

## Movement Disorders: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

- The primary neurochemical disturbance in idiopathic Parkinson's disease involves which of the following neurotransmitters?**
  - $\gamma$ -Aminobutyric acid
  - Dopamine
  - Glutamate
  - Serotonin
- Which of the following pathologic abnormalities are characteristically found in patients with Parkinson's disease?**
  - Corpora amylacea
  - Lewy bodies
  - Neurofibrillary tangles
  - Pick bodies
- Parkinson's disease is characterized by each of the following clinical symptoms EXCEPT:**
  - Action tremor
  - Bradykinesia
  - Postural instability
  - Resting tremor
- Which of the following symptoms or symptom complexes must be present to diagnose Tourette's syndrome?**
  - Coprolalia
  - Multiple motor tics present for 6 months
  - Multiple motor and phonic tics present for 12 months
  - Vocal tics present for 3 months
- What is the genetic inheritance pattern of Huntington's disease?**
  - Autosomal dominant
  - Autosomal recessive
  - Maternal
  - X-linked
- What is the gene mutation present in Huntington's disease?**
  - Frameshift mutation
  - Mitochondrial DNA deletion
  - Nuclear point mutation
  - Trinucleotide repeat expansion
- Which of the following is the most common tardive, drug-induced movement disorder?**
  - Chorea
  - Myoclonus
  - Orolingual dyskinesia
  - Tremor

*(turn page for answers)*

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## EXPLANATION OF ANSWERS

- (B) Dopamine.** The pathologic hallmark of Parkinson's disease is degeneration of pigmented dopaminergic neurons in the pars compacta substantiae nigrae.<sup>1</sup> Considerable degeneration of nigral neurons precedes the onset of symptoms, with a greater than 60% depletion of the neurons being the generally accepted figure. Reduction in striatal dopamine content by more than 80% is considered the threshold that must be surpassed prior to the development of clinical symptoms of Parkinson's disease.<sup>2</sup>
- (B) Lewy bodies.** The characteristic microscopic finding in Parkinson's disease is the Lewy body. A cytoplasmic inclusion, the eosinophilic Lewy body typically consists of a dense core surrounded by a less intensely stained region and a faint halo.<sup>3</sup> The peripheral halo of the Lewy body is comprised of neurofilaments that stain for tau and ubiquitin.<sup>4</sup> Lewy bodies have been identified in other disorders (ie, corticobasal ganglionic degeneration and diffuse Lewy body disease). In addition, incidental Lewy bodies have been noted during postmortem examination of elderly patients, with increasing prevalence in patients 60 years of age and older. The significance of this finding is unclear, although a preclinical form of Parkinson's disease has been suggested as the cause.<sup>5</sup>
- (A) Action tremor.** The tremor of Parkinson's disease characteristically occurs at rest. Movement typically suppresses the dyskinesia. However, postural and/or kinetic tremor does not exclude the diagnosis of Parkinson's disease.<sup>6</sup> The resting tremor typically is of low frequency (4 to 8 Hz). Observation of repetitive stroking of the index finger across the thumb by patients with the disease has led to the characterization "pill-rolling." Tremor is usually noted in the hands and arms and, although asymmetric at onset, extends to other extremities as well as the trunk. An inner tremor, possessing no superficial expression, has been described and can be a source of substantial discomfort and disability. The severity of the tremor is modified by factors such as stress and anxiety.
- (C) Multiple motor and phonic tics present for 12 months.** A diagnosis of Tourette's syndrome requires multiple motor and phonic tics to be present for at least a year.<sup>7</sup> This time frame helps to distinguish Tourette's syndrome from transient tic disorders, which often require no treatment, and isolated chronic motor or phonic tics. The many behavioral symptoms and disorders associated with Tourette's syndrome can hinder accurate and efficient diagnosis of the disorder.
- (A) Autosomal dominant.** The inheritance pattern of Huntington's disease has been defined as autosomal dominant with nearly complete penetrance.<sup>8</sup> Linkage analysis demonstrated localization of the Huntington's disease gene to the short arm of chromosome 4 in 1983,<sup>9</sup> with the genetic mutation delineated 10 years later.<sup>10</sup>
- (D) Trinucleotide repeat expansion.** Huntington's disease, like many other neurodegenerative disorders, is characterized by a trinucleotide repeat expansion. The cytosine-adenine-guanine repeat expansion (exon 1) is translated, producing an expanded polyglutamine tract. The size of the expansion correlates with the age of onset and, as some have suggested, the rate of progression.<sup>11</sup> This relationship does not provide sufficiently precise information to have prognostic relevance.<sup>12</sup> The trinucleotide repeat expansion is unstable and tends to expand with generational transmission. This instability provides a mechanism for anticipation, resulting in an earlier age of onset in succeeding generations. The largest expansions are seen with paternal transmission, thus accounting for the association of juvenile-onset Huntington's disease with an affected father.<sup>13</sup>
- (C) Orolingual dyskinesia.** Although virtually all possible involuntary movements have been associated with exposure to dopamine antagonists, orolingual movements (eg, lip-smacking, tongue protrusion, grimacing) are most common.<sup>14</sup> Tardive dyskinesia most often affects chronically medicated psychiatric patients with advancing age. The pathophysiology of tardive dyskinesia is not well defined, although supersensitive striatal dopamine receptors are often implicated. Treatment consists of limiting and, if possible, removing the responsible medication. For individuals requiring continued neuroleptic therapy, use of atypical compounds (eg, quetiapine, clozapine) is recommended.<sup>15</sup>

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