

# **PARKINSON'S DISEASE**

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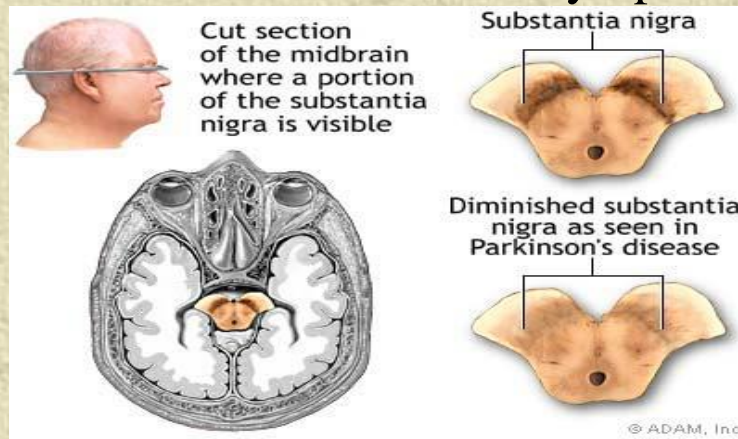


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# INTRODUCTION

- ✧ Progressive neurodegenerative disorder causing problems with movement
- ✧ Caused by a deficiency of dopamine due to loss of dopamine producing brain cells in substantia nigra
- ✧ Dopamine is the neurotransmitter between SN and the rest of the basal ganglia to produce smooth purposeful movement
  - ✧ Lost 60-80% of cells in SN at onset of symptoms





# HISTORY

AN  
ESSAY  
ON THE  
SHAKING PALSY.

BY  
JAMES PARKINSON,  
MEMBER OF THE ROYAL COLLEGE OF SURGEONS.

LONDON:  
PRINTED BY WHITTAKER AND HOWLAND,  
GROVE STREET,  
FOR SHERWOOD, NEELY, AND JONES,  
PATERNOSTER ROW.  
1817.

- ✧ 1817 – James Parkinson first described 6 cases in
  - ✧ “An Essay on the Shaking Palsy”
- ✧ 19<sup>th</sup> century – Charcot referred to disease as “maladie de Parkinson or Parkinson’s disease”
- ✧ Charcot also recognised non-tremolous forms of PD
  - ✧ Slowness of movement is different to weakness
- ✧ 1919 – Recognised that patients with PD lose cells in SN
- ✧ 1957 – Dopamine discovered
- ✧ 1960 – Decreased dopamine concentrations in striatum
- ✧ 1961 – Injected Levodopa improved akinesia
- ✧ 1971 – Oral Levodopa developed

# INTRODUCTION

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- ✧ Minority hereditary and linked to genetic mutation
  - ✧ Alpha-synuclein (PARK 1) - Early onset with AD inheritance
  - ✧ Parkin (PARK 2), PINK1 and DJ-1 – Rare, early onset
  - ✧ LRRK2 (dardarin) – late onset
  
- ✧ Majority are sporadic
  - ✧ Due to combination of genetic susceptibility and exposure to environmental factors that trigger the disease
    - Pesticides and other toxins
    - Smoking protective



# INTRODUCTION

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- ✧ Mean age of onset – 60
  - ◆ 10% present before age of 50
- ✧ 50% more men than women
- ✧ Generally progression of disability is slow
  - ◆ Mean duration to death after diagnosis –14 years
- ✧ Diagnosis sometimes difficult and uncertain
  - ◆ No definitive test
  - ◆ No biological markers (blood or CT changes)
  - ◆ Based on clinical criteria



# Queen Square Brain Bank

## Clinical Diagnostic Criteria for PD

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✧ **BRADYKINESIA** (slowness of movement)

+ 1 of the following

- ✧ **Rest Tremor – 4-6 Hz**
- ✧ **Muscle Rigidity**
- ✧ **Loss of Postural Reflexes**



# BRADYKINESIA

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## ✧ **Slowness of voluntary movement**

- ✧ Difficulty planning, initiating and executing movement when performing sequential and simultaneous tasks
- ✧ Decrement in amplitude of repetitive movements

## ✧ **Characteristic symptoms**

- ✧ Slowness of performing ADL's
- ✧ Slow reaction times

## ✧ **Best correlates with degree of dopamine deficiency**

## ✧ **Elderly with Parkinsonism**

- ✧ Decreased neuronal density in SN regardless of PD diagnosis

# BRADYKINESIA



## Characteristic signs

- ◆ Reduced facial expression (hypomimia) and blink rate
- ◆ Difficulty of fine finger movements and tasks
  - Doing up buttons, shoe laces, cleaning teeth, shaving
  - Micrographia
- ◆ Short, shuffling gait with reduced arm swing (freezing)
- ◆ Slow, soft, monotonous speech (hypophonic dysarthria)
- ◆ Difficulty swallowing and choking
- ◆ Drooling due to impaired swallow





# FREEZING

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- ✧ Form of akinesia (loss of movement)
- ✧ 47% of patients report freezing
- ✧ Most commonly affects legs
  - ◆ Sudden and transient (<10sec) inability to move
- ✧ Frequent cause of falls

## ✧ Types

- ◆ Start hesitation – when beginning to walk
- ◆ Sudden inability to move feet in specific act
  - Turning, narrow passage, crossing street
- ◆ Tricks – marching, stepping over, music

# TREMOR

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## ✦ Rest Tremor – 4-6 Hz

- ◆ Unilateral onset and asymmetrical
- ◆ Increased by anxiety, excitement, cold
- ◆ Decreased by action and sleep
- ◆ Hands, arms, legs, jaw and lips
  - Rarely involves neck, head or voice (ET or CD)
- ◆ Intrinsic hand muscles - pill rolling



## ✦ Postural (re-emergent) tremor – 4-6Hz

- ◆ Tremor DELAYED after hands outstretched and horizontal
- ◆ Also responsive to dopamine

✦ 69% at onset and 75% during course of disease



# RIGIDITY and POSTURAL INSTABILITY

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## ✦ Stiffness

- ◆ Increased resistance throughout range of passive movement of limb
- ◆ Limbs and axial
- ◆ Lead pipe rigidity and cog-wheeling (underlying tremor)
- ◆ Reinforcing manoeuvre increases rigidity esp. if mild
- ◆ Associated pain (misdiagnosed as arthritis, RC)

## ✦ Impaired balance

- ◆ Retropulsion, propulsion and festination
- ◆ Pull test (>2 steps abnormal)
- ◆ 1<sup>st</sup> fall in PD (108 months), early PSP (16.8) and MSA (42)

# Prospective Positive Criteria

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**3 or more of the following:**

- ✦ Unilateral onset
  - ✦ Rest tremor
  - ✦ Progressive disorder
  - ✦ Clinical course of greater than 10 years
  - ✦ Persistent asymmetry
- 
- ✦ Excellent response ( $>70\%$ ) to levo-dopa
  - ✦ Levo-dopa response for greater than 5 years
  - ✦ Severe levo-dopa induced dyskinesia



# Non-specific Initial Presentation

- 
- ✧ Slowness
  - ✧ Excessive tiredness and fatigue
  - ✧ Generalised aches and pains
  - ✧ Unexplained weight loss
  - ✧ Changes in posture
    - ◆ Flexing one elbow
    - ◆ Failing to swing one arm when walking
  - ✧ Restless legs syndrome
  - ✧ Loss of sense of smell (olfactory bulb affected early)

# Other Problems

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## ✧ Urinary frequency and urgency

- ◆ Detrusor instability - TCA / oxybutinin
- ◆ Enlarged prostate

## ✧ Constipation

- ◆ Reduced mobility of bowel muscles – fluid intake

## ✧ Dietary imbalance

- ◆ Swallowing dysfunction
- ◆ Poor eating and drinking
- ◆ Loss of weight

## ✧ Autonomic dysfunction

- ◆ Postural hypotension and syncope – Fludrocortisone
- ◆ Impotence



# Other Problems

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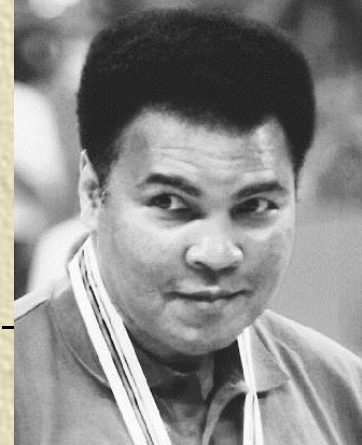
## ✧ Cognitive problems

- ◆ Subtle frontal lobe dysfunction
- ◆ Some develop coincidental Alzheimer's dementia
- ◆ Confusional and psychotic states
  - Seroquel (quetiapine) or Abilify

## ✧ Mood changes

- ◆ > 50% are depressed - reaction to disability
- ◆ Apathy – lack of motivation
- ◆ Nocturnal dose of SSRI – Lexapro
- ◆ Severe depression - ECT - may improve PD temporarily

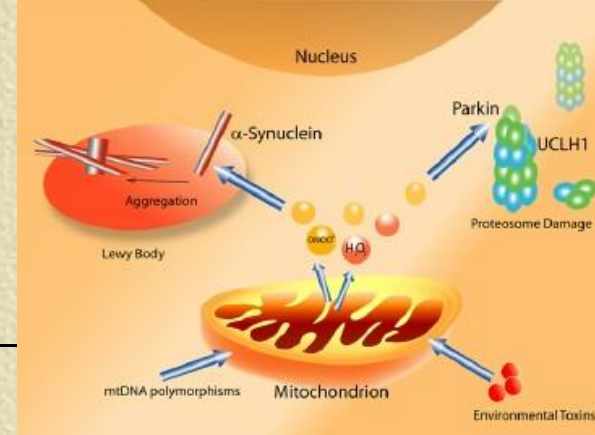
# EXCLUSION CRITERIA



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- ✦ Repeated strokes – stepwise progression
  - ✦ Repeated head injury
  - ✦ History of encephalitis
  - ✦ Neuroleptic treatment at onset of symptoms
  - ✦ Strictly unilateral after 3 years
  - ✦ Supranuclear gaze palsy
  - ✦ Cerebellar signs
  - ✦ Early severe autonomic dysfunction
  - ✦ Early severe dementia
    - ✦ Disturbances in memory, language and praxis
  - ✦ Communicating hydrocephalus
  - ✦ Negative response to large doses of levodopa (>750mg/day)



# PARKINSONISM



## ✧ Idiopathic Parkinson's Disease

- ✧ Most common form of PARKINSONISM - no cause found

## ✧ Genetic Parkinsonism – (70% <20 years of age)

- ✧ Alpha-synuclein (PARK 1) - Early onset with AD inheritance
- ✧ Parkin (PARK 2), PINK1 and DJ-1 – Rare, early onset
- ✧ LRRK2 (dardarin) – late onset

## ✧ Other disorders

- ✧ Multiple System Atrophy
- ✧ Progressive Supranuclear Palsy
- ✧ Diffuse Lewy Body Dementia
- ✧ Cortico-Basal Degeneration
- ✧ Drug-Induced Parkinsonism – Maxolon, anti-psychotics
- ✧ Arteriosclerotic (vascular) – tremor rare

# PARKINSONIAN SYNDROMES

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## ✧ Multiple System Atrophy (MSA)

- ✧ Early autonomic features
  - postural hypotension, impotence, constipation, incontinence
- ✧ Cerebellar – poor co-ordination and dysarthria

## ✧ Progressive Supranuclear Palsy (PSP)

- ✧ Early postural instability - falls backwards
- ✧ Abnormal eye movements – esp. vertical
- ✧ Severe axial rigidity in extension
- ✧ Prominent speech involvement



# PARKINSONIAN SYNDROMES

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## ✧ Diffuse Lewy Body Dementia

- ◆ Range from typical PD to Alzheimer's dementia
- ◆ Fluctuation in attention and alertness
- ◆ Early visual hallucinations – well formed and detailed
- ◆ Prominent psychiatric features – delusions and depression

## ✧ Corticobasal Degeneration

- ◆ Dystonia
- ◆ Myoclonus
- ◆ Visuo-spatial impairments
- ◆ Dyspraxia – inability to make familiar, purposeful movement

# RATING SCALES

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## ✧ Hoehn & Yahr

- ✧ Provides gross assessment of disease progression

## ✧ UPDRS (Unified Parkinson's Disease Rating Scale)

- ✧ Assesses disability and impairment



# HOEHN & YAHR



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## ✧ Stage 1

- ✧ Unilateral symptoms only

## ✧ Stage 2

- ✧ Bilateral symptoms – No impairment of balance

## ✧ Stage 3

- ✧ Mild-Moderate disease with balance impairment
- ✧ Physically independent

## ✧ Stage 4

- ✧ Severe disease, still able to walk with aids

## ✧ Stage 5

- ✧ Fully dependent - wheelchair bound or bedridden

# UPDRS

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## ✧ 4 subscales

- ✧ Part I – Mentation, behaviour and mood (4 questions)
- ✧ Part II – Activities of daily living (13 questions)
- ✧ Part III – Motor function (14 questions)
- ✧ Part IV – Motor and other complications of advanced disease (11 questions)

✧ Questions in parts I -III scored from 0-4

✧ Questions in part IV scored 1-3 or yes/no

✧ UPDRS total score = 199



# EXAMINATION

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## ✧ Observation during consultation

- ✧ Reduced facial movements
- ✧ Reduced blink rate

## ✧ Olfaction

- ✧ Scratch test – coffee, soap, chocolate, petrol

## ✧ Eye movements

- ✧ Supranuclear gaze palsy

## ✧ Glabellar tap (Present 80.5% - 83.3% sensitive, 47.5% specific)

## ✧ Palmomental reflex (Present 34% - 33% sensitive, 90% specific)

## ✧ Speech

- ✧ Soft, slow, monotonous

## ✧ Drooling

# EXAMINATION

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## ✧ Tremor

- ✧ Rest, increased with concentration

## ✧ Tone

- ✧ Lead pipe and cog-wheeling, increased on reinforcement

## ✧ Sequential fine finger and foot movements

- ✧ Bradykinesia and inco-ordination

## ✧ Gait

- ✧ Slow, shuffling
- ✧ Flexed posture
- ✧ Reduced arm swing
- ✧ Poor postural reflexes - retropulsion





# MANAGEMENT

✧ Maintenance of **Quality of Life** – presently, no CURE

## ✧ TEAM APPROACH

- ◆ Neurologist
- ◆ Rehabilitation Specialist
- ◆ Nurse
- ◆ Physiotherapist
- ◆ Occupational Therapist
- ◆ Speech Pathologist
- ◆ Dietician
- ◆ Psychologist



# MEDICATION

✧ Begin symptomatic treatment when symptoms start to **interfere with function** to provide relief of symptoms

- ◆ Threat to employment
- ◆ Difficulty with domestic ADL's
- ◆ Worsening gait and balance problems
- ◆ Restore function
- ◆ Individualise treatment





# MEDICATIONS

<b>Levodopa preparations</b>	Levodopa/benserazide (Madopar) Levodopa/carbidopa (Sinemet)	
<b>Dopamine agonists</b>	<b>Non-ergot</b> Pramipexole (Sifrol) Apomorphine Rotigotine	<b>Older Ergot</b> Bromocriptine Pergolide (Permax) Cabergoline (Cabaser)
<b>Catechol-O-methyltransferase (COMT) inhibitors</b>	Entacapone (Comtan)	
<b>Monoamine oxidase-B (MAO-B) inhibitors</b>	Selegiline (Eldepryl)	
<b>Anticholinergics</b>	Benzhexol (Artane) Benztropine (Cogentin) Biperiden (Akineton)	
<b>Other</b>	Amantadine (Symmetrel)	

# LEVODOPA – Sinemet and Madopar

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## ✧ Most effective medication

- ✧ Carbidopa or benserazide
  - delays conversion of levodopa to dopamine until reaches the brain
- ✧ Replenish brains dwindling supply
- ✧ Effective in 75% of cases
- ✧ Bradykinesia and rigidity respond best
- ✧ Tremor marginally reduced (anti-cholinergics better)
- ✧ Balance, speech and swallow may not improve
- ✧ Improve absorption
  - Take away from meals – 30 mins before or after
  - Empty stomach and avoid protein rich meals
- ✧ Each year of therapy – 10% chance of complications



# Levodopa Side Effects



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## ✧ Nausea

- ◆ Motilium (Doperidome)
- ◆ Maxolon and Stemetil – extrapyramidal SE's

## ✧ Postural Hypotension

- ◆ Fludrocortisone and Mestinon

## ✧ Dyskinesias

- ◆ Reduce dose
- ◆ Amantadine

## ✧ Hallucinations and psychosis

- ◆ Reduce dose
- ◆ Last tablet earlier at night
- ◆ Anti-psychotics (last resort) - Seroquel or Abilify

# Motor Fluctuations



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## ✧ Levodopa honeymoon

- ◆ Good initial period lasting 2 - 5 years on 2 - 4 doses/day
- ◆ Benefit smooth and stable
- ◆ Subsequently no good effect after each dose

## ✧ On-off phenomenon – (wearing off)

- ◆ Beneficial effect linked to doses of levodopa
- ◆ Start of relief after latency period
- ◆ Termination of beneficial effect
- ◆ Progressive shrinkage of benefit
- ◆ Nocturnal bradykinesia and stiffness



# Motor Fluctuations

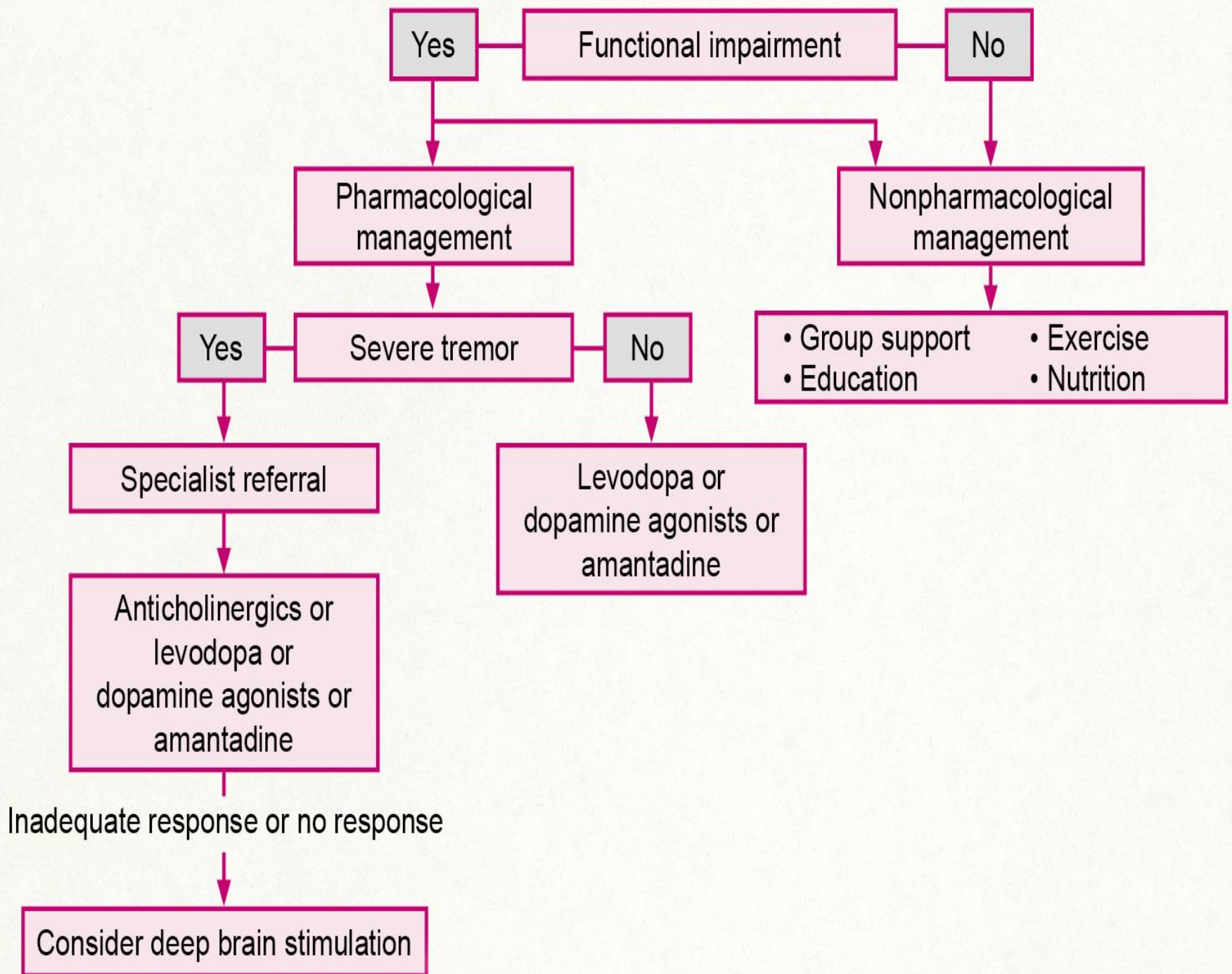


## ✦ Rescheduling levodopa daily doses

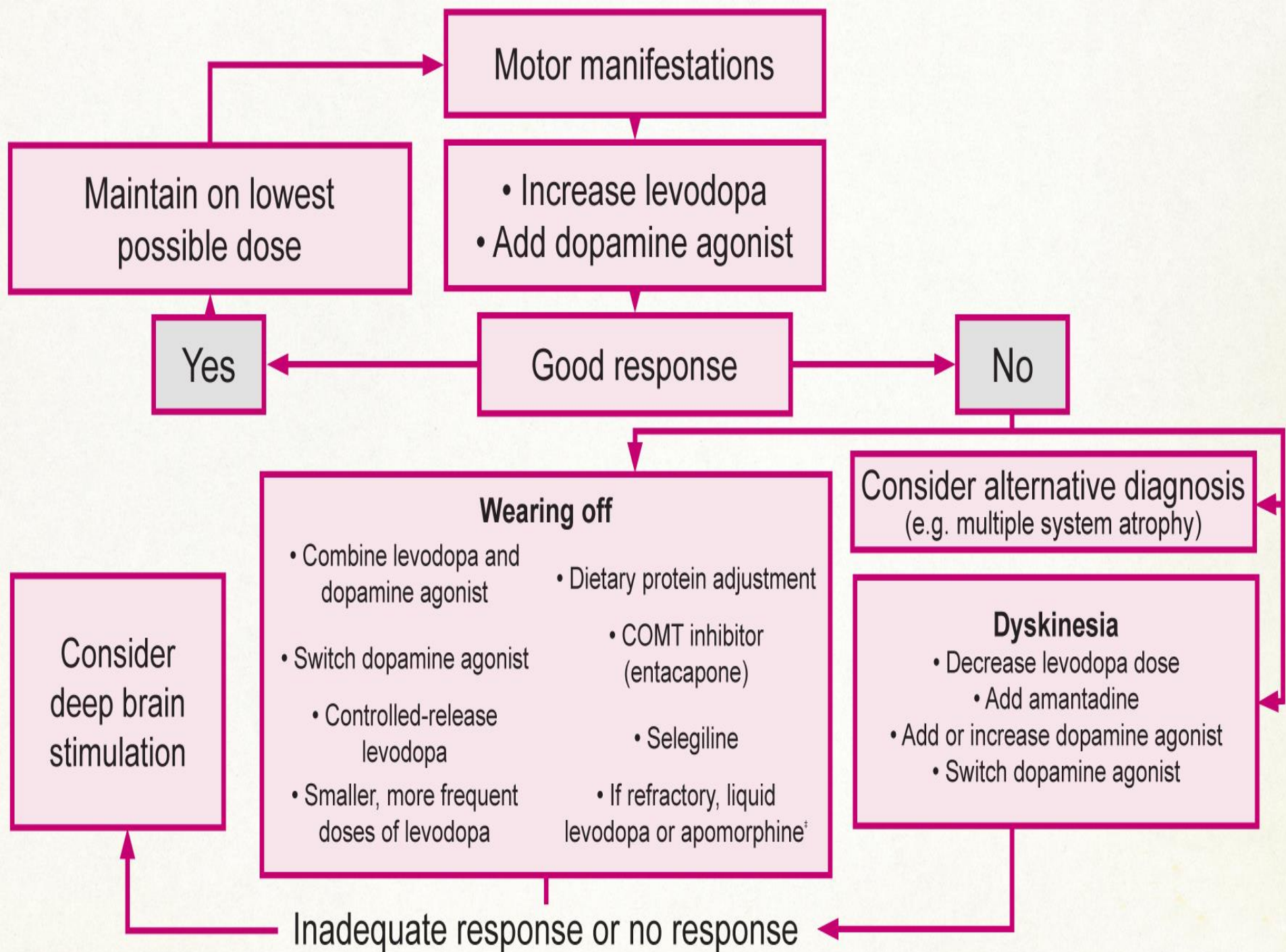
- ◆ 3 - 4 doses – every 3 - 4 hours from waking (6,10,2,6)
- ◆ Doses given during the day, when patient needs medication
- ◆ Improves ‘wearing off’
- ◆ Prolongs duration of ‘on’ hours
- ◆ Doses and times tailored to patients needs
  - First dose in morning higher to produce initiation
  - Increase afternoon doses that fail to induce ‘on’

## ✦ Controlled release – Sinemet CR

- ◆ Nocturnal – improves sleep and reduces rigidity
- ◆ May improve morning bradykinesia and foot dystonia







## Non-motor manifestations



```
graph TD; A[Non-motor manifestations] --> B[Orthostatic hypotension]; A --> C[Bladder symptoms]; A --> D[Constipation]; A --> E[Sexual dysfunction]; A --> F[Sialorrhoea]; A --> G[Psychosis];
```

### Orthostatic hypotension

- Increase salt and water intake
  - Domperidone
  - Pyridostigmine
  - Fludrocortisone
    - Ephedrine<sup>†</sup>
    - Stockings
    - Midodrine<sup>†</sup>
    - Octreotide

### Bladder symptoms

- Bladder training
- Oxybutynin, propantheline, nocturnal intranasal desmopressin

### Constipation

- Dietary modification and exercise
- Stool softeners, bulking agents

### Sexual dysfunction

- Urological evaluation
- Erectile agents

### Sialorrhoea

- Intraparotid botulinum, toxin A

### Psychosis

- Review antiparkinson drugs
- Low dose quetiapine, low dose clozapine



# DUO-DOPA



- 
- ✦ Advanced stage of PD
  - ✦ Motor fluctuations difficult to control with oral levodopa
  - ✦ Continuous intraduodenal levodopa / carbidopa gel
    - ◆ Less variability in levodopa concentrations
    - ◆ Trial with naso-duodenal tube
    - ◆ Significant improvement
      - PEG with tube placed at duodenal-jejunal junction
    - ◆ Portable pump
  - ✦ SE's similar to oral levodopa
  - ✦ Safe alternative for patients not suitable for DBS

# COMT inhibitors



## ✦ Comtan / Stalevo

- ✦ Stalevo – 100/25/200    150/37.5/200    200/50/200
- ✦ Catechol-O-methyltransferase (enzyme that breaks down dopamine)
- ✦ Prolongs effect of levodopa
- ✦ Decrease duration of ‘off’ periods
- ✦ Allow reduction of total levodopa dose
- ✦ SE's
  - Urine discoloration
  - Nausea, diarrhoea, dizziness, insomnia, hallucinations



# DOPAMINE AGONISTS



- ◆ Directly stimulate post-synaptic dopaminergic receptors
- ◆ Generally first line in ‘younger’ patients(< 60 yo)
- ◆ Reduces or delay motor complications
- ◆ Effective monotherapy and useful adjunct to levodopa
- ◆ Less symptomatic benefit but can prolong ‘on’ hours
  
- ◆ Lower risk of motor complications
  - Limit need for levodopa
  
- ◆ Poorly tolerated in elderly
  - Drowsiness, confusion, postural hypotension, hallucinations, dyskinesia, compulsive behaviour (gambling, hypersexuality)
- ◆ Fibrosis caused by older agents— chest and valvopathy

# PRAMIPEXOLE

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## ✧ Non-ergot (June 2008)

- ✧ Selective activity D2 receptors and preferential affinity for D3 receptors
- ✧ Approved for monotherapy in early PD
- ✧ Adjuvant therapy in advanced Parkinson's disease
- ✧ May delay need for levodopa for up to 4 years
- ✧ Better side effect profile
  - Nausea, dizziness, drowsiness, insomnia, hallucinations
  - Cognitive and behavioural changes may occur - gambling
- ✧ No associated cardiac fibrosis
- ✧ 250 ug to 4.5 mg per day (tds dosage)

## ✧ Ropinirole

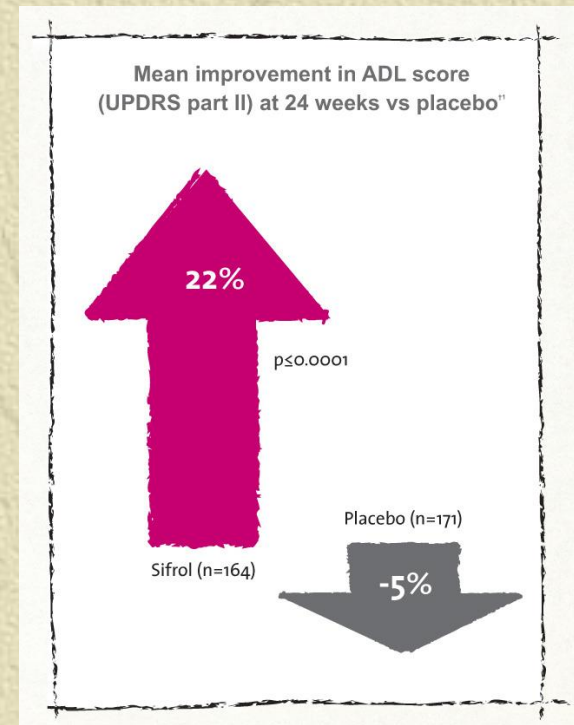
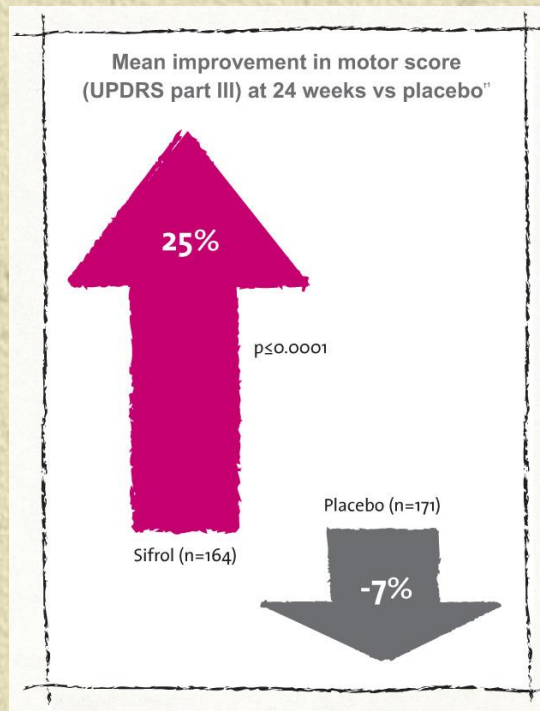
- ✧ 24 hour prolonged release, once daily 2-8 mg /day
- ✧ Approved in Australia for Restless legs syndrome



# PRAMIPEXOLE – Early PD

## ✦ Levodopa naïve patients

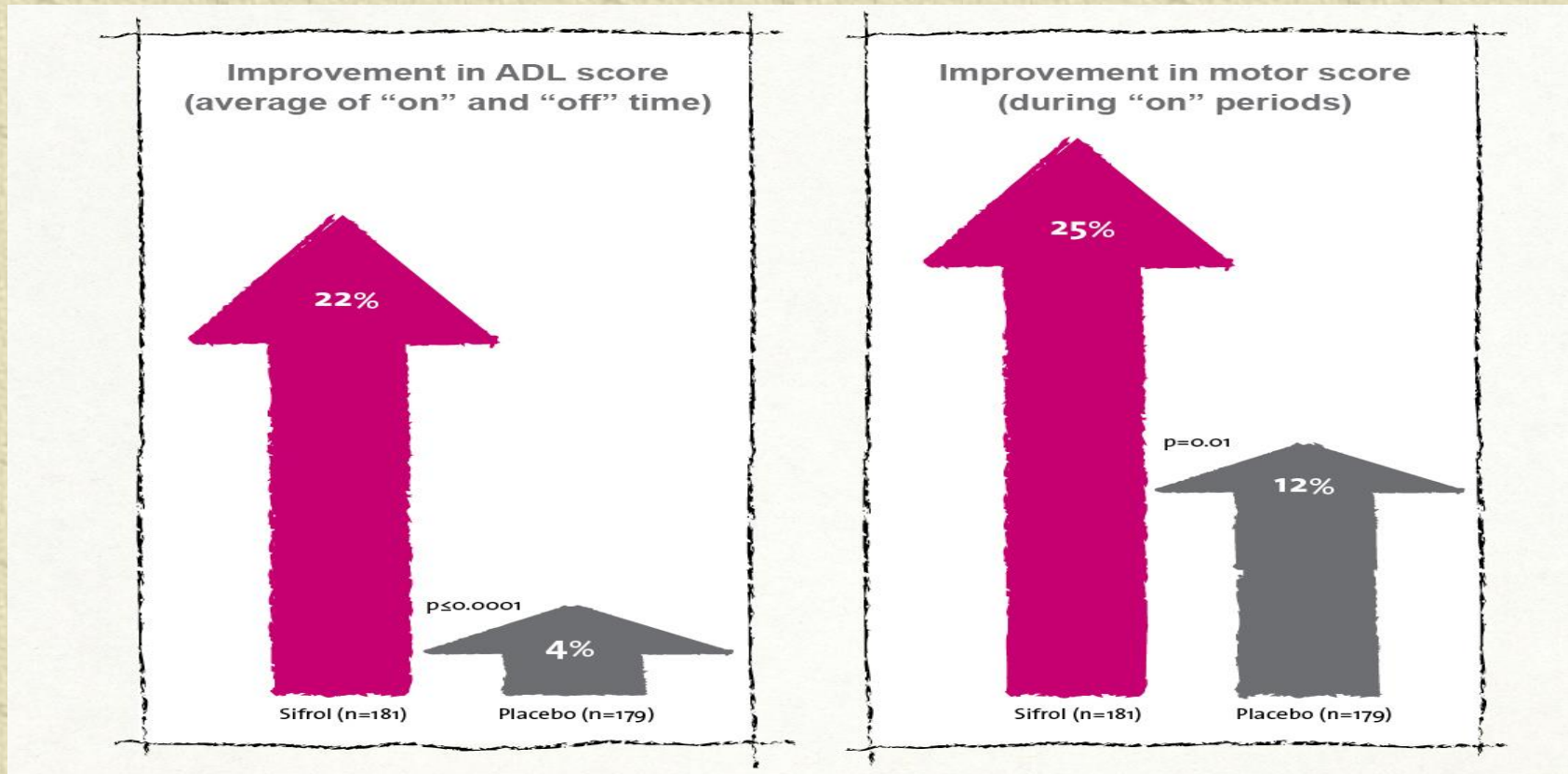
- ✦ Improved motor score (25%) and ADL ability (22%) from 3 weeks as monotherapy



# PRAMIPEXOLE – Advanced PD

## ✧ Sifrol + levodopa vs placebo + levodopa at 4 months

- Improved motor score (25%) and ADL ability (22%) at 18 weeks



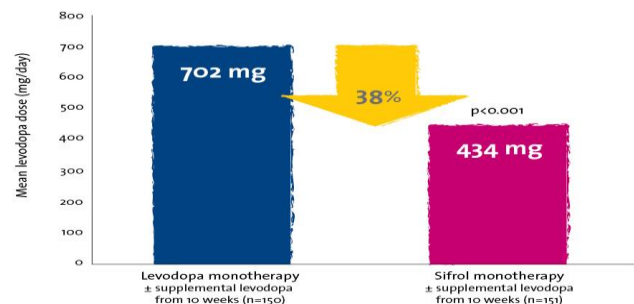
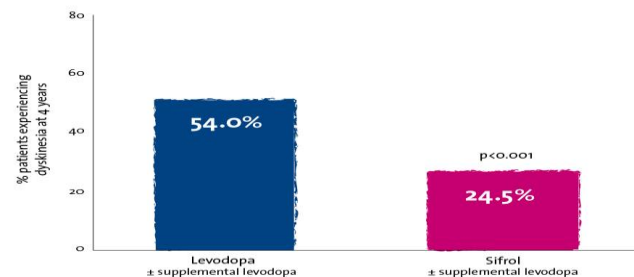
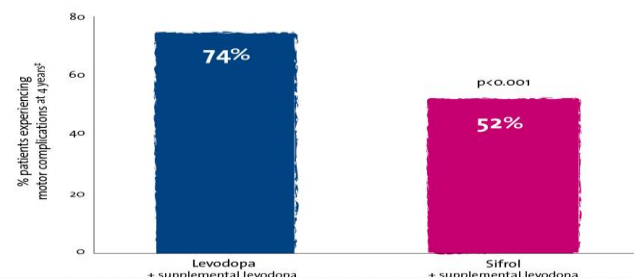


# CALM-PD: a 4-year study of Pramipexole vs levodopa as initial treatment for PD

✦ Delays onset of motor complications

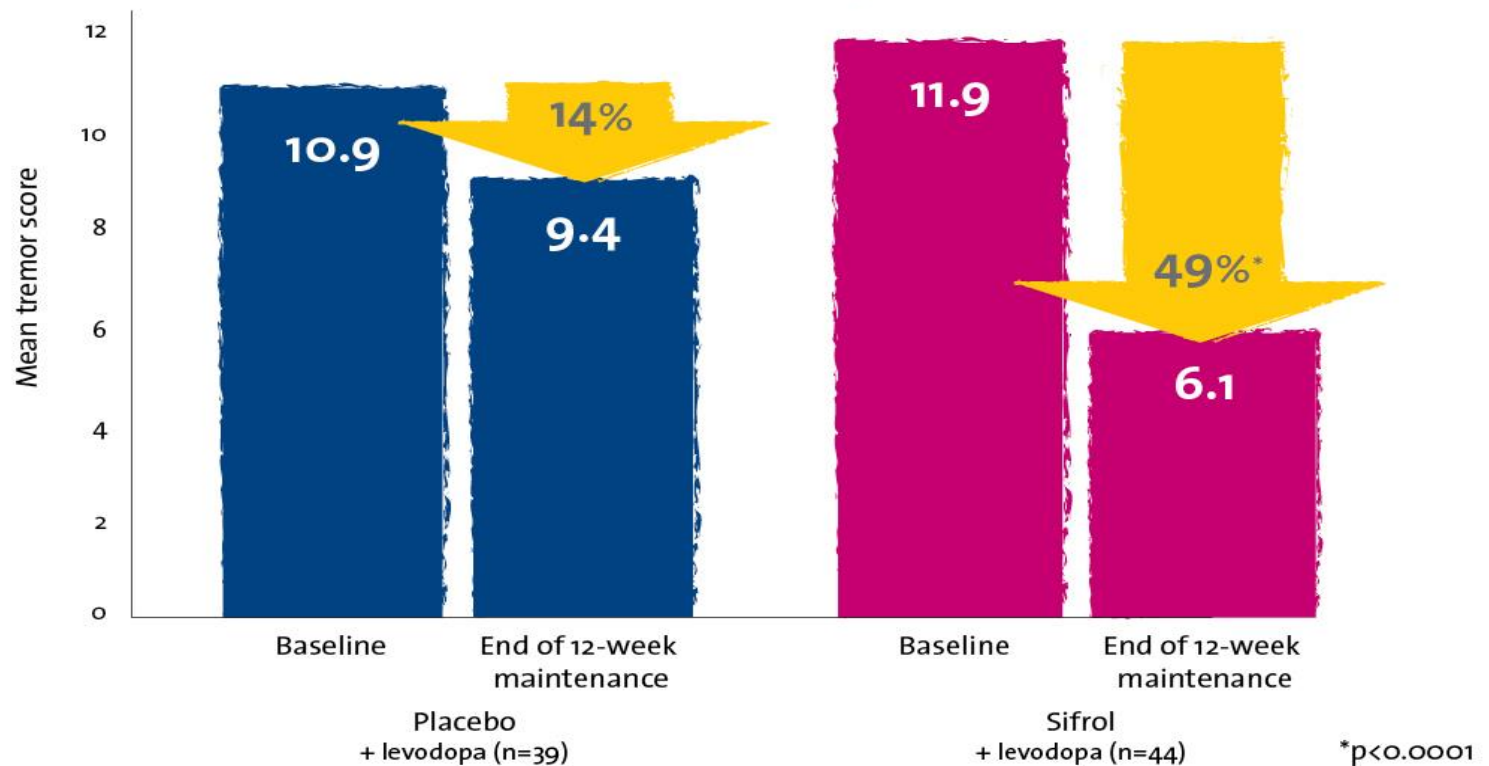
✦ Improves dyskinesia

✦ Enables reduction in levodopa (38%)



# PRAMIPEXOLE

## Drug resistant Tremor





# DOPAMINE AGONISTS



## ✦ Rotigotine (not available in Australia yet)

- ✦ Lipid –soluble, non ergot, D1, D2, D3 receptor agonist
- ✦ Transdermal patch
- ✦ Continuous, once daily administration
- ✦ Avoids pulsatile dopaminergic stimulation
- ✦ Better patient compliance
- ✦ Well tolerated

# APOMORPHINE



- ✧ Used since mid-1980's
- ✧ Potent, non-selective, short-acting dopamine agonist
- ✧ Fluctuating PD with recurrent off periods despite optimised oral therapy
  - ◆ Reduces “off” time by 50%
    - rapid onset within 15 min and lasts 90 mins
  - ◆ Reduces levodopa requirements
  - ◆ Reduced dyskinesia
- ✧ Subcutaneous infusion or intermittently
  - ◆ 75% improve with 2-6mg /day with mean of 3 rescue doses per day
- ✧ Subcutaneous injection site reactions
- ✧ Peripheral dopaminergic SE's – regular domperidone
  - ◆ Nausea, vomiting, dizziness, hypotension, yawning, rhinorrhea



# MAO-Inhibitors



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## ✧ MAO-B (monoamine oxidase-B) inhibitors

- ✧ Prolong duration of action of dopamine

## ✧ Selegiline

- ✧ MAO-B (monoamine oxidase-B) inhibitor
- ✧ Originally thought to slow the loss of nerve cells
- ✧ May delays need for levodopa therapy for 1 year
- ✧ With levodopa, may enhance and prolong its effect
  - Reduce wearing off
- ✧ SE's - Nausea, postural hypotension, insomnia
- ✧ Interaction with Fluoxetine (Lovan, Prozac)
- ✧ Approved in US for treatment of Depression

# MAO-Inhibitors



## ✦ Rasagiline

- ◆ 2<sup>nd</sup> generation irreversible MAO-B inhibitor
- ◆ 10 x more potent than Selegiline
- ◆ Not metabolised to amphetamine derivatives
- ◆ Effective as monotherapy or adjunct therapy
  - Reduces motor fluctuations and “off” time
- ◆ Rapidly absorbed by GIT tract and crossed BBB
  - Well tolerated in elderly
  - 0.5 – 1mg once daily
- ◆ Neuroprotection trials ongoing



# OTHER MEDICATION



## ✧ Amantadine

- ◆ Anti-viral
- ◆ Reduce levodopa induced dyskinesia
- ◆ Effectiveness wears off after a few months
- ◆ SE's – agitation, insomnia, hallucinations

## ✧ Anti-cholinergics – Akineton, Artane, Cogentin

- ◆ Reduce tremor and rigidity in 50%
- ◆ Short-lived improvement
- ◆ SE's – dry mouth, confusion, constipation, hallucinations

# SURGERY



## ✦ Advanced PD

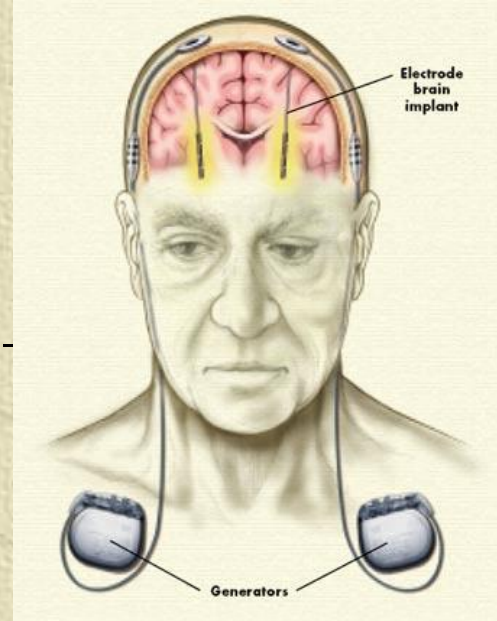
- ◆ levodopa-responsive
- ◆ dyskinesia or disabling 'off' fluctuations despite therapy

## ✦ Earliest surgery

- ◆ Selectively destroying specific parts of the brain
- ◆ **Thalamotomy – VIM nucleus**
  - Improved contralateral tremor
- ◆ **Pallidotomy – posteroventral**
  - Improved contralateral tremor, rigidity, bradykinesia
  - Improved gait and balance
  - Reduced need for levodopa - reducing dyskinesia and dystonia
- ◆ Permanent Complication - dysphasia



# SURGERY



## ✦ Deep brain stimulation

- ◆ Sub-thalamic stimulation by electrodes
- ◆ Reduce tremor, bradykinesia and rigidity
- ◆ Improve symptoms without fluctuations or dyskinesia
- ◆ Reduce need for levodopa and decrease dyskinesia
- ◆ Good response to levodopa = good response to stimulation
- ◆ No effect on speech, posture, balance, freezing or depression
- ◆ Battery life 3 – 5 years – surgically replaced
- ◆ Complications
  - Stroke, ICH, infection
  - Speech and balance problems

# PROGNOSIS

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- ✦ Chronic and progressive disease
- ✦ Some become severely disabled, others only minor
- ✦ Tremor may or may not be the major symptom
- ✦ Each case is individual and progression varies
- ✦ Generally symptoms progress over 20 years
- ✦ Not a fatal disease
- ✦ Does not reduce life expectancy
  - ✦ Late complications such as choking, pneumonia and falls



# PARKINSON'S CLINIC

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## ✧ Multi-disciplinary clinic

- ✧ Cathie - Co-ordinator - 6652 8820

## ✧ Allied Health Assessment – 4 hours

- ✧ Physiotherapist
- ✧ Occupational Therapist
- ✧ Nurse Educator
- ✧ Speech Pathologist and dietician (if required)
- ✧ Psychologist (if required)

## ✧ Neurologist review – 1 hour

- ✧ History, examination, management review

## ✧ Case conference

- ✧ Discuss patient and formulate management plan

# CASE – Mrs SE – Young Onset

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- ✧ 48 yo – registered nurse
- ✧ 6 month history of left sided tremor
  - ✧ Not interfering with function
  - ✧ Medication not commenced
- ✧ Review 9 months later
  - ✧ Dragging left foot when walks
  - ✧ Left sided tremor – difficulty taking manual BP
  - ✧ Sifrol commenced 125mcs bd increasing slowly
- ✧ Walking and tremor improved – Sifrol 500 mcg tds
  - ✧ Able to take manual BP easier
  - ✧ Occasional early morning nausea
  - ✧ Ongoing tremor and increased tone
  - ✧ Increased Sifrol slowly to 1mg tds
  - ✧ Motilium for nausea



# CASE - Mr LO – Tremor dom

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- \* 45 yo
- \* Self employed baker
- \* 12 month history of right hand tremor and stiffness of right leg
  - ◆ Sinemet 100/25 up to 2 tablet tds for 3 months – no improvement
- \* Seen first in May 2006 – commenced Cabaser
  - ◆ Tremor improved by 25% on 4mg daily
- \* Added Artane 2mg tds – SE's drowsiness – ceased after a week
- \* Frustrated with lack of improvement - ceased Cabaser
  - ◆ Tremor worse within a week – recommenced and increased slowly up to 8 mg daily
  - ◆ No further improvement
- \* Sinemet 100/25 added up to 2 tablet tds
  - ◆ No improvement in tremor
- \* Sub-thalamic brain stimulation discussed
- \* Sifrol added and slowly increased to 500 mcg tds
  - ◆ Tremor improved but nausea and drowsiness, increased Sinemet to 100/25 3 tablet tds
  - ◆ Tremor well controlled, experiencing motor fluctuations (wearing off ½ hour)
- \* Changed Sinemet to Stalevo 200/50/200 tds and reduced Sifrol to 250mcg tds

# CASE - Mr RP – Early PD

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- ✧ 60 yo
- ✧ Parkinson's disease Dx Aug 2005
- ✧ Commenced Sinemet 100/25 qid and Cabaser 0.5 mg nocte
- ✧ First reviewed in Aug 2005
  - ◆ Slow, shuffling, slurred speech
  - ◆ Cabaser increased slowly to 2 mg nocte
- ✧ Marked improvement in walking, transfers and bed mobility - 70%
- ✧ Wearing off – Sinemet changed to Stalevo 100mg qid
  - ◆ Improved by once again having difficulty with bed mobility and restless legs
- ✧ Sinemet CR added at night with improvement
- ✧ June 2008 – Cabaser ceased due to reports of valvopathy emerging and suggested Sifrol be commenced by GP, once available of PBS if deteriorates
  - ◆ Marked deterioration – shuffling and freezing but recommenced Cabaser
  - ◆ Despite remaining on Stalevo 100 mg qid and Sinemet CR nocte
- ✧ Sifrol commenced and slowly increased to 500 mcg tds.
  - ◆ Improved, but not as good as Cabaser
  - ◆ Increased further slowly to 1mg tds



# CASE - Mr N McF – Advanced

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- \* 78 yo
- \* Parkinson's disease Dx 1994 – reduced right arm swing and tremor
- \* 9 months later commenced on Sinemet with improvement in symptoms
- \* Permax 500 mcs tds added with improvement
- \* Sinemet CR then added to improve bed mobility
- \* Initial review Jan 2004 – experiencing wearing off
  - ◆ Sinemet CR increased to bd
  - ◆ Echo organised as on Permax
- \* Increased tremor and drowsy
  - ◆ Permax weaned and Sinemet increased to 250/25 qid with improvement
- \* Apathy during the day – reduced Sinemet CR to nocte
  - ◆ Improved level of alertness, but mobility and balance worse
- \* Sifrol added as higher dose of levodopa result in cognitive SE's
  - ◆ 250 mcg tds
  - ◆ Walking better and tremor improved
  - ◆ Tolerating well
  - ◆ Reduced Sinemet 250/25 to tds

# CASE – Mrs EW – Elderly PD

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✧ 83 yo

✧ Parkinson's disease Dx Feb 06

- ✧ Tremor of both hands
- ✧ Gait deterioration
- ✧ Sinemet 100/25 ½ tds helped tremor
  - Full tablet resulted in GIT SE's
- ✧ Changed to Madopar 100/25
  - Tolerated well at 1 tablet tds
  - Improved tremor, handwriting and ability to play bridge
- ✧ Gait slowed – Increased Madopar to slowly 2 tablets
  - No improvement
- ✧ Added Sinemet CR
  - Headaches – ceased after 3 days
- ✧ Added Sifrol 125 mcg bd and reduced Madopar to 1 tablet qid
  - Improved tremor and walking
  - No side effects



# CASE – Mrs NK

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✦ 63 yo

✦ 12 month history of restless legs

- ◆ Painful legs

- ◆ Heaviness in legs

- ◆ Constantly move when gets into bed

✦ Sifrol 250 mcg nocte

- ◆ “in heaven”

# PHYSIOTHERAPY



## ✦ Improve gait patterns and avoid immobilisation

### ✦ Walking

- ◆ Take larger steps and raise toes when stepping forward
- ◆ Feet approx 12 inches apart and stand up straight
- ◆ Swing arms - takes body weight off legs and reduces fatigue
- ◆ Maintain good posture and head control
- ◆ Floor markings - visual cues and encourages stepping
- ◆ Walking over obstacles to encourage weight bearing
- ◆ Music to help regain rhythmic movement
- ◆ Walking aids - tend to carry but rollator frame best



# PHYSIOTHERAPY



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## ✧ Restore normal body alignment

- ✧ Minimise risk of falls
- ✧ Stimulate balance reactions
- ✧ Teach how to regain balance when centre of gravity changed
- ✧ Encourage weight transfer with correct head and trunk movements

## ✧ Reduce increased tone

- ✧ ROM exercises - passive stretching
- ✧ Relaxation with facilitating techniques:
  - Light touching, vibration

# PHYSIOTHERAPY

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## ✧ **Reduced the effects of inactivity**

- ✧ Improve strength and flexibility
- ✧ Maintain muscle tone
- ✧ Prevent bones loss (osteoporosis)
- ✧ Improve independence – improve sense of well being

## ✧ **Release endorphins**

- ✧ Positive effective on brain
- ✧ Increased energy levels
- ✧ Reduce insomnia

## ✧ **Group therapy**

- ✧ Promotes social growth and development



# OCCUPATIONAL THERAPY

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## ✧ Adaptive equipment

- ✧ Elevating chair and bed
- ✧ Rails for the bathtub and toilet
- ✧ Toilet aids - raised toilet and bath seats
- ✧ Feeding - large rimmed plates and plate guards
- ✧ Large comfortable handles
- ✧ Velcro closures on clothes rather than buttons
- ✧ Bed poles and monkey bar

## ✧ Home visit

- ✧ individualise needs



# SPEECH PATHOLOGY

-----  
Hypophonic dysarthria with hesitation and freezing

## ✧ Formal therapy

- ◆ General speech and tongue exercises
- ◆ Provide appropriate communication aids
- ◆ Lee-Silverman voice therapy
- ◆ Ice and stroking under chin (vibration of muscles)
- ◆ Tilt head forward on swallowing

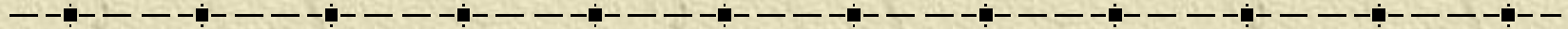
## ✧ Advise on dietary strategies

- ◆ Eat smaller portions more frequently
- ◆ Increase water intake (6-8 /day) to reduce constipation
- ◆ Avoid protein rich food around time of medication



# CONCORD PARKINSON'S DISEASE CLINIC

## INITIAL ASSESSMENT



✱ YEAR OF DIAGNOSIS: \_\_\_\_\_



✱ OTHER PERSONS PRESENT:



✱ Name: \_\_\_\_\_



✱ Relationship: \_\_\_\_\_



✱ Phone: \_\_\_\_\_



✱ MEDICAL PROBLEMS:



✱ MEDICATION:

✱ Type and dosage: \_\_\_\_\_



✱ MANAGEMENT: ☐ dosette ☐ alarm ☐ none ☐ self medicates ☐ carer



✱ RELIABILITY: ☐ always remembers ☐ occasionally forgets ☐ unreliable

✱ ISSUES: \_\_\_\_\_



✱ CLIENT IDENTIFIED PROBLEMS: \_\_\_\_\_

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

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## ✧ SOCIAL SITUATION:

✧ Occupants of house: \_\_\_\_\_

✧ Support network: \_\_\_\_\_

✧ Employment: \_\_\_\_\_

✧ Social activities / recreation / interests / groups: \_\_\_\_\_

✧ Would you be interested in counselling; ☐ yes ☐ no

✧ If yes; ☐ patient ☐ carer ☐ other \_\_\_\_\_

## ✧ COMMUNITY SERVICES:

✧ ☐ Nil ☐ SHNS ☐ Home care ☐ MOW ☐ Shopping bus

✧ ☐ Home respite ☐ Centre respite ☐ Residential respite

✧ ☐ Other: \_\_\_\_\_

✧ PRIVATE SERVICES: ☐ Nil

✧ ☐ Other: \_\_\_\_\_

✧ Services required: ☐ no ☐ yes

✧ If yes, which services \_\_\_\_\_



# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

## ✧ HOME ENVIRONMENT:

✧ *House structure:*    ☐ single    ☐ double    ☐ other \_\_\_\_\_

✧ *House ownership:*    ☐ own    ☐ rented    ☐ DOH

✧ *Comments:* \_\_\_\_\_

## ✧ Access:

✧                      Front: No. of steps: \_\_\_\_\_

Rails:    ☐ yes    ☐ no

✧                      Back: No. of steps: \_\_\_\_\_

Rails:    ☐ yes    ☐ no

✧                      Inside: No. of steps: \_\_\_\_\_

Rails:    ☐ yes    ☐ no

✧ *Comments:* \_\_\_\_\_

## ✧ Home visit:

✧ Home assessment previously performed?    ☐ yes    ☐ no

✧ Year \_\_\_\_\_ Provider \_\_\_\_\_

✧ Home assessment required?    ☐ yes    ☐ no    ☐ maybe

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

## ✧ MOBILITY:

✧ *Gait Aids:*    ☐ Nil    ☐ W /C    ☐ W / S    ☐ PUF    ☐ Wheeled frame

✧ ☐ Independent    ☐ Standby supervision    ☐ Assistance

✧ *Posture:*    ☐ Unimpaired    ☐ Impaired

✧ *Falls:*    ☐ no    ☐ yes    Number of falls in the last 3 months: \_\_\_\_\_

✧ Location: \_\_\_\_\_

✧ Activity: \_\_\_\_\_

## ✧ *Exercise Tolerance:*

✧ Outdoors: (distance in metres or time)

✧ \_\_\_\_\_

✧ Frequency of outdoor mobility: (e.g. daily, weekly etc)

✧ \_\_\_\_\_

✧ Limiting factors: (eg SOB, fatigue, freezing, pain, dystonic posture, dyskinetic movements)

✧ \_\_\_\_\_

✧ Gait assessment required:    ☐ yes    ☐ no    ☐ maybe

✧ **Gait assessment performed:**    ☐ yes    ☐ no    **Details:** \_\_\_\_\_



# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

## ✧ ACTIVITIES OF DAILY LIVING:

### ✧ Personal.

✧ **Eating:** ☐ Independent ☐ Independent/equipment ☐ Supervision ☐ Assistance ☐ Dependent

✧ **Toileting:** ☐ Independent ☐ Independent/equipment ☐ Supervision ☐ Assistance ☐ Dependent

✧ **Grabrails:** ☐ yes ☐ no **Nightlight:** ☐ yes ☐ no

✧ **Voiding pattern day and night:** \_\_\_\_\_

✧ **Bathing:** ☐ Independent ☐ Independent/equipment ☐ Supervision ☐ Assistance ☐ Dependent

✧ **Grabrails:** ☐ yes ☐ no

✧ **Dressing:** ☐ Independent ☐ Independent/equipment ☐ Supervision ☐ Assistance ☐ Dependent

✧ **Bed mobility:** ☐ Independent ☐ Independent/equipment ☐ Supervision ☐ Assistance ☐ Dependent

✧ **Handwriting:** Problems: ☐ no ☐ yes **Hand Dominance:** ☐ R ☐ L

✧ **Comment:** \_\_\_\_\_

✧ **Sample Client Name:** \_\_\_\_\_ **Sample Client Signature** \_\_\_\_\_

### ✧ Instrumental.

✧ **Cooking:** ☐ client ☐ carer ☐ shared duties

✧ **Cleaning:** ☐ client ☐ carer ☐ shared duties

✧ **Shopping:** ☐ client ☐ carer ☐ shared duties

✧ **Financial:** ☐ client ☐ carer ☐ shared duties

✧ **Laundry:** ☐ client ☐ carer ☐ shared duties

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

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## ✧ NUTRITION SCREEN:



✧ Obvious underweight or frailty ? ☐ Yes ☐ No

✧ Have you unintentionally lost weight ? ☐ Yes ☐ No

✧ **If yes to either above questions – refer to Dietitian.**

✧ Form provided: “Unplanned weight loss” ☐ Yes ☐ No

✧ Has food intake declined over past 3 months ? ☐ Yes ☐ No

✧ If yes, is this due to:

✧ ☐ loss of appetite

✧ ☐ digestive problems eg: reflux, nausea

✧ ☐ chewing difficulties

✧ ☐ swallowing difficulties

✧ ☐ difficulties with feeding self/ fatigue

✧ **If yes to any of above – refer to Dietitian**



# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

✧ Protein-levodopa interaction:

✧ Do you experience unpredictable “on-off”\* fluctuations in movements ?  
\*(“on” – improvement in PD symptoms, eg: less tremor/rigidity;  
“off” – return of PD symptoms, eg: bradykinesia)

☐ Yes ☐ No

**If yes – refer to Dietitian.**

✧ Do you experience constipation once a week or more?

☐ Yes ☐ No

✧ **Form provided: “Parkinson’s disease & constipation”**

☐ Yes ☐ No

✧ **Dietitian assessment required ?**

☐ Yes ☐ No

✧ Forms provided:

✧ “Good Nutrition and Parkinson’s disease”

☐ Yes ☐ No

✧ “Reflux and Parkinson’s disease”

☐ Yes ☐ No

✧ BMI **weight (kg) / height (m2)**

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

## ✧ SWALLOWING AND COMMUNICATION:

✧ *Since having Parkinson's Disease – Have you ever:*

✧ Had any chest infections or pneumonia ? ☐ yes ☐ no

✧ Had any problems when swallowing food, drinks or tablets ? ☐ yes ☐ no  
(eg coughing, choking, food sticking, pain, reflux, extra effort, increased time)

✧ Had any problems with saliva ? (eg too much drooling or dry mouth) ☐ yes ☐ no

✧ Had any problems chewing or holding food in your mouth ? ☐ yes ☐ no

✧ Comment: \_\_\_\_\_

✧ **If answer is yes to any question – score 1.** Score = \_\_\_\_\_

✧ Had a change in your voice volume ? ☐ yes ☐ no

✧ Had a change in the clarity, fluency or rate of your speech ? ☐ yes ☐ no

✧ Noticed that others have difficulty hearing or understanding you ? ☐ yes ☐ no

✧ Had any problems remembering words, making up sentences or understanding others ? ☐ yes ☐ no

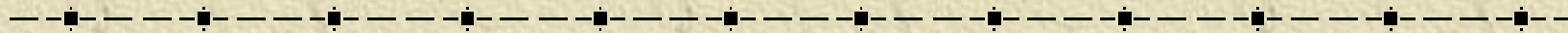
✧ **If answer is yes to any question – score 2.** Score = \_\_\_\_\_

✧ If patient scores 1 or 2 please refer to speech pathologist.

✧ Speech Pathology assessment required ? ☐ yes ☐ no



# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT



✧ Forms given to client / carer:

✧ “Ways You Can Compensate for Swallowing Difficulties” ☐ yes ☐ no

✧ Tips for Parkinson’s Disease – Swallowing Medications ☐ yes ☐ no

✧ Dry Mouth ☐ yes ☐ no

✧ Excess Saliva ☐ yes ☐ no

✧ Voice Volume ☐ yes ☐ no

✧ Unclear Speech ☐ yes ☐ no

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

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## ✧ COGNITION:

✧ **NB:** *This information should be collected from a secondary source e.g. carer / partner.*

✧ Previous cognitive assessment:    ☐ no    ☐ yes

✧ By whom? \_\_\_\_\_ When? \_\_\_\_\_ Where? \_\_\_\_\_

✧ Has this client been experiencing any changes in memory (e.g. not knowing where they are, forgetting recent events, names of people; misplacing objects; leaving appliances on such as the stove)?

✧ ☐ no    ☐ yes    If yes, please specify: \_\_\_\_\_

✧ Has this client been experiencing any changes in his / her thinking (e.g. difficulty organising things to do; taking longer to think things through; difficulty understanding someone else's point of view; difficulty acknowledging own difficulty; persisting on one topic)?

✧ ☐ no    ☐ yes    If yes please specify: \_\_\_\_\_



# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

✱ a) Driving: ☐ yes ☐ no (If no please go to g ).

✱ b) Manual / Automatic car \_\_\_\_\_

✱ c) Renewal date of licence \_\_\_\_\_

✱ d) Aware of current RTA legislation? ☐ yes ☐ no ☐ n/a

✱ e) Informed in this session: ☐ yes ☐ no ☐ n/a

✱ f) Driving restriction: Self / RTA ☐ yes ☐ no ☐ n/a

✱ g) Carer drives: ☐ yes ☐ no

✱ Public transport: ☐ yes ☐ no

✱ Independent: ☐ yes ☐ no

✱ Comments: \_\_\_\_\_

✱ Disabled parking permit: ☐ yes ☐ no Forms provided: ☐ yes ☐ no ☐ n/a

✱ ½ price taxi: ☐ yes ☐ no ☐ n/a Forms provided: ☐ yes ☐ no ☐ n/a

✱ PARKINSON'S AUSTRALIA:

✱ Member: ☐ yes ☐ no

✱ Membership package provided: ☐ yes ☐ no ☐ n/a

# CONCORD PARKINSON'S DISEASE CLINIC INITIAL ASSESSMENT

✧ PARKINSON'S DISEASE MOVEMENT DISORDERS:

✧ PROBLEMS WITH:

✧ **Movements**

✧ **Present at any time of day**

✧ **Impedes function to unacceptable level**

✧ Dyskinesia ☐ Y ☐ N

✧ Tremor ☐ Y ☐ N

✧ Dystonia ☐ Y ☐ N

✧ Rigidity ☐ Y ☐ N

✧ "On – off" periods ☐ Y ☐ N

✧ **SUMMARY:**

✧ **IDENTIFIED ISSUES:** \_\_\_\_\_

✧ **INTERVENTIONS:** \_\_\_\_\_