Nocturnal Problems in PD

Dr Doug MacMahon
Consultant Physician, Royal Cornwall Hospitals NHS Trust
Member NICE Guideline Development Group
‘From ghoulies and ghosties,
long legged(t)y beasties,
and things that go bump in the night,
Good Lord deliver us’

Variously ascribed:

*Traditional Scottish;*
*Cornish Peasants litany c 1550*
Overview

- Control of wakefulness and sleep
- Sleep in Older Adults – effects of Age
- Nocturnal Problems in PD
- Assessment & Management
- RLS
- Sleep Hygiene
- EDS
‘Sleep Attacks’ 1999

Falling asleep at the wheel: motor vehicle mishaps in persons taking pramipexole and ropinirole

‘The authors report a new side effect of the dopamine agonists pramipexole and ropinirole: sudden irresistible attacks of sleep. Eight PD patients taking pramipexole and one taking ropinirole fell asleep while driving, causing accidents. Five experienced no warning before falling asleep. The attacks ceased when the drugs were stopped.

Neurologists who prescribe these drugs and patients who take them should be aware of this possible side effect’
Thank you, Dr Frucht!

- Few Patients
- Telephone Interviews
- Insurance Ramifications
- DVLA vs EMEA; MCA
- Survivors of sleep-at-the-wheel accidents usually deny having nodded off. Although the driver’s fear of prosecution and loss of insurance indemnity could be the reason……

- John Schneerson; Adrian Williams

http://www.lboro.ac.uk/departments/hu/groups/sleep/arrive.htm
Nocturnal Falls
90 yr retired, married, ‘mechanical fall at 0400’

TDQ:
Defending wife by attacking rapist at the end of the bed
AN ESSAY ON THE SHAKING PALSY
James Parkinson 1817

...adopt unwillingly a running pace. In some cases it is found necessary entirely to substitute running for walking; since otherwise the patient, on proceeding only a very few paces, would inevitably fall.

In this stage, the sleep becomes much disturbed. The tremulous motion of the limbs occur during sleep, and augment until they awaken the patient, and frequently with much agitation and alarm.
The need of change of position at night is principally exhibited at night ... half an hour has scarcely elapsed until they require to be turned again and, if not gratified, they give vent to moans which testify to the unease they experience.

Charcot 1877
Training in Sleep Medicine

- Undergraduate
  - Median ‘a couple of minutes’

- Postgraduate?
  - ‘no formal training structure’

[Currie A, Peile E, Hanning C. BMJ 5 Feb 2005]
Prevalence of Sleep Problems in the general population

- Insomnia: 25-50% at some time
- RLS: 2-20%
- Depression: 10% (major) 50% minor
- Anxiety: 10% +
- Narcolepsy: ?1%
- Prostatism/Frequency/Nocturnal polyuria??
- REM BD: ‘rare’ ? 0.5% yet........
Shifting to and from Daylight Saving Time and Incidence of Myocardial Infarction

To the Editor: More than 1.5 billion men and women are exposed to the transitions involved in daylight saving time: turning clocks forward and backward. This time change occurs simultaneously in most of the world, and the effects may be more apparent than often realized. Evidence has been presented that the spring transition is associated with a substantial increase in the incidence of myocardial infarction. This increase is particularly pronounced on the first day after the clock change, and it appears to be greatest during the summer season. Conversely, during the autumn transition, the incidence is increased on the day after the clock change, and it is greatest during the winter season. These findings suggest that the abrupt change in body clocks may play a role in the increased incidence of myocardial infarction. The implications of these findings are significant, as they may help to explain the seasonal variation in the incidence of myocardial infarction and provide insights into the prevention of this devastating disease.
Daylight Saving – ‘Fall Backwards’

‘Better Sleep Council Canada Research’

- Given the choice, overall:
  - 44% would choose extra sleep
  - 44% would choose more sex

- Women - 55% opt for sleep versus 32% for more sex
- Men - 31% more sleep 57% prefer more sex

Significant sleep problems commonly reported in PD:

76 - 86% of clinic patients (cf ~ 40% diabetes)
60% of community population
>15% have excessive daytime sleepiness (EDS) (cf ~5% controls)
15% report repeated episodes of nocturnal violence

“It is possible to explain almost any sleep event in the parkinsonian patient in more than one way with little to indicate which, if any, explanation is correct ”
Nausieda 1993
Interventions for people with PD

**Diagnosis & early disease**

Refer untreated to a specialist who makes and reviews diagnosis:
- using UK PD brain bank criteria
- consider 123 I-FP-CIT SPECT
- specialist should review diagnosis at regular intervals (6-12 months)

**Throughout disease**

Consider management of non-motor symptoms in particular:
- dementia
- psychosis
- depression
- sleep disorders

Provide regular access to specialist care particularly for:
- clinical monitoring and medication adjustment
- a continuing point of contact for support, including home visits when needed
- these may be provided by a PD nurse specialist

Consider access to rehabilitation therapies, particularly to:
- maintain independence, including activities of daily living and ensure home safety
- help balance, flexibility, gait, movement initiation
- enhance aerobic activity
- assess and manage communication and swallowing

**Later disease**

It is not possible to identify a universal first choice drug therapy for people with later PD. The choice of drug prescribed should take into account:
- clinical and lifestyle characteristics
- patient preference

Consider apomorphine in those with severe motor complications unresponsive to oral medication:
- intermittent injections to reduce refractory on-offs
- continuous subcutaneous infusion to reduce off time and dyskinesia

Consider surgery:
- bilateral STN stimulation for suitable people refractory to best medical therapy
- thalamic stimulation for people with severe tremor who are not suitable for STN stimulation

**Collaborative care decisions reached by taking into account:**
- patient preference and choice after provision of information
- clinical characteristics, patient lifestyle and interventions available

**Provide communication and information about:**
- PD services and entitlements
- falls, palliative care and end-of-life issues

Published June 2006
Sleep stages

- 2 basic forms of sleep: slow wave sleep (SWS = Non-REM) and rapid eye movement (REM) sleep (= "paradoxical sleep")
- Infants: 50% of their sleep time in REM; 50% in SWS
- Adults: 20% REM; 80% SWS
- Elderly people: <15% sleep time in REM sleep
Typical Hypnogram of Young Adult

Time (hours through night)
EEG (central)

EEG (occipital)

OCCULOGRAM

CHIN EMG

PHYSIOLOGICAL CORRELATES OF SLEEP STAGES

waking

stage 1 ~5% total sleep

stage 2 50%

stage 3 15%

stage 4 10%

REM sleep 20%

100 µV

1sec
Effect of Age on REM sleep

Stages 3 and 4 in the first sleep cycle shorten in older people, so older people get less total deep sleep.

REM sleep drops off during adolescence and young adulthood, and decreases further in older age.

Older people commonly enter REM sleep quicker and stay there longer in the first REM stage.
Control of wakefulness and sleep

- Regulated by neuroanatomical, neurochemical and circadian systems,
- but
- No single brain centre is responsible for the whole sleep-wake cycle

'Being awake' involves two, parallel pathways that activate the cortex:

- **brainstem** - the classical reticular activating system (RAS);
- **hypothalamic** projections that incorporates the sleep-wake 'switch'.

3 distinct hypothalamic structures

- the ventrolateral preoptic (VLPO) area - **sleep-promoting**
- tuberomamillary (TMN) nucleus - **wake-promoting**
- suprachiasmatic (SCN) nuclei - 'internal clock' regulating circadian rhythm

A Bi-stable feedback loop. Saper et al
Mediated via Hypocretin / Orexin
Sleep Problems in PD


- Insomnias
  - Initial insomnia
  - Sleep maintenance (fragmentation)

- Parasomnias (NonREM, REM, Non phase dependant)
  - Vivid dreams, nightmares, night terrors, vocalizations, nocturnal hallucinosis, sleep talking, somnambulism, panic attacks, REM sleep behaviour disorder.

- Excessive daytime sleepiness
- Drug Induced

<table>
<thead>
<tr>
<th>Study</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausieda et al, 1982</td>
<td></td>
<td>74%</td>
</tr>
<tr>
<td>Lees et al, 1988</td>
<td></td>
<td>98%</td>
</tr>
<tr>
<td>Factor et al, 1990</td>
<td></td>
<td>89%</td>
</tr>
<tr>
<td>Smith et al, 1997</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>Tandberg et al, 1998</td>
<td></td>
<td>60%</td>
</tr>
<tr>
<td>Stocchi, 2001</td>
<td></td>
<td>72%</td>
</tr>
</tbody>
</table>

Note: UPDRS has one sleep-related question - *is patient hypersomnolent or insomniac?*
NMSQuest: highlighted the importance of NMS complex of PD from patients’ perspective

International Multicenter Pilot Study of the First Comprehensive Self-Completed Nonmotor Symptoms Questionnaire for Parkinson’s Disease: The NMSQuest Study


1Movement Disorders Unit, Kings College Hospital, University Hospital Lewisham, Guy’s King’s and St. Thomas’ School of Medicine, London, United Kingdom

2Unit of Neuroepidemiology, National Center for Epidemiology, Carlos III Institute of Health, Madrid, Spain

3Department of Neurosurgery, Royal Free Hospital Medical School and National Hospital for Neurology, London, United Kingdom

4Institute of Neurology, IRCCS NEUROMED, Pozzilli, Italy

5Medical College of Georgia, Georgia, USA

‘sleep disturbance in 43%’
Nocturnal Problems in Pd Assessment

- Motor
  - Turning over – Akinesia/Truncal Rigidity
  - Visit WC

- Sleep
  - Initiation – Maintenance – Awakening
  - PLMS; RLS; etc

- Hallucinations/ Dreams

- Pain
Drugs for Motor Problems

- Standard levodopa
- CR levodopa
- CoMTIs: Entacapone / Stalevo / Tolcapone
- Agonists
- MAOIs?
## Agonist studies: Adverse effects (%)

<table>
<thead>
<tr>
<th>Adverse Events</th>
<th>CALM-PD&lt;sup&gt;1&lt;/sup&gt;</th>
<th>ROP 056&lt;sup&gt;2&lt;/sup&gt;</th>
<th>CBS 09&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPX n = 151  L-dopa n = 150</td>
<td>ROP n = 179 L-dopa n = 89</td>
<td>CABS n = 208 L-dopa n = 204</td>
</tr>
<tr>
<td>Nausea</td>
<td>36.4  36.7</td>
<td>48.6  49.4</td>
<td>37.4&lt;sup&gt;#&lt;/sup&gt; 32.2&lt;sup&gt;#&lt;/sup&gt;</td>
</tr>
<tr>
<td>Somnolence</td>
<td>32.4  17.3</td>
<td>27.4  19.1</td>
<td>26.5&lt;sup&gt;<em>&lt;/sup&gt; 8.4&lt;sup&gt;</em>&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hallucination</td>
<td>9.3   3.3</td>
<td>17.3  5.6</td>
<td>4.3   4.8</td>
</tr>
<tr>
<td>Oedema</td>
<td>14.5&lt;sup&gt;@&lt;/sup&gt; 4</td>
<td>14   5.6</td>
<td>16.1  3.4</td>
</tr>
</tbody>
</table>

# Includes vomiting, dyspepsia and gastritis - can be avoided/treated with domperidone  
* Includes sleep disorders, somnolence, insomnia.  
@ Late onset

2. Rascol O et al. NEJM 2000; 342: 1484-9  
Drugs: e.g. Pramipexole
Caution during titration

somnolence (%) by study phase

<table>
<thead>
<tr>
<th></th>
<th>Pramipexole (n=151)</th>
<th>Levodopa (n=150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>32.4%</td>
<td>23.2%</td>
</tr>
<tr>
<td>Escalation</td>
<td>17.3%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>9.9%</td>
</tr>
</tbody>
</table>

Assessments at Baseline and at the End of Maintenance period were performed as inpatients. Patients were hospitalized the day before the assessment was performed and were evaluated at their morning Off state.
## Results: Parkinson's Sleep Scale: Overall Score (0-150)

*Giladi & Boroojerdi. Eur J Neurol 2006;13(suppl 2):321*

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>End of MP</th>
</tr>
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<tbody>
<tr>
<td>n</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>PDSS total score (cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>94.1</td>
<td>105.9</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
<td></td>
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<tr>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p&lt;0.0001*</td>
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</tbody>
</table>

Aancova results for the change in PDSS sum of scales; * p value LS means
Results: Percent change in PDSS 5 items

- Overall quality of night's sleep: Baseline = 5.19, Change = 23.7%
- Difficulty staying asleep: Baseline = 4.77, Change = 34.2%
- Getting up at night to pass urine: Baseline = 3.56, Change = 28.1%
- Waking up at night due to numbness or tingling of arms or legs: Baseline = 6.44, Change = 17.7%
- Feeling tired and sleepy after waking in the morning: Baseline = 5.74, Change = 22.8%

Baseline Values: Improvement
Number of nocturias reported by the patient [in hospital]

Ancova results for the change from baseline, *p value LS means
Results: Day-time Sleepiness Measured by Epworth Sleepiness Scale (ESS*)

- Baseline: n=46
- End of MP: n=46

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Baseline</th>
<th>End of MP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.3</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>p=0.0027**</td>
<td></td>
</tr>
</tbody>
</table>


Ancova results for the change from baseline ESS sum score, ** p value LS means
Other Sleep Problems

- Dyssomnias
- Parasomnias
- Depression
- RLS
- Excessive Daytime Somnolence (EDS)
- SOOS
RD dob 2.4.46

- Self-employed builder - PD dx 1993 retired 1997
- Sinemet Plus 125 x 2; CR 250x2
  - [ropinirole; selegiline short term - intolerant]
- Bizarre Dreams - grenades, trenches
- -> scalp laceration -> terrified wife
- Diagnosis?
- Cause?
- Management?
RD dob 2.4.46

Now: Clonazepam 0.5; Ropinirole 20mg; Sinemet 125*5
RBD - REM behavioural disorder

- Generally middle aged or elderly men.
- In sleep the 'Jouvets Centre' prevents us from action during our dreams by ‘paralysing’ activity
- Neurodegeneration / Stroke, allows the body to 'act out our dreams'
- ‘This is an ailment where the man has the complaint and the wife suffers it, especially if he enjoys football and plays it in his dreams’
- Prelude to PD / DLB
REM Behavioural Sleep Disorder
N=93

Mean age onset 60.9yrs(36-84)
M:F 87% male
Self injury 32%
Assaults on partner 64%
Injuries to partner 16%
Associated dreams 93%

Dream content
- Defensive (against human attack) 57%
- Defensive (against animal attack) 30%
- Adventure 9%
- Sports 2%
- Dreamer aggression 2%

Olson et al. Brain 2000;123:331-9
Sleep-related violence, injury, and REM sleep behavior disorder in Parkinson's disease


RBD is a frequent cause of SRI in older individuals

CONCLUSION: PD patients with SRI frequently have behavioral features of RBD. If RBD underlies most SRI, treatment with appropriate pharmacologic agents, such as clonazepam, may prevent future occurrences of SRI.

Clonazepam - 0.5-2 mg (beware drowsiness)
Long term
RBD Rx: No Controlled Trials

Review by Comella et al 2004

- Clonazepam (3/3 pts) Schenck et al 1987
  Olson et al 2000
- Melatonin
- Pramipexole (5/8 pts) Fantini et al 2003
- Levodopa Tan et al 1996
- Donepezil Ringman et al 2000
- ? Clozapine
- ? Quetiapine
- ? Carbamazepine
- Worsening with STN stimulation: Arnulf et al 2000
Sleep-related violence, injury, and REM sleep behavior disorder in Parkinson’s disease


RBD is a frequent cause of SRI in older individuals
61 consecutive PD patient/caregiver pairs interviewed
Prevalence 15% (7 men and 2 women) RBD.
More episodes of SRI in the RBD group, with 33% causing injury to themselves or to their caregivers compared with 6% of the non-RBD group (p = 0.005)
Significant association between SRI and RBD for dream-enacting sleep behaviors (p = 0.0001)

CONCLUSION: PD patients with SRI frequently have behavioral features of RBD. If RBD underlies most SRI, treatment with appropriate pharmacologic agents, such as clonazepam, may prevent future occurrences of SRI.
RBD - Treatment

- Clonazepam - 0.5-2 mg (beware drowsiness)
- Long term
- ?Melatonin
JH dob 2.9.31

- Brewery Saleman - retired 1996
- PD diagnosed 1993 (Sheffield)
- Ropinirole – started 1999
- Always had ‘memorable’ Dreams – mainly ‘nice’
- But some ‘trapped’; fallen out of bed
- Wife removed herself from marital bed
- Deteriorated from Jan 2003 – ‘Zelapar’
- Visual hallucinations; delusions
JH dob 2.9.31

- ‘Wizards’
- Tried Quetiapine – Aricept (MMTS 29) - Valproate
- Paranoid delusions increased
- Sectioned (2)
- Reduced Medication – siezed up
- Gentle Sinemet – 62.5 *4
- Still bizzarre dreams
JH dob 2.9.31

- Reduced Medication – siezed up
- Gentle Sinemet – 62.5 *4
- Still bizzarre dreams

- Settled on:
  - Clonazepam 0.5 nocte
  - Sinemet 125 qid

Rapidly declined and died 18/12 later
Management

- ‘Sleep Hygiene’
- OTC/Internet market
- ‘Ethical’ Pharmaceuticals

- Predicated on making the correct diagnosis
Internet options

Melatonin

Hypnosis tapes and CD, audiostrobe

Herbs, lavender pillows, bolsters and cushions, wheat and lavender heat packs, lavender essential oils and more. Magnetic Therapy

‘Treat sleep apnoea, arthritis and many other health problems with long-term healing effect’

[ www.godsendtherapy.com]
Drugs for Insomnia

- Benzodiazepines (2-4 weeks)
  - Intermediate-acting - greater risk withdrawal - flunitrazepam (Rohypnol)
  - Long-acting less withdrawal, more hangover (Nitrazepam)

- Z’s with GABA activity - zolpidem, zopiclone

- Sodium Oxybate (?)
AJ dob 13.05.1925

- Admitted post # Tibia
- Unable to rehabilitate
- Too tired by day
- Restless all night

Sinemet CR nocte – good effect
RESTLESS LEGS SYNDROME

“Wherefore to some, when being abed they betake themselves to sleep, presently in the Arms and Legs, leaping and Contractions of the tendons, and so great a Restlessness and Tossing of their members ensue, that the diseased are no more able to sleep, than if they were in a Place of greatest Torture”.

Thomas Willis -1672

Ekbom’s Syndrome: Karl A Ekbom 1945

It is usually an overwhelming urge to move the legs associated with uncomfortable or unpleasant sensations in the legs

Misdiagnosis is common and treatment subsequently delayed
International RLS Study Group
criteria for the diagnosis of RLS

a. Desire to move the extremities usually associated with discomfort or disagreeable sensations in the extremities.
b. Motor Restlessness-patients move to relieve the discomfort, for example walking, or to provide a counter-stimulus to relieve the discomfort, for example, rubbing the legs.
c. Symptoms are worse at rest with at least temporary relief by activity.
d. Symptoms are worse later in the day or at night.
EDS - A PRE - MOTOR FEATURE?

- Honolulu Asia Aging Study
- 3078 men (71-93 yrs)
- All free of prevalent PD and dementia
- 3 assessments 1994-2001
- 43 developed PD (19.9/10,000 person-years)
- 3 x risk of PD in men with EDS vs without
  (55.3 vs 17.0/10,000 person year)
Excessive Daytime Somnolence

Common

Needs careful assessment

‘Sudden onset of sleep’?

NB DVLA £38.50!

**TABLE 1. The Epworth sleepiness scale**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of dozing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
</tr>
<tr>
<td>Sitting, inactive in a public place (e.g. a theater or a meeting)</td>
<td></td>
</tr>
<tr>
<td>As a passenger in a car for an hour without a break</td>
<td></td>
</tr>
<tr>
<td>Lying down to rest in the afternoon when circumstances permit</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after a lunch without alcohol</td>
<td></td>
</tr>
<tr>
<td>In a car, while stopped for a few minutes in the traffic</td>
<td></td>
</tr>
</tbody>
</table>

*Thank you for your cooperation*
The National Sleep Foundation announces Drowsy Driving Prevention Week™, a national campaign to save the lives of young drivers by raising awareness of the dangers of drowsy driving and providing resources for advocacy at the state level.
ES Treatment

- Sleep hygiene and avoid sedating Rx
- Treat nocturia
- Stimulants
  - Caffeine
  - Methylphenidate
  - Amphetamine
- Modafinil
- Melatonin
- Selegiline and Amantadine of little benefit
SLEEP HYGIENE

Quiet, comfortable and cool sleeping environment
Regular hour for going to bed at night
Waking at the same time in morning
Adequate hours of sleep to feel refreshed and rested
Regular moderate exercise (six to eight hours before bedtime)
Avoiding tea/coffee or other stimulants before bed
Avoiding diuretics before bedtime
Avoiding reading work material or disturbing books at bedtime
Some people find sleeping late and rising late may be beneficial.
Modafinil in PD: Results
Adler et al, 2003

- ESS improved by 3.4 for modafinil vs worsening by 1.0 for placebo ($P = .039$)
- 35% reported improvement with modafinil vs 5% on placebo and 10% on both
- But Ondo – no effect, and licence altered

Sleep Apnoea in PD

- Sleep apnoea syndrome:
  - 40% - 43%
    - Arnulf et al. Neurology 2002;58:1019-1024
    - Wetter et al. Sleep 2000;23:361-367
  - Case Control PSG study (43%)
    - Early or moderate PD with apnoea hypopnoea index (AHI) suggesting Sleep Apnoea without Oxygen desaturation profile
      - Diedrich et al. Mov Disord 2005;20:1413-1418
Why Excessive Daytime Sleepiness is an Important Issue in Parkinson’s Disease

Specialists are likely to see many patients with excessive daytime sleepiness (EDS) since disordered sleep is so common, especially with neurological conditions such as Parkinson’s disease (PD), Alzheimer’s disease and other types of dementia, other neurodegenerative conditions, peripheral neuropathy, neuromuscular disorders, depression, epilepsy and chronic pain syndromes.

The corollary of impaired nocturnal sleep may be EDS. The issues related to excessive daytime sleepiness in PD attracted little attention until reports were published of patients treated with dopamine agonists falling asleep while driving. These episodes of irresistible sleepiness - or 'sleep attacks' - initially were thought to be specifically reported much higher figures: Ondo et al. found 'abnormally high' sleepiness scores in half of the PD patients they studied; similarly, an incidence of 51% was seen in a study of over 600, highly-functional PD patients without dementia; and in another study of PD patients, being evaluated for quality of life, 72% showed symptoms of increased daytime somnolence.

EDS in PD patients - what causes the problem?

It would be logical to try to assume that a key reason why patients may suffer from excessive sleepiness during the day is because they are not getting enough good quality sleep at night. Whilst this is largely true, it does not give the full picture in PD: many factors can have an influence.

<table>
<thead>
<tr>
<th>Table 2: Factors contributing to sleep disturbance in PD</th>
</tr>
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<tbody>
<tr>
<td>(Adapted from Comella, 2003 and Chaudhuri, 2003)</td>
</tr>
</tbody>
</table>

- **Nocturnal recurrence of PD symptoms e.g.**
  - Tremor
  - Akinesia (e.g. difficulty turning over in bed)
  - Rigidity
  - Painful cramps

- **Conditions often associated with PD e.g.**
  - Depression, anxiety
  - Restless legs syndrome
  - Periodic limb movement syndrome
  - Dementia
  - Sleep apnoea
  - Nocturia
  - Paroxysmal e.g. nightmares, somnambulism

- **Other comorbid disorders commonly seen in older people e.g.**
  - Arthritis and other painful conditions
  - Cardiovascular diseases
  - Respiratory diseases

- **Side-effects of medication (antiparkinsonian or other drugs)**
  - Insomnia
  - Changes in sleep architecture
  - Sleep-related effects such as vivid dreams, nightmares, hallucinations
  - Withdrawal effects

Doug MacMahon is Consultant Physician with special responsibility for the elderly, Royal Cornwall Hospital NHS Trust. He has particular interests in PD, community care and rehabilitation. He has written extensively on PD.
Conclusions: Sleep Disturbance in PD

- Sleep disorders common
  - both Motor and Non-motor problems
- Little professional preparation or training
- Ask proper structured history: sleep and wake- EDS(Epworth)?, Depression?
- Try simple techniques first
  - Environmental/physical
  - ‘Sleep Hygiene’
Conclusions: Sleep Disturbance in PD(2)

- Targeted drug Rx.
- Caution with ‘hallucinations’ or ‘vivid dreams’
  - Ask specifically about ‘acting them out’
- Consider REM behavioural disorder
  - Not withdrawal
  - Clonazepam (?Melatonin)
- Nocturia? – Consider Rotigotine
Assessment of Sleep: History

- Ask about the 3 phases of sleep
  - Initiation
  - Maintenance
  - Awakening
- Enquire from bed partner about leg movements: RLS, periodic limb movements of sleep
- Ask about hallucinations / vivid dreams
- Ask about acting out dreams
- Determine frequency and length of daytime naps/siestas
- Assess if excessive daytime sleepiness/sudden onset of sleep (impact on driving) – Epworth Scale (routine)
Management:

- **Sleep hygiene:**
  - Avoid stimulants in evening
  - Comfortable bedding and temperature
  - Establish regular pattern of sleep
  - Bed lever or rails to help with turning
  - Restrict daytime naps
  - Review medication

- Clonazepam 0.5-1mg at night very effective for RBD

- Advice on management of RLS can be found on RLS UK website (http://www.restlesslegs.org.uk)
# Stepwise control of sleep problems in older patients

<table>
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<th>ONE</th>
<th>TWO</th>
<th>THREE</th>
<th>FOUR</th>
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</table>
| Establish Pattern | Review current medication | Symptom evaluation | Treatment selection  
Aim to provide 24-hour control of symptoms – pain/PD/bladder/?depression  
Alleviate treatment-related causes of disturbed sleep  
Specific Treatment – RLS/RBD  
Alleviate residual excessive daytime somnolence |
| Review sleep hygiene | Take into consideration drugs that may have sleep-altering properties | Identify and evaluate other cause(s) of nighttime sleep disruption:  
Insomnia  
Dyssomnias  
Parasomnias | |
The End

Thank You

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