Post-Intensive Care Syndrome (PICS) Across the Continuum of Care

Date and Time of Presentation: 2/5/2015, 8:00 - 10:00 AM.
Location and Room: Indiana Convention Center, Room 102
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Course Description:
Over 80% of survivors of critical illness experience post-intensive care syndrome (PICS). This course will examine the etiology of symptoms comprising PICS and discuss evidence-based tests and measures to objectively evaluate individuals with PICS. Outcomes from recent clinical trials of interventions for people with PICS will be discussed and sample intervention programs will be described. This course will conclude with a discussion of current challenges associated with the evaluation and physical therapy management of individuals with PICS and offer some potential solutions.

Course Objectives:
Upon completion of this course, the participant should be able to:
1. Describe the etiology of the physical, cognitive, and psychological symptoms associated with PICS.
2. Describe the spectrum of physical impairments, activity limitations, and participation restrictions of patients with PICS presenting to an in-patient rehabilitation program, outpatient clinic, or home care setting.
3. Select evidence-based tests and measures including interventions to objectively quantify physical impairments, activity limitations, and participation restrictions for patients with PICS.
4. Discuss current challenges and potential solutions for the management of patients with PICS in in-patient rehabilitation program, outpatient clinic, or home care settings.

Introduction and etiology of PICS
Long-term outcomes after intensive care
Pulmonary
- Impairment in spirometry, lung volumes, and diffusion capacity
Neuromuscular
- Critical illness polyneuropathy, critical illness myopathy, disuse atrophy
Physical Function
- Performance of ADL and IADL, reduced 6-minute walk distance, fatigue
Psychiatric
- Depression, posttraumatic stress disorder, anxiety

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[PICS Across the Continuum of Care] [2/5/2015]
Cognitive
- Impairment in memory, attention, executive function, mental processing speed
Low rate of return to work & increased healthcare utilization

Family burden
- Anxiety, PTSD, depression, complicated grief
- Physical care

My story: What it was like for me the “P.T.” to become me the “pt”

Medical History and Clinical Presentation
1st pregnancy at age 28
- Complications: cyclic high fevers, endometritis, septic pelvic thrombophlebitis
- Outcomes: clotting disorder, ablated/damaged uterus, possible trigger of autoimmune thyroid deficiency

Despite the impossibilities; 2nd pregnancy at age 40
- High risk pregnancy (age and clotting issues)
- placenta accreta (progressed to increta/percreta)
- labor and delivery at almost 36 weeks (daughter was born premature)

C-section complications
- ovarian cysts removed and led to increased “cut to sew” time (responded initially well)
- D/C planning challenged; 48 hours post C-section symptoms of high blood pressure, swelling, jaundice, hyperreflexive.
- Increased C-section “cut to sew” time complicated clotting disorder issues; initiated blood transfusions

Family visit to prep D/C and CCU/ICU instead
- 11year old son
- Family noticing symptoms of fatigue, swelling worsening, BP rising to critical levels-hypertensive emergency rising to >180/>130
- HELLP syndrome and multisystem organ failure, transfusions and initial heparin were not completely effective and critical care began with magnesium, heparin dosage change and BP medication.
- Critical care began-CCU/ICU limitations on visitors (family impact)

Hospitalization Recovery
- Critical care was 1 week (husband, mother and baby in tow)
- 11 yr old son able to get in CCU to see me
- The next week very much a haze
  - Room was bright for day and dark for night (for the baby?)
  - Advocating for time up and mobile for me (moving early and often)

Physical Impairment Following Critical Illness
- Pulmonary- decreased aerobic capacity, high blood pressure
  - Walking issues, 2 story home a challenge (bedrooms upstairs)
  - Returning to training (runner) challenges with muscle fatigue, muscle stiffness (flexibility issues), plantar fasciitis
  - Lung capacity (pneumonia, bronchitis multiple times in up to 3 year post)
- Neuromuscular/ICU weakness- multisystem organ failure (now called multiple organ dysfunction syndrome)
  - Liver function low (clotting issues, drug metabolism issues)
  - Thyroid dysfunction and regulation frustrations (high or low or no regulation)
Cognitive impairments in memory—had to “chart” meds, “chart” baby feeding times until the ‘fog’ cleared

Psychiatric—not depressed but kept being asked about it?
(Family perspective—just couldn’t keep up with everything like I used to)
Psychiatric—no PTSD, but frustrated with MD’s because didn’t feel well and yet everyone would say “your liver function will get better and then your thyroid meds will work and besides…you look so healthy!”

**Family Insights**
- Health care background helped. The experience reinforced the “listening” part of communication (“heard” the priorities, “caught” the misreads and determined how to focus on the data/tests or not)
- The children. Motto for daughter, what we shared with our son.
- Advocates (husband, mom, neonatal pediatrician)
- Support system (friends, family, co-workers, medical personnel-normalcy)
- Healthcare provider trust and partnership. Shared care

**Video Resources**
**Society of Critical Care Medicine (SCCM) perspectives:**
Video series featuring ICU survivors from SCCM
www.youtube.com/sccm500

**Patient and Family perspectives**
Video link from Vanderbilt University’s ICU Delirium group:
http://www.icudelirium.org/testimonials.html

**Patients Perspectives on Survivorship after Critical Illness:**
Video links from Johns Hopkins Outcomes After Critical Illness & Surgery:
http://www.hopkinsmedicine.org/pulmonary/research/outcomes_after_critical_illness_surgery/oasis_videos_news.html

**Examination – Tests and Measures to Objectively Quantify PICS Using an ICF Approach**

Survivors of critical illness experience a constellation of impairments of bodily functions, activity limitations, and participation restrictions. To optimally evaluate and track the individual’s status and response to interventions, it is essential to use appropriate valid and reliable tests and measures.

**Bodily Functions**

**Pain**
- Numeric Rating Scale (0 – 10)
  - MCID (minimal clinically important difference) is ~ 2 points.

**Joint Range of Motion**
- Goniometric measurements are appropriate

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**Muscle Strength**

- **MRC Sum Score**
  - Many individuals experience ICU acquired weakness (ICUAW) that persists after ICU and hospital discharge.
  - Compute the MRC Sum Score to identify the presence and resolution of ICUAW.
  - Determined as the sum of the manual muscle test using the Oxford 0 - 5 scale for the following muscle groups bilaterally – shoulder abduction, elbow flexion, wrist extension, hip flexion, knee extension, and dorsiflexion.
  - Scoring: the maximum score is 60 and a score of < 48 is consistent with ICUAW.
  - See Ciesla N et al., 2011 for an excellent article on measuring MRC Sum Score; Stevens et al., 2009.

**Activity Limitations**

**Functional Ability**

- **6 Minute Walk Test**
  - Measures functional exercise ability
  - MCID ~ 25 - 50 meters depending on patient population; has not been determined for individuals with PICS

- **Incremental Shuttle Walk Test (ISWT)**
  - Measures functional ability
  - See Singh et al., 1992; Salisbury et al., 2010

- **Physical Function in the ICU (PFIT)**
  - Measures functional ability and muscle strength
  - Used in the ICU but may be relevant to continue to use following hospital discharge
  - See Skinner et al., 2009; Denehy et al., 2012; Nordon-Craft et al., 2014

- **Functional Independence Measure (FIM)**
  - Measures functional independence in motor and cognitive themes
  - See [http://www.udsmr.org/WebModules/FIM/Fim_About.aspx](http://www.udsmr.org/WebModules/FIM/Fim_About.aspx); Dennis et al., 2011

**Balance**

- **Berg Balance Scale**
  - Measures balance
  - Scoring: <45/58 indicates an increased risk for falls
  - See Berg et al., 1992; Denehy et al., 2014

- **Timed Up and Go**
  - Measures functional mobility
  - Scoring: >13.5 secs indicates an increased risk for falls
  - See Podsiadlo et al., 1991; Shumway-Cook et al., 2000; Salisbury et al., 2010; Denehy et al., 2014

- **5 Times Sit to Stand**
  - Measures functional transfer mobility
  - Scoring: >12 secs indicates an increased risk for falls
  - See Lord et al., 2002; Tiedemann et al., 2008; Denehy et al., 2014
**Self-Care and ADLs**
- Barthel Index
  - Measures self-care and ADL ability
  - See Wade et al., 1988; van der Schaaf et al., 2009; Dennis et al., 2011; Elliott et al., 2011
- Katz Activities of Daily Living
  - Measures level of dependence in activities of daily living
  - See Katz et al., 1963; Jackson et al., 2014

**Participation Restrictions**

**Participation**
- Short Form 36 (SF-36)
  - Measures health related quality of life
  - See Chrispin et al., 1997; Dowdy et al., 2006; Fan et al., 2014

**Interventions – Current Evidence for Effective Management of Patients with PICS**
The key to effective management of PICS is multi-faceted with the recognition of a constellation of cognitive, psychological, and physical symptoms including prolonged muscle weakness, reduced performance of activities of daily living, diminished ambulation and strength, post-traumatic stress disorder, and anxiety. These symptoms persist for months and years following hospital discharge. Current evidence focuses on ability to provide safe and effective exercise prescription, patient and family training in the ICU in the acute and chronic phases, Interprofessional collaboration, and development of clinical practice guidelines in the management of patients with PICS.

**Challenges and Potential Solutions for the Management of People with PICS Across the Continuum of Care**

**Acute phase (hospital, inpatient rehabilitation)**
- Prevention
- Manage transitions
- Education
- Coordination of services

**Chronic phase (home care and outpatient services)**
- Recognition & validation
- Interventions
  - Restoration
  - Compensation
  - Persistence

**Raising awareness about PICS**
- Development of a clinical practice guideline on PICS
- Education to health care providers
- Coordination of healthcare services

**Future research needs**
References:

- Farrar JT, Young JP, LaMoreaux L, Werth JL, Poole RM. Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale.

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