

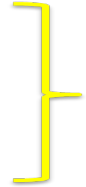
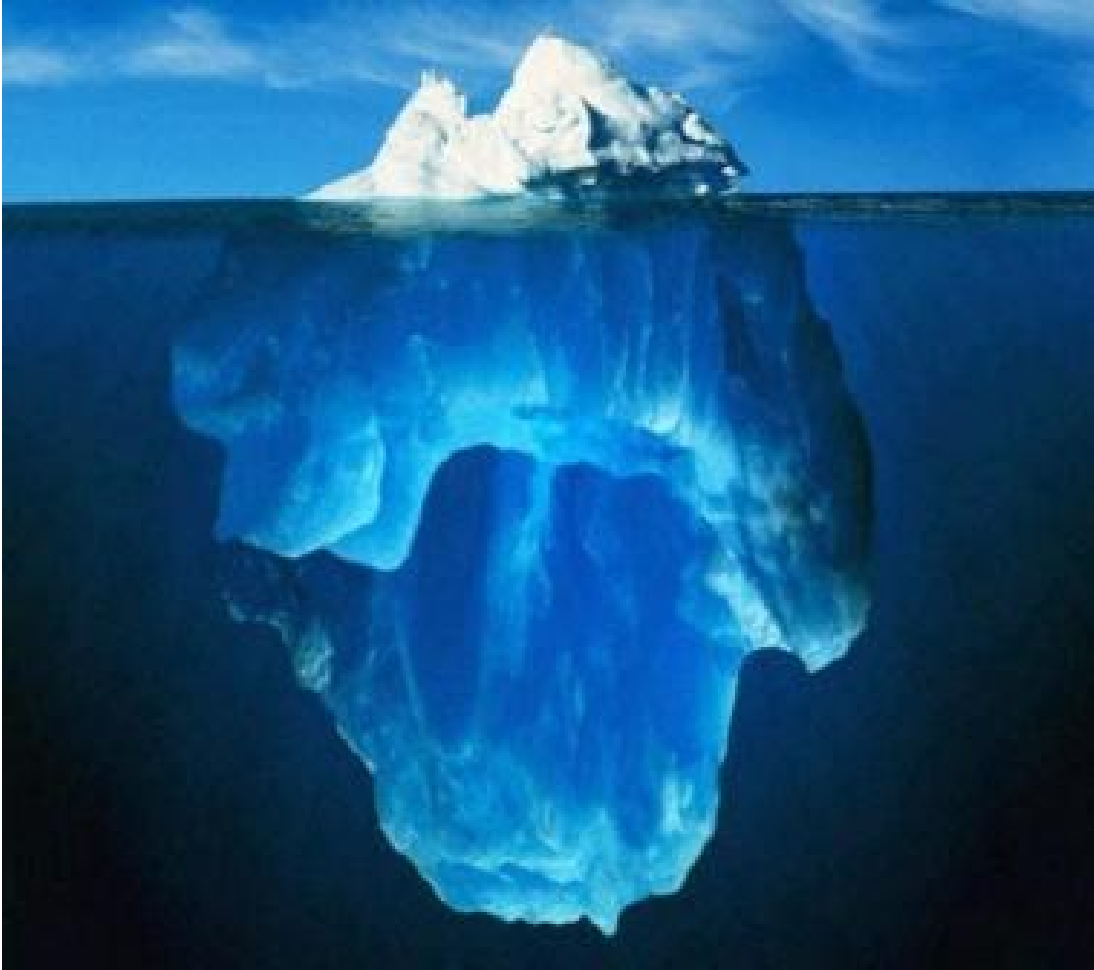


Parkinson Disease Non-Motor Symptoms: Depression, Anxiety and Sleep Disorders

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Motor symptoms



Non-motor symptoms

Pre-motor non-symptoms

- Decreased or loss of sense of smell
- Constipation
- Fatigue
- Depression
- REM sleep behavior disorder

Non-motor features

- **Neuropsychiatric symptoms**
 - Depression
 - Apathy
 - Anxiety
 - Cognitive impairment and dementia
 - Impulse control disorders
 - Psychosis
- **Autonomic dysfunctions**
 - Drooling
 - Excessive sweating
 - Orthostatic hypotension
 - GI and urinary dysfunction
 - Erectile dysfunction
 - Constipation
- **Sleep disturbances**
 - Sleep fragmentation
 - REM sleep disturbances
 - Excessive daytime sleepiness
 - Insomnia
- **Other**
 - Fatigue
 - Olfactory dysfunction
 - Ophthalmologic dysfunction

Depression

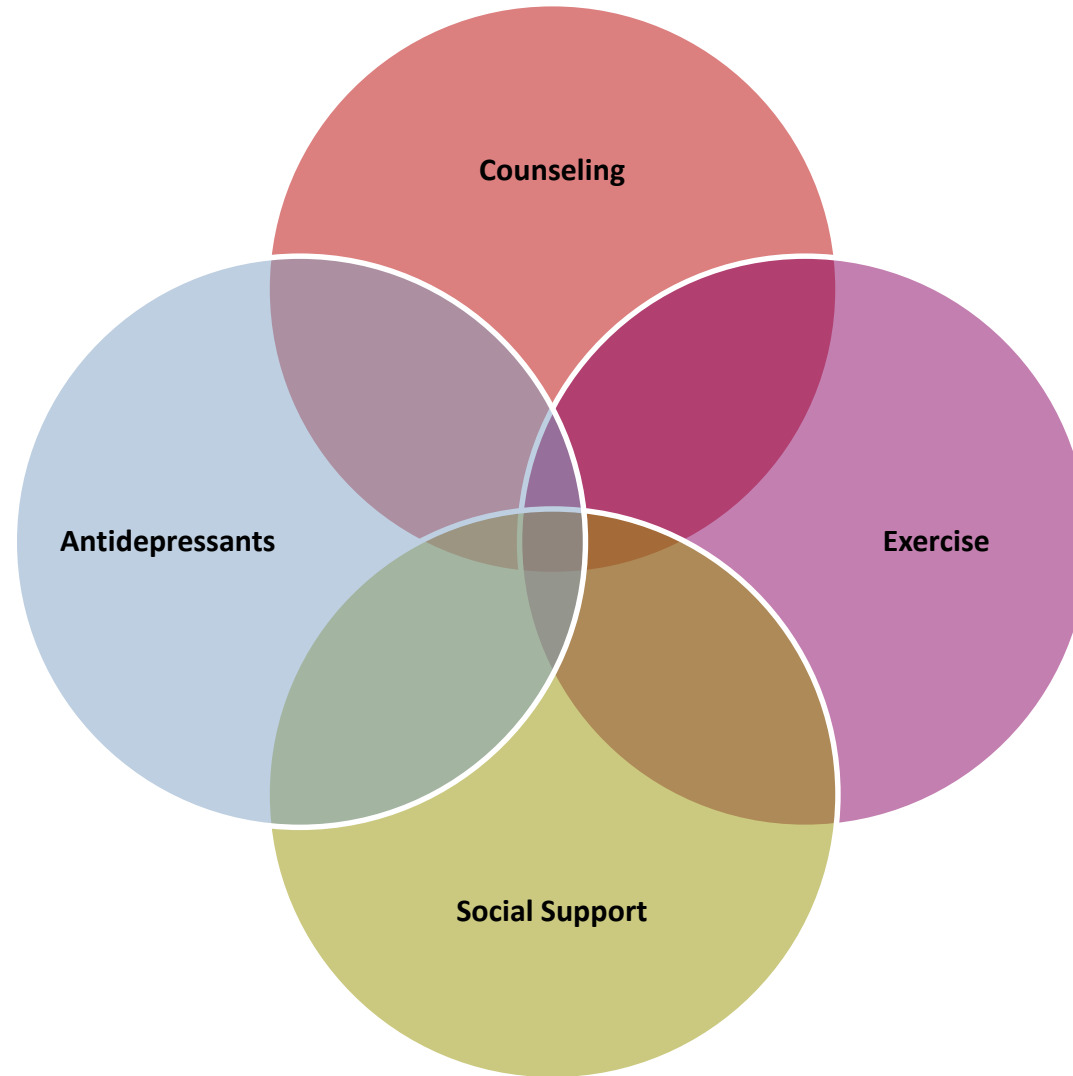
Sustained feelings of sadness, hopelessness, worthlessness that can interfere with daily activities and social interactions

Depression

- Depression is common in Parkinson Disease
- Can be unrecognized due to overlapping features between depression and PD
- Parkinson's Outcomes Project (>12,000 participants)
 - Impact of depression on quality of life is almost twice that of the motor impairments
 - Depression and anxiety have greatest effect on health status



Depression Treatment



Depression treatment

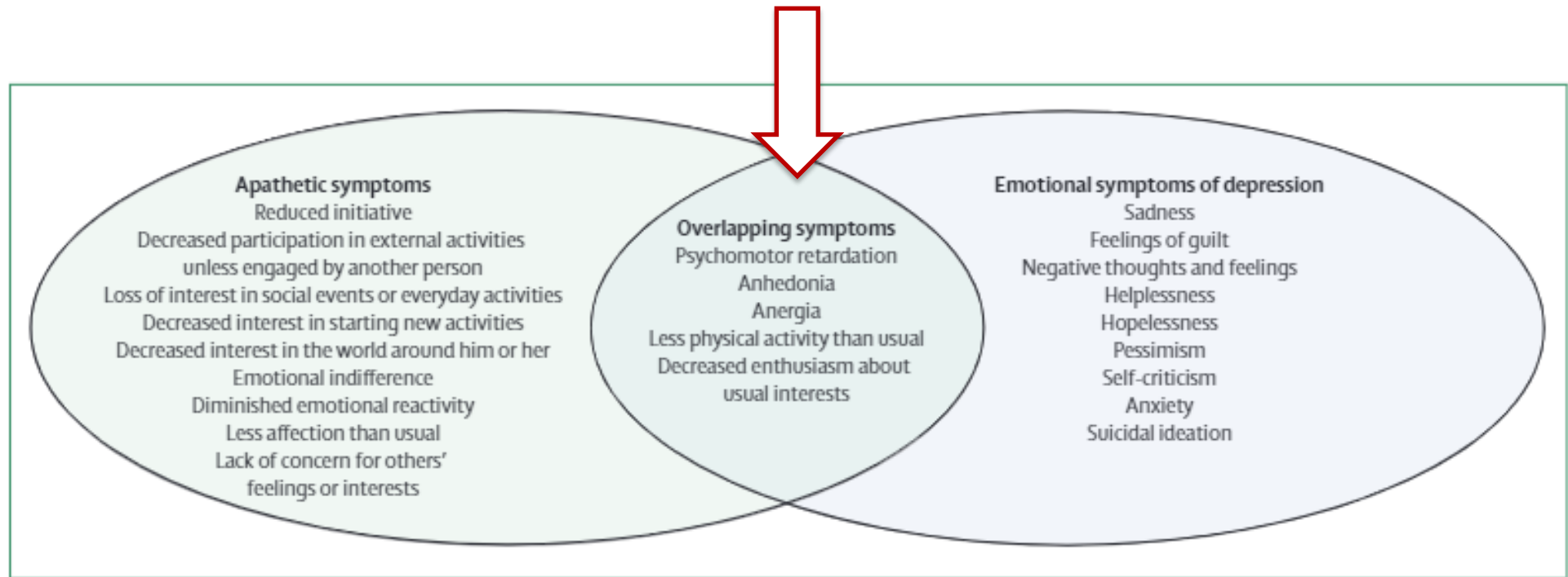
- Dopamine agonist
 - Pramipexole
- Tricyclic antidepressants
 - Nortriptyline
 - Desipramine
 - Amitriptyline
- Selective serotonin reuptake inhibitors/selective serotonin norepinephrine reuptake inhibitors
 - Citalopram
 - Sertraline
 - Paroxetine
 - Fluoxetine
 - Venlafaxine

Seppi K et al 2019

Apathy

Lack of interest or pleasure in activities once enjoyed

Apathy vs Depression



Pagonabarraga J et al 2015

Apathy treatments

- Acetylcholinesterase inhibitors
 - Rivastigmine
- Dopamine agonists
 - Rotigotine - investigational

Seppi K et al 2019

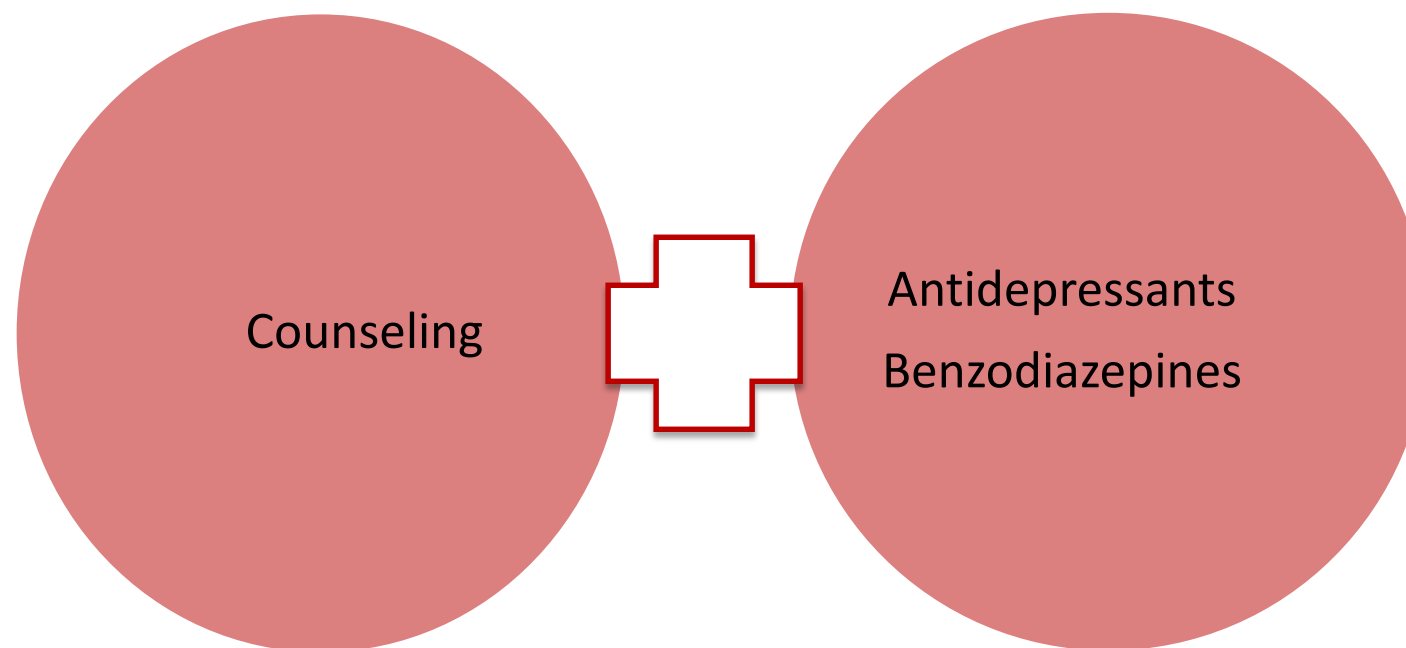
Anxiety

Sustained feelings of being nervous, worried or tense that can interfere with daily activities and social interactions

Anxiety

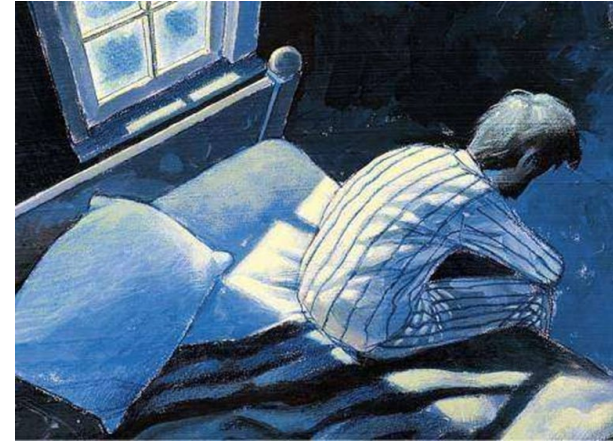
- Up to 55% of PD patients with significant anxiety
- 41% coexisted with depression

Yamanishi et al 2013



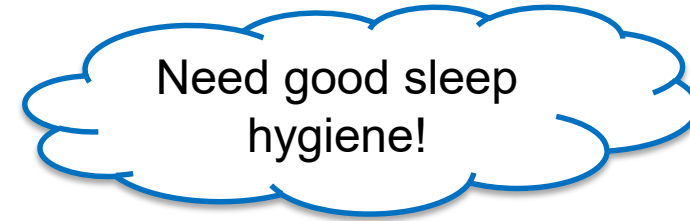
Sleep Disorders

- Insomnia – most common
- Sleep fragmentation
- Excessive daytime sleepiness
- REM sleep behavior disorder



Sleep disorder treatments

- Insomnia
 - Rotigotine
 - Melatonin
 - Continuous positive airway pressure (CPAP)
- Excessive daytime sleepiness
 - Modafinil
 - CPAP
- REM sleep behavior disorder – no evidence based treatments
 - Environment modification
 - Clonazepam
 - Melatonin





ENLIGHT-PD Clinical Trial

A Dose Selection Trial of Light Therapy for Impaired Sleep in Parkinson's Disease



Non-motor Symptoms Part 2: Cognitive changes ...