Comprehensive Parkinson’s Care – A new approach to an old problem

Joyce Lee MD and Greta Mah RPh
NYGH Parkinson’s Program
Disclosures

• Dr. Lee has received honoraria from Pfizer for medical education

• Greta Mah – received honoraria from Coalition of Pharmacists Caring for Aging Canadian and Pear Healthcare Solutions Inc.
Outline

• Epidemiology & Health care utilization of Parkinson’s Disease (PD)
• Complexity of PD with a case scenario
• Exploration of Comprehensive Parkinson’s Care
• Success in hospitalization prevention
Epidemiology of Parkinson’s Disease

- 82% of persons with Parkinsonism are ≥ 65 y.o. in Ontario
- Central LHIN – 0.5% of population (1.65M) = 7500
- Fastest growing neurological disease > Alzheimer’s
- 2011 – 85,200 people with PD in Canada
- Number will double by 2031

JAMA Neurol 2018:75(1):9-10
Health Care Costs of Parkinson’s Disease in Canada

- Health care system cost per year for one patient with PD at 85 years or older = $21695/year
- 31.1% is hospital care cost

Brain Disorders in Ontario Report 2015
PD and Hospitalization

~ 3400 people with PD - 1 out of 3 patients had a hospital encounter

→ 50% readmission

*Parkinsonism Relat Disord.* 2013 Nov;19(11):949-54
Hospitalization and PD

- Longer length of stay
- Main reasons for hospitalization:
  - Psychosis/PD Dementia
  - Non motor symptoms of PD – dizziness and falls, constipation, bladder symptoms, depression/anxiety
  - Motor complications
  - Infection (UTI, Asp. Pneumonia)

Gerlach 2011
Risk factors for readmission

- Older age
- Higher number of medications
- Higher number of comorbidities
- High caregiver stress

Caregiver burden increases hospitalization

- 40% of caregivers reported their health and social life had suffered, almost half had depression. (Schrag et al. 2006)
- Caregiver-burden increased as patients suffered with increasing disability & PD symptoms, particularly with:

  - Falls
  - Depression
  - Confusion & Dementia
  - Psychosis
Pathophysiology of Idiopathic PD

Progressive degeneration of Dopaminergic neurons in Substantia Nigra

Motor Symptoms

Early

- Tremor
- Rigidity
- A-/Brady-kinesia

Moderate

- Shuffling Gait
- Postural imbalance

Advanced

- Freezing of Gait
- Falls
Freezing of Gait
Medications for Motor Symptoms

1. Levodopa becomes dopamine in the brain
2. COMT inhibitor – Entacapone prolongs levodopa benefit
   (Entacapone + Levodopa = Stalevo)
3. MAO-B inhibitors – Rasagiline prolongs dopamine benefit
4. Dopamine Agonists – Pramipexole, Ropinirole, Rotigotine patch - mimic dopamine (not initiated for older patients)
5. Anticholinergics - Trihexyphenidyl, Benztropine for tremor only (rarely used)
6. Amantadine for dyskinesia (involuntary movement)
Complex disease

- Motor
  - Bradykinesia
  - Rigidity
  - Postural instability
  - Tremor

- Non-motor
  - Cognition
  - Personality
  - Pain
  - Fatigue
  - Sensoric
  - Continence
  - Sleep
  - Sexual
  - Behavioral

Langston, Ann Neurol, 2006
Depression/Anxiety
Constipation
REM disorder (Scream/kick when dreaming)

Pain
Soft/unclear speech
Frequent Urination
Dizziness + Low BP

PD Non-motor symptoms
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Yes (Y)</th>
<th>No (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Difficulty swallowing food or drink or problems with choking</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Vomiting or feelings of sickness (nausea)</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Soft voice and unclear speech</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Constipation (bowel movement every 2-3 days) or having to strain</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Bowel (fecal) incontinence</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>A sense of urgency to pass urine makes you rush to the toilet</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Getting up regularly at night to pass urine</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Feeling light headed, dizzy or weak standing from sitting or lying</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Excessive sweating</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Pain</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Seeing or hearing things that you are told are not real.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Problems remembering things that have happened recently or forgetting to do things</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Loss of interest in what is happening around you or in doing things</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Difficulty concentrating or staying focussed</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Feeling sad, 'low' or 'blue'</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Feeling anxious, frightened or panicky</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Finding it difficult to stay awake during activities such as working, driving or eating</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Difficulty getting to sleep at night or staying asleep at night</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Intense, vivid dreams or frightening dreams</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Talking or moving about in your sleep as if you are 'acting' out a dream</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Unpleasant sensations in your legs at night or while resting that you need to move</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Swelling of your legs</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Falling</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Recent ER visit or hospital admission</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>
Comprehensive Parkinson’s Assessment

Motor:
1. TRAP
2. Motor fluctuations/complications
3. Falls risk and osteoporosis

Neuropsychiatric:
1. Depression/Anxiety
2. Psychosis/dementia
3. Sleep disorders

Autonomic:
1. Constipation, GERD
2. Orthostatic Hypotension
3. Urinary incontinence, OAB
4. Pain syndromes
5. Dysphagia/drooling
Each patient may experience different non-motor symptoms at different stages.

Treatment has to be individualized!
Jay had recurrent unexplained falls

- 72 yr old retired artist, lives with wife
- PD for 5 years
- Multiple unexplained falls – 5 falls in 1 month, went to ED 3 times
- C/O postural dizziness, blurred vision, difficulty in concentrating/thinking
- Falls usually in “on” state
- BP stand: 72/56 P – 67
Orthostatic Hypotension (OH) =
after standing: drop in SBP >20 mm Hg, DBP >10 mmHg within 3 min.
Medication induced hypotension

- Alcohol
- Alpha-blockers for BPH (i.e. Flomax)
- Antiparkinson (i.e. Levodopa, ropinirole, pramipexole, rasagiline)
- Antihypertensives (i.e. Beta blockers, nitrates, diuretics)
- Antidepressants (TCAs ie. amitriptyline, )
- Antipsychotics (i.e. Quetiapine, haloperidol)
- SGLT-2 inhibitors (i.e. Dapagliflozin) (new diabetes medication)
Symptoms of Orthostatic Hypotension (OH) due to Autonomic Dysfunction

- Positional and post-prandial symptoms:
  - Syncope (black-outs), presyncope, recurrent unexplained falls, headache, blurred vision,
- Lack of “normal” compensatory autonomic response to hypotension – no HR increase
- Often coexists with other dysautonomia
- Tx Goals:
  - reduce symptoms, prevent falls, improve function
Non-Pharmacological Management

- **Patient Education:**
  - Identify triggers - big meals, defecation (forceful), dehydration, heat
  - Symptoms and monitoring postural BP

- **↑ Blood volume:**
  - Fluid intake – 5-8 eight ounce glasses/day
  - Salt 2g tid if no CV contraindication (V8/broth/sodium tabs)

- **↓ Venous pooling:**
  - Elevate legs, compression stockings, abd. binder

- Raise head of the bed by 4 inches to ↓ nocturia & supine HT.

Pharmacological Management of OH

1. **Midodrine (vasoconstrictor)**
   
   2.5 - 10 mg tid (q3-4h, 1st dose before rising in AM)
   
   Avoid lying down within 4 hrs or late evening dose to prevent supine hypertension.

2. **Fludrocortisone (vol. expansion)**

   0.05 mg – 0.2 mg OD

   Contraindicated in CHF/CRF; monitor lytes & edema

   * If supine hypertension, may need a small dose of captopril/NTP (short-acting antihypertensive drug) qhs.
Management of OH

3. Pyridostigmine 30-60mg tid or Mestinon Timespan 180mg SR OD
– modest vasoconstrictor effect especially during standing, not cause supine hypertension
SE: diarrhea, abdominal colic, nausea, sialorrhea
- Rasagiline 1mg daily
- Stalevo 100 qid @7,12,17,22
- Sinemet CR 100/25 qhs
- Tamsulosin CR 0.8mg daily
  (↓to 0.4mg)
- May reduce rasagiline to 0.5 mg daily before adding Midodrine 2.5mg to 5 mg @7 & 11, 3pm

- Pantoprazole 40mg daily prn
- Tylenol ES 1-2 tid prn
- Rosuvastatin 5mg daily
- Vitamin D 1000iu daily
- Dutasteride 0.5mg daily
Early
Tremor, Muscle Stiffness, Slow Movement, Rigidity, Akinesia

Moderate
Shuffling Gait, ↓Balance & Falls, Postural Instability

Advanced
Freezing of Gait

Depression/Anxiety
Constipation
soft/unclear speech
Scream/kick when dreaming

Pain
Frequent Urination
Dizziness + Low BP

Depression
Anxiety
Psychosis
Dementia
Sleep problems
Dysphagia
Pneumonia
Jay’s minor and benign hallucinations became disturbing and scary over time. While trying to run out of house, had gait freezing and fell down.

Five years later, Jay was admitted to hospital.
Psychosis – caregiver’s story
Approach to PD Psychosis

1. Rule out potential causes of delirium:
   - acute illness/infection, constipation/fecal impaction, urinary retention, metabolic, drugs, head injury, etc.

2. Detailed medication review – can any medication be contributing to psychosis?

3. Detailed history and assessment re: PD dementia?
PD Medication Review Approach

- Minimize common culprits – anticholinergics, BZ, etc.
- Since all PD medications can potentially worsen psychosis, decrease/stop those with greater potential for worsening psychosis first, balancing with motor symptoms
  - Stop anticholinergics, taper down Amantadine
  - Taper down Dopamine Agonists
  - ↓ or stop Rasagiline / Selegiline or Entacapone
  - ↓ Levodopa very gradually (LAST RESORT)
- Monitor for worsening of motor symptoms!
Parkinson’s Disease Dementia (PDD)

- Always assess for PDD in PD psychosis - underdiagnosed
- First line: CI’s (Donepezil and Rivastigmine)
- Judicious use: antipsychotic
  - Prolong QT
  - Increase risk of stroke, death
  - Constip, hypotension, falls

Cummings JL. J Geriatr Psych Neurol 1988;1:24-36
Avoid medications which may worsen PD:

<table>
<thead>
<tr>
<th>AVOID:</th>
<th>Safer alternatives (not worsen parkinsonism):</th>
</tr>
</thead>
<tbody>
<tr>
<td>haloperidol, perphenazine,</td>
<td>- Quetiapine (1st choice)</td>
</tr>
<tr>
<td>fluphenazine, thioridazine,</td>
<td>- Clozapine (routine CBC - agranulocytosis 0.38% )</td>
</tr>
<tr>
<td>trifluoperazine, loxapine,</td>
<td></td>
</tr>
<tr>
<td>pimozide, risperidone,</td>
<td></td>
</tr>
<tr>
<td>olanzapine, aripiprazole,</td>
<td></td>
</tr>
<tr>
<td>ziprasidone</td>
<td></td>
</tr>
</tbody>
</table>
Jay - PD Psychosis and Dementia
MoCA: 17/30
(executive, visual spatial, fluctuations, attention >> memory)

1. Rasagiline 0.5 mg daily
   D/C Rasagiline
2. Stalevo 100 qid @7,12,17,22
   D/C Entacapone by switching gradually back to L-Dopa
3. Sinemet CR 100/25 qhs
4. Quetiapine 6.25-12.5 mg bid prn
5. Donepezil 5 mg daily or Rivastigmine 1.5 mg bid

- Pantoprazole 40 mg daily prn
- Tylenol ES 1-2 tid prn
- Rosuvastatin 5 mg daily
- Vitamin D 1000 iu daily
- Dutasteride 0.5 mg daily
- Tamsulosin CR 0.4 mg hs
- Midodrine 5 mg @ 7 & 11 am
  2.5 mg @ 3 pm
Consequences of Hospitalization in PD patients

High rates of complications due to:

- Poor adherence to PD medication schedule
- Use of contraindicated drugs (like Haldol)
- Immobilization
- Acute confusion, psychosis, delirium

Older patients (mean age = 78) with PD vs. non-PD:

- Longer LOS
- More functional decline
- Higher admission to LTC after hospitalization  (Woodford 2005)

Currently NO hospital PD management guidelines
Is it time to rethink of PD in the elderly as a Geriatric Syndrome?

Shared Risk Factors
- Increased age
- Cognitive impairment
- Functional impairment
- Impaired mobility

Geriatric Syndromes
- Incontinence
- Falls
- Pressure Ulcers
- Delirium
- Functional decline

Frailty

Poor Outcomes
- Dependence
- Disability
- Institutionalization
- Death

Bates Guide to Physical Exam and History Taking – Chapter 20
Inouye et al. JAGS 2007
PD = an Old Disease but new Geriatric Syndrome

Motor
(Falls, Functional decline)

Non-motor
(cognitive decline, depression, hypotension, UI, functional decline)

Comorbidities

Polypharmacy – drug-drug, drug-disease interactions and adverse effects
Parkinson’s disease (PD) in the elderly: An example of geriatric syndrome (GS)?

Fulvio Lauretani a,*, Marcello Maggio b, Claudio Silvestrini a, Anna Nardelli a, Marsilio Saccavini c, Gian Paolo Ceda b

a Geriatric Unit and Laboratory of Movement Analysis, Geriatric and Rehabilitation Department, University Hospital of Parma, Via Gramsci 14, I-431126 Parma, Italy
b Clinical Geriatrics, Geriatric-Rehabilitation Department, University of Parma, Via Gramsci 14, I-431126 Parma, Italy
c Rehabilitative Medicine, Rehabilitation Department, ULSS n° 9, Borgo Cavalli 42, I-31100 Treviso, Italy
Advanced PD = a Geriatric Syndrome, needing geriatrics management

“Management of PD in elderly patients is made more challenging by the common occurrence of co-morbidity, both physical and psychiatric. 

.. Associated polypharmacy increases the potential for drug interactions and adverse effects.”

(Source: British Geriatrics Society Website)
Advanced PD = a Geriatrics Syndrome, needing geriatrics management

British Geriatrics Society recommends:

- A full medical assessment by specialists in Geriatric Medicine
- Comprehensive service providing outpatient clinics, Geriatric Day Hospital, inpatient assessment / rehabilitation and long term care is required
- PD Academy was founded in 2002 and has run 9 formal Masterclasses for geriatricians...

(Source: British Geriatrics Society Good Practice Guidelines – Parkinson’s Disease 2007)

NICE 2017 Guidelines:

- Specialists providing care for PD include geriatricians and neurologists, supported by interprofessional team
Canadian Guidelines on PD 2012

PD care should be comprehensive, holistic, supported by an inter-professional team, with a key clinician point of contact to support patients and caregivers.
Current “Usual Care” for Advanced PD in Canada

1. Specialists working in silos – fragmented care
2. Often lack of holistic, interprofessional team approach
3. Caregiver does not know who to call in case of problem → increased caregiver stress
Comprehensive Parkinson’s Care at North York General Hospital

- Geriatrics Clinic for Parkinson’s – since 2007
- Fanny Bernstein Living Well with Parkinson’s Exercise and Education Program
- Geriatrics Day Hospital
Inter-professional Parkinson’s Care Team

- Geri MD
- PT
- OT
- MD
- RN
- RD
- SLP
- SW
- RPh

Patient + Caregiver

Geri Day Hosp / FB - LWWP

Geriatrics Clinic for PD
Combining skills for Parkinson’s disease

People with Parkinson’s disease (PD) often have difficulty taking their medications properly. The risk of adverse effects is high due to declined cognition, fear of side effects, complicated dosing schedules and frequent denial of their diagnosis. This, in turn, can result in greater disability, caregiver stress and hospital admissions. To address the needs of this complex patient population, a team of healthcare professionals at North York General Hospital Seniors’ Health Centre has developed a specialized program that profoundly improves the lives of people with PD.

The team includes a physician, neurologist, pharmacist, physiotherapist, social worker, occupational therapist, speech language pathologist, dietitian, recreational therapist, and various support staff. The program integrates multimodal approaches, including medication management, cognitive training, exercise, and support groups, to provide a comprehensive, individualized care plan for each patient.

This collaboration between caregivers and patients empowers individuals with PD to manage their condition more effectively, improving their quality of life and reducing the burden on healthcare systems.
Fanny Bernstein
Living Well with Parkinson’s Program

For early stage of PD

Provides:

• One time individual consultation by pharmacist/PT
• 8 weekly group education & exercise program
Fanny Bernstein Living Well with PD

Empower patient & caregiver to:
• recognize PD symptoms, understand treatment & communicate better with MD
• develop positive attitude to live well with PD

Provides patients with:
• movement strategies
• therapeutic exercise
Geriatric Day Hospital for more advanced PD

10 wk program for:
• gait & balance training
• Med management & improve function/ADLs
• support for patient & caregiver
Geriatrics Clinic for Parkinson’s

- Since inception in 2007, over 1000 patients served
- Comprehensive assessment and management of PD + telephone intervention service M-F
- Certified Geriatric Pharmacist with NPF certification
- COE physician with training in PD (6 years training at TWH Movement Disorders Centre)
Can Comprehensive Parkinson’s Care prevent hospitalization for older patients with PD?
ED Visit Prevention through Clinician Case Management in a Comprehensive Geriatrics Clinic for Parkinson’s

Objectives:
(1) whether pharmacist-administered telephone intervention (with physician support) averts ED visits
(2) reasons for calls
(3) user satisfaction

Method:
• Prospective Observational study - all calls received in 2016
• Designated as “Crisis calls” when callers indicated intention to visit ED if issues were not resolved.
• Pharmacist follow up within 1 week
• Research assistant administered anonymous satisfaction survey
Patient Characteristics

337 calls were received re: 114 patients
81% calls from caregivers

Male : Female 58% : 42%

Avg Age 80 (61-95)

# of Medical Co-morbidities 9 (2-19)
(50% dementia, 61% anxiety/depression)

Avg UPDRS (Part III) 34/108

Avg Duration of PD (Years) 9 (1-29)
82 of 337 calls with intention to visit ED - “crisis calls”
Reasons for “Crisis Calls”

- **Non-Motor Symptoms**:
  - Psychosis
  - Orthostatic hypotension
  - Anxiety/Depression
  - Pain
  - Constipation

- **Adverse Drug Effects** (24 Calls or 29.3%)
- **Drug Interactions** (3 Calls or 3.7%)
- **Drug Information** (1 Call or 1.2%)
- **Urgent Referrals** (3 Calls or 3.7%)
- **Motor Fluctuations** (15 Calls or 18.3%)
- **Non-Motor Symptoms** (36 Calls or 43.9%)
Timely telephone intervention by the Geriatrics Clinic for Parkinson’s is effective in ED visit prevention for frail elderly patients with PD.

- **ED Visits & Admission**: 7%
- **Potential ED visits AVERTED**: 93%
- Anonymous survey – 97% satisfaction, 92% high confidence
Key Success Factors of Our Model

• **Comprehensive approach to management of non-motor and motor symptoms of PD**

• **COE/Geriatrics MD competence in management of PD and multi-morbidities in frail elderly**

• **Clinician Driven Case Management** – Certified Geriatrics Pharmacist has core expertise in PD and polypharmacy in elderly

• **Strong therapeutic relationship with patients/caregivers who know to “Call us first”**
Summary

• PD in elderly - complex Geriatric Syndrome
• Comprehensive PD Care with Clinician Case Management
  93% of potential ED visits/hospitalizations prevented in a frail, elderly PD population
• Program Implementation:
  Training:
    • Geriatricians and COEs in PD care
    • Elder Care Pharmacist or Nurse in PD care
    • Geriatric Day Hospital and Parkinson’s Education teams to support care
• Funding and Commitment
Resources


To reach us...


---

**Specialized Geriatric Services**

The community North York General Hospital serves has one of the highest percentages of older adults in the country. Our Specialized Geriatric Services help older adults maintain their sense of dignity and independence through improved health and quality of life.

---

**Geriatric clinics and services**

We offer many services for seniors with medical or mental health problems that threaten their independence or the ability to live at home. Our services include:

- Acute Care for the Elderly Clinic (ACE)
- Chronic Disease Self-Management Program (CDSM)
- Geriatric Day Hospital
- Geriatric Medicine and Psychiatry Outreach Home Visit
- Geriatric Medicine and Psychiatry Outpatient Clinics
- Memory Clinic
- Osteoporosis and Fracture Prevention Clinic
- Parkinson's Clinic
- The Fanny Bernstein Living Well with Parkinson's Program

Watch our six-video series Seniors' Care at NYGH.