Success of A Respiratory Therapist-Driven Tracheostomy Decannulation Protocol

Richard MacGillivray BS, CRT, Lorraine Cullen RRT, Brett Gerstenhaber MD, Luis Teba MD  Gaylord Hospital, Wallingford, Connecticut


► RATIONALE

In Long Term Acute Care Hospitals (LTACH), once patients are liberated from mechanical ventilation (MV), the next goal is tracheostomy tube (TT) removal. Little evidence is available to guide the decannulation process and optimal timing of TT removal. Some publications report a decannulation failure of up to 5% (1,2). Randomized controlled trials and well established guidelines to facilitate the decannulation process are lacking. At our LTACH, we instituted a respiratory therapist-driven decannulation protocol (DP), in order to determine readiness for decannulation. We present a summary of our DP and outcomes.

► METHOD

Patients liberated from MV support who tolerated tracheal collar ≥3 days and had a cuffless TT were considered for inclusion in the protocol. They had to be alfieal, hemodynamically stable, and have maximal expiratory peak flow ≥150 L/min; if lower, a pulmonologist’s waiver was required. In addition, the patients had to have minimal tracheal secretions, stable chest radiogram, low aspiration risk, no evidence of airway obstruction, able to tolerate a speaking valve ≥12 hours/day, O2 sat ≥95% on FiO2 0.5, ETCO2 ≤50 mmHg, and serum HCO3 ≤30 mmol/L. In patients with compensated respiratory acidosis, the last two values could be higher if the condition was stable. The protocol began with continuous TT plugging for up to 12-16 hours/day. On days 1 through 2, the TT was left open overnight. On day 3, the TT was kept plugged overnight and nocturnal oximetry testing was recorded (NOT). The protocol is incorporated in our clinical information system. Daily progress of the decannulation process will be documented by the Respiratory Care Practitioner (RCP). The RCP will maintain daily communication with the LIP and/or consultant regarding the progress of the decannulation process.

► PROTOCOL SUMMARY

All patients undergoing decannulation will need to be evaluated by a Pulmonary or COM consultant and determine if the patient is ready to be enrolled in the protocol. The protocol is incorporated in our clinical information system. Daily progress of the decannulation process will be documented by the Respiratory Care Practitioner (RCP). The RCP will maintain daily communication with the LIP and/or consultant regarding the progress of the decannulation process.

All the enrollees must have all the following:

- Able to tolerate a speaking valve
- No clinical evidence of tracheal obstruction
- No evidence of airway obstruction

Criteria for unplugging sooner than 12 hours:

- Any of the following:
  - Any change in hemodynamics (BP 15% above or below baseline)
  - Increased RR (15% above baseline)
  - O2 Sat <92%
  - Increase in ETCO2 of >10% over baseline
  - FEVER ≥101.5 F

Criteria to begin plugging trials:

- VS stable (within 15% of baseline)
- For patients with no underlying lung disease:
  - O2 Sat ≥95%
  - ET CO2 ≤30 mmHg
- For patients with underlying lung disease:
  - Stable Blood Gases
  - O2 saturations ≥92% on Room Air or Oxygen
  - Patient with history of sleep apnea and using home CPAP or BIPAP should be cleared by the consultant before undergoing overnight plug trial with nocturnal oximetry.

Decannulation Process:

Day 1 and 2

- Plug tracheostomy tube
- Monitor VS q 4 hours
- Monitor O2 Sat and ETCO2 q 4 hours
- Increase in ETCO2 of >10% over baseline
- Increased RR (15% above baseline)
- Fever ≥101.5 F

Day 3

If day 1 and 2 of the protocol are successful, on day 3 plug tracheostomy tube and leave it plugged for 24 hours and the patient will undergo a NOT study. Arterial blood gases will be obtained at the end of the NOT study. The above results will be read by a pulmonologist, and if these are appropriate, the patient will be decannulated and observed during the next 24 hours.

► REFERENCES:


► RESULTS:

A total of 59 patients with a mean age 64±16, 30 were women, completed the DP during a seven month period. Forty-eight patients completed the DP satisfactorily, were decannulated, and discharged from our hospital. Of the successful DP’s, 20 went home, 26 to skilled nursing facility (SNF), and one to acute care hospital. Of the 48 decannulated patients, only one had to be reintubated. Eleven patients had the DP terminated due to complications, therefore remained with TT, and were eventually discharged. Of those that remained with the TT, 4 went home (3 required home ventilator), 4 to SNF, and 3 returned to acute care hospital.

► CONCLUSION:

Successful tracheostomy tube removal was achieved in 98% of patients using a respiratory therapist-driven decannulation protocol. Patients failing the protocol were not able to be decannulated during their hospitalization.
Transient Global Amnesia from Intrathecal Baclofen- A Case Report

David Rosenblum MD, Gaylord Hospital, Wallingford, CT

Abstract

A 67 year old woman with multiple sclerosis effectively treated for severe spasticity with intrathecal baclofen (ITB) developed recurrent antegrade amnesia and was diagnosed with transient global amnesia (TGA). Neurologic and medical work up was negative for other etiologies, and there was no evidence of seizures. Her dose of intrathecal baclofen was carefully titrated down from 530 micrograms per day to 96 micrograms per day with resolution of TGA. She was then titrated up to 130 micrograms per day with good control of spasticity and continued resolution of TGA. This is the first reported case of ITB associated TGA that was effectively managed with titration of dosing of ITB. The incidence, pathophysiology, differential diagnosis and treatment options for TGA in patients with ITB are presented.

Pharmacological Treatment of ITB Induced TGA

1) Adjustment of dosing of baclofen
2) One case report using nitroglycerin based on role for nitric oxide(NO) metabolism and modulation of release of GABA
   - Nitric Oxide: mediator of memory formation in rat hippocampus, modulates release of GABA
   - Baclofen induced amnesia in rats is reversed by NO donor molsidomine
   - Nitroglycerin is an NO donor, and was shown to prevent and terminate TGA induced by ITB
   - Nitroglycerin may adversely affect BP

Intrathecal Baclofen

Approved for the treatment of spasticity of both cerebral and spinal origin
   - Effective in reducing spastic hypertonia
   - Infusion of baclofen in pump implanted in abdominal wall
   - Drug released by pump and delivered via catheter which is placed in intrathecal space
   - Infusion is programmed by external device

Etiology of ITB induced TGA

Hypothesis:
Baclofen, as a Gaba- B receptor agonist, has been shown to induce antegrade amnesia in rodents, but it is very rare in humans.

Diagnosis of TGA:
- Witnessed attack of less than 24 hours duration
- Antegrade amnesia
- No clouding of consciousness
- No loss of personal identity
- Cognitive impairment limited to amnesia
- No recent history of head trauma or seizures

Incidence:
- Rare, 3-30 per 100,000 people

Intervention

Adjustment of dose of intrathecal baclofen was effective in both eliminating TGA and treating spasticity.

Conclusion

People with ITB who develop antegrade amnesia would be evaluated for TGA. Dose adjustment of ITB may then be considered as part of the treatment plan.

References

7) Kolanowski A, Chmiel A. Baclofen and nitric oxide modulate the release of GABA in the rat hippocampus. J Neural Transm 2006, 113(1):75-81

Resolution of a Persistent Vesicocutaneous Fistula Through the Use of Continuous Low Pressure Suction

Donna Trigilia, MSN, BC, APRN, CWCN, Luis Teba MD  Gaylord Hospital, Wallingford, Connecticut

MATERIALS AND METHODS

TRAGIC BEGINNING

- May 17, 2013 – Train collision in New England
- Admitted to a Trauma Center in New England
- CT scan of the chest – revealed a Flail Chest
- CT scan of the head – showed multiple areas of infarct which later was noted to be hemorrhagic
- CT angiogram – Right Internal Carotid Artery Dissection
- Multiple fractures – Bilateral tibia fibulas, left scapular, sternal and ribs
- CT Scan of the abdomen: Intra and extra peritoneal bladder rupture
- CT scan of the abdomen: Extra peritoneal bladder rupture – noted a 6.0 cm laceration

TIMELINE

- CT scan of the abdomen: Bladder – revealed a Fistula
- CT scan of the chest – revealed a Left pneumothorax
- CT scan of the head – showed multiple areas of infarct which later was noted to be hemorrhagic
- CT angiogram – Right Internal Carotid Artery Dissection
- Multiple fractures – Bilateral tibia fibulas, left scapular, sternal and ribs
- CT scan of the abdomen: Intra and extra peritoneal bladder rupture
- CT scan of the abdomen: Extra peritoneal bladder rupture – noted a 6.0 cm laceration
- CT scan of the abdomen: Extra peritoneal bladder rupture – noted a 6.0 cm laceration

MULTIPLE TRAUMA

- May 17, 2013 – Train collision in New England
- CT scan of the pelvis – noted an unstable fractures of the pelvis
- CT scan of the chest – revealed a Flail Chest
- CT scan of the abdomen: Extra peritoneal bladder rupture
- CT scan of the abdomen: Intra and extra peritoneal bladder rupture
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- CT scan of the abdomen: Extra peritoneal bladder rupture
- CT scan of the abdomen: Extra peritoneal bladder rupture – noted a 6.0 cm laceration
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SURGICAL REPAIR

- Exploratory Laparotomy
- Identified a 6.0 cm laceration of the bladder dome which included the rupture of the peritoneal surface overlaying the dome
- The lacerations were repaired
- Indwelling Urinary Catheter was maintained

LITERATURE REVIEW

- Prospective randomized trial of high versus low negative pressure suction in management of postpartum urinary tract infection
- Mis-G, Chang K et al. 2012, Head and Neck
- Use of a chest drainage system with automatic constant negative suction successful in treating iatrogenic chyle leakage
- Filosso PL, Giobbe R et al. 2010, Journal of Cardiovascular Surgery
- Department of Urology and Surgery at Armed Forces General Hospital in Taiwan
- Utilized continuous suction for treating extra peritoneal rupture of the bladder post trauma
- Yen-Tsung Fu, Shang-Sen Lee et al. 2007, JTUA
- Wu G, Chang X et al. 2012, Head and Neck
- Use of a chest drainage system with automatic constant negative suction successful in treating iatrogenic chyle leakage
- Department of Urology and Surgery at Armed Forces General Hospital in Taiwan
- Utilized continuous suction for treating extra peritoneal rupture of the bladder post trauma
- Yen-Tsung Fu, Shang-Sen Lee et al. 2007, JTUA

TWO WEEKS LATER

- Persistent drainage
- Trial of catheter removal led to all urine coming from the fistula and not the urethra
- Indwelling urinary catheter was replaced
- Cystoscopy and fistulogram were done – a fistula was found 2-3cm up from the bladder neck
- When the bladder was filled could see inside the fistula
- Screw was noted not protruding into the bladder but through a bone fragment
- Further surgical procedure was contraindicated

CONCLUSION:

Our limited experience showed that continuous low pressure suction offers an alternate way to treat a patient with a vesicocutaneous fistula after conventional methods using a catheter drainage system. It provides for improved quality of life without medical complications. It may shorten LOS and reduced healthcare costs.
Improved Gait Speed After Use of Ekso™ in a Person with Chronic Motor Incomplete Spinal Cord Injury Due to Transverse Myelitis

Erika Ozdemirer, PT, DPT, NCS, Erin Prastine, PT, MSPT, NCS, David Rosenblum MD, Gaylord Hospital, Wallingford, CT

Case Description

A 20 year old man diagnosed with transverse myelitis nine years ago (12/25/04), presented to physical therapy services with decreased lower extremity strength, impaired postural control, balance, and spasticity. These impairments created limitations in ambulation ability. The patient was treated for nine walking sessions using the Ekso™ bionic exoskeleton. His 10 M walk speed was assessed prior to exoskeletal ambulation and after nine walking sessions. Self-selected walking speed for the 10 M walk test improved from .34 m/s to .48 m/s at the completion of his ninth session. The patient’s walking time, up time (standing time) and number of steps per session increased from start to program completion. The incidence, pathophysiology, progressive gait training options and outcome measures for persons with chronic motor incomplete SCI will be discussed.

Results

There was a clinically significant improvement in 10M gait speed noted after nine Ekso™ walking sessions. Walk time, up (standing) time, and number of steps increased across training sessions. Improved postural control and gait quality was achieved.

Discussion

Transverse myelitis is a neurological disorder caused by inflammation across both sides of a segment of the spinal cord. Symptoms of transverse myelitis include a loss of spinal cord function including: paralysis, changes in tone, decreased sensation, urinary retention, and loss of bowel control. Most individuals recover from transverse myelitis with minimal residual deficits; however, some suffer permanent impairments which affect their ability to ambulate independently or efficiently. Traditional gait training strategies employed by physical therapists often requires the use of assistive devices and customized orthotics, and comes at high energy expenditure for both ambulator and therapist. Traditional methods may allow for a decreased quality of gait, slow gait speeds, and short ambulation distances. This report demonstrates the use of ekoskeletal ambulation as a safe and effective gait training tool for a person with nontraumatic incomplete SCI.

Conclusion

The use of the Ekso™ system was successful in improving gait speed in a person with chronic motor incomplete spinal cord injury. The use of Ekso™ was both a safe and effective gait training tool

References

ACADEMY OF SPINAL CORD INJURY PROFESSIONALS

Development of a Phone-Based Self-Management Training Program for People with Spinal Cord Injury

Objective
To develop and trial a phone-based health care utilization and self-management training program for people with spinal cord injury (SCI) living in the community.

Background
Care Call, a phone-based self-management program developed and tested by NERSCIC, was effective in reducing pressure ulcers and depression in persons with SCI. Based on this success, additional modules were developed to promote self-management and healthcare utilization. The expanded program, My Care My Call (MCMC), can provide support to promote healthy behaviors and enhance participants’ ability to meet their primary care needs.

Development
An SCI Content Expert Panel co-led by a NERSCIC team members, including an individual with SCI, informed the intervention framework and defined the Peer Health Coach’s role. The team developed a Resource Directory, Consumer Workbook and Intervention Manual, with corresponding audio peer and clinician vignettes. Materials were developed based on the Translative Model. We used tailored processes to determine and increase the person’s readiness to self-advocate. Both internal and external training (e.g., Brief Action Planning and motivational interviewing) for the coaches and a tracking program were developed to promote opportunities to build upon prior conversations with the consumer.

My Care My Call Intervention
Scheduled Conversations
Month 1: 1x Weekly
Months 2-4: Biweekly
Months 5 & 6: Monthly
Approximately 30 minutes per call
• Conversations are guided by patient’s activation level

Consumer

Peer Health Coach

Content
Health Care Utilization Module
1) Tracks healthcare appointments
2) Activates people to communicate with providers
3) Address barriers to missed appointments

Expected Outcome
Increase appropriate access to healthcare and to help improve communication and satisfaction with ICP

Self-Management Training Module
Build and maintain:
1) A personal support network
2) Personal skills, (e.g., assertiveness, problem-solving, decision-making)
3) Goal setting

Expected Outcome
Increase healthcare self-advocacy and healthcare service navigation

Conclusion
Resources are needed to provide low-cost effective interventions to promote healthy behaviors in persons with SCI. Care Call provides evidence that phone-based interventions can be effective. The two new MCMC modules will be piloted in 10 diverse participants with SCI. Modifications will be made, as needed, prior to conducting an RCT (N=60). We will determine if MCMC is effective in promoting self-management and healthcare utilization. Our goal is that MCMC will provide an important resource for SCI centers and community organizations and will enhance the lives of people with SCI by providing them the necessary resources to self-advocate.

Benefits of Overground Bionic Ambulation in an Individual with Chronic Incomplete Spinal Cord Injury: A Case Report

Erin Prastine Lampron, PT, MSPT, NCS, Erika Ozdemirer, PT, DPT, NCS, Gaylord Hospital, Wallingford, CT

Objective
To explore potential benefits of the use of overground bionic ambulation (OBA) including improved lower extremity (LE) strength and ambulation ability outside of the device, in an individual with chronic incomplete spinal cord injury.

Participant
A 45 y.o. male presenting to therapy services status post a T10 ASIA C spinal cord injury 18-month prior.

Examination
Patient presents with decreased LE strength, impaired postural control and balance, impaired LE coordination, sensation, and flexibility. Patient is non-ambulatory upon initial examination.

PT Intervention
Patient presents with decreased strength, impaired postural control, impaired sensation, coordination, and flexibility. These impairments create limitations in overall functional mobility including gait due to incomplete spinal cord injury.

Outcome Measures
Data collected while ambulating in the exoskeletal device includes: time spent standing in the device (up time), wall time, number of steps, level of assistance, and use of assistive device (AD). Incidence of falls and adverse effects during exoskeletal use are discussed. Data obtained from ambulation outside of exoskeletal use includes: ambulation distance, level of assistance, use of AD, and LE orthotic use. ASIA impairment scale (ASIS) scores and LE motor scores (LEMS) are reviewed.

Results
With training the participant averages an up time of 18 minutes, wall time of 32 minutes and an average of 1,066 steps per session. Increases in up and wall time were observed, as well as an increase in # steps per session over time. Decreased levels of assistance and use of a lesser AD during OBA were also noted at the end of the training period. Good tolerance to training sessions was observed with no sessions terminated due to adverse effects. No incidences of falls were reported. LEMS improved during the training period and ASI assignment progressed from C to D. Improvements in ambulation ability outside of OBA were also observed including: increased walking distance, decreased level of assistance, use of lesser AD and LE orthotic intervention.

Discussion/Conclusion
Traditional gait training strategies often require the use of assistive devices and customized orthotics, and comes at a high energy cost for both ambulator and therapist. Traditional training methods may allow for a decreased quality of gait, slow gait speeds, and short ambulation distances. Of note, pt was also receiving traditional land and aquatic based PT while participating in OBA. This report demonstrates the use of exoskeletal ambulation as a safe and effective gait training tool for a person with chronic incomplete spinal cord injury. OBA may also improve LE strength or (LEMS) in this population.
Development of the New England Spinal Cord Injury Toolkit for Peer-to-Peer Clinical Education

Objective
The New England Regional SCI Center facilitated development of the New England SCI Toolkit (NESCIT), a collaboration among medical centers providing SCI care. Our primary objectives are to improve outcomes, decrease the frequency of complications, and provide educational resources to patients and providers. NESCIT will support staff in facilities that admit patients with SCI after acute rehabilitation.

Design
The Work
Four face-to-face work group sessions, totaling 228 work hours, along with many additional hours of independent resource review led to the creation of the Toolkit.

The Process
SCI clinicians shared clinical experience and information, critically reviewed resources and determined the top topics and best resources that are clinically up-to-date, easily accessible, and comprehensive yet concise, for best practices for SCI care.

The Toolkit
Seven minimum-care standards were developed and coupled with the best educational resources for each topic standard:

- Patient/family/caregiver education
- Autonomic dysreflexia
- Skin care
- Bladder management
- Bowel management
- Sexual health/fertility
- Spasticity

Each participating facility identified a “Champion” to provide clinical consultation support to clinicians, centers, and patients seeking information.

Interventions
The Toolkit was presented in a live seminar to 25 healthcare professionals from rehabilitation facilities, skilled nursing facilities and home care agencies, demonstrating its easy access and use.

Pre-Review
- 19 of 25 said they are only “somewhat” to “not at all” confident in treating someone with SCI.
- 20 of 25 rate themselves as only “somewhat” to “not at all” knowledgeable about treating people with SCI.

Post-Review
- 25 of 25 said they feel more confident in addressing patient needs.
- 25 of 25 said they would refer to the Toolkit in the future.
- 21 of 25 said they would recommend the Toolkit to others.

Main Outcome Measure
Clinician consensus, final approval of best practices and related resources for SCI care led to the creation of the Toolkit. The surveys completed by seminar attendees attested to the value and influence of the Toolkit.

Conclusion
NESCIT offers a unique tool to improve the education and quality of care for clinicians at hospitals, skilled nursing facilities, home health care agencies, or personal caregivers working with SCI patients. The Toolkit and Champion will support the continuum of care. Pilot testing of the Toolkit measured clinicians and facility report of ease of use, clarity of information, likelihood of recommending, and meeting of educational needs via online/in-person surveys.

Presented at:
- American Congress of Rehabilitation Medicine (ACRM) Conference, Dallas, TX October 2015
- Health & Disability Research Institute (HDR), Boston, MA, November 2015
Development Of An Innovative Tool To Share And Disseminate Spinal Cord Injury Information To Providers Across The Continuum Of Care

Introduction

The New England Regional SCI Center facilitated development of the New England SCI Toolkit (NESCIT), a collaboration among New England medical centers that provide SCI care, with the goal of standardizing care throughout the region. Our primary objectives are to improve outcomes, decrease the frequency of complications, and provide educational resources to patients and providers.

Methods

SCI professionals shared clinical experience and information, critically reviewed and determined best resources, and, in turn, formed a consensus for best practices for SCI care. Resource review included recommendations from participating centers, national and international websites and publications. Selection criteria for resource inclusion included: information that was professional and clinically up-to-date, easily accessible, and comprehensive yet concise.

Results

We developed seven minimum care standards: patient/family/caregiver education; autonomic dysreflexia; skin care; bladder management; neurogenic bowels; sexual health and fertility; and spasticity. Based on consensus, each standard lists the disciplines to be involved, the process for care delivery, recommended resources, and how to measure NESCIT’s effectiveness. Each participating facility committed a representative “champion” to provide clinical consultation and support to external clinicians, centers, and patients seeking information on SCI care.

Conclusion

NESCIT offers an innovative tool with clinical support to expand the capacity of any hospital staff, skilled nursing facility (SNF), home health care agency, and caregiver to treat SCI patients. It is currently being piloted with SNFs throughout New England via multiple channels.

Recommended Resources:

- New England SCI Toolkit (NESCIT) website and the MSKTC website as a complete booklet (http://tinyurl.com/nerstcic).
- Model Systems Knowledge Translation Center SCI Factsheets (available online from Northeast Rehabilitation).
- Patient Education Manual (site-specific – shared across sites Gaylord Hospital and Northeast Rehabilitation).
- Inpatient and outpatient support groups including family/caregiver support groups.
- Stepping Forward Staying Informed Consumer Education Program and Knowledge in Motion webcasts (available on NERSCIC website) (http://tinyurl.com/NERSCICvids)
- Paralysis Resource Center, Christopher and Dana Reeve Foundation (http://www.christopherreeve.org) and toll-free 1-800-225-0292. Information is offered in multiple languages.
- PVA Clinical Practice Guidelines are available on multiple topics and are free downloads at (http://www.pva.org)
- PVA Consumer Guidelines are available on multiple topics and are free downloads at (http://www.pva.org)
- Core educational areas: autonomic dysreflexia, bladder management, neurogenic bowels, sexual health and fertility; and spasticity. Based on consensus, each standard lists the disciplines to be involved, the process for care delivery, recommended resources, and how to measure NESCIT’s effectiveness. Each participating facility committed a representative “champion” to provide clinical consultation support to external clinicians, centers, and patients seeking information on SCI care.
Effective Treatment of Neurogenic Bladder/Detrusor Hyperreflexia in Spinal Cord Injury in an Inpatient Rehabilitation Setting Utilizing the Beta-3 Adrenergic Receptor Agonist Mirabegron with, and without, Anticholinergic Medication.

**OBJECTIVE**

The aim of this study was to report inpatient experience using the beta-3 receptor adrenergic receptor agonist mirabegron either alone, or in combination with anticholinergic bladder medication, in the treatment of detrusor hyperreflexia in inpatient spinal cord injured patients.

**CASE DESCRIPTION**

Three patients are described, with spinal cord injury, with detrusor hyperreflexia causing incontinence inbetween catheterizations. A 66 year old gentleman with gun shot wound to the spine resulting in T11 ASIA A paraplegia and detrusor hyperreflexia was unable to tolerate anticholinergic medications. Mirabegron at 25 mg a day was effective in preventing urinary incontinence between catheterizations, and was well tolerated. A 42 year old woman with C5 ASIA B and detrusor hyperreflexia had partial control with anticholinergic medication; the addition of mirabegron 25 mg a day completely controlled her hyperreflexic bladder. A 46 year old with a cervical ependymoma with detrusor hyperreflexia did not respond to anticholinergic medication trials, but did respond to the combined use of mirabegron 25 mg a day and anticholinergic medication. The use of a beta-3 receptor adrenergic agonist was both well tolerated and effective in these cases.

**DISCUSSION**

Neurogenic bladder is a common sequela of spinal cord injury. Detrusor hyperreflexia can cause urinary incontinence even in people utilizing intermittent catheterization. Pharmacological interventions are aimed at bladder relaxation to allow the bladder to fill more and hold urine without detrusor spasm which can cause incontinence. Anticholinergic medications are often utilized as a first line medication option. However, they may not be fully effective, nor well tolerated. Mirabegron, a beta-3 receptor adrenergic receptor agonist, is the only bladder medication approved by the FDA for use in overactive bladder in its class. Its unique mechanism of action has potential advantages which include the absence of dry mouth. The use of a beta-3 receptor agonist either alone, or in combination with an anticholinergic, may be an effective pharmacological option for persistent and difficult to treat detrusor hyperreflexia.

**RESULTS**

There was improvement in bladder function with the combined use of anticholinergic medication and mirabegron.

**MIRABEGRON (Myrbetriq™)**

- **How does mirabegron cause relaxation of bladder:** Urinary storage is regulated by sympathetic nervous system via norepinephrine (NE). NE activates beta 3 adrenergic receptors which relaxes detrusor muscle. Mirabegron is a beta 3 agonist.
- **Dosage:** 25 mg once a day; effective within 8 weeks. May be increased to 50 mg a day.
- **Side effects:** Most frequent leading to discontinuation (0.2%): nausea, headache, hypertension, dizziness, constipation, dry mouth, and tachycardia. Use caution in patients with hypertension; dose adjustment with moderate hepatic or renal impairment.

**OTHER AGENTS TO TREAT OVERACTIVE BLADDER**

- **Anticholinergics and overactive bladder:** competitively antagonize subtypes of muscarinic acetylcholine receptors; has direct spasmolytic effect on bladder smooth muscle.
- **Side effects of anticholinergics includes dry mouth and constipation.
- **Examples include:** Oxybutynin (Ditropan, Oxytrol), Galantirone (Detrol), Toviaz (Fesoterodine), Detrol (Gelnique), Tolerodine (Trospium), Sanctura (Trospium), Enablex (Darifenacin), Vesicare (Solifenacin), Interix (Fesoterolone), Novantrone (Ibutilide).

**CONCLUSION**

The use of a beta-3 receptor adrenergic agonist may be an effective and well tolerated treatment option for detrusor hyperreflexia in spinal cord injury.
Benefits of Overground Bionic Ambulation in an Individual with Stroke: A Case Study

Erin Lampron, PT, MSPT, NCS, Erika Ozdemirer, PT, DPT, NCS, Alyse Sicklick, MD, Stephanie Zanvettor, MSPT, Gaylord Hospital, Wallingford, CT

Background/Purpose

After stroke, common impairments reported are weakness, sensory loss, pain, and fatigue, which may create functional limitations including abnormal gait. These impairments may contribute to serious health conditions such as obesity, diabetes and cardiovascular disease. One option for persons with stroke to regain ambulatory function and limit health risks is the use of Overground Bionic Ambulation (OBA). OBA is battery powered and externally applied, with parameters that can be adjusted for each individual. OBA enables individuals with lower extremity (LE) weakness to stand and walk.

Objectives

To explore potential benefits of OBA including: improved LE strength, postural control/balance and ambulation ability outside of the device, as well as a decreased fall risk in an individual with stroke.

Design/Methods

A retrospective case study report of a 45 y.o. woman with R MCA ischemic stroke. Participant presents with decreased LE strength, impaired postural control/balance, and abnormal tone contributing to impaired gait. Participant completed 47 sessions of OBA using Ekso™ over 14 months in addition to receiving traditional land and aquatic therapy. Data collected while ambulating in the Ekso™ includes: time spent standing in the device (up time), walk time, number of steps, path and assist data, level of assistance, use of assistive device (AD), adverse effects and incidence of falls. Data obtained from ambulation outside of OBA includes: ambulation distance, level of assistance, use of AD, and LE orthotic use. LE strength scores and Timed Up and Go (TUG) test scores were reviewed. Balance assessments include: Romberg, Sharpener Romberg and single leg stance times.

Results

Increases in up and walk time and number of steps per session over time during OBA were observed. Decreased levels of assistance and use of a lesser AD during OBA were also noted. Decreases in path deviation and decreased assistance required from Ekso™ were recorded. No OBA sessions were terminated due to adverse effects. No falls were reported. TUG score improved by 4 seconds, indicating a clinically significant improvement.

Improved ambulation ability outside of OBA was also observed including: increased walking distance, decreased level of assistance, use of a lesser AD, and improved balance and postural control. LE strength improved. No change in LE spasticity was reported.

Discussion/Conclusion

Traditional gait training strategies often require the use of an AD and customized orthotics, and comes at a high energy cost for both ambulator and therapist. Despite good intentions, traditional methods may contribute to decreased quality of gait, slow gait speed and short ambulation distances. This report demonstrates the use of OBA as a safe and effective gait training tool for a person with stroke. OBA may also improve LE strength, postural control and balance, contributing to a decrease fall risk in this population.

Table: Patient’s Ambulation Outside of Ekso Use

<table>
<thead>
<tr>
<th>Session Dates</th>
<th>Hip Flexion</th>
<th>Hip Abduction</th>
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<tr>
<td>10/3/15</td>
<td>3+</td>
<td>4+</td>
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Table: Improvements in Strength

<table>
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<tr>
<th>Type of Assistance</th>
<th>4/29/14</th>
<th>5/5/15</th>
<th>6/24/15</th>
<th>8/25/15</th>
<th>10/3/15</th>
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<tr>
<td>Variable Assist</td>
<td>2-</td>
<td>2-</td>
<td>3+</td>
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<tr>
<td>Adaptive Assist</td>
<td>1-</td>
<td>1+</td>
<td>1+</td>
<td>2-</td>
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<tr>
<td>Path Assistance</td>
<td>5+</td>
<td>5+</td>
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<tr>
<td>Forward Assist</td>
<td>3+</td>
<td>3+</td>
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<tr>
<td>Bipolar Max Assist</td>
<td>4+</td>
<td>4+</td>
<td>4+</td>
<td>4+</td>
<td>4+</td>
</tr>
</tbody>
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For more details, contact Erin Lampron at erin.lampron@gaylordhospital.org.
Health Empowerment Approach in a Peer-Led Telehealth Intervention for Spinal Cord Injury

Presented at: ISCoS and Asia Joint Scientific Meeting
Montreal, Canada March 2015

Development of a Novel Peer Health Coach Model in Supporting Goal Setting and Self-Management of Health Care Needs for People with Chronic SCI

Sarah Everhart Stiles, MPH; Judi Zazula, MS, OTR/L; Bethlyn Houltian, MSW, MPH; Diana Pernigotti, MSG; Shalisa Haskins; Miriam Brody, BBA; Christa Grems, BBA; Hannah Murcher, MS, OTR/L; Timothy Belliveau, PhD, ABPP; David Rosenbloom, MD; Subramani Seetharama, MD; Alan Jette, PhD, PT

New England Regional Spinal Cord Injury Center Boston University School of Public Health, Gaylord Hospital, Hospital for Special Care

Introduction

Peer support for people with spinal cord injury (SCI) primarily occurs within one year post-injury, alongside intensive rehabilitation. Yet people with chronic SCI need additional intensive support to be effective with health management and advocacy. We developed a new Peer Support Model, Consumer Resource Guide, and Peer Health Coach (PHC) Toolkit, specifically for chronic SCI, which forms the basis for My Care My Call (MCMC), a pilot telephone intervention.

Peer Support Model

- Consumer-researcher co-led consumer-based process
- Content Expert Panel guided basic tenants of MCMC
- Initial Elements of Peer Support Model
  1. Role of Peer Health Coach
  2. Resource Book
  3. Consumer Workbook
  4. PHC Toolkit

MCMC Resource Guide Development

Resource Book & Workbook combined into MCMC Resource Guide after pilot

- Resource Book
  Identified most appropriate “shopping” informational resources and local organizational/facility resources.

- Workbook
  Embedded existing & created new information & worksheets for skill development
  Brief Action Planning (BAP) for goal setting Includes a part of Motivational Interviewing & incorporated topic appropriate advice from consumers & helpful tips throughout Workbook.

Pilot Study – Before & After

<table>
<thead>
<tr>
<th>Pilot Study</th>
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</thead>
<tbody>
<tr>
<td>2 PHCs &amp; 7 Peers</td>
</tr>
<tr>
<td>Living with SCI</td>
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<tr>
<td>6 calls over weeks</td>
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<tr>
<td>Overall, MCMC was</td>
</tr>
<tr>
<td>found to be feasible &amp; acceptable for both peers &amp; PHCs</td>
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</table>

Conclusion

The MCMC model and associated tools could be adopted by national collaborators, based on results of the current randomized controlled trial (N=48).

Presented at: ISCoS and Asia Joint Scientific Meeting Montreal, Canada March 2015 and American Congress of Rehabilitation Medicine (ACRM) Annual Conference Dallas, TX October 2015
ACADEMY OF SPINAL CORD INJURY PROFESSIONALS

New England Spinal Cord Injury Toolkit Offers an Easy to Access and Use Education Tool to Any SCI Caregiver

Objective

The New England Regional SCI Center facilitated development of the New England SCI Toolkit (NESCIT), a collaboration among New England medical centers that provide SCI care, with the goal of standardizing care throughout the region. Primary objectives are to:

- Improve functional outcomes
- Decrease the frequency of complications
- Provide educational resources to patients and providers.

Problem Statement

Once discharged to a post-acute care setting, people with SCI are often at greater risk for developing secondary complications than they were when admitted to the acute care rehabilitation setting. Although the patient may be able to direct their own care, the staff at the new facility may not be familiar with the care of people with SCI treatment.

Contact Information:
- Dr. Neggati@Gaylord.org
- infoRCISC@gaylord.org

Results

The Toolkit resources provide SCI care information that is professional, clinically up-to-date, easily accessible, comprehensive, and concise. The champions can provide personal support and blend their experience with the resources to provide a targeted support package to fit a patient's and/or institution's specific needs.

Significance

- The Toolkit allows clinicians and caregivers to share and disseminate SCI care information to healthcare providers across the continuum of care.
- Especially useful to patients discharged to long-term care facilities lacking expertise in SCI.
- For those with older ages at onset of injury.
- Clinicians and caregivers can quickly become accurately educated to the specific needs of their patients.
- The portability of the online or print version allows for easy access in myriad of settings.

Conclusion

NESCIT offers an easy to access and useful educational tool with clinical support to improve the SCI knowledge of clinicians in hospitals, skilled nursing facilities, home health care agencies, and caregivers to treat SCI patients. It is currently being used in various settings by multiple disciplines.
Development of a Peer-Led Phone Intervention for Goal-Setting Primary Healthcare Needs in Chronic Spinal Cord Injury

Bethlyn Houlihan, MSW, MPH; Sarah Everhart Skeels, MPH; Judi Zazula, MS, OTR/L; Diana Pernigotti, MSG; Stathis Hasiotis; Hannah Mercier, MS, OTR/L; Miriam Brody, BBA; Christa Green, BA; Timothy Belliveau, PhD, ABPP; David Rosenblum, MD; Subramani Seetharaman, MD; Alan Jette, PhD, PT

New England Regional Spinal Cord Injury Center: Boston University School of Public Health, Baystate Hospital, and Hospital for Special Care

Introduction
People with spinal cord injury (SCI) are without needed support to access services and resources for self-management of health and advocating for better care. We developed and piloted My Care My Call (PCHC), an innovative, peer-led, community-based telephone intervention to empower consumers in actively managing and addressing their primary healthcare needs.

Development of My Care My Call
SCI Content Expert Panel: 5 healthcare professionals; 3 consumers. Informal intervention framework: 4 peer support is crucial. Defined the Peer Health Coach (PHC) role.

Developed Intervention Materials
- Resource Book
- Consumer Workbook
- PHC Toolkit

PHC Training
- MCROC protocol training
- Peer Mentor Program training through United Spinal
- Vulnerable populations training through Northeast Independent Living Program
- Certification in Brief Action Planning (BAP), an evidence-based, goal-setting technique adapted for peer delivery
- Training in Motivational Interviewing (MI) wrap around skills, an evidence-based, goal-setting technique that identifies and addresses a person’s readiness, willingness, and ability to change

Theoretical Framework
- Transcultural Model
- Social Cognitive Theory
- Empowerment Model

My Care My Call Content
Peer Health Coach

Coaching and support are tailored by level of activation (i.e., the willingness and ability to manage one’s own health and health care).

PHC Toolkit

Pilot Study Methods & Results
Design
Participants were asked to:
- Complete 6 calls with a PHC over 3 weeks
- Complete a brief online survey after each call
- Participate in an exit phone interview

Participants
- 5 with tetraplegia
- 2 with paraplegia
- 4 male
- 4 female
- 24-64 years old
- 4 complete
- 3 incomplete
- 9-27 years injured

Results
Participants completed 81% of calls

PHCs were rated ‘Very Good’ or ‘Excellent’ for 80% of calls

Significance
Pilot study showed need for:
- Important process changes for PHC
- How PHCs were able to address patients’ needs beyond the usual primary care
- Relaying PHC training on role play to master PHC tools
- Removal of Motivational Interviewing from PHC Toolkit
- The peer component superseded the need for relationship building
- More scripting of the PHC Toolkit
- Established ongoing support calls between PHCs

Randomized Controlled Trial

Sample: 40 adults with SCI from BU Medical Campus, Baystate Hospital, and Hospital for Special Care

Intervention Group:
- Resource Guide
- PHC calls for 6 months

Control Group:
- Resource Guide
- Usual Care

Eligibility criteria:
- Traumatic SCI, injured > 6 months
- English-speaking
- Health-related need

Enrollment: 6 months by phone

Contact Information: bwerg@bu.edu; ajette@bu.edu

Poster content made possible with support from National Institute on Disability and Rehabilitation Research Grant #HHSN23120002

Empowering Adults with Spinal Cord Injury for Healthcare Engagement

**Introduction**

Adults with spinal cord injury (SCI) experience barriers to accessing healthcare services and accommodations, which may restrict the opportunities they have to learn or collaborate with healthcare providers for managing SCI throughout their lifetime. The interdisciplinary team of researchers, clinicians, and consumers at New England Regional SCI Center developed the My Care My Call (MCMC) telehealth intervention to promote healthy behaviors and self-advocacy for meeting primary care needs using a health empowerment approach.

A health empowerment approach reflects health promotion focus of the Ottawa Charter for enabling people to increase control over, and to improve, their health (p. 1). Focusing on techniques to maximize the patient’s capacity for health and wellness, health empowerment interventions have shown that informed and empowered patient involvement in healthcare may enhance mental and physical health outcomes, improve well-being and quality of life, and may lead to providers using a more patient-centered communication style.

**Health Empowerment Principles**

- Participant develops skills and motivation to actively participate in own healthcare
- Participant self-manages health and uses healthcare resources to optimize health outcomes
- More knowledgeable providers may increase self-efficacy, health literacy, and condition knowledge to inform decision-making, problem-solving and resource utilization, and contact with clinicians

**Next Steps**

Using a health empowerment approach, My Care My Call may act as a healthcare service extender for adults with SCI as it bridges a gap between information acquisition and action. My Care My Call is a telephone-based intervention for adults with SCI using Peer Health Coaches to:
- Enhance the patient’s self-efficacy for addressing health needs and interacting with healthcare providers
- Support goal setting, problem solving and skill development for accessing quality healthcare and health-related resources

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