

HOSPITAL PHYSICIAN®

NEUROLOGY BOARD REVIEW MANUAL

STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Neurology Board Review Manual* is a peer-reviewed study guide for residents and practicing physicians preparing for board examinations in neurology. Each quarterly manual reviews a topic essential to the current practice of neurology.

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Neurodegenerative Disorders: Parkinson's Disease

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Neurodegenerative Disorders: Parkinson's Disease

Catherine L. Gallagher, MD

INTRODUCTION

As the population ages, adult-onset neurodegenerative disorders will be encountered even more frequently by clinical neurologists. New treatments will continue to emerge as scientific understanding of the molecular genetic and pathophysiologic basis of these disorders evolves.

Volume 8 of the *Hospital Physician Neurology Board Review Manual* will focus on the diagnosis and management of neurodegenerative disorders. Because many excellent comprehensive reviews of these topics have been written, the goal is to provide an outline for review of basic concepts and to stimulate critical thinking. This manual is devoted to a discussion of Parkinson's disease. Future manuals in this volume will address parkinsonian syndromes, dementia, and neurodegenerative conditions of the peripheral nervous system and muscle.

CLINICAL AND PATHOLOGIC FEATURES

Movement disorders are classified as *hyperkinetic* (ie, abnormal forms of excess movement are the dominant feature) or *hypokinetic* (ie, decreased movement is the essential feature). Parkinson's disease is the most common hypokinetic disorder and the second most common late-life neurodegenerative disease, affecting 1% of persons older than 65 years.¹ Idiopathic Parkinson's disease is characterized clinically by the triad of resting tremor, bradykinesia, and rigidity and pathologically by loss of dopaminergic neurons in the pars compacta (dorsal portion) of the substantia nigra.

CLINICAL PRESENTATION

The clinical presentation of Parkinson's disease is heterogeneous. As in many neurodegenerative conditions, clinical signs of disease appear when cerebral reserve has been exhausted. Several prodromal symptoms seem to occur more frequently in individuals who develop Parkinson's disease. These symptoms include late-life depres-

sion,² rapid eye movement sleep (REMS) behavior disorder,³ constipation,⁴ and anosmia. At initial presentation, patients may describe classic symptoms of tremor, micrographia, extreme slowness in completing activities of daily living, voice changes, or difficulty maneuvering in bed. They also may present with nonspecific complaints, such as stiffness, pain, weakness, fatigability, mild incoordination, or poor balance.⁵

Motor Symptoms

A clinical diagnosis of Parkinson's disease is based on the presence of 3 of 4 cardinal signs (tremor, rigidity, bradykinesia, and impaired postural reflexes) or the presence of 2 signs if tremor, rigidity, or bradykinesia is asymmetric.⁶ The classic tremor is a unilateral pill-rolling 3- to 5-Hz rest tremor that is most evident when the patient is walking or seated with hands relaxed. However, leg tremor that improves with weight bearing and action (postural) tremor that dampens transiently with assumption of a new posture (reemergent rest tremor) are frequently observed. Chin tremor is common.

The essential change in muscle tone in patients with Parkinson's disease is rigidity. Rigidity is velocity-independent resistance to passive movement about a joint. Paratonia, in contrast, implies inability to voluntarily relax. Although the tone change in Parkinson's disease may be termed cogwheeling, a physician flexing and extending the arm of any patient with tremor may note a ratcheting quality to the movement. In patients with Parkinson's disease, rigidity should be detectable in addition to cogwheeling. Rigidity may be confirmed by asking the patient to perform a voluntary ("mirror") movement in the contralateral limb.

Parkinson's disease causes slowness and reduced amplitude of movements, appearing in the spectrum of hypokinesia, bradykinesia, and akinesia. Specific manifestations include bradyphrenia (slow verbal responses), hypophonia, hypomimia (masked facies), micrographia, digital impedance (tendency for rapid alternating movements to "block" or assume the rhythm of the tremor),⁶ and decreased arm swing. Later, more severe symptoms appear, including freezing (inability to