

Sleep Apnoea in the Elderly

Sleep apnoea is widely prevalent in the geriatric population, yet poorly recognised, affecting 1 in 10 older Australians. Treatment substantially improves vitality and well-being and ameliorates the effects of coexisting health co-morbidities, such as cardiovascular disease. Treatment improves quality of life and increases life expectancy.

WHAT IS SLEEP APNOEA AND WHY IS IT IMPORTANT?

Sleep apnoea is a condition of reduced control of upper airway integrity, leading to narrowing, with relaxation of the muscles and soft tissue structures, jaw and tongue. This causes limitation to airflow, vibration ie. the sound of snoring, stertorous or laboured breathing, and partial or full obstructions.

Sleep apnoea has numerous symptoms and detrimental effects. Common symptoms noticed to varying degrees the following day are:

- lack of refreshment tiredness,
- fatigue, sleepiness,
- reduced mental performance,
- reduced higher functioning,
- mood disturbances.

This sleepiness can lead to drowsy driving and a consequent increase in road accidents. Interestingly people with proven

sleep apnoea often feel there is little or nothing wrong with their sleep!

In the elderly, sleep apnoea and sleep deprivation, worsen many other common complaints. Sleep is reported to be uncomfortable, broken or punctuated by periods of frequent wakefulness. It is common to experience a worsening of pain from pressure points, discomfort from arthritis and musculoskeletal complaints, nocturia, nocturnal thirst and nocturnal reflux.

The presence of sleep apnoea, once adjusted for confounding variables such as obesity, smoking history, or chronic diseases such as diabetes, increases the rates of death, rates of morbidity, and health care utilisation. Sleep apnoea independently increases fatal and non-fatal cardiovascular events and worsens complications of other common co-morbidities, such as destabilising diabetes and promotion of weight gain through appetite stimulation.

THERE IS AN INCREASED PREVALENCE IN SLEEP APNOEA IN THE ELDERLY

Cross-sectional population data shows that sleep apnoea is more prevalent in the elderly, although it is less severe than the middle-age group. There are 4 main reasons:

1. There is reduced respiratory drive to the upper airway during the ageing process, so there is more airway collapse, snoring and more subtle forms of sleep apnoea.
2. There is a general increase in weight in our elderly population.
3. Sleep apnoea approximates truncal weight. Often in the elderly there is a loss of mean muscle mass, but a compensatory gain in fat mass, without a change in absolute weight. This nevertheless pushes the pendulum towards upper airway collapse even though the absolute weight may not have changed greatly.
4. Postmenopausal women lose the protective respiratory stimulating effects of progesterone, and the truncal weight protection of oestrogen, and therefore develop sleep apnoea far more readily than the premenopausal state. (The female that now out-snores her husband, five years after menopause is an extremely common staple for the sleep physician)

There are common underlying factors which predispose to sleep apnoea, relevant to all age groups. They include.

- nasal blockage,
- anatomical variations which result in a narrow throat - usually associated with a narrow maxilla with a high palatal arch, and or, a narrow mandible, or constricted mandibular arch, or backward positioning of the mandible
- the presence of residual or enlarged tonsils

HOW IS SLEEP APNOEA GRADED, AND WHAT IS THE JARGON USED IN SLEEP REPORTS?

Sleep apnoea has to be separated out from other typical complaints of sleep disturbance in the elderly. This is best done by subjectively looking at sleep with a thorough sleep history, a sleep diary,

particularly if there is poor recollection, and comprehensive sleep testing, preferably in a sleep laboratory where full multichannel analysis can be undertaken. A common complaint in the elderly, "but how do you expect me to sleep with all those things attached to me?" is really a red herring, as in experienced hands the failure rate of good data acquisition is less than 1%. There is an emergence of home sleep testing providers who offer a home sleep test, designed to find significant sleep apnoea rather than be a comprehensive assessment of sleep ailments in the elderly.

As awareness increases amongst GPs, so should referral for testing. Testing is indicated for both typical cases, and atypical sleep disturbances, and in symptomatic patients even though they may not have the typical body habitus or more classical features of full-blown sleep apnoea.

The spectrum of sleep apnoea comprises: snoring, upper airway resistance, complicated snoring (leading to disturbance), mild / moderate / severe / very severe sleep apnoea, hypoventilation, and nocturnal respiratory failure. There may be the classical apnoeas ie cessation of breathing for 10 seconds or more, but there are often partial reductions in breathing for 10 seconds or more, called hypopnoeas.

The prevalence of heart disease increases the occurrence of another type of sleep apnoea, namely Central Sleep Apnoea, also known as Cheyne-Stokes breathing, where there is central respiratory drive dysregulation causing a crescendo/decrescendo pattern of abnormality, and is often mixed in with obstructive sleep apnoea.

The amount of breathing disturbance averaged per hour is the most recognised measure and is expressed as the apnoea hypopnoea index (AHI), or respiratory disturbance index (RDI), (both roughly equivalent). In general less than five events per hour is regarded as normal, although in some circumstances less than 10 would be acceptable. A score of 5-15 would be regarded as mild abnormality, 15-30 is moderately abnormal, 30-50 is severe, and 50 events or more is regarded as very

severe. The breakup of sleep continuity and deficiency in progression towards slow wave sleep (deep sleep) and rapid eye movement (REM) sleep, are factored into any report.

Oxygen desaturation is usually highlighted. In general good health precludes oxygen saturations from dipping much below 90%, and sustained dips below 90% indicate there is a hypoxic load overnight. These dips are pro-inflammatory and correlate well with increased sympathetic nerve activity, one of the most powerful markers of the propensity towards death.

There are several common behavioural components that interfere with sleep in the elderly. The absence of adequate bright light exposure during the day, along with inadequate physical activity, blunts the intrinsic 24-hour cycle which promotes adequate sleep at night. Anyone with vitamin D deficiency is at risk of having sunlight-determined melatonin secretion dysregulation at night. It is remarkable how many people substantially improve sleep continuity simply from exposure to bright light during the middle part of the day (see Table 1).

A delay in initiating, or consolidating sleep is loosely called insomnia. Secondly, the elderly tend towards more episodes of wakefulness or breakup of sleep continuity, and is typically called maintenance insomnia, often with prolonged awakenings from sleep.

There are many misperceptions in the elderly about sleep, with a tolerance that sleep should be more broken and less refreshing. Spending a long time in bed, for example watching television, doing crosswords or reading, is often counter-productive to easily falling asleep.

Daytime napping remains controversial. There is inherently a natural diurnal variation in alertness in the average 24-hour cycle, with a lull around 3 PM. There is minimal harm in a short nap during the afternoon lull, as long as other sleep habits and practices are intact. In those who depend on these naps for refreshment, this may lead to difficulties at night.

Lastly, complaints of leg movements,

TABLE 1: FACTORS THAT CONTRIBUTE TO SLEEP APNOEA

usage of pain medication and other centrally acting medications
chronic hypnotics
excessive alcohol consumption
untreated, or inadequately treated, Parkinson disease
prostatism, nocturnal frequency, incontinence

either rhythmic or non-rhythmic, (known as periodic leg movement syndrome) are much more common in the elderly, and typically associated with iron deficiency, vitamin D deficiency and the lack of exposure to bright light and physical activity. Although it can present on its own, frequent leg movements are often seen in obstructive sleep apnoea, and the sleep apnoea is the component that needs to be treated first.

The treatment is rarely undertaken without looking at other sleep habits and contributory factors.

The first basic approach in any individual is to encourage plenty of outside time, physical activity if possible, between the hours of 9 AM, and 3 PM, and try to provide approximately 8 hours of time for sleep, and if possible avoiding daytime naps. Weight loss, or minimising further weight gain, or at a minimum, increased mental activity during daylight hours, should be a priority in all individuals.

Secondly, counter-productive sleep habits and sleep hygiene manoeuvres should be tackled. Long-term habits may seem difficult to shift, and often require cognitive behavioural strategies. Specialist sleep psychologists can be accessed through most major sleep services/laboratories, with Medicare rebates payable through a mental health care plan.

Improving nasal airflow and decreasing nasal resistance often makes a major difference, with manoeuvres to decongest the nose with nasal saline, possibly nasal washouts or intranasal steroids. After a week or two, BreatheRight nasal strips typically become annoying.



Sleep Apnoea in the Elderly ...continued

Sleeping more upright is remarkably effective, and works through the mechanism of decongesting the head and neck. Other postural changes include: putting a wedge underneath the mattress, putting the head of the bed up on a brick, putting old pillows underneath the mattress. The aim is to raise the angle of the torso without disturbing the relationship between the head and neck with the head slightly elevated with respect to the chest and abdomen.

Avoiding sleep in the supine body position, to avoid backward movement of the lower jaw, makes a major difference in many people. This can be difficult to achieve, but sewing a pouch and placing and irritant into a T-shirt such as tennis ball/ golf ball, or using other devices, such as a positional vibrating device, are fairly effective.

A small proportion of patients benefit from the use of a chin strap, which prevents the mouth from gaping open, or the jaw hinging or falling backwards.

CONTINUOUS POSITIVE AIRWAY PRESSURE TREATMENT (CPAP)

CPAP treatment has re-emerged as the treatment of choice for patients with significantly symptomatic sleep apnoea, moderate to severe sleep apnoea, and milder forms of sleep apnoea.

Most retailers now provide an initial rental and acclimatisation program, so unnecessary purchase is avoided. The vital introduction period, over the first month or two is closely supervised and encouraged.

Although dreaded by many patients,

modern CPAP treatment is remarkably quiet, and there is a range of slimline masking which makes the treatment remarkably comfortable. Modern units operate at 25 dBs, and are far more acceptable to sensitive bed partners. They now come with integrated humidifiers with condensation reduction.

There are many comfort and convenience factors built-in to modern CPAP treatments, such as minimising the amount of buttons, and auto-starting, so all the patient has to do is put the mask on, take two breaths, and the machine will start (and stop) itself. Although substantially more expensive, automatic units range up and down compensating for variability in upper airway obstruction.

As there are next to no downsides of CPAP treatment, apart from perhaps patient discomfort factors, stigmatisation, and financial cost, it is this author's belief that modern CPAP treatment can be offered to most elderly patients. It can be rendered highly effective, particularly with encouraging support through an appropriate retailer, even if there is significant visual impairment, arthritis and manipulation difficulties, restlessness, frequent trips for toileting, or mild-moderate cognitive impairment.

OTHER MORE INTENSIVE MANOEUVRES

Mandibular advancement splints are designed to hold back the lower jaw in relation to the upper jaw to allow for a more open airway and reduce the amount

KEY PRACTICE POINTS

- ▣ Sleep apnoea is very prevalent in the elderly, and under-recognised
- ▣ Sleep apnoea is often hidden amongst other sleep complaints and contributory health issues
- ▣ Sleep testing in a sleep clinic should be readily encouraged
- ▣ Untreated sleep apnoea substantially worsens morbidity, mortality and quality of life
- ▣ Modern treatment strategies are well tolerated in the elderly

of obstruction. They are very effective at reducing snoring, and in those who have milder sleep apnoea or positional, eg. supine, sleep apnoea. They are best made by a specialised dentist and do require the patient to have fairly good dentition. However, they are not devoid of problems, and are associated with temporomandibular joint discomfort, masseter discomfort and potential tooth movement.

Although it is rare to find enlarged tonsils in the older patient, it is not too uncommon to find surgically correctable nasal obstructions. Complicated jaw advancement surgery in the elderly is largely avoided.

No conflict of interest declared.

TABLE 2: SLEEP STAGES IN THE ELDERLY DURING A TYPICAL AVERAGE NIGHT'S SLEEP COMPARED TO YOUNGER AGE GROUPS

	Sleep Hours	Stage 1 & 2 %	Stage 3-4 % SWS or deltasleep	REM %
Infants	13-16	10-30	30-40	40-50
Children	8-12	40-60	20-30	20-30
Adults	6-9	45-60	15-25	15-25
Elderly	5-9	50-80	5-20	15-25



Dr. Peter Solin
MBBS FRACP PhD
Respiratory & Sleep Disorders
Physician, Brighton Vic
Senior Lecturer Monash
University.
Director: Cabrini Sleep
Laboratory & Maryvale Sleep
Service
Medical Director: National
Sleep Diagnostics & National
Sleep Clinic, and
Centurion Health Care Group