td>
<td>Alert &amp; Oriented x 2</td>
<td>Mild dysarthria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited bilateral upward gaze &amp; impaired bilateral smooth pursuit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diplopia on the far right gaze</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impaired proprioception/sensation</td>
</tr>
<tr>
<td>Integumentary</td>
<td>Skin rash at buttock area</td>
<td></td>
</tr>
<tr>
<td>Internal Organ</td>
<td>Negative liver and renal function tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incontinent bowel and bladder</td>
</tr>
</tbody>
</table>

Impaired Motor Function and Sensory Integrity

Associated with Acute or Chronic Polyneuropathies. The physical, occupational, and speech therapists recommended patient discharge to an inpatient rehabilitation setting after his acute care stay to optimize functional recovery. In addition, he would benefit from a social work or psychology consultation for emotional support during the process of rehabilitation.

Prognosis

For CIDP, prognosis depends on clinical course, clinical presentation, and initial response to medical therapy.8,19 Long-term poor outcomes include severe disability and inability to walk, occurring in thirteen percent (13%) of patients with CIDP even without comorbidities.19,20 Since this patient’s path to a confirmed CIDP diagnosis was lengthy, with severe existing co-morbidities, clinical presentation and initial response to medical therapy would determine his prognosis. Strong indicators included a somewhat symmetrical clinical presentation, demyelination in the distal nerve with abnormalities in NCS, and a fair response to initial steroid therapy. Due to a chronic onset of CIDP, expectations were for a slow and incomplete functional recovery with the patient requiring assistive devices and perhaps orthoses for future functional mobility. On a positive note, this patient was very motivated and had a supportive family.

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Table 3. Manual Muscle Testing of Major Muscle Groups

<table>
<thead>
<tr>
<th>Muscle Groups (Bilateral, Symmetrical)</th>
<th>Initial Examination</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder flexion</td>
<td>3/5</td>
<td>4/5</td>
</tr>
<tr>
<td>Shoulder abduction</td>
<td>2/5</td>
<td>4/5</td>
</tr>
<tr>
<td>Elbow flexion</td>
<td>3/5</td>
<td>5/5</td>
</tr>
<tr>
<td>Elbow extension</td>
<td>3/5</td>
<td>5/5</td>
</tr>
<tr>
<td>Wrist flexion</td>
<td>3-5</td>
<td>4/5</td>
</tr>
<tr>
<td>Wrist extension</td>
<td>3-5</td>
<td>4/5</td>
</tr>
<tr>
<td>Finger flexion</td>
<td>2/5</td>
<td>3/5</td>
</tr>
<tr>
<td>Finger extension</td>
<td>2/5</td>
<td>3/5</td>
</tr>
<tr>
<td>Hip flexion</td>
<td>1/5</td>
<td>2+5</td>
</tr>
<tr>
<td>Hip extension</td>
<td>1/5</td>
<td>2-5</td>
</tr>
<tr>
<td>Hip internal/external rotation</td>
<td>1/5</td>
<td>2-5</td>
</tr>
<tr>
<td>Knee flexion</td>
<td>0/5</td>
<td>3/5</td>
</tr>
<tr>
<td>Knee extension</td>
<td>0/5</td>
<td>3-5</td>
</tr>
<tr>
<td>Ankle dorsiflexation</td>
<td>0/5</td>
<td>3-5</td>
</tr>
<tr>
<td>Ankle plantarflexation</td>
<td>0/5</td>
<td>3-5</td>
</tr>
</tbody>
</table>

Table 4. Functional Independence Measure (FIM)††

<table>
<thead>
<tr>
<th>FIM category</th>
<th>Admission</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Eating</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2. Grooming</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3. Bathing</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4. Dressing – upper body</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>5. Dressing – lower body</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sphincter control</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. Bladder management</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7. Bowel management</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Transfers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Bed, chair, wheelchair</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9. Toilet</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10. Tub, shower</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Locomotion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Walk/wheelchair</td>
<td>0</td>
<td>5 (wheelchair)</td>
</tr>
<tr>
<td>12. Stairs</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Comprehension</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14. Expression</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Social cognition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Social interaction</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>16. Problem solving</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>17. Memory</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

FIM Levels. 7 = Complete independence (timely, safe, no helper). 6 = Modified independence (device, no helper). 5 = Supervision (subject < 100%). 4 = Minimal assist (subject = 75%). 3 = Moderate assist (subject = 50%). 2 = Maximal assist (subject = 25%). 1 = Total assist (subject < 25%). 0 = Unable to test.

4. Improved bed mobility from dependent assistance of two persons to moderate assistance of one person to maintain skin integrity. Bed mobility activities included rolling, scooting, bridging, and supine to and from sitting.

5. Improved bed to wheelchair transfer from unable (limited by pain) to maximal assistance of one person squat pivot transfer with a sliding board. This would increase time out of bed for seated ADLs and exercises.

6. Improved wheelchair mobility from unable to able to propel wheelchair 150 feet with minimal assistance (required assistance less than 25% of time) to increase independence with locomotion. Initial goals did not include ambulation secondary to significant lower extremities weakness on MMT, pain, limited activity tolerance, and risk of overstretch weakness. The physical therapist examined the patient’s condition weekly and used examination results to determine whether the patient was ready to initiate gait training.

Intervention sessions: Each session consisted of approximately thirty minutes of therapeutic exercise and functional mobility training for an average of five times per week. The actual duration of each visit and frequency of treatment depended primarily on the patient’s activity tolerance and fatigue level, as well as the operational nature in the acute care setting. The patient also performed ADLs (grooming, personal hygiene, and upper body dressing) to tolerance and strengthening exercises using exercise p newer and elastic bands outside of PT sessions. In addition, nursing staff assisted the patient to get out of bed into a cardiac chair initially and a wheelchair using a mechanical lift as the patient progressed. Table 5 summarizes the interventions by week. The interventions were chosen based on the patient’s interests, goals, and priorities in this setting. This was an attempt to minimize the adverse effects of bed rest, balancing overuse and fatigue with the patient’s pain level, and perceived effort related to activities, and motivation.

Outcomes

About one week after the beginning of prednisone therapy, the patient made substantial progress in his strength and functional mobility. He stayed in the acute care hospital for one month and progressed steadily in his body function, strength, and functional mobility (Tables 3, 4, 6). Upon discharge from acute care, the patient required minimal assistance for bed mobility, supervision for wheelchair mobility on level ground, and maximal assistance of two persons for bed to wheelchair transfer. He was able to maintain good sitting balance without support while performing ADLs. Improvement in overall ADLs. Improvement in overall ADLs, transfers, and mobility (Tables 3, 5, 6). Upon discharge from acute care, the patient was able to perform ADLs (grooming, dressing, and toileting) independently, with minimal assistance for wheelchair mobility.

Medical unit rounds exist. In this case, the authors believed frequency and quality of interactions and communications served this patient well. These included:

1. Frequency: Daily reciprocal communication exchanges with occupational/speech therapists and nurses, and as needed with physicians. Weekly patient-care rounds with all other disciplines such as social workers and case managers.
2. Type: Reading progress notes of other team members, discussing changes in patient condition, and providing input during patient rounds.
3. Key areas: Alerts for medical concerns, issues, challenges, and obstacles that limit rehabilitation progress, patient frustration levels, and achievements towards functional goals, exercise tolerance, general motivation, and well-being.
4. Red flags: Communications for any neuromuscular changes, significant decline in muscle strength and/or functional abilities (signs and symptoms may indicate medication intolerance or adverse side-effects).

The strength of communication included focus on patient-centered goals and support for providers, patient, and family. A weak area for this particular case was that communications were not always totally clear and timely. Recommendations for future improvement include greater sharing of test results, medication changes, and possible side effects of and expected results from medications and rehabilitation.
The purpose of this case report was to describe the collaborative medical and rehabilitation teams for a patient with CIDP who had multiple significant co-morbidities and many complications over the course of his diagnostic and acute care period. The patient’s course of improvement relied on coordination of care between the medical and rehabilitation teams for optimal recovery. In the first two weeks of his acute care admission, the patient showed little progress in bodily function and mobility. His initial pain level, low functional status, poor endurance, and anxiety about mobility greatly limited physical therapy interventions. The physical therapist’s provision of supportive care, persistence, encouragement, and reinforcement of even small gains, likely slowed the onset of functional decline and immobility, and eventually laid the groundwork for a road to recovery. The physical therapist also used knowledge of specific factors about CIDP and evidence from the literature to remain vigilant for significant changes in the patient’s condition, communicate regularly with the team, and implement a flexible plan of care. Medical interventions were key initially to reversing the inflammatory process, which allowed the patient to benefit from rehabilitation. The patient in this case had slow functional gains despite improvement in strength and endurance. Complications related to his co-morbidities, which included an incidental finding of kidney stones, a urinary tract infection with methicillin-resistant Staphylococcus aureus, and TIPS malfunctioning during his acute care stay, might have contributed to the slow improvement. While the role of exercise prior to the beginning of medical therapy is unclear, an appropriate level of training may minimize complications related to immobility. Whether an exercise program with dedicated frequency and schedule would have furthered his patient’s functional gains in the acute stage is not known. Although the physical therapist managed the patient’s fatigue level closely during interventions, no objective measures of fatigue or participation restriction were used. Since fatigue is a major impairment in patients with GBS and CIDP, assessing how PT management affected this impairment, regardless of disease stages and settings would have been beneficial. The Fatigue Severity Score and Fatigue Impact Scale are two examples of potential outcome measures that could be used to indicate a change in self-reported fatigue with exercise training. The development of standardized outcome measures and specific practice guidelines for CIDP might lead to best practice care for this condition.

ACKNOWLEDGMENTS

The authors thank Jeffrey Terasoka, MD, Lisa Ruma, MSPT, Debby Bolding, MS, OTR/L, and Diane Allen, PT, PhD for their valuable comments during the preparation of the manuscript.

REFERENCES

University of Rochester Acute Care Evaluation: Development of a New Functional Outcome Measure for the Acute Care Setting

Julie DiCicco, Deborah Whalen

ABSTRACT

The Physical Therapy Department at the University of Rochester determined a need for a functional outcome measure to be used in the acute care setting because current outcome measures in practice do not quantify the lower level function often found in this setting. After reviewing the literature, the John’s Hopkins Hospital Functional Acute Care Score (or JHH-FACS) was chosen to be trialed and did not adequately quantify the functional abilities of our patient population. The tool was modified after a trial use period and survey of staff members to create a new tool. We describe the steps taken to create the outcome measure, called the University of Rochester Acute Care Evaluation (or URACE), that objectively assesses an individual’s function while in the acute care setting.

Due to the nature of the illnesses or injuries that cause individuals to be admitted to acute care hospitals, declines in strength are common, which can impair tasks such as bed mobility, transfers, and ambulation. Significant functional decline has been observed within 48 hours of hospitalization. Although the average length of stay has decreased from 7.8 days in 1970 to 4.8 days in 2005, the time length of stay has decreased from 7.8 days in 1970 to 4.8 days in 2005, the time...
Evaluation: Development of a New Functional Outcome Measure for the Acute Care Setting

In the acute care setting, the physical therapists’ role includes clearly and objectively documenting the individual’s functional status as a means of developing a plan of care and making an appropriate discharge recommendation. Objective outcome measures allow physical therapists to standardize the assessment and documentation of an individual’s initial functional status. Outcome measures allow reassessment, so physical therapists can objectively document an individual’s improved level of function, determine the effectiveness of treatment, and finalize discharge planning. Discharge planning relies on the therapist’s ability to predict an individual’s previous level of function and then compare it to the current level of function as documented by the functional outcomes measure.1

The individual’s home environment, equipment and any assistance at home are also taken into consideration.2 Discharge planning is therefore highly dependent on individuals’ functional mobility supporting the need for a standardized tool to ensure an objective assessment.

Due to the short length of stay and focus on early discharge planning the acute care setting is often fast paced. Individuals are discharged from many different services during the course of only a few days, often reducing the time available for the type of comprehensive care that patients in a manner that will make substantial improvements in their functional status. Many therapists in acute care settings report feeling inadequate time to work with individuals due to the severity of their illnesses, and interruptions from other health care professionals and visiting families. Consequently, outcome measures for this setting should be designed so they can be completed in a timely manner due to limited individual contact time and potential interruptions from other members of the medical team that often occur in the hospital setting. Complete FIM scoring requires input from other health care professionals as it is not designed solely for assessing mobility.

Less known is the Alpha FIM instrument, which was modified from the FIM, for the purpose of measuring an individual’s functional status during the first 72 hours of acute care hospitalization.3 The Alpha FIM was designed to triage individuals by determining the next appropriate care setting and pinpointing the earliest opportunity for transfer, but presents with the same interdisciplinary limitations as the FIM.4 Due to the limitations associated with the FIM and Alpha FIM, a tool that exclusively measures mobility that can be completed independently by a physical therapist is necessary for efficient assessment in busy acute care hospitalizations.

In 1996, the Johns Hopkins Hospital research committee piloted a modification to the motor FIM for use in the acute care inpatient setting, which they called the JHH-FACS.5 The JHH-FACS was more specific than the FIM due to the ability to score each assistive device used as well as breaking down the increments of distance for locomotion. The principal objective was to improve the sensitivity of the motor portion of the FIM while taking into account the efficiency needed to be applicable to the busy environment of the acute care setting. A small pilot study provided little detail regarding the methodology used to perform testing of inner-rater and inter-rater reliability. The findings indicated fair reliability with transfer ability and fair to good reliability with locomotion. The reliability testing was incomplete due to lack of sufficient data.6

Many other functional outcome tools exist in the physical therapy literature including but not limited to the Timed- Up-And-Go Test (or TUG),7 the Berg Balance Scale,8 the gait speed test9 and chair rise test.10 These outcome tools were created to objectively assess an individual’s mobility. However, many of the tasks involved allow for high functioning for a large number of individuals in an acute care setting and thus a floor effect might be seen. Tools such as those mentioned above may also fail to capture subtle changes in the function of the activity being measured. For example, a person not able to stand without assistance was given a score of 0 on the TUG, gait speed and chair rise tests because the tools only take into account an individual’s ability to stand and walk, totally excluding any ability to sit up from bed.

After reviewing the current literature we were unable to find any standardized tool that addresses relevant to patients in the acute care setting that met our needs of effectively analyzing the requisite functional mobility skills related to bed mobility, transfers, ambulation and stair negotiation. Therefore, the purpose of the functional outcome measure was to create an outcome measure that would objectively assess an individual’s function while in acute care.

METHODOLOGY

The Functional Outcome Committee of the URMC Physical Therapy Department trialed several outcome measures in an effort to find a test that would be appropriate at both evaluation and discharge for our acute care population. The physical therapy department started using the chair-rise and the gait speed tests as they were quick, easy and objective. Unfortunately, these outcome tools were not inclusive enough for non-ambulatory individuals in the hospital setting. The next functional outcome measure trialed was the JHH-FACS. The committee introduced in-service staff on the JHH-FACS tool, and precise methods of scoring the instrument before using it on individuals in the hospital. The staff therapists, therefore, varying educational levels from bachelor’s to doctorate degrees in physical therapy. All thirteen staff members were asked to utilize the tool to score adult individuals at evaluation and discharge and record all scores on the data sheets. After a 3-month trial period, the functional outcome committee surveyed the physical therapists on their opinion of the JHH-FACS and any suggested changes to the tool. The survey questions included in Appendix 2. The survey questions were used to make changes to the tool to produce a more objective, sensitive outcome measure for the acute care physical therapists. (See Table 1) The new tool was again trialed for three months by all staff therapists. The survey was again given to the staff members for suggestions and no further changes were deemed necessary.

RESULTS

Based on the therapists’ survey responses, the Functional Outcome Committee made changes to the design of the JHH-FACS in order to make it more specific to the population in our medical center. When changing the JHH-FACS, the first area addressed was the issue of bed mobility not being scored independently of transfers and therefore neglecting possible progress being made by low functioning individuals. A considerable number of individuals referred to physical therapy at URMC have neurological disorders, severe deconditioning and other severe conditions that limit or prevent transfers and ambulation. The JHH-FACS was changed to allow assessment of lower level mobility in bed bound individuals without experiencing the floor effect present in the JHH-FACS. A subset system was also created for the height of the head of the bed and the use of bed rails due to the variety of conditions and contraindications seen in the hospital setting. (See Appendix 3) Higher scores were given for the ability to get out of bed with the head of the bed flat and no use of a bed rail. A further modification was also made to the stair section. The category of stairs was broken into 4 subsets to better quantify the number of steps completed by an individual and increase the overall sensitivity of the tool. (See Appendix 3) The new outcome tool was named the URACE. All staff was trained in how to score the tool and began administering it to individuals in the hospital.

The scoring of the entire URACE tool was also uniformly changed to numeric values in order to allow for ease in statistical analysis and for a total score to be calculated. The original JHH-FACS tool was scored with both numeric values and was found to be confusing for the therapists scoring the tool. The URACE scoring form was also reformatted to

**Table 1. Feedback from staff survey following trial of the JHH-FACS**

<table>
<thead>
<tr>
<th>Ease of use</th>
<th>Ease of scoring</th>
<th>Scoring specificity</th>
<th>Assesses patient’s ability</th>
</tr>
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<tbody>
<tr>
<td>Ease of use</td>
<td>Scoring confusing with numbers and letters</td>
<td>No specific instructions for bed positioning or bed rail</td>
<td>Groups bed mobility and transfer abilities together</td>
</tr>
<tr>
<td>Quick to administer</td>
<td>Ambulation distance does not include distances less than 5 feet</td>
<td>Able to assess ambulatory and non-ambulatory individuals</td>
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<tr>
<td>Includes only functional activities</td>
<td>Stair distances given only for bed can vary greatly depending on the position of the bed and utilization of a rail</td>
<td>Able to assess with or without use of assistive devices for activities</td>
<td></td>
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<tr>
<td>Includes activities that are already part of typical evaluation in acute care</td>
<td>Stairs given only to choices and not able to score for less than 6 steps</td>
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</table>
provide the therapist with a scoring key on the same document to avoid having to refer back separate scoring instructions for every individual seen. (See Appendix 3) Prior to using the URACE, all therapists were trained in the proper testing and scoring of the new tool. (See Appendix 4) The procedure of testing also needed to be consistent so that patients were assessed in the same way regardless of the clinician in an effort to improve inter-rater reliability. Therefore, the committee members decided, that the first time an individual performed a supine to sit maneuver with a physical therapist a URACE outcome measure was scored despite whether this occurred during the initial visit or on a subsequent visit. This ensured that all individuals being scored were off of bed rest and able to tolerate sitting upright.

**DISCUSSION**

The goal of the functional outcome committee was to create an outcome measure that would objectively assess an individual’s function in the acute care setting as the trend in health care is on greater use of tools to objectify current evaluation in health care is on greater use of tools to objectify current evaluation in health care. The URACE is clearly able to provide the therapist with a scoring tool to objectify current evaluation in health care.

The URACE tool allows physical therapists to assess the ability to go from supine to sitting at the edge of the bed, but does not account for lower level bed bound activities such as rolling or scooting up in bed. Another limitation, like the FIM, is that the scoring of the assistance level provided to the patient is still somewhat subjective. The amount of assistance is scored based on the percentage of the task completed by the patient and could be perceived differently by separate therapists. While this method of grading was found to be reliable in the FIM, it is still a somewhat subjective grading system. The URACE has not thus far been tested for reliability and validity. Further study would need to be done to determine whether it has acceptable validity. Additionally, the URACE has no total score so therefore at this time it cannot be statistically correlated to the FIM or any other functional outcome tool. Further testing may also be useful to determine if the URACE can play a role in predicting appropriate setting for discharge.

Overall, the URACE outcome measure closely encompass their populations’ functional abilities.

**REFERENCES**


**Appendix 1**

**144 The John Hopkins Hospital 1996**

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Instr: Circle appropriate item in each column. *Please indicate below nature of interrupted score.

| Patient name: |
| Therapist scoring I.E.: |
| Date of I.E.: |
| Total #Rx’s at D.C.: |

**Appendix 2**

**Questionnaire on the JHH-FACS**

In your opinion is the JHH-FACS easy to administer?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>If no, please explain why.</td>
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</table>

In your opinion is the JHH-FACS easy to score?

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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tr>
<td>If no, please explain why.</td>
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Was the scoring specific enough?

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<th>Yes</th>
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<td>If no, please explain why.</td>
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Do you feel this tool adequately enables you to score a patient’s ability?

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<td>If no, please explain why.</td>
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What other changes would you recommend?

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Appendix 3

University of Rochester Acute Care Evaluation

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<th>Eval</th>
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<th>Transfer</th>
<th>Locomotion</th>
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<td>N/T</td>
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</table>

*T initial: Reason for not tested

URACE Testing and Scoring Instructions

Activities are scored taking into account the amount of assistance required by the patient and the percentage of patient effort put forth into the activity. The level of assistance is scored 1 to 7, again using the level of patient effort along with the amount of assistance required. A score of N/T or not tested is given if the activity was not able to be completed for any reason including interruptions or safety reasons. Please identify reason for not tested for any activity not able to be scored.

**Assistance Scoring:**
1 = total assistance or <25% patient effort
2 = maximal assistance or 25-49% patient effort
3 = moderate assistance or 50-74% patient effort
4 = minimal assistance or >74% patient effort
5 = supervision or setup only
6 = modified independence by use of assistive device only
7 = independent

For all activities and all measures if a patient seems to be between two scores the lower of the two scores is given.

Scores are also identified for any assistive devices used or distances traveled.

For sitting to sitting activity a bed score is given to objectively identify the position of the head of the bed as this can greatly affect a patient’s ability to complete the tested activity.

1 = > 45°
2 = < 45°
3 = head of bed is flat

For sitting to sitting activity a bedrail score is also given to objectively identify the use of a bedrail or not as this can also greatly affect a patient’s ability to complete the tested activity.

1 = use of bedrail
2 = no use of bedrail

For transfer scoring the amount of assistance is scored based on the above assistance scoring scale. Then the type of transfer is identified as outlined below:

1 = sit-pivot transfer
2 = sit-stand transfer
3 = stand-pivot transfer

For transfer scoring a device must also be identified for the patient scored as below:

1 = walker
2 = crutches
3 = cane
4 = none/other

For locomotion scoring an activity must first be chosen and circled on the score sheet: ambulation or wheelchair mobility. The assistance level used and device scoring is completed as above. Distance must be scored as below:

1 = 1-24 ft.
2 = 25-49 ft.
3 = 50-149 ft.
4 = > 150 ft.

For stairs scoring the assistance level is completed as outlined above. A score will then be given for distance used on the stairs as below:

1 = handrail
2 = no handrail
3 = crutches
4 = cane
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For locomotion scoring an activity must first be chosen and circled on the score sheet: ambulation or wheelchair mobility. The assistance level used and device scoring is completed as above. Distance must be scored as below:

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In order to reflect a patient’s true ability it is important to allow and encourage a patient to give his/her best effort with all portions of the test.

Adapted from Johns Hopkins Hospital Function Acute Care Score for use by Strong Physical Therapy

Appendix 4

Evaluation: Development of a New Functional Outcome Measure for the Acute Care Setting

**URACE Testing and Scoring Instructions**

Activities are scored taking into account the amount of assistance required by the patient and the percentage of patient effort put forth into the activity. The level of assistance is scored 1 to 7, again using the level of patient effort along with the amount of assistance required. A score of N/T or not tested is given if the activity was not able to be completed for any reason including interruptions or safety reasons. Please identify reason for not tested for any activity not able to be scored.

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In order to reflect a patient’s true ability it is important to allow and encourage a patient to give his/her best effort with all portions of the test.
The Effects of a Physical Therapy Triage System on the Outcomes of ICU Patients with Respiratory Failure

Joni Rapp, Jaime C. Paz, Christine McCallum, Jeanne Cole, Lynn Steffey

ABSTRACT

Background: In September 2003, the Summa Health System implemented an activity protocol and a triage system to prioritize the delivery of physical therapy services in the intensive care unit (ICU). The triage system first identified patients who required skilled physical therapy (PT) interventions to reach the expected continuum of care level (COC) at discharge and then allocated PT services accordingly.

Purpose: The purpose of this study is to answer the clinical question, “Does the triage system decrease length of stay (LOS), decrease the number of PT visits, and improve physical function while achieving the predicted COC level for patients with respiratory failure who were admitted to the ICU?”

Methods: A retrospective chart review utilized a sample of 117 patients, 60 patients from January to May of 2002 (Group 1) and 57 patients from January to March of 2007 (Group 2). Group 2 was further divided into 41 Level I patients (Group 2a), 12 Level II patients (Group 2b), and 4 Level III patients (Group 2c), based on the Triage system criteria. Non-parametric tests and central tendency was used in the analysis. The triage system was continued through 2008. The triage system was reapplied every 3 - 5 PT sessions per week. A patient at Level II is also appropriate for skilled PT services and is considered to be at their prior level of function and only require skilled PT sessions per week to reduce deconditioning.

Results: Hospital LOS and ICU LOS were both decreased by two days and the number of PT visits per patient decreased by two sessions when comparing Groups 1 and 2. Significant changes from function upon initial evaluation to discharge were shown in Group 1, Group 2a and Group 2b. Patients achieved the predicted COC level 72% of the time in Group 2.

Conclusion: A physical therapy triage system can decrease patient and hospital ICU LOS, decrease the number of PT visits and achieve the predicted continuum of care level.
The Effects of a Physical Therapy Triage System on the Outcomes of ICU Patients with Respiratory Failure

Figure 1. Physical Therapy Continuum of Care

The continuum of care (COC) level predicted by the evaluating therapist at the initial evaluation was divided into six categories based upon the following labels: long term acute care, skilled nursing facilities (SNF), rehabilitation, home with or without assistance, SNF versus home or uncertain. The category of “uncertain” was typically given when the patient was sedated or unconscious and a true prognosis could not yet be determined. The category of “SNF versus Home” was considered a correct prognosis if the patient had gone home or to a skilled nursing facility.

Analysis
Data analysis was completed using SPSS 17.0 and Microsoft Excel 2007 software. Non-parametric tests were used and included the Mann-Whitney U and the Wilcoxon signed-ranks test. The Mann-Whitney U test was performed to compare Groups 1 and 2 regarding level of function, length of stay, and group characteristics. The Wilcoxon signed-ranks test was performed to compare change in function or change in COC level for an individual group over time. The level of significance was set at 0.05 for these analyses. Central tendencies, or averages, were used in addition to statistical significance to identify changes in the number of physical therapy visits and number of days of hospital and ICU length of stay for Groups 1 and 2.

RESULTS
Demographics
The characteristics for Groups 1 & 2 are outlined in Table 2. The characteristics of Group 2, which was further divided into Groups 2a, 2b, and 2c, are outlined in Table 3. For the number of co-morbidities, which was calculated by counting the number of diagnostic codes, Group 1 was significantly higher ($p < .001$) than Group 2 (including subgroups) for reasons unknown to the authors. However, this may be attributed to changes in medical management over

of each ICU patient chart by a senior therapist to determine uniformity of the documentation of triage levels by the staff PTs. The result of the QA process determined few errors in the assignment of a triage level and follow up interventions by hospital PTs.

The purposes of this study were to evaluate the effectiveness of the triage system and to answer the clinical question: “Does the triage system and to answer the clinical question: “Does the triage system and to answer the clinical question: “Does the triage system

METHODS
This is a non-experimental, descriptive study in which a retrospective chart review of patients admitted to the ICU at SHS between January and March of 2002 and between January and March of 2007 was used for data collection.

Sample
An initial sample was collected by Summa Health Systems Quality Resource Management that included patients given a primary diagnosis of respiratory failure resulting in mechanical ventilation. Patients were excluded from the sample if they had expired while in the hospital, were discharged to hospice, were initially seen for cardiac or orthopedic procedures, or were found to have other life-limiting co-morbidities. The final sample included 2 Groups of patients. Group 1 consisted of sixty patients who received PT services prior to initiation of the triage system. Group 2 consisted of 57 patients who received PT services after the triage system was put in place. Group 2 was further divided into three subgroups based on the triage system criteria (Fig. 2). Group 2a consisted of 41 patients triaged as Level I; Group 2b consisted of 12 patients triaged as Level II; and Group 2c of 4 patients at Level III.

Data
The administrative data provided by Summa Health Systems Quality Resource Management included age, sex, hospital length of stay, ICU length of stay, the number of co-morbidities, and discharge status from the hospital. A retrospective chart review was then completed by 3 physical therapists on the final sample of 117 patients to collect the following data: diagnosis, number of PT visits, number of days from admission to PT examination, level of functioning at PT examination, and triage level designated by the evaluating physical therapist. The chart review identified the level of function documented at initial PT examination and at the last physical therapy treatment note prior to discharge from the hospital. For purposes of comparison, these data were collapsed and stratified into six levels of function (Table 1) similar to the classifications used in the Kansas University Hospital Physical Therapy Acute Care Functional Outcomes Tool.12 Several patients were seen only once by physical therapy and therefore, their data were eliminated from the comparisons of change in level of functioning.

- The Wilcoxon signed-ranks test was performed to compare change in function or change in COC level for an individual group over time.

- The level of significance was set at 0.05 for these analyses.

- Central tendencies, or averages, were used in addition to statistical significance to identify changes in the number of physical therapy visits and number of days of hospital and ICU length of stay for Groups 1 and 2.

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a five-year span. The average number of physical therapy visits decreased by 2.5 visits in Group 2 compared with Group 1 (p=.001). The mean hospital length of stay and ICU length of stay decreased by approximately two days in Group 2 compared with Group 1, although statistical tests performed did not indicate a high probability of true differences between groups (Mann-Whitney U test for hospital LOS: p=.283, and ICU LOS: p=.876) (Fig 3).

### Level of Function
The level of function at initial evaluation for Groups 1 and 2 appeared to be different based on the Mann-Whitney U test (p=.015). This suggests an initial difference between the groups, which prevented us from exploring any further between group comparisons regarding change in function from initial evaluation to discharge from hospital. Patients from both Group 1 and Group 2 who were admitted to the ICU. The goal of the triage system was to improve patient function in order for the patient to advance from the ICU to the next level of care as quickly as possible while utilizing fewer PT visits. The intent was to provide physical therapy services with a higher frequency to those patients who had the potential to improve more quickly or who required more intense therapy while decreasing the number of visits to patients with chronic conditions without compromising quality of care. As frequency of therapy visits increase, the patient should improve in function, which would allow for a more rapid transfer out of the ICU. Quality of care at Summa Health Systems indicates that the appropriate number of PT visits necessary to improve patient function and achieve the predicted continuum of care level at discharge has been provided.

### Length of Stay
A decrease in the number of physical therapy visits, the average number of co-morbidities, and the average intensive care unit LOS occurred from 2002 (Group 1) to 2007 (Group 2) (Fig 3). The decrease in the length of stay, for both hospital and ICU may be in part due to changes in patient management in that 5-year time span as costs for acute care have risen and reimbursement has been reduced. However, the U.S. Department of Health and Human Services’ Healthcare Cost and Utilization Project indicated no change in average hospital LOS from 2002 to 2007. In comparison, the Summa Health System was able to decrease the hospital LOS in 2007, which may have been partially attributed to addition of the triage system. Further analysis of all the contributing variables to hospital LOS is necessary to fully determine the reasons for decrease in hospital LOS at this facility.

### Level of Function
We hypothesized that the triage system would increase physical function for the 2007 (Group 2) patients compared with the 2002 (Group 1) patients upon hospital discharge or at the last documented PT visit. Because Groups 1 and 2 were different at initial evaluation, statistical comparisons could not be made. Therefore, we could not safely conclude that the triage system led to greater increase in physical function compared with physical therapy management prior to initiating the triage system.

### Discussion
The purpose of this study was to determine the effectiveness of the physical therapy triage system in decreasing the number of physical therapy visits, decreasing the length of stay (hospital and ICU), increasing patient function, and achieving the predicted continuum of care level for patients with respiratory failure who were admitted to the ICU. The goal of the triage system was to improve patient function in order for the patient to advance from the ICU to the next level of care as quickly as possible while utilizing fewer PT visits. The intent was to provide physical therapy services with a higher frequency to those patients who had the potential to improve more quickly or who required more intense therapy while decreasing the number of visits to patients with chronic conditions without compromising quality of care. As frequency of therapy visits increase, the patient should improve in function, which would allow for a more rapid transfer out of the ICU. Quality of care at Summa Health Systems indicates that the appropriate number of PT visits necessary to improve patient function and achieve the predicted continuum of care level at discharge has been provided.
The Effects of a Physical Therapy Triage System on the Outcomes of ICU Patients with Respiratory Failure

Limitations
The limitations of this study include a relatively small sample size compared with a similar study and the possible role of changes in medical management over a five-year span. The samples analyzed in the study covered a small period and included patients with many different medical diagnoses, patients with a large age range, and patients with various medical histories including drug abuse and chronic non-life-threatening conditions. Complexity in patient population may have further limited statistical significance; however, this variety of sampled patients may have increased the likelihood of outcome application to other mechanically ventilated patients. Additionally, the long time span between groups may have also affected the results. Over several years, length of stay and COC level may have been altered by not only the physical therapy protocols but also by changes in the health care system such as reimbursement restrictions and newer, more effective medical treatments.

Another possible limitation to this study was the data gathering points. For the data, the initial level of functioning was compared with the functional documenter at the last PT visit. However, the data collectors often noticed that higher levels of functional activity were achieved by patients during their stay than was recorded at the last PT visit. This was due partly to the common practice (at this facility) of allowing the patient to complete only bed exercises on the day of expected transfer to another facility to allow energy conservation. This practice may have negatively skewed the data and decreased significance; therefore a larger statistical significance may have been seen if the exception criteria had been made between level of functioning at initial evaluation and the highest level of activity achieved.

Further limitations of this study are due to the nature of a retrospective study and include a lack of standard documentation and differing methods of patient care. This may have occurred as a result of staff with less tracheostomy protocol training, such as shortage of contract employees and students. As described by Jette et al., clinicians with less acute care experience tend to be more conservative with their continuum of care level recommended upon discharge. This may also be true regarding the level of activity the therapist encourages their patients to achieve. Future research in this area will need to address these limitations better understand the potential implications of this triage system or similar systems utilized at other facilities.

CONCLUSION
Triage systems similar to the one created by Summa Health System have been described in professional literature; however, no current research studies have been identified to determine the efficacy of such a system. This research study demonstrates the effectiveness of a triage system in decreasing LOS (both hospital and ICU), and allocating the appropriate number of PT visits to CI patients. The data also demonstrate how physical therapy is able to increase the functional ability of the patient in the acute care setting regardless of a tracheostomy protocol. Lastly, physical therapists using the triage system were able to correctly identify the level of care required upon discharge. Results of this study confirm the vital role physical therapists play in the medical management of the acute care patient.

REFERENCES
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change in function from evaluation to discharge in each of those respective groups. Change in function within the same group was also analyzed to provide comparison to the triage subgroups. Improvement in function from initial evaluation to discharge within each group (Groups 1, 2a and 2b) was found to be statistically significant (Fig. 4). Although the initial difference between Groups 1 and 2, did not allow us to test the full effectiveness of the triage system statistically, our results suggest that the triage system helps physical therapists in clinical decision making and their ability to allocate PT services appropriately to CI patients while still achieving improvement in functional levels. These results are consistent with previous literature documenting the ability of physical therapists to manage CI patients successfully in the ICU.

Continuum of Care Level
The Summa Health System triage classification includes a physical therapy evaluation of the patient, which identifies the expected discharge continuum of care level. Each therapist considers many factors to determine the potential for each patient to reach a certain level.

Figure 4. Change in Level of Function

Figure 5. Continuum of Care Level at Discharge

Figure 5. Continuum of Care Level at Discharge
The Effects of a Physical Therapy Triage System on the Outcomes of ICU Patients with Respiratory Failure

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Platform Presentation Abstracts

Low Frequency Ultrasound Delivered at 35KHZ Decreases Methicillin Resistance in a Clinical Wound Isolate of MRSA.
Conner-Kerr, Teresa 1; Alston, Geleana 2; Kute, Tim 2
1. Physical Therapy, Winston-Salem State University, Winston-Salem, NC, United States. 2. Microbiology, NC A&T University, Greensboro, NC, United States.

Purpose/Hypothesis : The purpose of this study was to determine if low frequency ultrasound (LFU) delivered at 35 KHZ reverses methicillin resistance in a clinical wound isolate of MRSA.

Number of Subjects : A known clinical isolate of MRSA from a lower extremity wound with an established resistance to oxacillin and erythromycin was exposed to LFU treatment.

Materials/Methods : The MRSA isolate was subcultured, plated and grown on sheep blood agar (SBA) using standard microbiological techniques. Serial dilutions of the organisms were prepared using sterile saline. Cultures received either no treatment or treatment with LFU for 30, 60 and 180 seconds. Inocula from each of the test groups were placed on SBA. Subsequently, an oxacillin test disk was placed on the SBA plates in the initial zone or first quadrant used for organism inoculation. The organisms were incubated at 37 degrees C and grown overnight. The zone of inhibition was determined for each test group according to manufacturer’s guidelines. Three separate experiments were performed with 3 replications each. Inocula of the tested cultures that demonstrated conversion to a methicillin-susceptible organism were then plated and grown over night to determine persistence of methicillin susceptibility. This process was continued for 72 hours post-ultrasound treatment. Samples of MRSA from the control, non-treatment group and LFU treated groups were also examined using scanning electron microscopy to determine if ultrastructural changes had occurred as the result of treatment. Samples were also taken for flow cytometry.

Results : Zones of inhibition congruent with oxacillin (oral form of methicillin) susceptibility were detected for the clinical isolate of MRSA at all tested treatment times. A dose-dependent increase in the zone of inhibition was detected with 35 KHZ LFU treatment times as low as 30 seconds. The zone of inhibition increased by 14% with a treatment time of 60 seconds and by 30% with a treatment time of 180 seconds. These zones of inhibition were maintained for as long as 48 hours after LFU treatment. LFU was also effective in changing other colonial characteristics of MRSA as well as producing significant reduction in colony counts and changing membrane permeability.

Conclusions : This is the first demonstration of the reversal of methicillin resistance with a biophysical energy. The data suggest that LFU reduces or reverses methicillin resistance in a clinical isolate of MRSA for up to 48 hours after initial treatment.

Clinical Relevance : Delivery of LFU at 35 KHz may be an effective treatment for wounds heavily colonized or infected with MRSA.

KEYWORDS: MRSA, Low Frequency Ultrasound, Wounds

Survey on the Use of Aides to Support Physical Therapists’ Services
Smith, Jim M.; Crist, Molly H.; Probst, Suzanne. Utica College, Utica, NY, United States.

Purpose/Hypothesis : Use of staff to support the physical therapist (PT) is a strategy that may increase the PT’s efficiency. The profession has defined PTs and PT assistants (PTAs) as the only providers of interventions, and the aide as “any support personnel who perform designated tasks related to the operation of the physical therapy service. Tasks are those activities that do not require the clinical decision making of the PT or the clinical problem solving of the PTA” (APTA HOD P06-00-17-2B). The last investigation of the role of aides (1993) reported the use of aides for providing treatment was a common practice. The purpose of this investigation was to (1) determine the extent aides provide physical therapy services under the supervision of a PT, (2) identify PTs’ opinions about the utilization of aides; and (3) identify the resources PTs use to inform their decisions for aide utilization.
Materials/Methods: A survey was designed to collect information from PTs on the tasks performed by aides. The survey gathered data and information on PTs’ opinions regarding support staff. The frequency distribution of responses was analyzed and Spearman’s rho analysis was performed to determine correlation between the responses and the demographic data.

Results: The tasks identified as most frequently performed by aides were: phlebotomy (36%), aerobic/endurance activities (32%), active/resistive exercise with equipment (29%), whirlpool (16%) and data collection for height and weight (16%). Opinions on the use of aides included: 54.3% reported that the use of aides made them feel that they were helping their patients, and 83.9% reported that they were comfortable with aides in their practice; and 47.5% reported that they were comfortable with aides in their practice and 83.9% reported that they were legally responsible for actions of an aide. Resources that informed PTs’ decision on utilization of aides were: 59% were familiar with utilization of aides, 52% were familiar with state statutes (52%); and recommendations from an administrator or manager (38%).

Conclusions: The use of aides in physical therapy is an acceptable practice as long as the aide is under the direct supervision of a therapist. However, physical therapists performing therapeutic activities in the presence of aides may be at risk of liability for ethical and legal reasons. Therefore, it is imperative that therapists in this environment have a clear understanding of the restrictions following the procedure, patient population due to the severity of their muscle wasting and the acuity of their post-operative medical status. There is a need for training and education for therapists, aides, nurses, and other health-care staff.

Number of Subjects: Twenty-two subjects (13 men, 9 women, mean age 53.9 years, mean height 5’4”, mean weight 160 lbs) were recruited from a level II rehabilitation clinic.

Materials/Methods: A randomized study was conducted with a control group performing usual care and a treatment group performing a progressive HEP targeting the gastrocneumius, quadriceps, and gluteal muscle groups. The intervention progressed from gravity eliminated exercise to movement against gravity and elastic bands of resistance. A physical therapist performed the initial exercise instruction and then provided telephone and clinic follow-up. Baseline, 8, and 12 week measurements were taken on strength measures: heel-rise and bridging; and activity limitation measures: 30 Second Chair Stand (CS), 6 Minute Walk Test (6MWT).

Results: Repeated Measures ANOVA demonstrated a significant difference in the change from baseline to follow up for Bridging (treatment increased from 23.5 to 36.5, control increased from 24.7 to 32.2 [p<0.01]) and for CS (treatment increased from 9 to 14, control increased from 9 to 10 [p<0.05]). Heel-rise approached significance (treatment increased from 10.4 to 21.4, control increased from 12 to 16.9 [p=0.12]). Although the treatment group improved more than controls for 6MWT (treatment increased from 1349 to 1608, control increased from 1137 to 1371) the difference was not significant (p=0.32). There were no adverse effects on liver enzymes or surgical incision healing in either group.

Conclusions: Both treatment and control groups improved from baseline; however, the treatment group that performed progressive resistance exercise improved more in strength and function compared to controls. Only the treatment group performed aerobic walking activity.

Materials/Methods: We compared average inpatient length of stay data using information collected at UMHS and information published in the Journal of the American Medical Association. Staff training for independent management of VAD patients includes: VAD specific performance training, case studies, hands-on practice with demo VAD, extensive VAD research notebook, mentoring by facility staff, and direct patient care, and competency testing. Physical therapy goals for hospitalization and discharge include a functional lower extremity evaluation which is received post-operative day 0, standing activity orders which include up to chair three times per day and ambulation four times per day and physical expectations. Discharge goals include independence with mobility, independence with VAD alarms to allow for independent mobility, independence with strengthening program and independence with precautions to allow for safe mobility.

Results: As noted above average inpatient length of stay following placement of a VAD is 21 days at UMHS. The most recently published data obtained from a November 2007 survey at UMHS found the average length of stay is 30 days. We are currently obtaining more up to date information from the national database.

Conclusions: While there are multiple factors that affect length of stay, we feel that extensive PT staff training and aggressive physical therapy in the post-VAD placement patient contributes to shorter length of stay and better patient outcomes.

Clinical Relevance: As the number of VADs continues to increase, we hope to share a model of PT staff training and aggressive post-operative physical therapy for independent management of VAD patients. This model is based on the frequency distribution of responses and will guide PT staff training and independent management of VAD patients.
Gait and Balance Deficits in a Patient Hospitalized with Bipolar Schizoaffective Disorder: A Case Report
Kranenburg, Megan; Cleary, Kimberly K. Eastern Washington University, Spokane, WA, United States.

Background & Purpose: In schizoaffective disorder, symptoms of schizophrenia and a mood disorder with psychotic features overlap. Up to one-third of patients diagnosed with schizophrenia may have schizoaffective disorder. Evidence indicates that affective disorders affect a person’s psychomotor skills and gait. Patients with schizophrenia show decreased ability to regulate stride length, and those with bipolar disorder exhibit significantly increased variability in swing time. Existing research is clear that the mental illness itself is likely the primary cause of altered gait patterns.

Case Description: A 56-year-old female admitted to an inpatient psychiatric hospital. In addition to her psychiatric illness, she had multiple systemic and musculoskeletal comorbidities, including osteoarthritis, Type II diabetes, and asthma. In addition, an anoxic brain injury experienced during infancy left her with diminished cognitive function. Gait analysis revealed an unpredictable gait pattern. She drags her right foot and used a step-to-step pattern that varied with speed and she exhibited a Trendelenburg lurch bilaterally. Use of a front wheeled walker may have exacerbated poor gait habits. Her initial score on the Berg Balance measure was 45/56, indicating falls risk of 80%. Her prognosis was fair to return to MD. Limited independence without an assistive device.

Outcomes: The plan of care for this patient included strengthening and gait retraining. Specific interventions included aquatic therapy (walking, side-stepping, bicycles, and wall squats), lower extremity ergometry, and wedge sitting. The patient’s difficulty maintaining focus during physical therapy sessions was the primary challenge to treatment. The patient was treated in the pool 3 times and in the clinic 7 times over her two and a half week episode of care. At re-examination prior to discharge, the patient’s Berg Balance score increased to 48/56, which reduced her falls risk to approximately 60%. Subjectively, the quality of her performance of these functional tasks also improved. No measurable, consistent improvement in gait was noted, but the patient did begin exercising independently by the end of the episode of care. The patient was discharged from the inpatient psychiatric hospital to a group home setting.

Discussion: The slight improvement in this patient’s balance may be attributed to aquatic therapy, which has been shown to decrease lateral postural sway in older women with lower extremity osteoarthritis. The ongoing gait deficits are most likely the result of her mental illness, however, future research should examine the effects of specific physical therapy interventions on gait dysfunction in patients with psychiatric illness. Information about these disease-specific dysfunctions should also be formally incorporated into entry-level physical therapist education in order to fully prepare the acute care physical therapist for appropriate intervention planning in this patient population.

KEYWORDS: Gait, Schizoaffective, Balance

Efficacy of a 12 Week Progressive Resistance Training Protocol in Liver Transplant Patients
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Background & Purpose: Chronic liver disease affects more than 5 million Americans and results in severe loss of muscle mass, strength, and activity limitation. Liver transplantation serves as a modality to prolong survival and improve quality of life (QOL). However, research demonstrates muscle wasting continues, strength and QOL remains impaired, and many individuals do not return to employment. Current post-liver transplant care does not include rehabilitation of lost muscle strength. The purpose of this study was to assess the efficacy of a 12 week progressive resistance training (PRT) exercise protocol, closely monitored by a physical therapist (PT), consisting of 14 exercises predominantly focusing on the lower extremities (LE). Research indicates that short-term PRT programs are effective at increasing strength and lean body mass.
in adults with HIV and ESRD, both of which demonstrate similar degrees of muscle wasting.

Case Description: Patients was a 56 year old male diagnosed with Laennec’s Cirrhosis 3 years prior to transplantation. The patient’s past medical history reveals a 28 year smoking history, alcohol consumption, and family history of liver disease. The patient was evaluated 12 weeks post-transplantation for baseline measures of LE strength, function, and QOL. LE strength was assessed via Heel-Rise, Bridging, 30 Second Chair Stand, and the 6 Minute Walk Test (6MWT). QOL measures were recorded using a self-reported SF-36 and Chronic Liver Disease Questionnaire (CLDQ). During his medical intervention, every other day, consisted of 14 LE exercises, targeting key muscle groups (gastrocnemius, quadriceps, and gluteals), progressing from anti-gravity to resistance with elastic bands. The PT demonstrated the importance of the intervention and reevaluated with weekly telephone monitoring. Post-intervention testing was conducted on weeks 8 and 12.

Outcomes: Exercise compliance was high. Post-intervention, the patient’s LE strength significantly improved from baseline. Sixteen days post-MVA, LM was transferred from acute care to his home. His lack of progress was likely most primary due to the ADE. Discussion: As PT education has evolved, there has been an increased focus on PT’s knowledge of pharmacotherapy. Even with this enhanced knowledge, PTs may not address ADEs with members of the medical team due to lack of confidence, uncertainty of their role in pharmacological management, or failure to identify a link between rehabilitation decline and medication change. The purpose of this case report is to describe an example in which failure to identify an ADE contributed to a less than optimal patient outcome in the acute rehabilitation setting.

Case Description: LM is a 67 year old male who sustained an incomplete C6 ASIA B spinal cord injury following a motor vehicle accident (MVA). Sixteen days post-MVA, LM was transferred to acute rehabilitation with multiple co-morbidities including type II diabetes mellitus, obesity, and hypertension, and poly-pharmacy. Due to a recent respiratory failure, he was transferred to acute care and required extensive medical management, including discontinuation of his ACE-inhibitor. LM was also dehydrated and was re-admitted to the rehabilitation setting. Heel-Rise remained in renal failure, and his left foot was warm with signs of purulent drainage. Despite use of an abdominal binder and lower extremity bandaging.

Outcomes: After the reintroduction of the ACE-inhibitor, LM was unable to fully participate in rehabilitation or progress in his functional goals. Lack of progress led to transfer to a long term acute care facility. His lack of progress was most likely primarily due to the ADE. Discussion: As PTs must be aware of the effects of medications on function and ability to fully participate in rehabilitation or progress in his functional goals. Lack of progress led to transfer to a long term acute care facility. His lack of progress was most likely primarily due to the ADE.

Purpose/Hypothesis: I was unable to fully participate in rehabilitation or progress in his functional goals. Lack of progress led to transfer to a long term acute care facility. His lack of progress was most likely primarily due to the ADE.
Impressions of Physical Therapy Students Towards Hospital Based Physical Therapy Care

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Purpose/Hypothesis : States.

Results : Students with a formal clinical education experience expressed more specific insights regarding their impressions of HBPT. In general, their responses were more positive, with greater understanding of the importance of the healthcare system and the role of physical therapy in the patients’ care. The responses from students with the most exposure to HBPT were more positive about HBPT. Conclusions : Regardless of how much time was spent in HBPT for observation, volunteering, or even employment, students with specific full time clinical education experiences working in the clinical role demonstrated greater understanding and expressed more positive impressions of that setting. They suggested that acute care facilities do more to advertise the pace and complexity of HBPT as a positive work environment.

Clinical Relevance : Academic and clinical institutions should partner to provide more opportunities to expose students to HBPT so that they become more aware of the positive attributes this practice setting offers. This could potentially lead to more physical therapy students being attracted to HBPT as a career choice.

KEYWORDS: acute care, clinical education, career choices.

Patient readmission rates are lower when acute care physical therapists’ discharge recommendations are followed.

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Purpose/Hypothesis : The purpose of our study was to determine the frequency with which the acute care PT’s recommendation of patient discharge location matched the patient’s actual discharge location, as well as the impact of mismatches. In addition, we explored factors associated with a mismatch.

Number of Subjects : Our retrospective study included the discharge recommendations of 40 acute care PTs for 762 patients in a large academic medical center.

Materials/Methods : We calculated the frequency of mismatch between physical therapist recommendation and patient discharge location. We assessed the relationship between mismatches and patient readmission rate. We also explored factors contributing to a mismatch: therapists acute care experience and treatment by one or multiple therapists evaluation to discharge.

Results : Overall, therapists’ discharge recommendations were followed 84% of the time. Patients were more likely be readmitted if the BWSTT recommendation was not followed.

Conclusions : Our study supports the role of physical therapists in discharge planning in the acute care setting.

Clinical Relevance : PTs demonstrated the ability to make appropriate discharge recommendations for complex, acutely ill patients with fluctuating functional and medical status.

KEYWORDS: discharge recommendations, readmission rate, acute care.

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Purpose/Hypothesis : Purpose: Determine if body-weight support treadmill (BWSTT) improved the functional outcomes, speed of walking, chronic traumatic (TT) amputation and comorbidities, and who had already completed standard rehabilitation. Hypothesis: BWSTT would improve endurance, chosen gait velocity, self-reported locomotor ability and decrease fear of falling in an individual with a TT amputation and comorbidities.

Number of Subjects : Subject: A 41-year-old female with a left TT amputation due to musculoskeletal instability two and one half years prior to the study. She had comorbidities of obesity, weight 336 lbs or BMI of 54, and a recent right total knee replacement (TKR). Prior to the TKR she had a fear of falling, a history of falls and gait impairment.

Materials/Methods : Impairment measures included a measure of fear of falling using the Activities-Specific Balance Confidence Scale (ABC). Activity measures include distance walked during a 6-minute walk test using the 10-meter Walk Test, and a self-report of locomotor proficiency using the Locomotor Capabilities Inventory 5 (LCIS). Study protocol: 2 weeks of pre-testing (4 sessions total), 4 weeks of intervention, and 1 post-test 2 weeks after the intervention. The proposed intervention of BWSTT was to be carried out 3 times per week for 4 weeks. The outcome measures were to be collected during the pre-testing sessions and once per week prior to the third intervention session that week.

Results : Although the study was designed for 21 total sessions, only 8 sessions were completed: 4 testing sessions, 3 before intervention and 1 after 1 week of intervention, and 4 training sessions. The subject reported that she could not complete the study because she had to move to another city. Of the testing sessions completed, the subject increased her gait speed from 0.5 m/sec to 0.6 m/sec by the fourth testing session. Total distance walked during the 6-minute walk test increased by 88 feet. ABC scores changed from 35 to 37 out of a possible 42.

Conclusions : Even though the subject did not complete the training sessions with the BWSTT, there were observable improvements in gait velocity and in total distance walked in 6 minutes. Based on the results of this study. BWSTT may be beneficial for individuals with TT amputations who ambulate with a prosthesis and have comorbidities, which might make traditional locomotor training impractical.

Clinical Relevance : Although independent ambulation may be achieved following a lower extremity amputation, recent studies have shown that many individuals with amputation do not use their prosthesis at all, and if ambulation achieved, approximately two-thirds of individuals remain ambulatory after two years. Although BWSTT is used in practice by prosthetists and physical therapists, there are not many research studies done on individuals with amputations.

KEYWORDS: prosthetic, body weight support treadmill training, amputee.

Developing and Implementing a Program using Functional Outcome Measures in Acute Care at Parkland Health & Hospital System (PHH)

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Purpose : To display the development and implementation process of using functional outcome measures in acute care at PHHS. The steps described include functional outcome measure selection, literature review, notebook compilation, PT staff education, and follow up with staff.

Introduction : The program development included outcome measure selection based on patient and diagnosis appropriateness, feasibility, high validity and reliability, and clinical relevance. A literature review for each outcome measure was performed to determine patient appropriateness and the measures’ properties. 2 notebooks were compiled notebook I included tables, instruction, and scoring interpretation, and notebook 2 included reference articles. An interview was given to PT staff to explain the purpose of the program and instruction on the various outcome measures. The implementation process involved encouraging PT staff to use functional outcome measures during their acute care rotation. To achieve this goal, PT Staff was asked to record outcome measure usage on log forms. They were also asked to fill out a survey at the end of their acute care rotation describing benefits and limitations of using functional outcome measures in acute care. The authors collected the log forms and surveys to determine the need for change in the program.

Summary of Use : This program provides physical therapists the tools for using functional outcome measures in acute care. It specifically describes the development and implementation process of using functional outcome measures in all patient and diagnosis categories. Most importantly outcome measures help determine effective and efficient treatment intervention, establish patient specific and functional goals, document change, and aid in reimbursement and benchmarking. The purpose of this poster is to give an example of how to develop and implement the use of functional outcome measures in an acute care setting.
KEYWORDS: Functional Outcome Measures, Acute Care.

Self-Reported Measurements of Vital Signs by Physical Therapists: Harris, Katherine S.; Smith, Megan; Agnese, Kristen. Quinnipiac University, Hamden, CT, United States.

Purpose/Hypothesis: Vital signs are listed as part of a systems review that should be performed with all patients or clients at the start of physical therapy care. The purpose of this study was to survey physical therapists (PTs) who were members of the Connecticut Physical Therapy Association (CPTA) to determine the role in assessing vital signs and to determine if the assessment of vital signs has increased since past studies. The hypotheses stated that vital signs would be assessed more in the number of PTs who assess vital signs as compared to previous studies. It was also hypothesized that home health and acute care PTs would assess vital signs more frequently than PTs in other settings.

Number of Subjects: Members of the CPTA (Connecticut Physical Therapy Association). 767, were invited to participate in an online survey.

Materials/Methods: The questionnaire consisted of demographic information and a 17-item survey about opinions regarding vital signs and assessment of vital signs. Data analysis included descriptive statistics consisting of mean and frequency, return rate and response characteristics, measurement and use of vital signs, reasons given for not measuring vital signs and relationship between practice settings and the assessment of vital signs.

Results: One-hundred-four respondents participated in the survey, for a response rate of fourteen percent. However, thirty-one surveys could not be used because the surveys were incomplete, therefore the data analysis was 73. Usable survey questionnaires were received from 73 respondents (41% and of those 50.7% reported working in an outpatient facility. The majority of respondents strongly agreed or agreed (71.2%) that measurement of HR, BP and RR should be included in physical therapy screening, with 57.1% (strongly agree or agree) indicated that assessing vital signs on a routine basis in clinical practice was essential. The majority of respondents never assessed BP, HR or RR (37%, 31.5%, and 43.8%, respectively) as part of the examination of a new patient. Clinicians’ opinion of vital sign health, followed by acute care and nursing home (respectively), assessed vital signs the most while clinicians in the school system assessed vital signs the least.

Conclusions: Our data indicated that vital signs were infrequently measured in new patients and existing patients. However, the majority of participants generally agreed that vital signs should be assessed on a routine basis in clinical practice. Our data indicates that our hypotheses were correct and that more PTs are assessing vital signs than in previous studies and PTs in acute care, home health and nursing home settings are assessing vital signs the most.

Clinical Relevance: Vital signs are a critical component to physical therapy evaluation and progression of treatment interventions. This small study indicated that vital signs are considered important though infrequently obtained. Further research across care settings and geographic regions should be undertaken to assess barriers to vital sign monitoring.

KEYWORDS: vital signs.

Background & Purpose: It has been suggested that hardware exposure within a wound bed heralds a poor outcome. Previous studies have shown that rhamnolipid (32%) is an antifungal, antiseptic, and cationic detergent to stable membrane repair. With few existing guidelines predicting successful closure, the study assessed hardware exposure, the safety and efficacy of second-generation healing technologies, namely LPU, under such a wound bed. Clinicians in an acute care setting followed the standard of care. The study served to determine if LPU is a useful adjunct to negative pressure wound therapy (NPWT) in healing a wound with exposed hardware.

Case Description: The subject was a 54-year-old male referred to physical therapy (PT) services at the CT Hospital, an acute hospital setting, for the first time. He presented with stage III right tibialcalcaneal arthrodesis site. The patient’s past medical history included CAD, HTN, NIDDM and venous insufficiency. While best practice algorithms suggested favorable soft tissue reconstruction only upon removal and stabilization of the implants was vital for bony fusion and joint stability. Consequently, irrigation and surgical debridement occurred to promote visualization of the wound bed, facilitate removal of necrosis and enable aggressive cleansing prior to use of LPU. PT sessions included LPU and NPWT application for each week. Operating parameters aligned with industry standards. Healing was assessed by visual analysis of wound measurements, wound bed characteristics, wound drainage, and integrity of the peripheral wound vessels. Given wound characteristics, the patient was considered for use of LPU, over exposed hardware and prepare the wound for closure.

Wound margin maceration during the first three weeks of care resulted in a 15% increase in width and only a 2.6% decrease in length. Upon return to the traditional NPWT dressing, a 25% decrease in width and a 6% decrease in length occurred over the subsequent two weeks. Drainage decreased as customary with the NPWT usage. Necrotic and dried tissues were excised as part of the treatment. Negative wound cultures and the absence of local or systemic signs of infection negated the need for antibiotic management. Application of a skin graft or bioengineered skin substitute is currently being considered.

Discussion: While long-term outcomes are yet unknown, the postoperative hardware exposure did not appear the wound derived benefit from the debridging and bacteriocidal effects offered via LPU. Further, no adverse effects to the orthopedic hardware or the operating ultrasound sound head were noted. Progress may have been slowed by the limitations of the alternate dressing component of the NPWT system. Analysis indicated the patient benefited from concomitant use of LPU and NPWT to granulate over exposed hardware and prepare the wound for closure.

KEYWORDS: low frequency ultrasound, hardware exposure, wound healing.

A Comprehensive Physical Therapy Approach for a Premature Infant in the Neonatal Intensive Care Unit (NICU): Aligning with the Evidence
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Purpose/Hypothesis: The purpose of this project was to determine if the recently implemented class on neonatal orthopedics given by physical therapists to graduate nurses new to our institution was effective. Feedback from new nurses revealed that the didactic portion of their training included less than 1 hour of lecture on the care of the patient with an orthopedic diagnosis. Our hypothesis was that an on-site training class specific to orthopedic care at our community hospital would be the best way to improve nurses’ knowledge immediately after the class as well as one month later.

Outcomes: Utilization of multimodal interventions: pain medication, pain intensity and tone as evidenced by improved scores on the posture section of the Morgen Neonatal Neurobehavioral Scale (NNNS) and pain assessment scale, with increased tolerance to changes in position as evidenced by increased vital sign stability, slightly greater arousal, decreased touch aversion with handling as evidenced by decreased irritability, and reduced supplemental oxygen requirements. The subject’s right cervical rotation preference and limited respiratory endurance did not respond as anticipated despite intervention.

Discussion: Current findings demonstrate the benefits of early physical therapy intervention on a medically fragile infant in the NICU. Ongoing monitoring of the infant needs to occur to fully appreciate the degree to which developmental delay, as well as cognitive and behavioral disorders, were minimized or averted based upon ongoing intervention. Further investigation to identify more specific temporal guidelines for physical therapy involvement in the NICU would be beneficial.

KEYWORDS: premature infant and development disabilities, neuromotor development and physical therapy, Morgen, Neonatal Neurobehavioral Examination.

Is a General Orthopedic Class Taught by Physical Therapists In A Large, University Hospital Effective in Providing Sustained Knowledge to Nurses?
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Purpose/Hypothesis: The purpose of this project was to determine if the recently implemented class on general orthopedics given by physical therapists to graduate nurses new to our institution was effective. Feedback from new nurses revealed that the didactic portion of their training included less than 1 hour of lecture on the care of the patient with an orthopedic diagnosis. Our hypothesis was that the didactic portion of their training included less than 1 hour of lecture on the care of the patient with an orthopedic diagnosis. Our hypothesis was that early intervention and intervention with facilitation, increased tolerance to changes in position as evidenced by increased vital sign stability, slightly greater arousal, decreased touch aversion with handling as evidenced by decreased irritability, and decreased supplemental oxygen requirements. The subject’s right cervical rotation preference and limited respiratory endurance did not respond as anticipated despite intervention.

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KEYWORDS: premature infant and development disabilities, neuromotor development and physical therapy, Morgen, Neonatal Neurobehavioral Examination.
Materials/Methods: A written 10 question test (6 multiple choice and 4 true/false) was devised to be given pre- and then immediately post-class as well as again 1 month later.

Results: Scores show improvements in pre-to post-test scores as well as pre- to one month follow up scores. Pre-test mean was 57.7% with a range of 30%-90% and a standard deviation of ±1.34. Immediate post-test mean was 87.7% with a range of 80-100% and a standard deviation of ±6.85. One month follow up mean was 83.6% with a range of 70-100% and a standard deviation of ±8.39. Individual students averaged a positive gain from pre- to post-test score of 28.6% and pre- to one month post-test scores of 25.9%. T-test reveals statistical significance at the 0.05 level.

Conclusions: A knowledge deficit has been reported by graduate nurses entering our facility regarding the care of the patient with an orthopedic diagnosis. Data collected shows improvements in test scores both immediately after and one month after the orthopedic class. These scores show knowledge gained is retained at least one month post-class. We recommend further study to assure that this knowledge will be retained for greater than a one month period as well as to determine if carryover to patient care is achieved.

Clinical Relevance: True multidisciplinary care is a model desired by many practitioners. In order to achieve this, caregivers from across disciplines need to have an understanding of and respect for contributions made by all members of the healthcare team. By enhancing knowledge, teamwork and multidisciplinary care planning can be facilitated so that the goal of maximizing patient outcomes can be achieved.

KEYWORDS: orthopedics, post test, physical therapy.

Use of mobility protocol decreases the length of stay in the intensive care unit.

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Purpose/Hypothesis: Background: Research has shown that immobilization for a critically ill patient leads to further complications and that physical therapy aids by improving function and may decrease the patients length of stay in the intensive care unit. Purpose: The purpose of this study is to assess the effectiveness of a prescribed mobility protocol for patients with respiratory failure in the intensive care unit. Additionally, we will assess the the implementation of the mobility protocol across different medical diagnoses.

Hypothesis: We hypothesize that the mobility protocol will substantially decrease the length of stay in the intensive care unit as compared to those who received standard physical therapy treatments without the mobility protocol.

Number of Subjects: Number of subjects: The study includes a stratified sampling of 100 patients that were admitted to the intensive care unit over the past year for the group with the implementation of the mobility protocol and the year prior to the implementation of the mobility protocol. The patients are divided into groups based on whether they received the mobility protocol or received standard physical therapy treatments without the mobility protocol. The groups include equal number of males and females.

Materials/Methods: Materials/Methods: Patients admitted to the intensive care unit with respiratory distress were evaluated for specific criteria to be included in the mobility protocol program. The mobility protocol was administered by an acute care physical therapist. The mobility protocol includes transfer training, gait training and therapeutic exercise along with special settings on the ventilator. The physical therapy portion of the mobility protocol is administered 1 time per day after medical clearance. Some of the variables that are assessed include: the length of stay in the intensive care unit, time spent on the ventilator, lab results, and vitals. Our study utilizes a single factor design for repeated measures, involving two groups of patients: those receiving the mobility protocol and those who did not.

Results: Results: Preliminary results of the data, are indicative of improved gas exchange, decreased time on the ventilator, and improved functional mobility. In addition, the length of stay appears to be minimized by 30% after the implementation of the mobility protocol.

Conclusions: Conclusion: There appears to be a positive correlation between the implementation of the mobility protocol and the reduced length of stay in the intensive care unit. This is an ongoing study to be completed by the end of the year and all of the results will be presented at the combined Sections Meeting.

Clinical Relevance: Clinical Relevance: The use of the mobility protocol is beneficail in decreasing complications from immobility. In addition, the length of stay may be decreased by 30% after the implementation of the mobility protocol.

KEYWORDS: mobility protocol, intensive care, early mobility.
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