



What is Parkinson's Disease?

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What is Parkinsonism?

- A patient who has 2/4 of the following features is said to have *Parkinsonism*
 - Bradykinesia (slowness of movement)
 - Rigidity (stiffness)
 - A tremor at rest
 - Postural instability (falls)



What Causes Parkinsonism?

- Strokes
- Infections (Von Economo's encephalitis)
- Tumors
- Medications/ Drugs
 - Heart Medications
 - Antipsychotics
 - Antinausea
 - MPTP
- Metabolic/Wilson's disease in young
- Trauma (i.e. Boxers)
- Normal Pressure Hydrocephalus
- Degenerative Disease

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What is a Degenerative Disease?

- Disease of the brain itself in which parts of the brain deteriorate (or degenerate) over time
 - Deterioration of nerve cells leading to cell death
- Most *common* degenerative disease that causes Parkinsonism is **Parkinson's disease**

Other Causes of Parkinsonism

Progressive Supranuclear Palsy

Corticobasal degeneration

Multiple systems atrophy

Lewy Body disease

Alzheimer's with Parkinsonism

Introduction

AN
ESSAY
ON THE
SHAKING PALSY.

CHAPTER I.
DEFINITION—HISTORY—ILLUSTRATIVE CASES.

SHAKING PALSY. (*Paralysis Agitans.*)

Involuntary tremulous motion, with lessened muscular power, in parts not in action and even when supported; with a propensity to bend the trunk forward, and to pass from a walking to a running pace; the senses and intellects being uninjured.

Historical Evidence: Descriptions in Ancient Indian Medical Literature

- “Kampavata”
 - *Kampa* - shaking
 - *Vata* - lack of muscular movement



Mucuna pruriens

Parkinson's Disease – Epidemiology

- Prevalence (percentage of the population who has the disease at a single point in time) is approximately 0.3% in those 40 years of age and older
 - 7.5 million people worldwide are affected
 - Prevalence rises with age
 - 0.04% for ages 40 to 49 and 1.9% for ages 80 and older
 - Estimated that 9 million people with PD by year 2030
- Appears to be more common in the U.S.
 - Patients live longer?
 - Better medical care?
- More common in males than females (3:2)
 - More head trauma in men?
 - Estrogen may be protective

Symptoms

Features of Parkinson's Disease

Motor

Bradykinesia

Rigidity

Tremor

Postural Instability

Non-Motor

Alteration in memory, mood, and thinking (neuropsychiatric)

Sleep Disorders

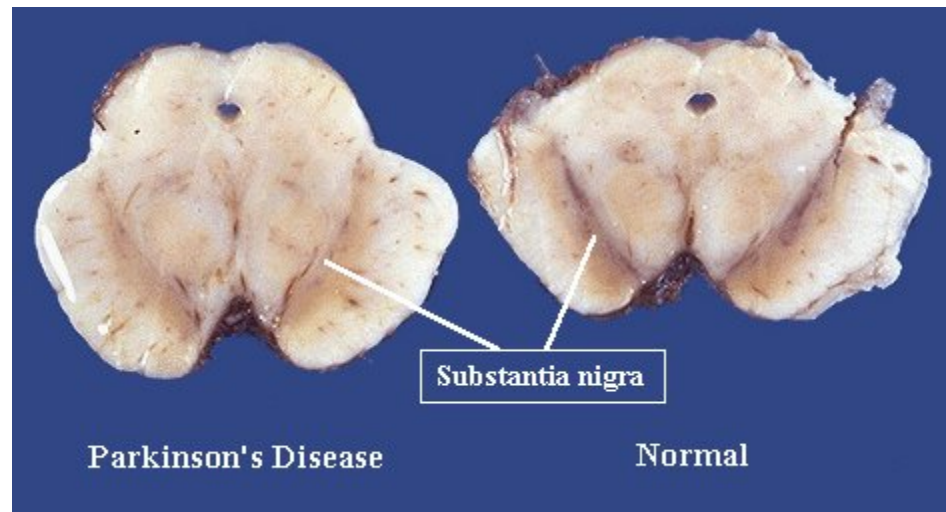
Autonomic Symptoms

Gastrointestinal Symptoms

Sensory Symptoms

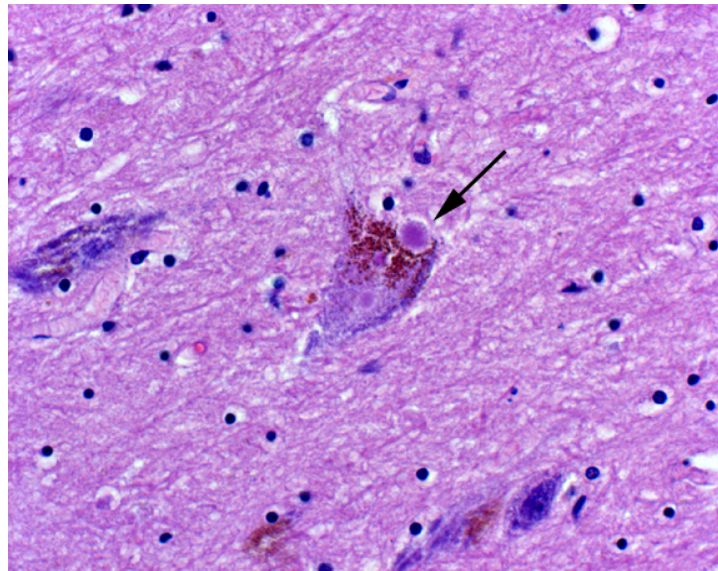
Parkinson's Disease

- How does PD develop?
 - There is a loss of brain cells that produce dopamine, a chemical, in a specific area of the brain, the *substantia nigra*



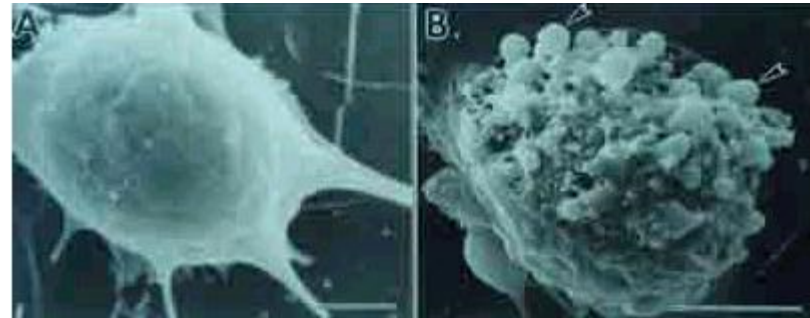
Parkinson's Disease

- How does PD develop?
 - The disease affects multiple other brain chemicals (serotonin, noradrenaline) and multiple areas of the brain



What Causes Cells to die?

- The cause of neurodegeneration involves programmed cell death (apoptosis)
- 0.5 percent of neurons in normal brain undergo apoptosis - 2 percent in those with PD
- Likely involves a cascade of events including
 - abnormalities in protein processing
 - oxidative stress
 - mitochondrial dysfunction
 - inflammation
 - lack of growth factors



Parkinson's Disease: Protective Factors and Risk Factors

- Protective Factors
 - Smoking
 - Caffeine intake
 - Vigorous exercise
- Definite Risk Factors
 - Family history
 - Age

Parkinson's Disease: Protective Factors and Risk Factors

■ Protective Factors

- Smoking
- Caffeine intake
- Vigorous exercise

■ Potential Risk Factors

- Concussion
- Midlife migraine with aura
- Living in urban areas
- Rural areas-pesticide
- Excess body weight
- Higher levels of education
- Lower muscle strength in adolescence
- High dietary consumption of iron and manganese
- Melanoma and prostate cancer

Genetics

- 20-25 percent of patients with sporadic PD have at least one first degree relative
 - Having a family member of PD is more likely when age of onset is less than 50 years
- First degree relatives are 2.3 times as likely to develop PD



Parkinson's Disease

- Genes and Parkinson's
 - Several genes have been identified that cause parkinsonism (familial forms)
 - Other genes may not cause Parkinson's, but increase risk



Parkinson's Disease – Diagnosis

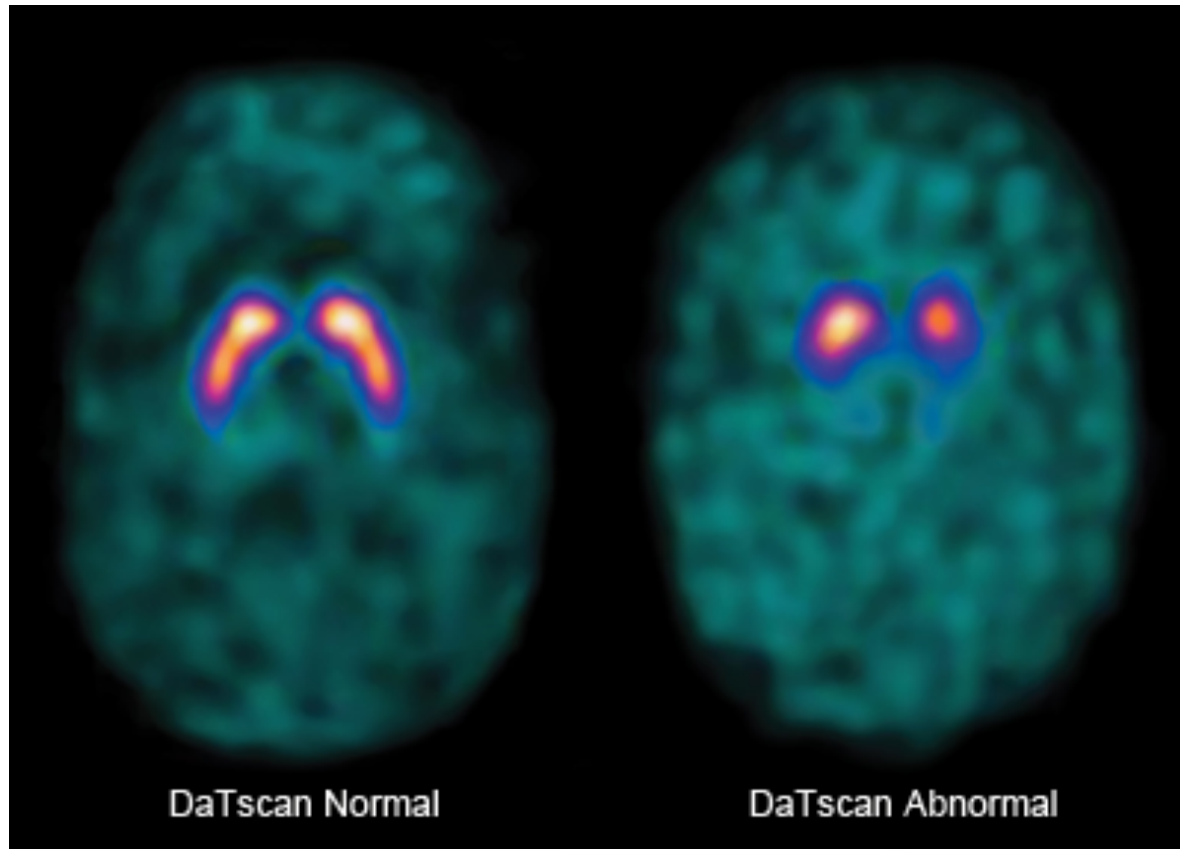
- Parkinson's is a clinical diagnosis
 - Diagnosis can only be proven by a brain biopsy, done at autopsy

Parkinson's Disease – Diagnosis

- If this is so, then why do we order MRI or brain, CT scan, etc.?



Parkinson's Disease – DaTscan



Parkinson's Disease – DaTscan

- **Can** reliably distinguish essential tremor from Parkinsonian syndromes (Parkinson's disease, lewy body disease, MSA, etc.)
- **Cannot** distinguish Parkinson's disease from other parkinsonian syndromes
- Subject to interpretation and is not 100 percent sensitive (although very high at 97%)
- Useful when patients have an atypical tremor or other signs such as bradykinesia, rigidity, etc. are questionable
- **Not** useful in clinically obvious cases

Parkinson's Disease Future

- Studies underway to help predict outcomes
 - DodoNA project
- Personalized Medicine

