

# Parkinson's Disease and Parkinsonism

Video guide in diagnosis

# HOW IS A MOVEMENT DISORDER SPECIALIST LIKE A BIRD WATCHER?





– Tremor

- Rest
- Postural

•Bradykinesia

•Rigidity

•Postural

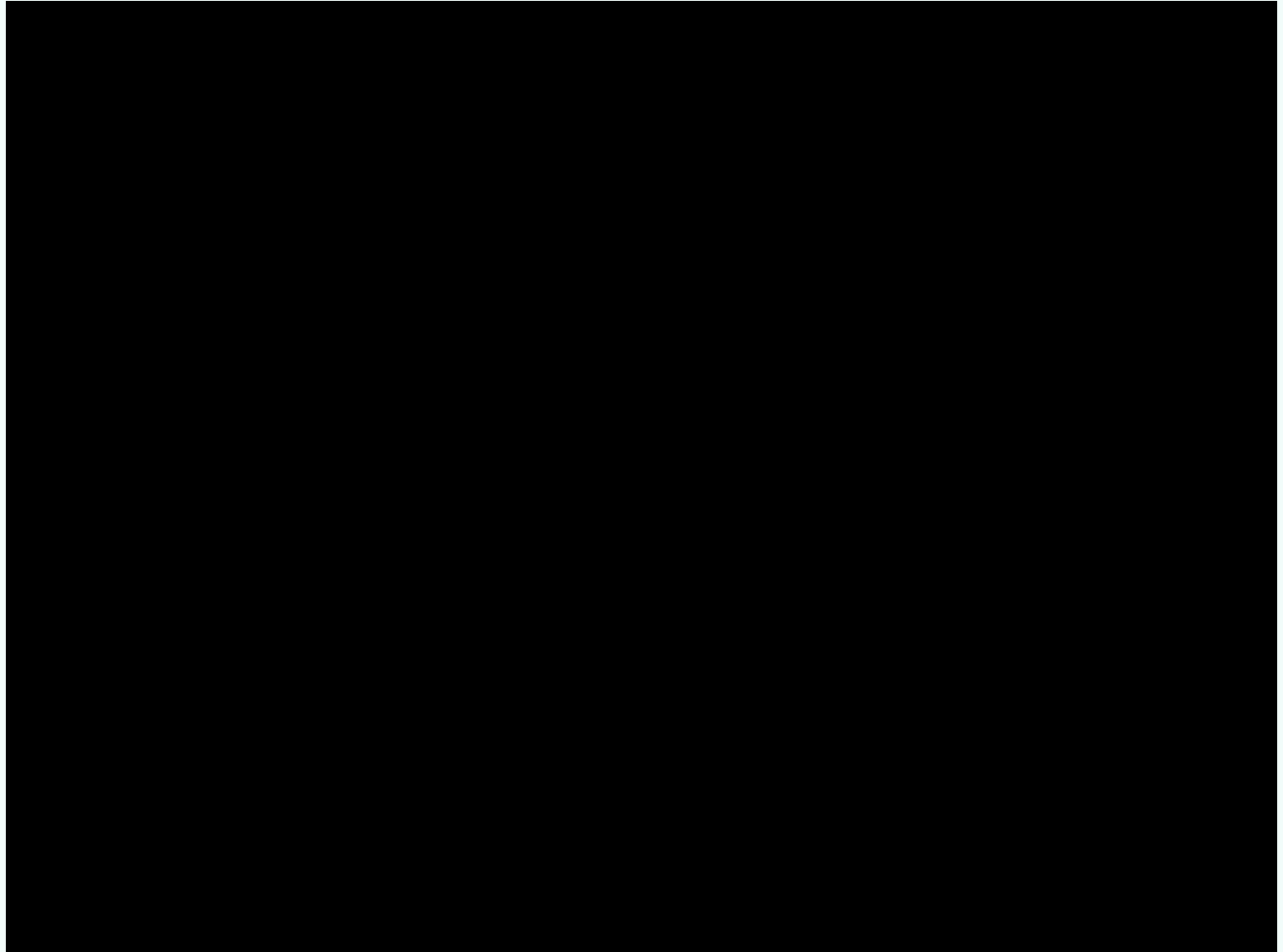
reflex

impairment

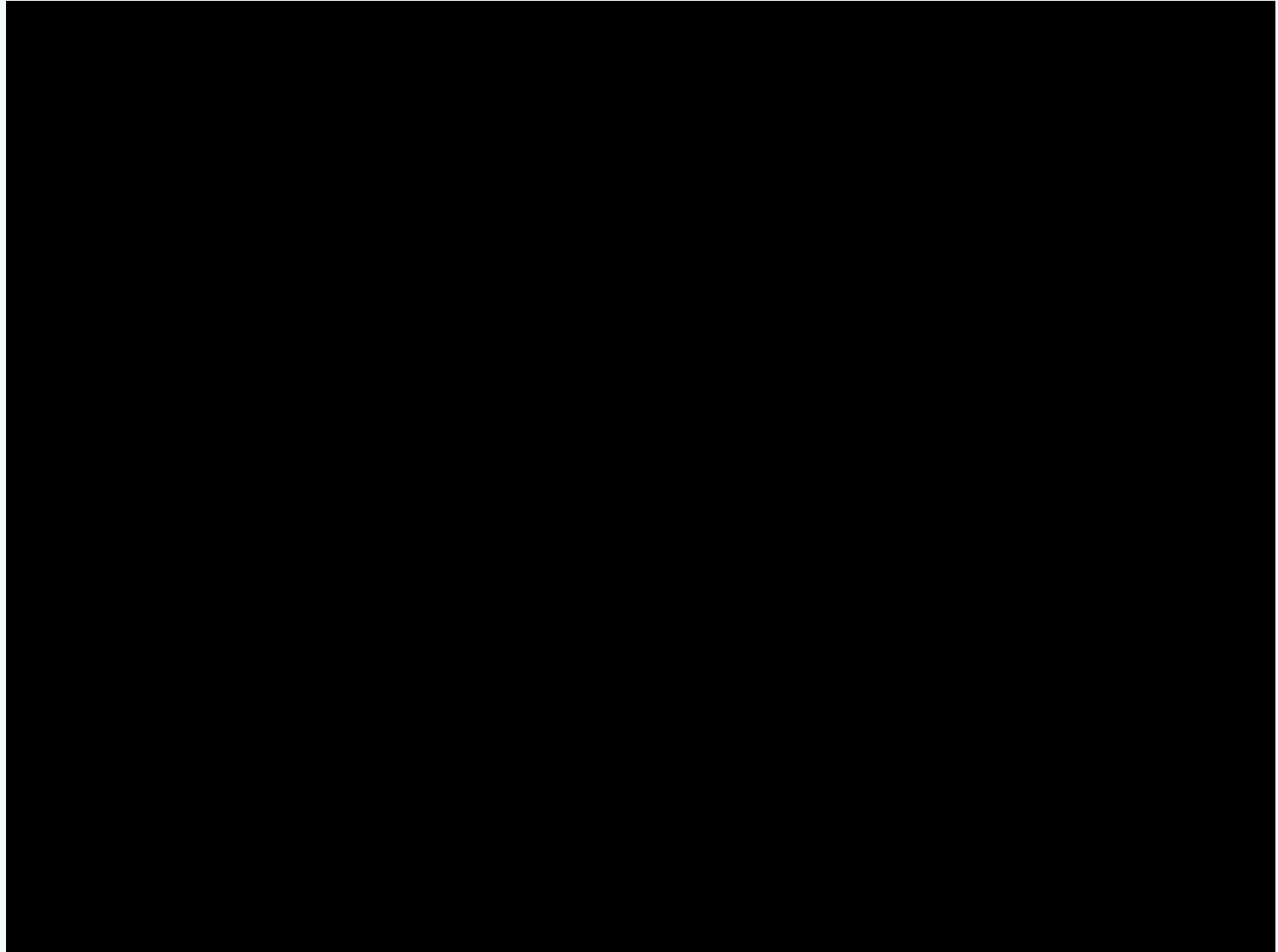
# PD Subtypes

- Tremor-predominant
  - Classic PD
  - Benign Tremulous Parkinsonism
- Akinetic-Rigid
- Postural Insufficiency and Gait Disturbance (PIGD)
  - Rising from chair, gait and posture
  - Freezing of gait, speech, swallowing

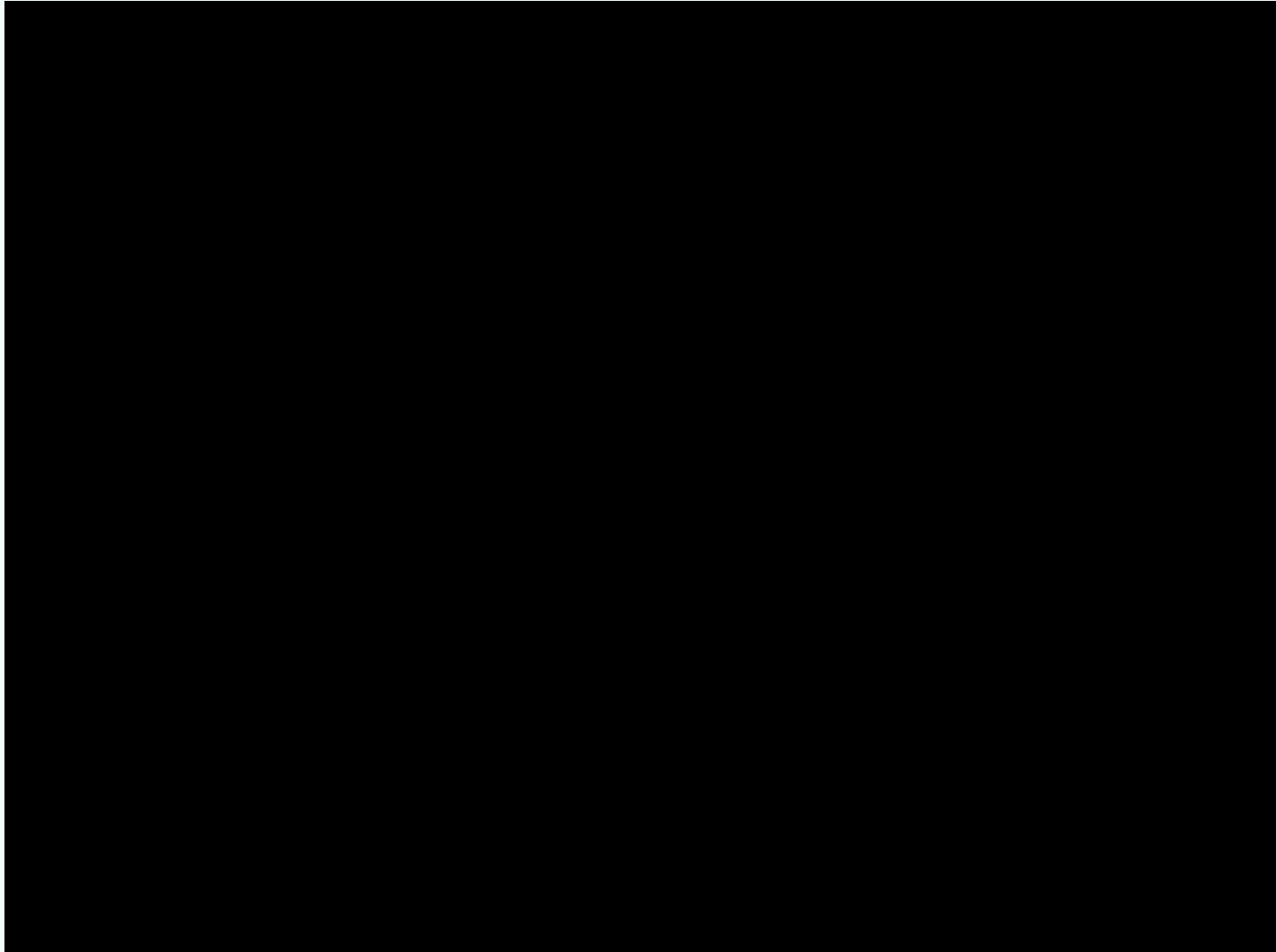
# Tremor-predominant PD



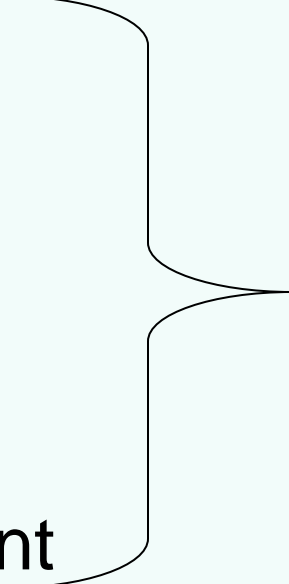
# Akinetic-Rigid PD



# Postural Instability and Gait Dysfunction (PIGD)



# Parkinsonism

- Tremor
    - Rest
    - Postural
  - Bradykinesia
  - Rigidity
  - Postural reflex impairment
- 
- Any Two  
Clinical Signs



# Diagnosing Parkinson's disease

## United Kingdom PD Society Brain Bank Criteria

### Step 1

- Bradykinesia
- At least 1...
  - Rigidity
  - 4-6 Hz rest tremor
  - Postural instability
    - Not visual
    - Not vestibular
    - Not cerebellar
    - Not sensory

# Diagnosing Parkinson's disease

## Step 2—exclusions

- Neuroleptics, anti-emetics
- Stepwise progression
- Cerebellar signs
- Early, severe ANS
- Early, severe dementia
- Babinski sign
- Tumor/hydrocephalus
- Supranuclear gaze palsy

## “Soft” exclusions

- Dopa unresponsive
- Head injuries
- Familial (?)

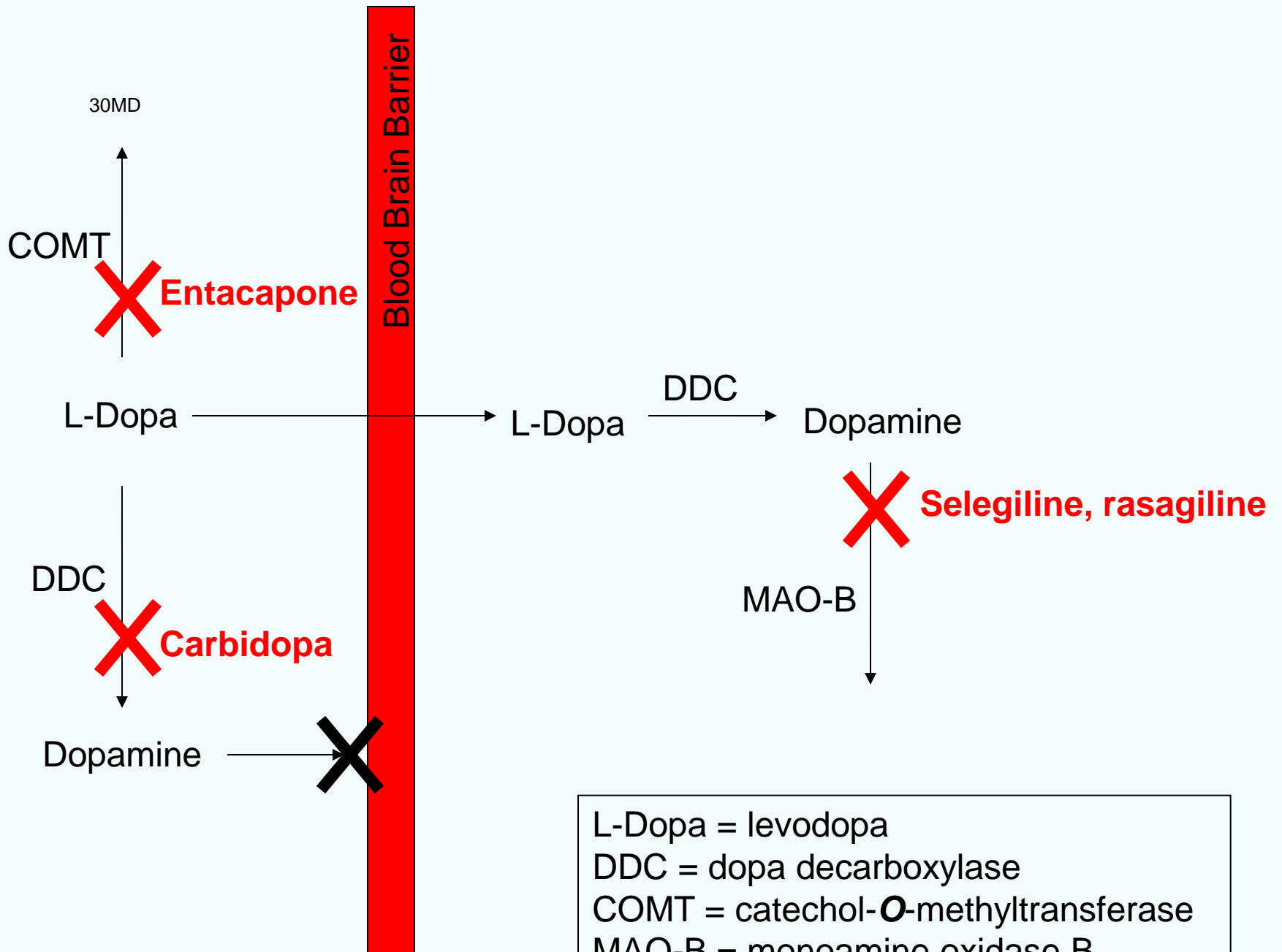
# Diagnosing Parkinson's disease

## **Step 3—supportive features**

- Unilateral onset
- Rest tremor
- Progressive disorder
- Persistent asymmetry, worse on onset side
- 70-100% response to levodopa
- Severe levodopa-induced dyskinesias
- > 5 year history levodopa-responsiveness
- Disease course  $\geq$  10 years

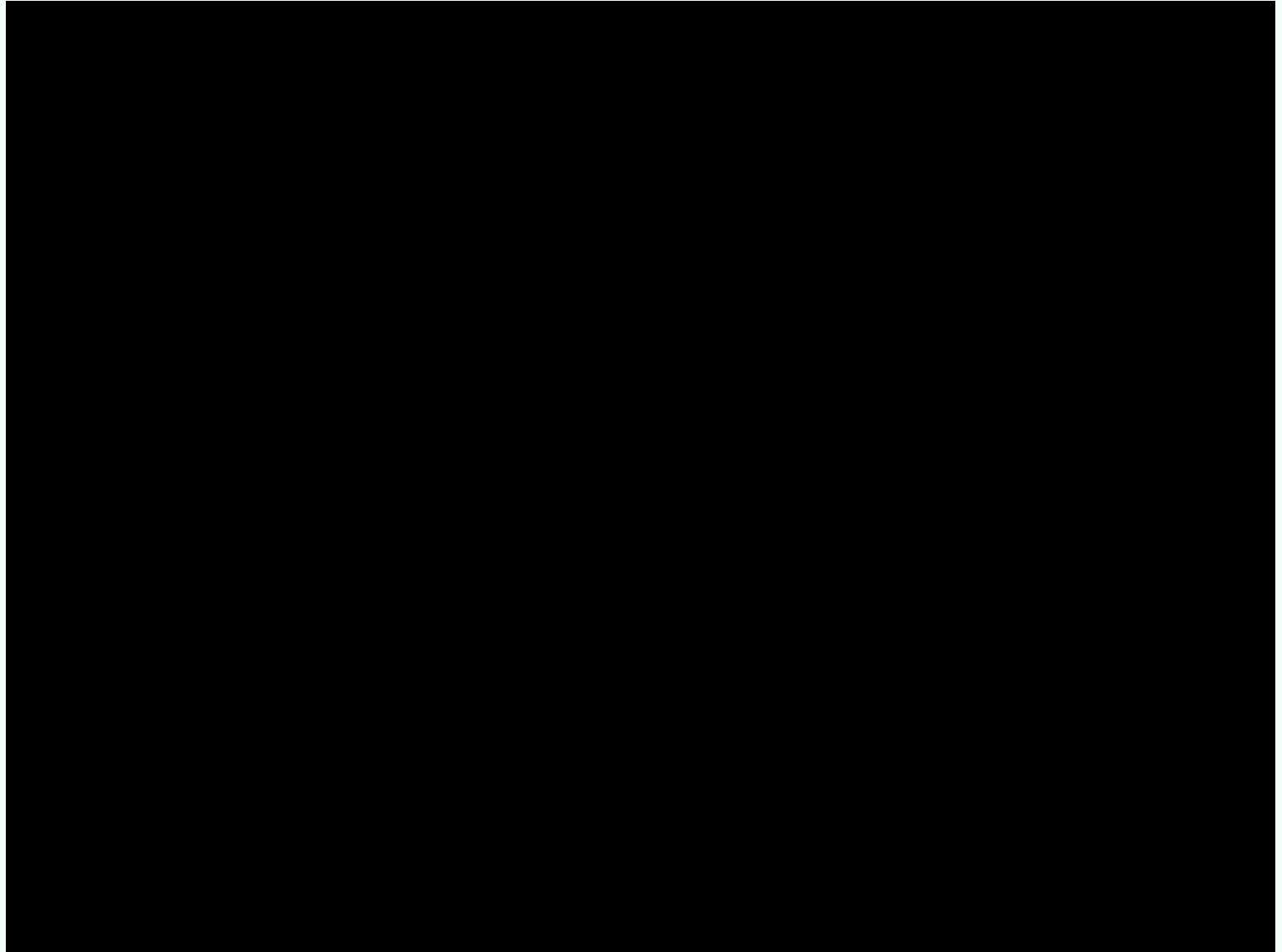
# Levodopa challenge

- MUST explain to patient what to expect
  - Time medication should be effective
    - One hour after dose, lasting about 3-4 hours
  - What symptoms should improve
- MUST give adequate challenge
  - Start with 25/100 TID
  - Increase to 50/200 if no effect
  - If patient does not experience nausea, you are not getting high enough dose.
  - Some patients need extra carbidopa to block dopa decarboxylase
  - Some patients need entacapone or even tolcapone to inhibit COMT.

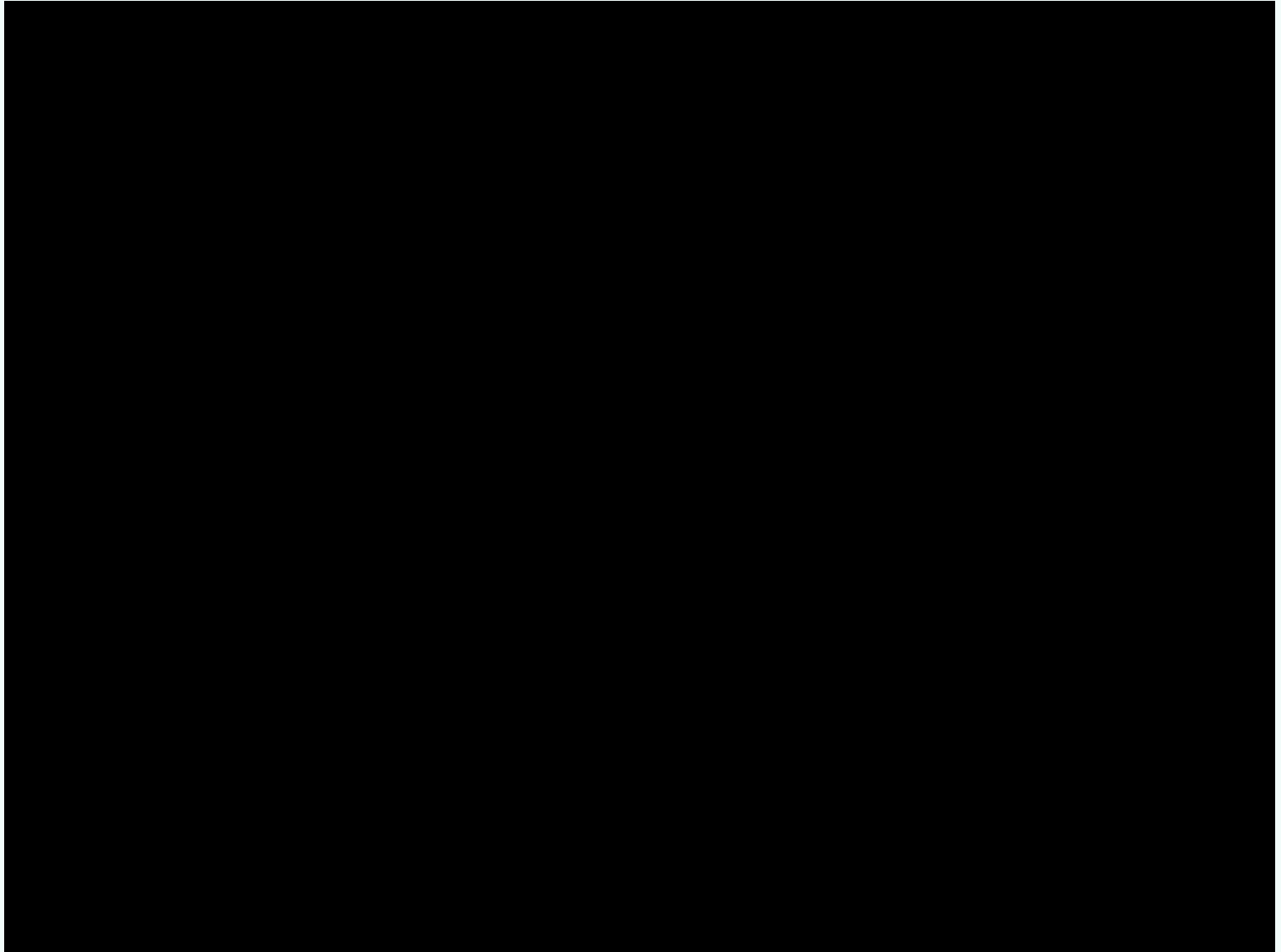


L-Dopa = levodopa  
 DDC = dopa decarboxylase  
 COMT = catechol-O-methyltransferase  
 MAO-B = monoamine oxidase B

# Layman's view of PD



# Essential Tremor



# Degenerative Parkinsonisms

- Parkinson's disease
  - Hereditary forms
  - Sporadic
- Multiple system atrophy (MSA)
- Diffuse Lewy body disease
- Progressive supranuclear palsy (PSP)
- Corticobasal degeneration
- Frontotemporal dementia with parkinsonism
- Pallidal degenerations
- **Alzheimer disease**
- Spinocerebellar ataxias (types 2,3,17)



# Degenerative Parkinsonisms

- Huntington's disease
  - Juvenile presentation
  - Later in disease course
- Wilson disease
- Acquired hepatolenticular degeneration
- Parkinsonism Dementia Complex of Guam
- Neuroferritinopathy
- Basal Ganglia calcification
- Gaucher's disease
- GM1 gangliosidosis
- Chediak-Higashi disease
- Chorea-acanthocytosis

# PARKINSONISM

IF THE EARLIEST SYMPTOM IS:

MEMORY  
LOSS

FALLING

BEHAVIOR  
CHANGE

FAINTING

↓  
LEWY BODY  
DEMENTIA  
(LBD)

↓  
PROGRESSIVE  
SUPRANUCLEAR PALSY/  
CORTICOBASAL  
DEGENERATION  
(PSP/CBD)

↓  
FRONTOTEMPORAL  
DEMENTIA  
(FTD)

↓  
MULTIPLE SYSTEM  
ATROPHY  
(MSA)

# LEWY BODY DEMENTIA (LBD)

- 10 YEARS AGO, J.W. RETIRED EARLIER THAN PLANNED AT 65 BECAUSE COULD NOT MULTI-TASK AND HAVING ISSUES WITH VISUOSPATIAL ORGANIZATION. HAD ACTIVE DREAMING.
- 5 YEARS AGO DIAGNOSED WITH EARLY DEMENTIA
- 3 YEARS AGO DIAGNOSED WITH “PARKINSON’S DISEASE” BECAUSE OF BRADYKINESIA, MILD RIGIDITY, BUT DOES NOT HAVE A ROBUST RESPONSE TO MEDICATIONS.
- NOW (age 70) HAVING HALLUCINATIONS AND DELUSIONS ABOUT 40 PEOPLE WITHOUT LEGS LIVING IN HIS HOUSE.

# LEWY BODY DEMENTIA (LBD)

1. PHYSICALLY, J.W. HAS MILD-MODERATE BRADYKINESIA, WALKS SLOWLY BUT WITHOUT ASSISTANCE
2. MENTALLY, CAN HOLD A CONVERSATION, FEED AND CLOTHE HIMSELF, DO MOST NORMAL ACTIVITIES, BUT MUST HAVE SUPERVISION.

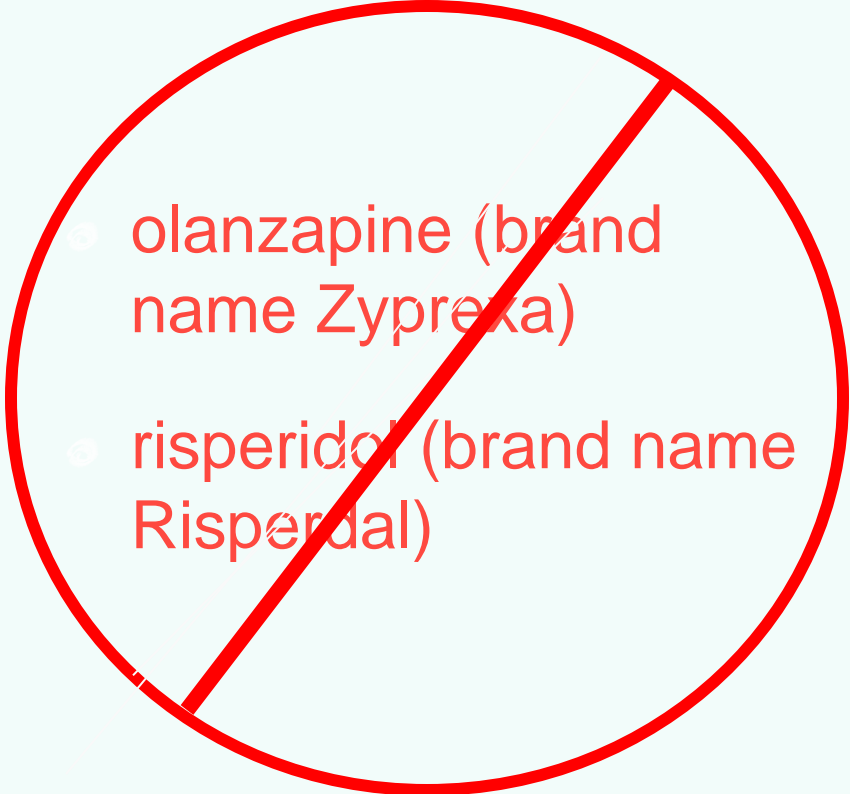
# LEWY BODY DEMENTIA TREATMENT\*

1. PARKINSON'S DISEASE MEDICATIONS
  - Can worsen psychosis
2. MEMORY MEDICATIONS
  - Can worsen psychosis
3. ANTIPSYCHOTIC MEDICATIONS
  - With caution

\*LBD patients have unusual sensitivity to ALL medications and can have delirium triggered by cardiac medications, antibiotics, ect. Watch for paradoxical responses, as well.

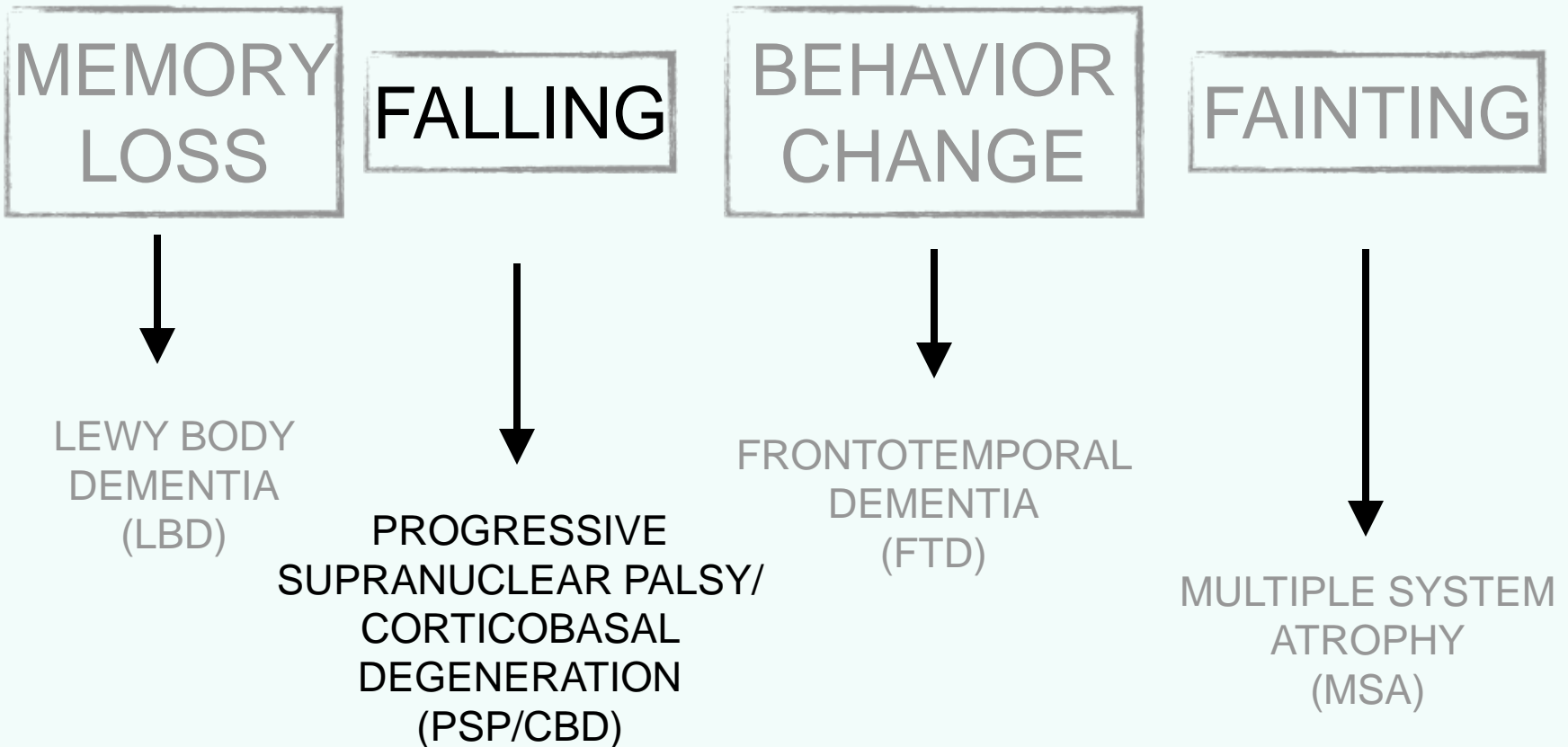
# Antipsychotic medication for ANYONE with parkinsonism

quetiapine  
(Seroquel)  
clozapine  
(Clozaril)

- 
- olanzapine (brand name Zyprexa)
  - risperidol (brand name Risperdal)

# PARKINSONISM

IF THE EARLIEST SYMPTOM IS:



## PROGRESSIVE SUPRANUCLEAR PALSY

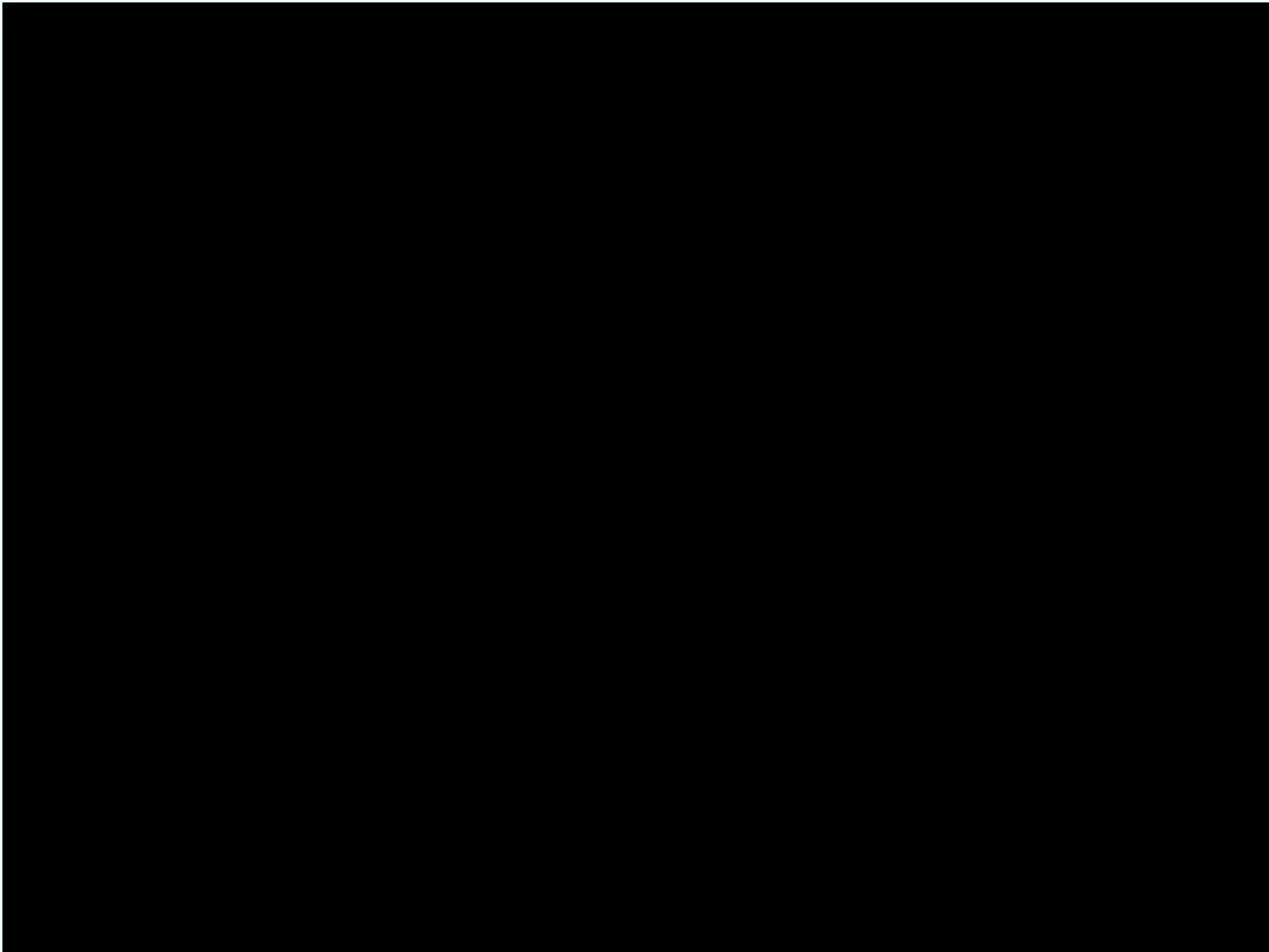
- **4 YEARS AGO (AGE 60) J. R. WAS INTERMITTENTLY FALLING BACKWARDS**
- **1 YEAR AGO STARTED HAVING DOUBLE VISION**
- **6 MONTHS AGO DIAGNOSED WITH “PARKINSON’S DISEASE,” BUT DOES NOT RESPOND TO MEDICATIONS.**
- **CURRENTLY HAS SEVERE IMBALANCE**

## CORTICOBASAL DEGENERATION

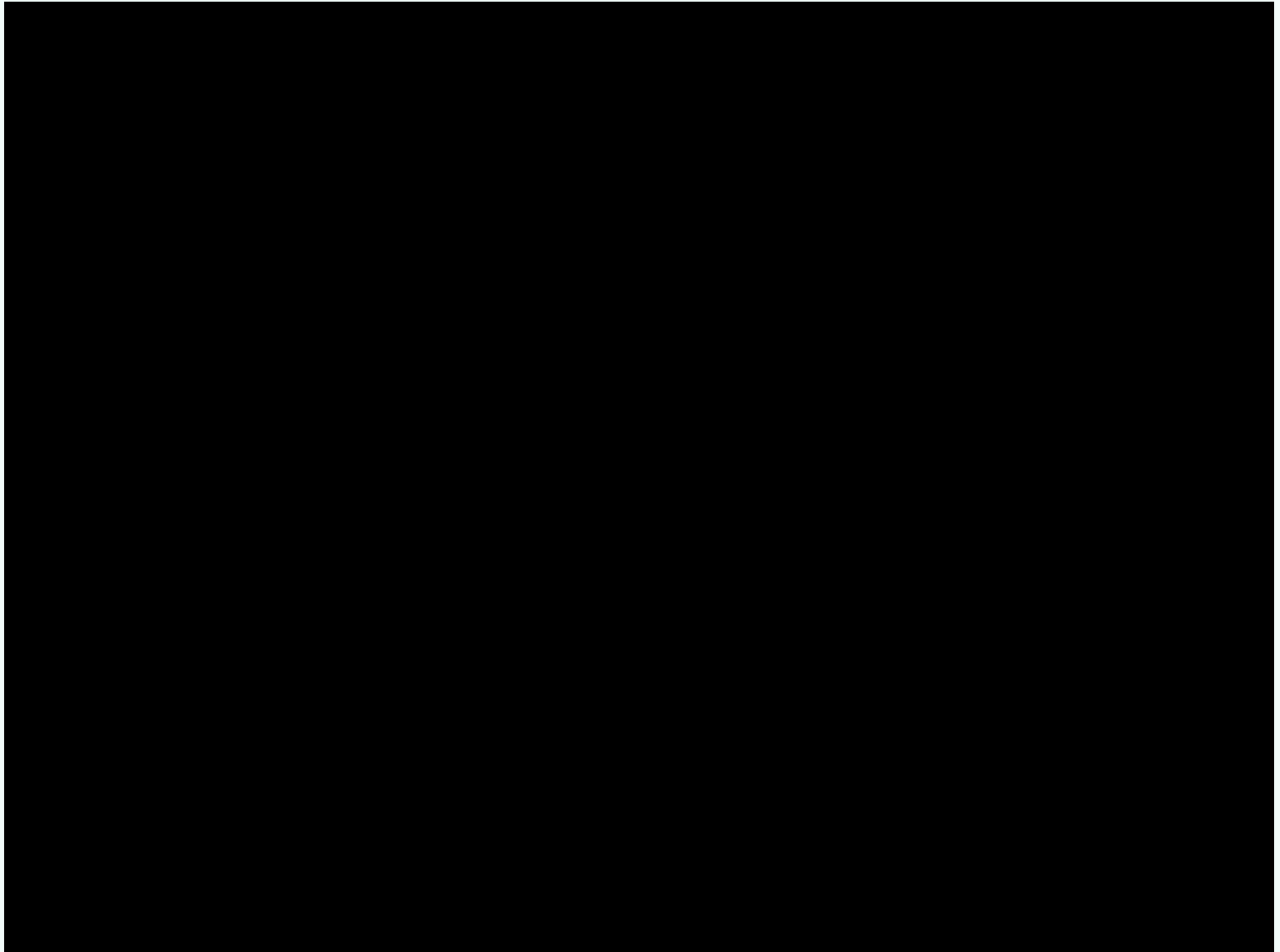
- **4 YEARS AGO (AGE 60) B.P. NOTICED POOR DEXTERITY IN LEFT HAND**
- **3 YEARS AGO TOLD SHE HAD A “STROKE”**
- **2 YEARS AGO STARTED FALLING**
- **6 MONTHS AGO DIAGNOSED WITH “PARKINSON’S DISEASE,” BUT DOES NOT RESPOND TO MEDICATIONS.**
- **CURRENTLY HAS LIMITED USE OF LEFT ARM**



PSP



PSP



# PSP IMAGING FINDINGS

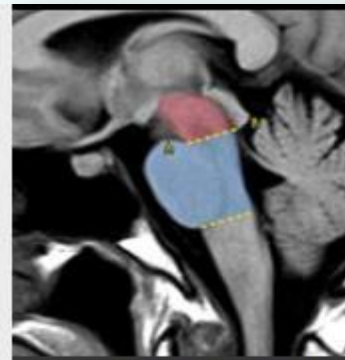
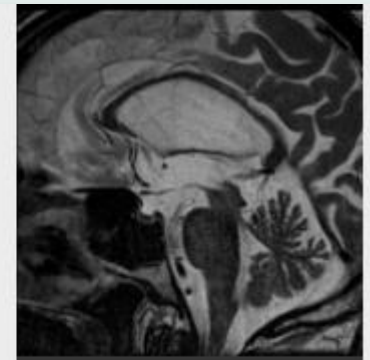
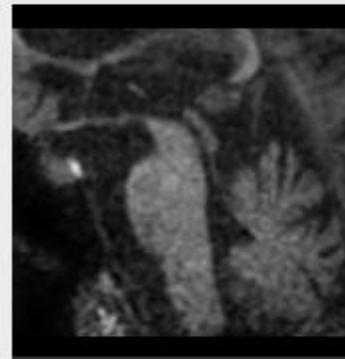


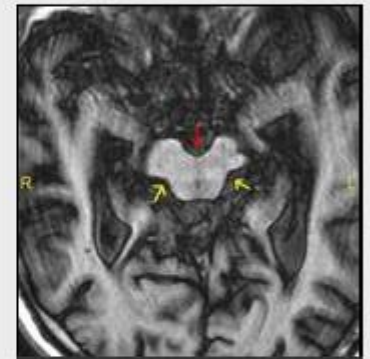
Figure 1: sagittal midbrain to pons ratio



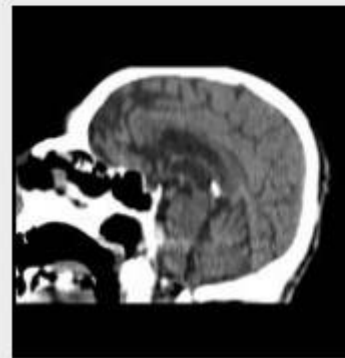
Case 1: hummingbird sign



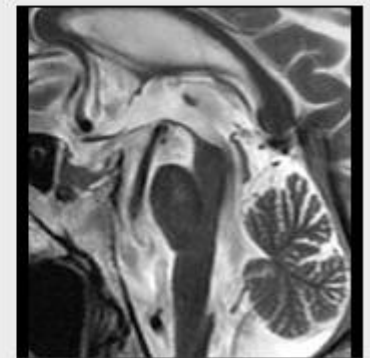
Case 2: hummingbird sign



Case 3: mickey mouse sign



Case 4: hummingbird sign

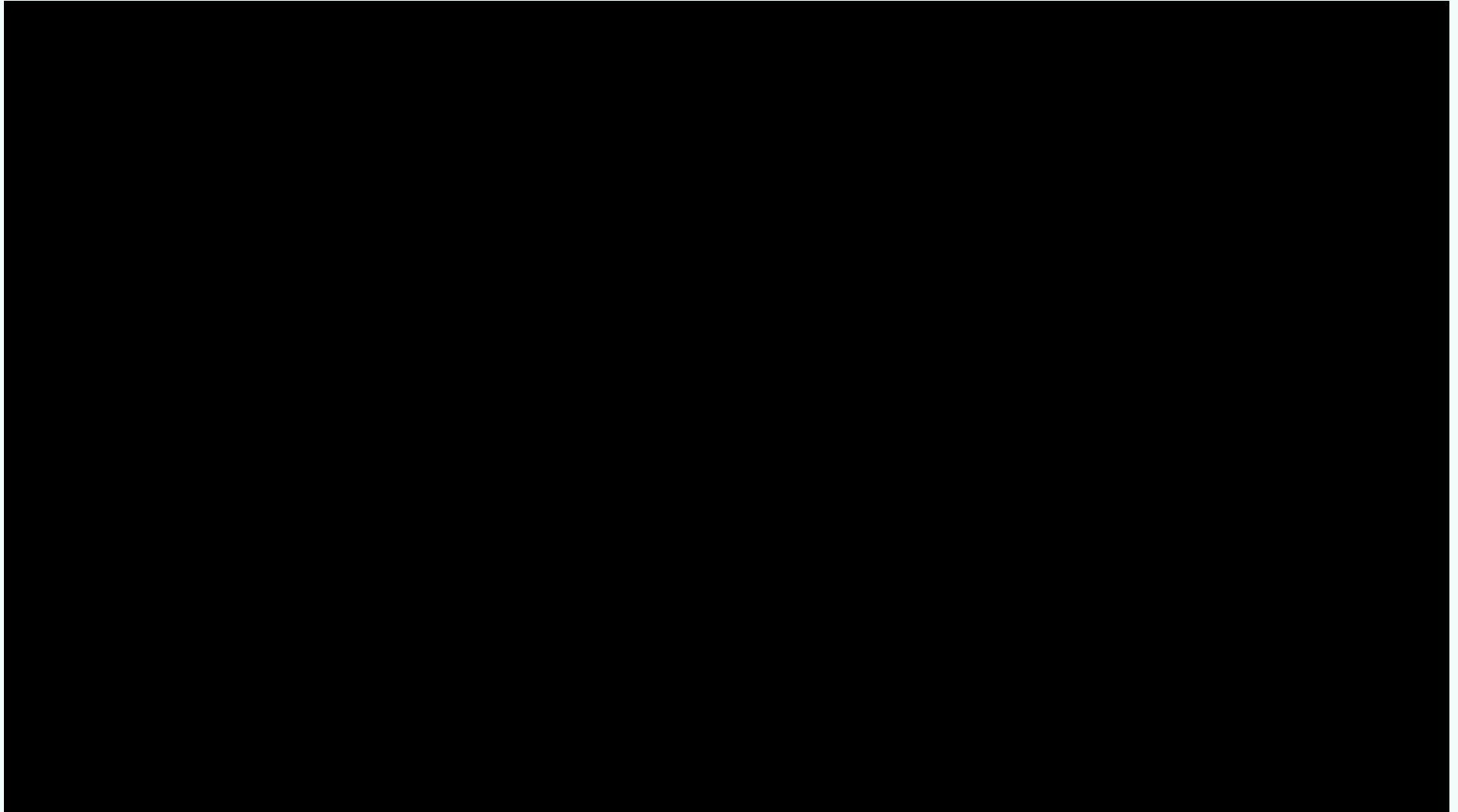


Case 5: hummingbird sign

<https://radiopaedia.org/articles/progressive-supranuclear-palsy-1>

CBD

[Neurology Journal](#)



PROGRESSIVE SUPRANUCLEAR PALSY & CORTICOBASAL  
DEGENERATION  
(PSP/CBD)  
TREATMENT

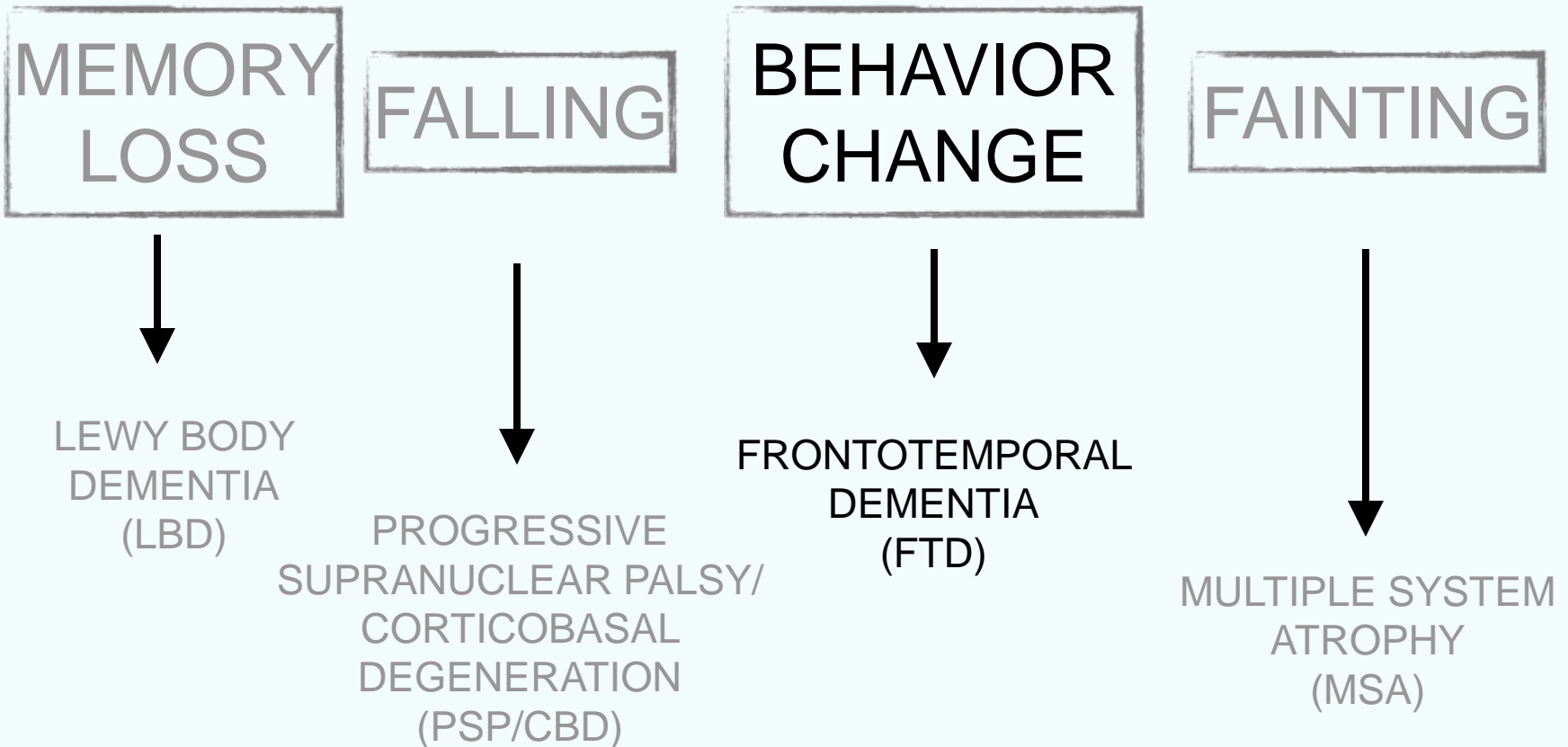
1. CARBIDOPA-LEVODOPA MAY HELP INITIALLY AND “A LITTLE”
2. PHYSICAL, OCCUPATIONAL AND SPEECH THERAPIES ARE CRUCIAL
3. WEIGHTED WALKERS, FEEDING TUBES, SPECIAL EYE GLASSES CAN HELP

# PROGNOSIS

- PSP: 6-8 YEARS FROM SYMPTOM ONSET
- CBD: 10-? YEARS FROM SYMPTOM ONSET

# PARKINSONISM

IF THE EARLIEST SYMPTOM IS:

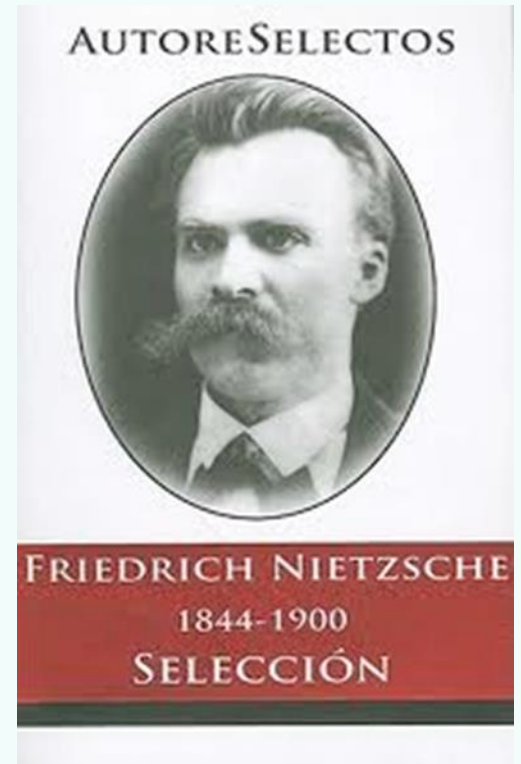


# FRONTOTEMPORAL DEMENTIA (FTD)

(FORMERLY KNOWN AS PICK'S DISEASE)

Second only to ALZHEIMER'S DISEASE (AD) in prevalence, FTD accounts for 20% of young-onset dementia cases.

Signs and symptoms typically manifest in late adulthood, more commonly between the ages of 55 and 65, approximately equally affecting men and women.





# FTD SYMPTOMS

- Disinhibition, poor impulse control
- Apathy
- Loss of sympathy or empathy
  - Behavioral Variant type
- Loss of semantic understanding
  - (Primary Progressive Aphasia type)
- Memory loss is negligible
- Loss of social awareness)

# bvFTD

- **1 YEAR AGO (AGE 56), W.L. STARTED EMBARRASSING WIFE AT PARTIES**
- **8 MONTHS AGO DID NOT SEEM TO CARE WHEN HER BROTHER DIED SUDDENLY**
- **6 MONTHS AGO NOTICED A TREMOR IN RIGHT HAND AND DIAGNOSED WITH “PARKINSON’S DISEASE,” BUT DID NOT RESPOND TO MEDICATIONS**
- **Currently, physician must advise patient that no kissing or hugging will take place (boundaries have to be re-established each visit).**

# bvFTD, apathetic

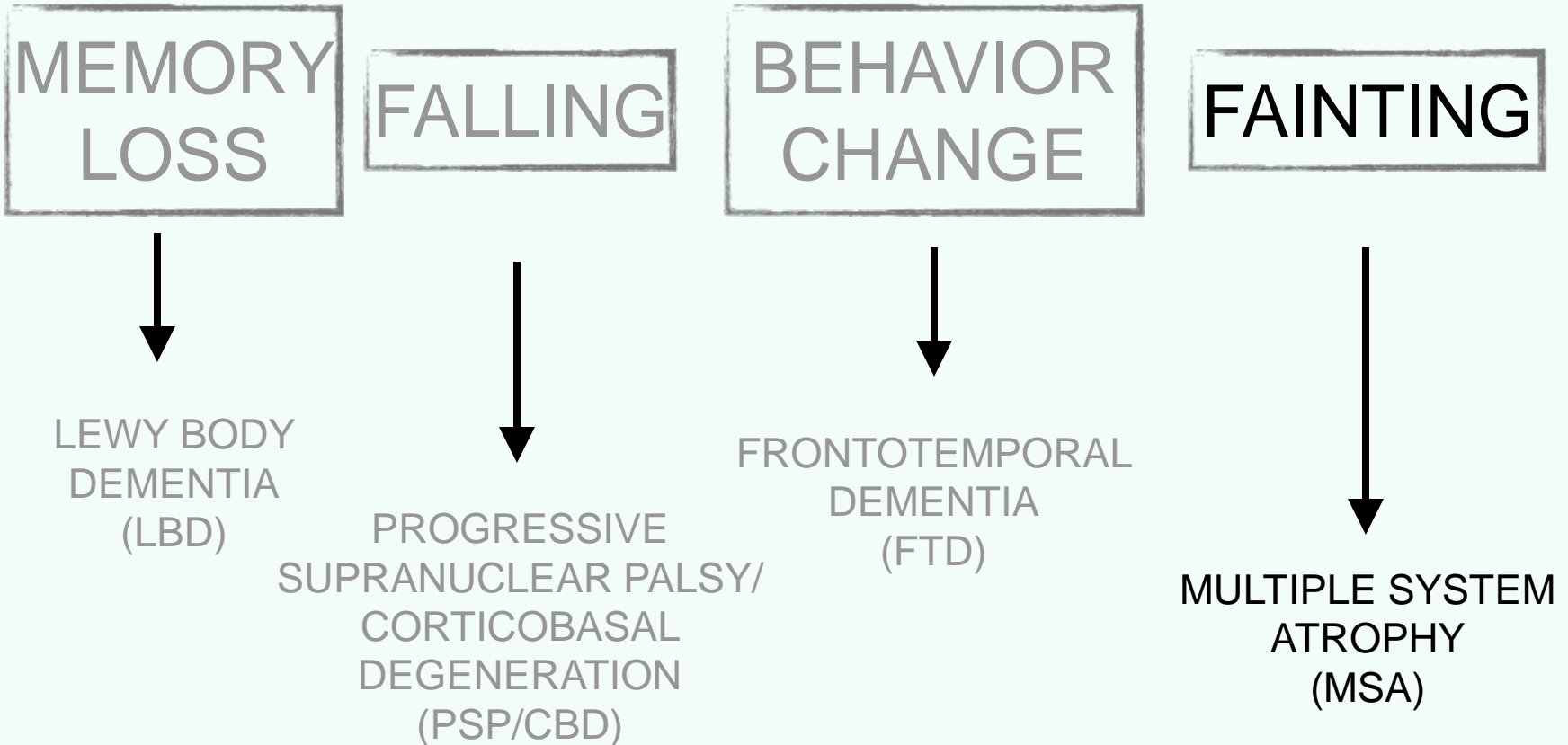
- **1 YEAR AGO (AGE 56) T.C. STOPPED GOING TO SOCIAL EVENTS, DENIES DEPRESSION**
- **6 MONTHS AGO NOTICED A TREMOR IN RIGHT HAND AND DIAGNOSED WITH “PARKINSON’S DISEASE,” BUT DID NOT RESPOND TO MEDICATIONS**
- **CURRENTLY, SISTER MUST CONSTANTLY MOTIVATE AND TELL HIM WHEN TO BATHE, WHEN TO EAT, OR HE WOULD SIT IN RECLINER FOR DAYS.**

# FRONTOTEMPORAL DEMENTIA (FTD) Treatment

1. LEVODOPA CAN HELP PHYSICAL SYMPTOMS
2. MEMORY MEDICATIONS CAN HELP A LITTLE
  - Caution, as can increase impulsivity
3. BEHAVIOR MEDICATIONS HAVE LIMITED EFFECT,  
ESPECIALLY ON APATHY

# PARKINSONISM

IF THE EARLIEST SYMPTOM IS:



# MULTIPLE SYSTEM ATROPHY (MSA)

- 3 YEARS AGO, AT AGE 52, T.M. STARTED HAVING DIZZINESS
- 2 YEARS AGO HAD TO SEE A UROLOGIST FOR BLADDER PROBLEMS
- 1 YEAR AGO STARTED FAINTING AND DIAGNOSED WITH PARKINSON'S DISEASE DUE TO RIGIDITY

# MULTIPLE SYSTEM ATROPHY (MSA)

- Treatment is supportive only, levodopa has minimal, if any effect.
  - Midodrine, flori­nef, droxidopa for orthostatic hypotension.
- Prognosis is poor: average 6 years life expectancy after diagnosis
- Most are wheelchair-bound due to the severe drops in blood pressure

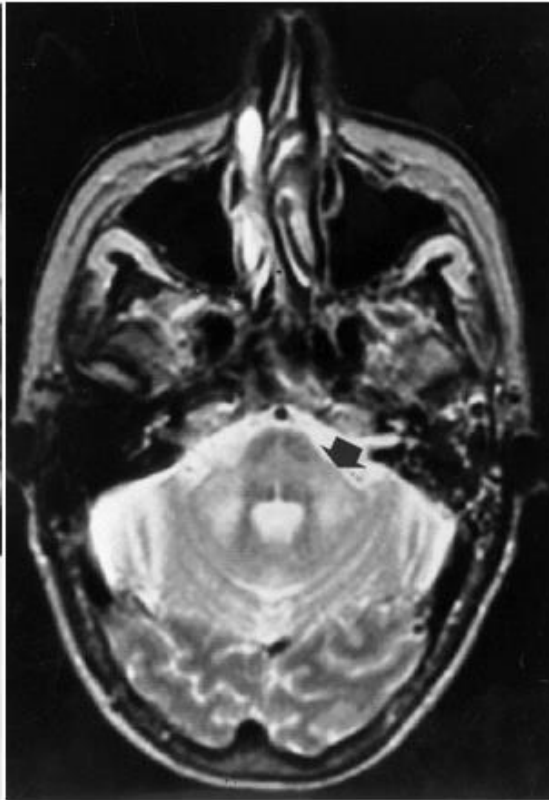
## MSA MRI findings:

Sensitivity of 85% and specificity of 100% to differentiate between MCA and PD

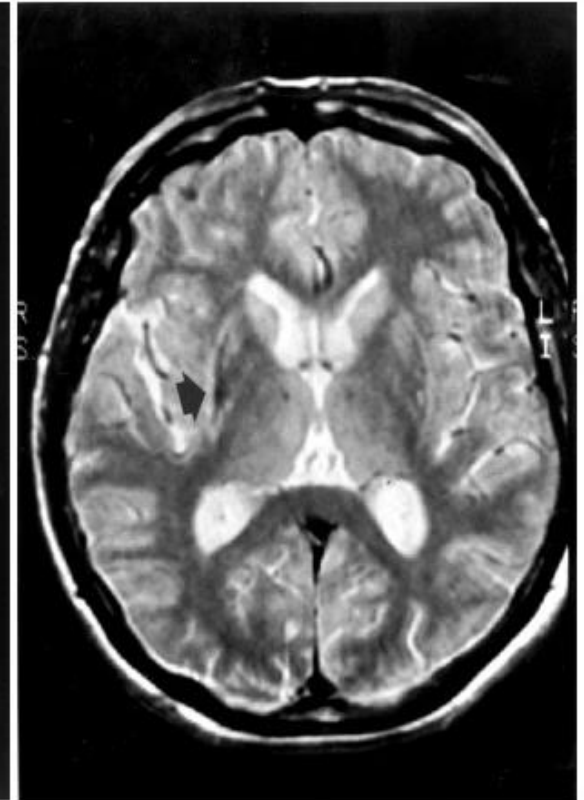
Hot cross bun sign



hyperintensities of middle cerebellar peduncle



hyperintensities of putamen rim





The End