

Bursting Out of Parkinsonian Bradykinesia and Postural Abnormalities

Benjamin White PT, DPT
C/NDT, C/VR, C/Concussion, MBA

**Movement
Disorder Activity:
Walk in Their Shoes**

Schootemeijer et al 2020

- Parkinsons (PD)
 - Barriers
 - Neuroanatomy
 - Personal Conditions
 - Environmental Conditions
 - Motivators
 - Bring ADLs and exercise together

Schootemeijer et al 2020

- Barrier

- Low self-esteem
- Depression
- Comorbidities

- Motivator

- Self-efficacy
- Drive to Independence
- Belief in Effectiveness
- Affirmation
- Goals
- Therapy Tailored to Goals
- Belief in the fight against PD

Innovation

- Neuroplasticity
- Saliency
- Less emphasis to compensation
- Emotional empowerment
- Emotional engagement

Which neurological system predominantly drives motivation to engage in mobility?

Somatosensory System

Limbic System

Mesenteric System

Gastrointestinal System

Saliency

Patient D presents wheelchair bound and has poor seated balance with poor flexibility throughout his body. Name the initial goal the therapist should strive for to obtain better balance in the seated position.

Posterior pelvic tilt

Anterior pelvic tilt

Thoracic extension

Cervical extension

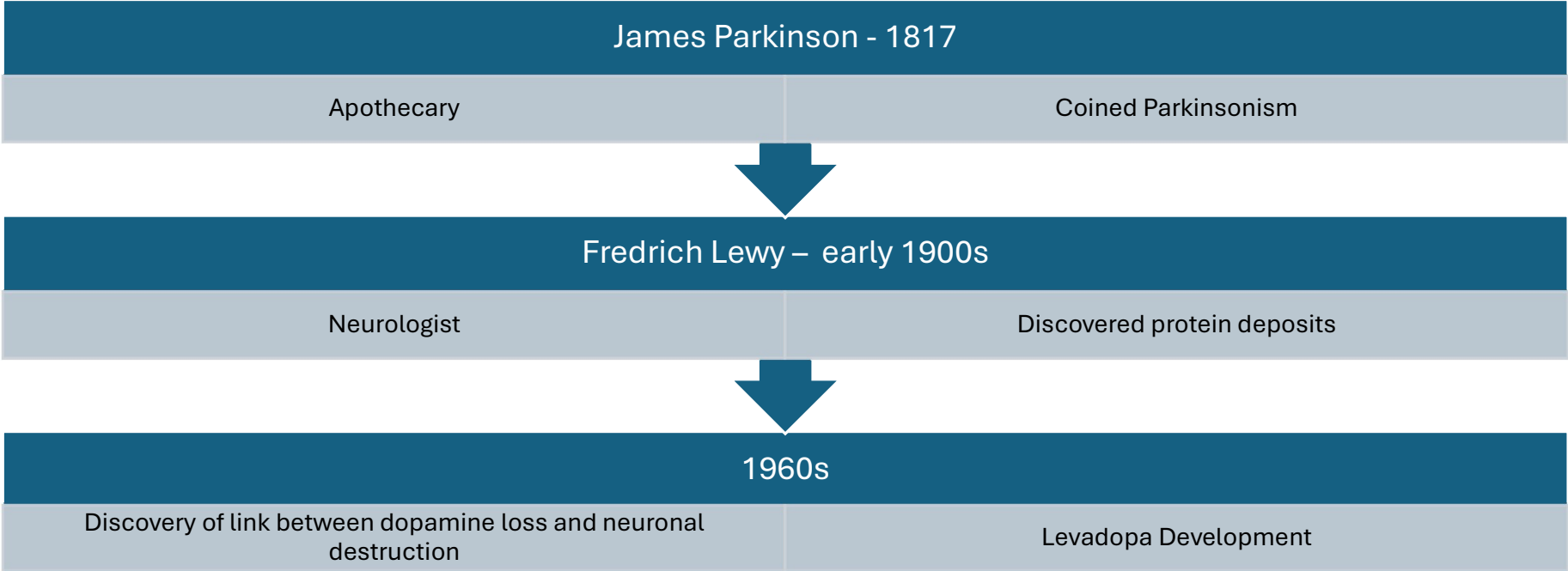
Parkinson's Disease

- Degeneration
 - Substantia Nigra
 - Central
 - Peripheral
 - Enteric System
 - Lewy body implantation

Parkinsonism - Davis Phinney Foundation

- Overarching term
 - Destruction of dopaminergic producing neurons
 - Parkinsons (PD)
 - Approximately 15% of total

The Birth of Parkinsonism



Drug-Induced Parkinsonism (DIP)

Dementia with Lewy Bodies (DLB)

Multiple System Atrophy (MSA)

Progressive Supranuclear Palsy (PSP)

Vascular Parkinsonism

Corticobasal Degeneration (CBD)

Parkinsonism – PD vs LBD and DIP

Lewy Body Dementia

- Vast difficulty as proteins deposit in many locations
- Cognitive impairment first to arrive

Drug-Induced

- Symptoms are temporary

Parkinsonism – PD vs MSA

Multi-System Atrophy

- Autonomic system more severely involved
 - i.e. vital signs
- Medication cannot slow progress of disease

Parkinsons

- Medication can slow advancement of disease
- Less systems involved

Parkinsonism

Vascular

- Several CVAs
- Non-progressive

Corticobasal Degeneration

- Apraxia
- Balance issues later
- Executive function
- ADLs

Parkinsonism – PD vs PSP

Progressive Supranuclear Palsy

- Lean backward
- Progress faster
- Destruction of nerves by the eyes
 - Ocular movement and focus impaired

Parkinsons

- Lean forward
- Respond more effectively to medication

Diagnosis

- No single test for all
- So much variety

Define the term saliency.

Having fun in therapy

Reaching the appropriate therapeutic intensity

Doing a task that is familiar to the patient

Meaningful activities that drive and motivate individuals to participate in mobility

Which of the following is NOT a part of the evidenced-based medicine?

Patient preference

Family perspective

Clinical expertise

Literature

Energy

- Mechanical
 - Auditory
 - Pinna to Malleus
- Electrical
 - Behind the Tympanic Membrane to Vestibular Nerve
 - Vestibular System

Vestibulopathy

- Destruction to Vestibular System Causing Poor Signaling to Central Nervous System

Vestibulopathy

- Gans Sematonsensory Exam
- History of Reduced Balance
- History of Circulatory Disorder

So What Who Cares?

- Progressive Disease
 - Poor proprioception
 - Poor balance
 - Sedentary state

Symptoms

- Rigidity
- Posture
- Dyskinesia – involuntary muscular movement
- Dysmetria
- Bradykinesia
- ADLs

PD Outcome Measures LSVT Global Inc.

- Schwab and England ADL Scale
- Modified Hoehn and Yahr
- Unified Parkinsons Disease Rating Scale
 - Multi-faceted
 - ADL
 - Dyskinesia
 - Bradykinesia

Parkinson's

- 5x sit to stand
- Functional Item
 - Successful completion
 - Less compensation without assist

Subtypes

- Clinical Presentation
 - Tremor-dominant
 - Non-tremor dominant
 - Motor and non-motor symptom variability

Bradykinesia

- Slow movement patterns
- Slow motor
- Slow parasympathetic functions
- Slow sympathetic functions
- Impact on quality of life

Dyskinesia

- Involuntary movements
- Frustration
- Depression
- Embarrassment

Busting Out

- Barriers can be held tightly or used to your advantage

Busting Out

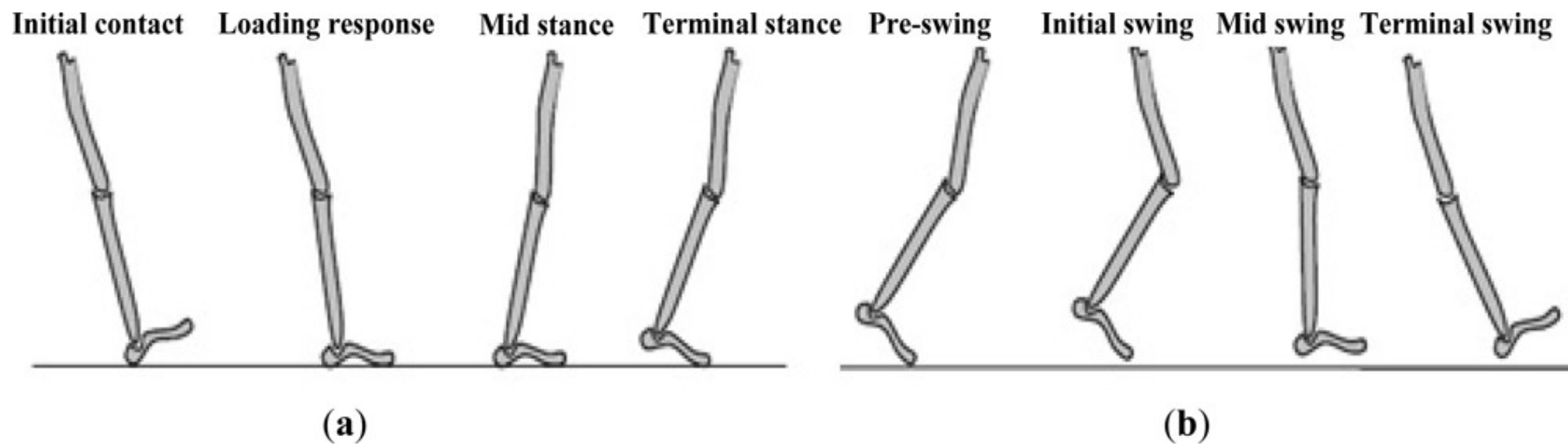
- Exercise consistency
- Balance
- Functional tasks

Transdisciplinary Approach

- ICF Model
- Collaboration
- Holistic Approach

Patient Education and Empowerment

- Self-management strategies
- Participation in treatment decision making
- Fear of falling
- Fear of failure



Gait and Movement Analysis

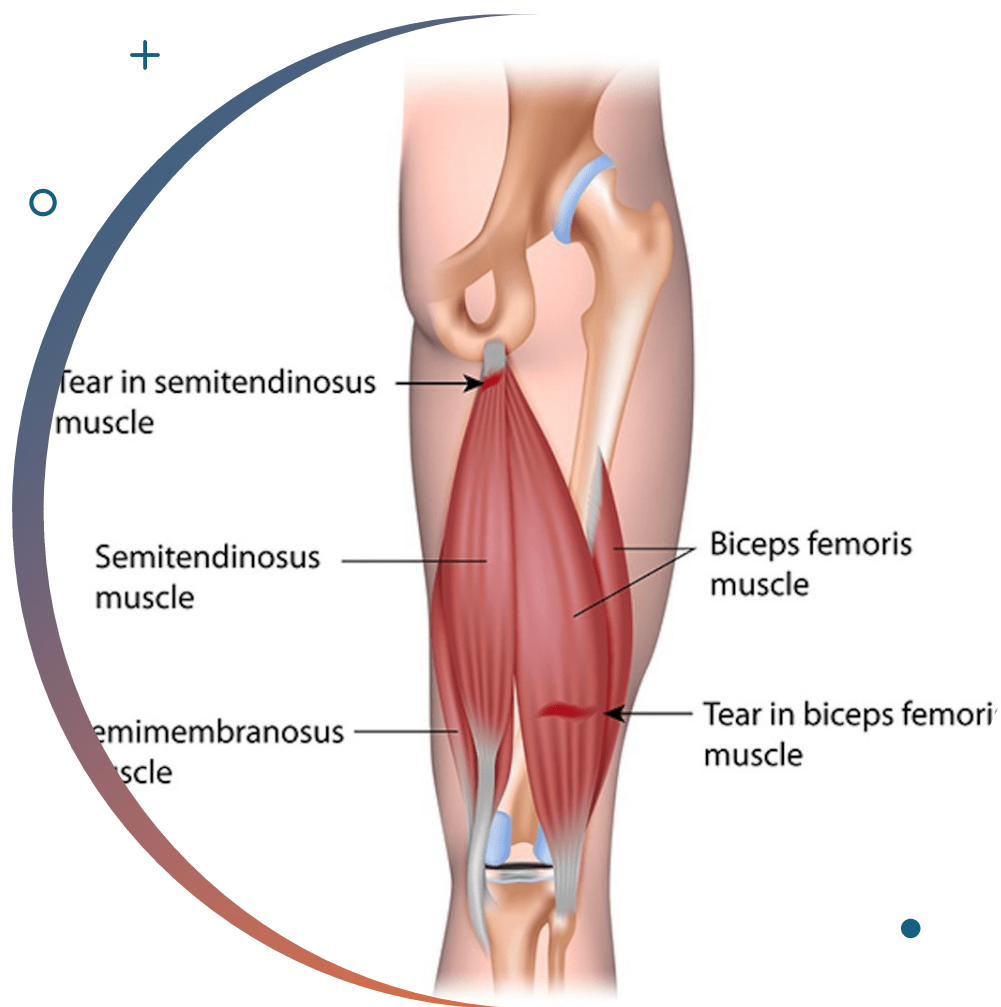
- Quality of life
- ADL
- Gait
 - Key motor symptom

Decelerating Forces

- Adductor longus
 - Control of limb to flexion of hip
 - Reduces compensation

What are the muscles of the hamstring?

- Semitendinosus
- Semimembranosus
- Biceps Femoris



Hamstring

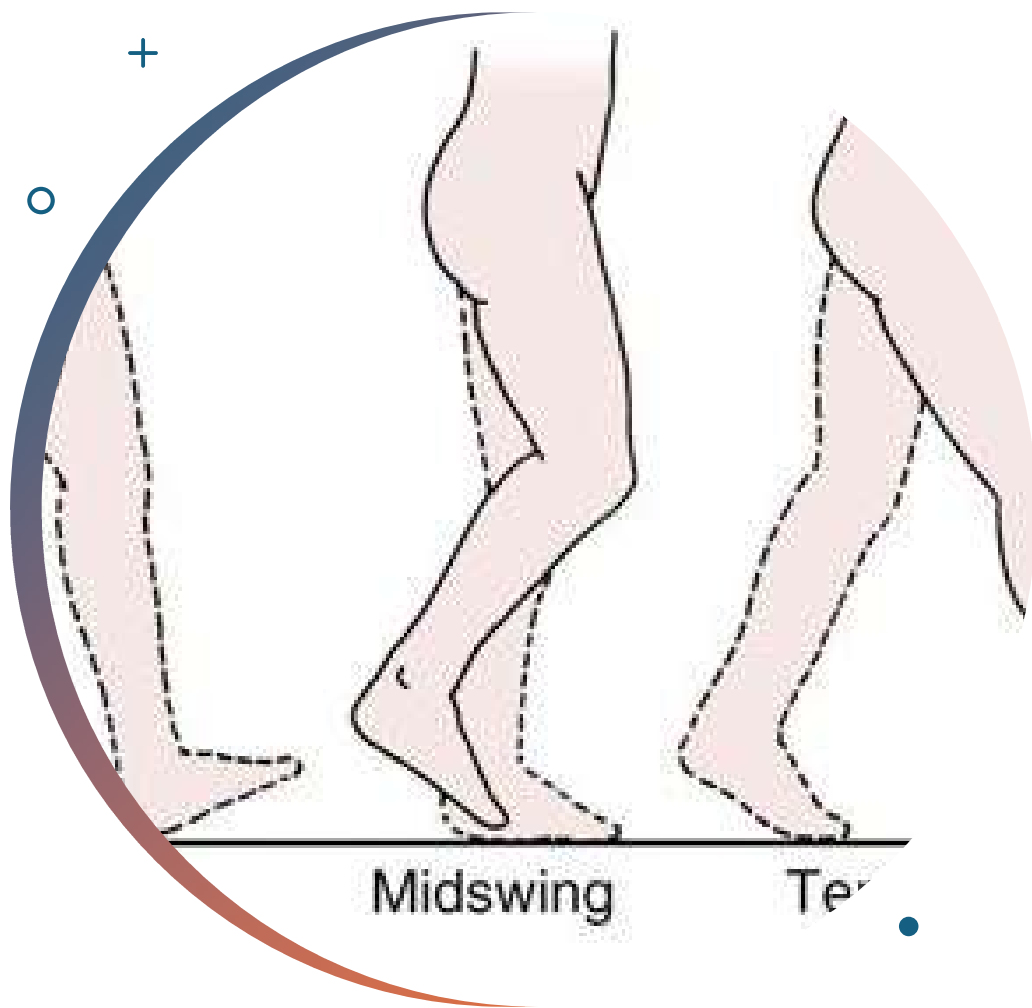
- Clearance of limb from ground
- Huge impact

Gait Identification

- Benefit to earlier diagnosis and treatment

Momentum

- Midswing
 - Need it here to complete the swing phase



Terminal Swing

- Terminal Swing = Preparation phase
 - Let's get ready to accept some weight
 - Hamstrings, quads, pretibial muscles
 - Hip deceleration
 - Knee deceleration
 - Ankle dorsiflexion
 - Quads working to knee extension

Movement Analysis

- Root Cause Analysis
- Stride length
- Freezing of gait
- Shuffling
- Foot drag
- Ataxia

Postural Alignment

- Objective Testing
 - LOB
 - Postural Sway
 - Weight Distribution
- Postural Markers
 - Center of Gravity
 - Impaired proprioception and vision

Postural Assessment

- Multiple Functional Positions
- Balance = BOS + Alignment

LSVT BIG

- Why BIG matters
- Effect on postural alignment
- Effect on fall risk
- Effect on confidence