

**CURRICULUM VITAE**

**DATE:**                                 **July, 2024**

**NAME:**                                 **Beth Elaine Crowner PT, DPT, NCS, MPPA**

**CONTACT INFORMATION:**

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**PRESENT POSITION:**                 Professor of Physical Therapy and Neurology  
Program in Physical Therapy  
Washington University School of Medicine

**EDUCATION:**

<u>Degree</u>	<u>Institution</u>	<u>Field</u>	<u>Date</u>
BS	<b>Washington University</b> St. Louis, MO	Physical Therapy	1989
MS	<b>Washington University</b> St. Louis, MO	Physical Therapy	1989
MPPA	<b>University of Missouri</b> St. Louis, MO	Public Policy Administration	1997
DPT	<b>Washington University</b> St. Louis, MO	Physical Therapy	2007

**ACADEMIC POSITIONS / EMPLOYMENT:**

Physical Therapist	<b>Christian Hospital Northeast</b> St. Louis, MO	05/89-01/90
Level II Physical Therapist	<b>St. John's Mercy Medical Center</b> St. Louis, MO	01/90-01/93
Senior Physical Therapist	<b>National Rehabilitation Hospital</b> Washington, D.C.	01/93-09/93
Team Leader/Supervisor	<b>St. John's Mercy Medical Center</b> St. Louis, MO	09/93-01/03

**Washington University School of Medicine**

Academic/Department Rank

Instructor	Physical Therapy	2003-2007
Assistant Professor	Physical Therapy and Neurology	2007-2012
Division Director of Clinical Practice	Physical Therapy	2007-2020
Associate Professor	Physical Therapy and Neurology	2012-present
Professor	Physical Therapy and Neurology	2017-present

**CLINICAL TITLE and RESPONSIBILITIES:**

**Washington University School of Medicine-Department of Neurology** 2003-2004

Movement Disorders Clinic: Physical Therapist

*Clinical Responsibilities:* direct care of patients with Parkinson Disease; consultation with clinic physicians for patients myriad movement disorders.

**Washington University School of Medicine-Program in Physical Therapy** 2007-2020

Washington University Physical Therapy Clinics:

*Division Director Responsibilities:* oversight of clinical operations of the Washington University Physical Therapy Clinics; strategic planning for the clinical practice; integration of the clinical mission with the research and education missions of the Program in Physical Therapy; integration of clinical residencies and fellowships within the faculty clinical practice.

**Washington University School of Medicine-Program in Physical Therapy**

Washington University Physical Therapy Clinics: Physical Therapist

2003-present

*Clinical Responsibilities:* Direct care of patients with neuromuscular conditions

**Past Clinical Responsibilities**

Provided direct patient care in large teaching hospitals across the continuum of care; participation in interdisciplinary patient evaluation, management, and discharge planning; supervisory oversight of physical, occupational, speech, and recreation therapy in the acute and inpatient rehabilitation at St. John's Mercy Medical Center.

**TEACHING TITLE and RESPONSIBILITIES:**

**Current Teaching Responsibilities**

Domain Lead: Systems Based Practice

Thread Lead: Diagnosis and Management of Movement Problems and Health Systems

Module 2: Lecturer and Lab Assistant

Module 3: Lecturer and Lab Assistant

Module 4: Lecturer and Lab Assistant

Module 5: Build Team Member, Lecturer and Lab Assistant

Module 6: Build Team Member, Lecturer and Lab Assistant

**Past Teaching Responsibilities**

Professional Clinical Doctorate (DPT) Curriculum (WUSM)

Participation in, and coordination of, lecture and laboratory courses focused on safe handling and basic exercise strategies with wide array of patients; clinical education team member: clinical experience mentor and advisor for professional students during full time and part time clinical clerkships and internship.

2003-2007

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Essential Clinical Skills I (PT 603)

Lecturer: 2007-present

Course Master or Assistant: 2003-2007

4 Credit hours

Diagnosis and Management of Neuromuscular Conditions I (PT 629)

Course Master: 2013-2021

2 Credit hours

Diagnosis and Management of Neuromuscular Conditions II (PT 643)

Course Master: 2014-2018; Course Assistant 2018-2022

4 credit hours

Diagnosis and Management of Neuromuscular Conditions (PT 639)

Lecturer and Lab Assistant: 2003-2006

Course Master: 2007-2013

4 Credit hours

Participation in selected other courses for the professional clinical doctorate curriculum:

Case Integration I (PT 628), Case Integration II (PT 642), Case Integration III (PT 654), and Diagnosis and Management of Musculoskeletal Conditions I (PT 614), Professional Issues and Skills Development I (PT602), Professional Issues and Skills Development III (PT635), Professional Issues and Skills Development IV (PT 655), and Health Fitness and Prevention (PT653), Inter-professional Education (Center for Inter-professional Practice and Education)

Professional Clinical Doctorate (DPT) Curriculum (WUSM)

Organizational and Management Issues (PT 651)

Course Master: 2003-2023

3 Credit hours

Post-Professional Clinical Doctorate

Dynamics of the Healthcare System (M22 640)

Lecturer 2007 and 2011

PhD in Movement Science

*Dissertation Reviewer*

“Biomechanical and Neural Factors Associated with Gait Dysfunction and Freezing in People with Parkinson Disease”

Daniel Peterson, 2013

“Motor adaptation and automaticity in people with Parkinson’s disease and freezing of gait”

Sam Nemanich, 2016

**UNIVERSITY, SCHOOL OF MEDICINE and HOSPITAL APPOINTMENTS and COMMITTEES:**

Program in Physical Therapy

Committee on Academic and Professional Evaluation of Students (CAPES)

Member

2003-present

Competency Attainment Committee

2021-present



<u>Academy of Neurologic Physical Therapy (Formerly the Section on Neurology-APTA)</u>	
Member	2004-present
Balance and Falls Special Interest Group-Nominating Committee/Chair	2011-2014
StrokeEDGE taskforce	2010-2011
Practice Committee	2011-2014
Board of Directors:	
Director of Practice (elected 2014; re-elected 2017)	2014-2020
Director of Education (elected 2024)	2024-present
Co-Chair: Knowledge Translation Taskforce for PD CPG	2021-2024
 <u>Section on Pediatrics (APTA)</u>	
Member	2005-2014
 <u>Section on Health Policy and Administration (APTA)</u>	
Member	2014-2018
 <u>Academy of Physical Therapy Education</u>	
Member	2019-present
 <b><u>COMMUNITY SERVICE CONTRIBUTIONS:</u></b>	
<b>St. Louis Children’s Hospital-Cerebral Palsy Center</b>	
Coach for cerebral palsy basketball clinic for children ages 12+	2001-2003
 <b>Service for Washington University School of Medicine</b>	
Mini Medical School	2005
Minority Career Fair	2005-2007
School of Medicine Health Professional Student Leadership Council	2011-2013
-Integrated Case Study	
 <b>Service for Washington University</b>	
Alumni and Parents Admission Program	2019-present
 <b>Other Service</b>	
Invited presentation to national meeting for Huntington’s Disease	2004
Invited presentation to regional support group for Huntington’s Disease	2006
Provided a talk to a national audience of patient’s families and clinicians	2006
on the role of physical therapy intervention in Progressive Supranuclear Palsy	
Participated in the creation/filming of an educational video for assessment	2011
and treatment of individuals with Parkinson disease (APDA)	
Creation of newsletter article for the APDA on treating freezing of gait	2015
Created a newsletter article for the APDA on exercise and fall prevention	2017
Provided community talk on fall prevention at Delmar Gardens	2017
Provided community talk to support group for patients with ataxia on the role	2018
of physical therapy and exercise	
Provided community talk to support group for patients with dystonia on the role	2020
of physical therapy, exercise and strategies for symptom management	

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**INVITED PROFESSORSHIPS and LECTURESHIPS:**

“Balance of Power: How to Keep From Falling Down In the Assessment and Documentation of Postural Control”

Crowner BE

Missouri Physical Therapy Association-Eastern District Meeting  
September 2004

“Recent Research and Practical Applications in Motor Control”

Crowner BE, Earhart GM, and Lang CE

Missouri Physical Therapy Association-Fall Conference  
October 2007

“Incubating Innovation”

Bezner J, Crowner B, Deusinger S, Gandy J, Johnson M, and Wilson J

APTA Combined Sections Meeting-Educational session  
February 2010

“StrokEDGE: Report and Recommendations from the Neurology Section Taskforce on Outcome Measurement for Individuals with Stroke”

Sullivan JE, Pinto-Zipp G, Rose D, Kluding P, Nichols D, Crowner B, Yoshida R

APTA Combined Sections Meeting-Educational session  
February 2011

“The Vision of Physical Therapy Services in the Emergency Department: Making it a Reality”

Deusinger SS, McDonnell DA, Wendl PM, Crowner BE, Burlis TL

APTA Combined Sections Meeting-Educational session  
February 2012

“An Evidence-Based Approach to Examination and Intervention for People with Parkinson’s Disease Across the Continuum of Disability”

Crowner BE and Duncan RP

Missouri Physical Therapy Association-Fall Conference  
October 2012

“Neurological Rehabilitation: Strategies for Maximizing Intensity Across the Rehabilitation Continuum”

Mitchell K, Lang CE, Hayes H, Crowner B, Osborne MB

APTA Combined Sections Meeting-Educational session  
January 2013

“Neurologic Practice Issues Forum: Selection of objective measures in neurologic rehabilitation- Maximize your skills in coding, motivating patients and detecting change to improve patient outcomes”

Mitchell K, Studer M, Crowner B; Moore J, Van Der Laan K

APTA Combined Sections Meeting-Educational session  
February 2014

“Does Medicare Really Cover Maintenance Therapy”

Brown J, Crowner B, Drummond-Dye R, King T, Studer M

APTA Combined Sections Meeting-Educational session  
February 2015

Beth Crowner

“The Dilemma of Balance Rehabilitation: Prescribing the Right Dosage of Difficulty for Each Patient’s Program”

Crowner B, Espy D, Linder S, Printz C, Studer M  
APTA Combined Sections Meeting-Educational session  
February 2015

“An Evidence-Based Approach to Examination and Intervention for people with Parkinson’s Disease Across the Continuum of Disability”

Physical Therapy Special Interest Group-Belleville Memorial Hospital  
Crowner B, Duncan R  
August 2015

“What Is Backward Disequilibrium and How Do I Treat It?”

Scheets P, Crowner B, Stith J  
APTA Combined Sections Meeting-Educational session  
February 2016

“From Theory to Clinical Practice: Using Clinical Practice Guidelines to Implement Evidence Based Care across a Variety of Physical Therapy Settings”

Crowner BE and Holtzman GW  
Missouri Physical Therapy Association-Fall Conference  
October 2016

“Utilization of Knowledge Translation in Neurologic Physical Therapy Practice”

Crowner B, Tilson JK, Siles A, Rafferty MR  
APTA Combined Sections Meeting-Educational session  
January 2019

“Integrating Current Evidence into Neurologic PT Educational Programs”

Hornby TG, Crowner BE, Lang CE, Reisman D, Moore JL, Holleran C, Earhart GE, Duncan RP, Morris L  
APTA Combined Sections Meeting-Pre-Conference Course  
January 2019

Building Capacity for Knowledge Translation in Rehabilitation

Crowner B, Moore J, Hornby T, Robinson J, Goodwin L, Hennessy P, Scheets P, MacDonald J, Rafferty M  
APTA Combined Sections Meeting-Educational session  
January 2019

Building Capacity for Knowledge Translation in Rehabilitation

Crowner B, Fritz N, Goodwin L, Hennessy P, Hornby TG, Moore JL, Robinson J  
APTA Combined Sections Meeting-Educational session  
February, 2021

Parkinson’s Foundation Course for DPT Faculty Educators

June, 2022

Implementation Strategies for the Clinical Practice Guideline for People with Parkinson Disease

Crowner B, Rafferty M, Kegelmeyer D, Criminger-Morris C  
APTA Combined Sections Meeting-Educational session  
February, 2023

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Let's Get Moving! Tools for the Real World, Implementation of the Parkinson Disease CPG  
Crowner B, Criminger-Morris C, Kegelmeyer D, O'Neil L  
APTA Combined Sections Meeting-Pre-Conference Course  
February, 2024-Accepted for presentation

### **RESEARCH SUPPORT**

#### **Governmental**

Co-Investigator

Botulinum Toxin's Effects on Plantar Ulcer Recurrence

PI: Mary Hastings, PT, DPT, ATC

Source: NIH; 1R21 HD048972-01

January 2004-December 2008

#### **Non-Governmental**

Principal Investigator

Systemic Effects on Strength Following Botulinum Toxin A Injections in Children With Cerebral Palsy

PI: Beth Crowner PT, DPT, NCS, MPPA

Source: Internal funding, Department of Neurology and the Program in Physical Therapy, Washington University School of Medicine

July 2005-June 2007

Co-Investigator

Botulinum Toxin A for Lower Extremity Spasticity in Children with Cerebral Palsy: a single blinded trial comparing two dilution techniques

PI: Susan Criswell, MD

Source: Internal Funding, Program in Physical Therapy, Washington University School of Medicine

April 2007-2009

Principal Investigator

The Use of Sensory or Motor Cues Using Electrical Stimulation to Reduce Gait Freezing in Patients with Parkinson Disease

PI: Beth Crowner PT, DPT, NCS, MPPA

Source: Internal Funding, Program in Physical Therapy, Washington University School of Medicine

October 2007-September 2009

Principal Investigator

The Impact of Botulinum Toxin Injections on Gait, Function, Motor Control and Quality of Life in Children with Cerebral Palsy

PI: Beth Crowner PT, DPT, NCS, MPPA

Source: Internal Funding, Program in Physical Therapy, Washington University School of Medicine

February 2010-2012

### **TRAINEE/MENTEE/SPONSORSHIP RECORD:**

**Independent Study (M22 500):**

“Advanced Topics in Physical Therapy Professional Practice”

Toby Kinney, 2008

“Use of Gait Velocity and Distance Measures to Predict Functional Independence in Patients with Stroke”

Merri Leigh Johnson, 2008

“Outcome Measures Use and Implementation for Individuals following Spinal Cord Injury”

Stacy Kinstler, 2010



“Efficacy of respiratory exercises and assisted technology in improving pulmonary function and cough production in patients with spinal cord injury”

Melanie Orell, 2012

Capstone Project (M22 820)

“Effects of the Wii and Wii Fit on Outcomes in an Individual with Chronic Stroke”

Jennifer Wang, 2009

“Heterotopic Ossification in Burn Injury: Risk factors, Prevention, and Surgical Outcomes”

Melanie Orell, 2013

## **BIBLIOGRAPHY:**

### **Manuscripts-Peer Reviewed**

1. Criswell, SR, **Crowner BE**, Racette BA. The use of botulinum toxin therapy for lower-extremity spasticity in children with cerebral palsy. *Neurosurg Focus*. 2006; 21(2):1-7.
2. **Crowner BE**, Brunstrom JE, Racette BA. Iatrogenic botulism in a pediatric patient due to a therapeutic botulinum toxin A injection. *Clin Neuropharmacol*. 2007; September/October; 30(5): 310-313.
3. Willis AW, **Crowner BE**, Brunstrom JE, Racette BA. High dose botulinum A toxin for the treatment of lower extremity hypertonicity in children with cerebral palsy. *Dev Med Child Neurol*. 2007; 49(11): 818-822.
4. **Crowner BE**. Cervical dystonia: disease profile and clinical management. *Phys Ther*. 2007; 87(11) 1-16.
5. **Crowner BE** and Racette BA. A prospective study of remote effects of botulinum toxin A in cerebral palsy. *Pediatr Neurol*. 2008; 39(4):253-8.
6. **Crowner BE**, Torres-Russotto D, Carter A, Racette BA. Systemic weakness after therapeutic injections of botulinum toxin A: a case series and review of the literature. *Clin Neuropharmacol*. 2010;33(5):243-7.
7. Leddy A, **Crowner BE**, Earhart GM. Functional Gait Assessment and Balance Evaluation System Test: reliability, validity, and fall risk assessment for individuals with Parkinson disease. *Phys Ther*. 2011; 91(1): 102-113.
8. Leddy A, **Crowner BE**, Earhart GM. Utility of the Mini-BESTest and BESTest sections for balance assessments in Parkinson Disease. *J Neurol Phys Ther*. 2011; 35(2): 90-7.
9. Hastings MK, Mueller MJ, Sinacore Dr, Strube MJ, **Crowner BE**, Johnson JE, Racette BA. Botulinum toxin effects on gastrocnemius strength and plantar pressure in diabetics with peripheral neuropathy and forefoot ulcerations. *Foot Ankle Int*. 2012; 33(5): 363-70.
10. Sullivan JE, **Crowner BE**, Kluding PM, Nichols D, Rose D, Yoshida R, Pinto-Zipp G. Outcome measures for individuals with stroke: process and recommendations from the American Physical Therapy Association neurology section task force. *Phys Ther*. 2013; 93(10): 1383-96.
11. Harris-Hayes M, Willis AW, Klein SE, Czuppon SC, **Crowner B**, Racette BA. Relative Mortality in United States Medicare Beneficiaries with Parkinson Disease and Hip and Pelvic Fractures. *J Bone Joint Surg*. 2014; 96: e27: 1-7.
12. Deusinger SS, **Crowner BE**, Burlis TL, Stith JS. Meeting contemporary expectations for physical therapists: imperatives, challenges, and proposed solutions for professional education. *J Phys Ther Educ*. 2014; 28 (1): 56-61.
13. Scheets PL, Sahrman SA, Norton BJ, Stith JS, **Crowner BE**. What is Backward Disequilibrium and How Do I Treat It?: A Complex Patient Case Study. *J Neurol Phys Ther*. 2015; 39(2): 119-26.
14. Reszel J, Daub O, Leese J, Augustsson H, Moeske Bellows D, Cassidy CE, **Crowner BE**, Dunn SI, Goodwin LB, Hoens AM, Hunter SC, Lynch EA, Moore JL, Rafferty MR, Romney, W, Stacey D. Essential content for teaching implementation practice in healthcare: A mixed-methods study of teams offering capacity-building initiatives. *Implementation Science Communications*. 2023; 4(151): 1-20.

15. Tueth LE, Duncan RP, **Crowner BE**, Earhart GM. Comparing balance using the BESTest in Alzheimer, Huntington, and Parkinson disease. *Neurdegener Dis Manag* (in press)

#### **Manuscripts-Non Peer-Reviewed**

1. **Crowner B**, Bland MD. Home Exercise Program. *A Compendium for Teaching Professional Level Physical Therapy Neurologic Content, V. 2016; Academy of Neurologic Physical Therapy, American Physical Therapy Association.*
2. **Crowner B**, Bland MD. Intervention Assignment. *A Compendium for Teaching Professional Level Physical Therapy Neurologic Content, V. 2016; Academy of Neurologic Physical Therapy, American Physical Therapy Association.*

#### **Abstracts**

1. **Battock BE**, Brown MB. (1988) Does Habitual Physical Activity Affect Aging? APTA Annual Conference, Las Vegas, NV
2. **Crowner BE**. (2007) Systemic Effects on Strength Following Botulinum Toxin A Injections in Children with Cerebral Palsy. APTA Combined Sections Meeting, Nashville, TN
3. **Crowner BE**. (2007) A Web-enabled Database: A Novel Application to Enhance Efficiency and Management of Clinical Education. APTA Annual Conference, Denver, CO
4. Leddy A, **Crowner BE**, Earhart GM. (2010) Balance Assessment in Parkinson Disease: the BESTest and the Mini-BESTest. Accepted for presentation at the 2<sup>nd</sup> World Parkinson Congress in Glasgow, Scotland, UK, *Mov Disord*; 25(Suppl 3): S684.
5. Leddy AL, **Crowner BE**, Earhart GM. (2011) Comparative analysis of balance measures in Parkinson disease. APTA Combined Sections Meeting, New Orleans, LA.
6. Leddy AL, **Crowner BE**, Earhart GM. (2010) Functional Gait Assessment and Balance Evaluation System Test: reliability, validity, and fall risk assessment for individuals with Parkinson disease. Missouri Physical Therapy Association Meeting, St. Louis, MO
7. Hastings MK; Mueller MJ, Sinacore DR, **Crowner B**, Bohnert KL, Johnson JE, Racette B. (2011) Botulinum Toxin Effect on Plantarflexor Muscle Strength and Plantar Pressure. APTA Combined Sections Meeting. New Orleans, LA. 2011. *Journal of Orthopaedic and Sports Physical Therapy*. 2011; 41(1): A31.
8. Wang J and **Crowner BE**. (2010) Effects of the Wii and Wii Fit on Outcomes in an Individual with Chronic Stroke. APTA Combined Sections Meeting, San Diego, CA
9. Tilson JK, MacDowell S, **Crowner B**, Dannenbaum L, D'Silva L, Farrell L, Roth RH, Skop K. (2017) Building Capacity for Dissemination and Implementation of CPG's Published by Non-profit- Non-governmental Organizations in the United States. 8<sup>th</sup> International Conference of EBHC Teachers and Developers. Taormina Italy
10. **Crowner BE**. (2007) A Web-enabled Database: A Novel Application to Enhance Efficiency and Management of Clinical Education. APTA Annual Conference, Denver, CO
11. Leddy A, **Crowner BE**, Earhart GM. (2010) Balance Assessment in Parkinson Disease: the BESTest and the Mini-BESTest. Accepted for presentation at the 2<sup>nd</sup> World Parkinson Congress in Glasgow, Scotland, UK, *Mov Disord*; 25(Suppl 3): S684.
12. Leddy AL, **Crowner BE**, Earhart GM. (2011) Comparative analysis of balance measures in Parkinson disease. APTA Combined Sections Meeting, New Orleans, LA
13. Leddy AL, **Crowner BE**, Earhart GM. (2010) Functional Gait Assessment and Balance Evaluation System Test: reliability, validity, and fall risk assessment for individuals with Parkinson disease. Missouri Physical Therapy Association Meeting, St. Louis, MO

14. Hastings MK, Mueller MJ, Sinacore DR, **Crowner B**, Bohnert KL, Johnson JE, Racette B. (2011) Botulinum Toxin Effect on Plantarflexor Muscle Strength and Plantar Pressure. APTA Combined Sections Meeting. New Orleans, LA. 2011. *Journal of Orthopaedic and Sports Physical Therapy*. 2011; 41(1): A31.
15. Wang J, **Crowner BE**. (2010) Effects of the Wii and Wii Fit on Outcomes in an Individual with Chronic Stroke. APTA Combined Sections Meeting, San Diego, CA
16. Tilson JK, MacDowell S, **Crowner B**, Dannenbaum L, D’Silva L, Farrell L, Roth RH, Skop K. (2017) Building Capacity for Dissemination and Implementation of CPG’s Published by Non-profit- Non-governmental Organizations in the United States. 8<sup>th</sup> International Conference of EBHC Teachers and Developers. Taormina Italy
17. Tilson JK, MacDowell S, **Crowner B**, Dannenbaum E, D’Silva L, Farrell L, Roth RH, Skop K. (2018) A Model for Active Dissemination and Implementation of CPGs Published by Academies of the APTA. APTA Combined Sections Meeting, New Orleans, LA.
18. Crumley, M, Notestine T, Bland M, **Crowner B**, Duncan R, Holleran C. (2021) Barriers to and Percentage of Vital Sign Assessment in an Outpatient Neurologic Physical Therapy Setting. APTA Combined Sections Meeting (Poster Presentation)
19. Rafferty M, **Crowner B**, Ellis T, Osborne J. (2023) Clinical Practice Guideline for the Physical Therapist Management of Parkinson Disease: an American Physical Therapy Association and Academy of Neurologic Physical Therapy Collaboration for Quality Improvement. World Parkinson Congress. Barcelona, Spain

#### **Commentaries**

1. Cornbleet S, Burlis T, **Crowner B**, Caldwell C. Letter to Editor entitled “The Prize and the Prejudice.” *Pediatric Physical Therapy*. 2003; 15(4): 263.