

How Sleep changes with normal ageing

One of the major changes that accompany the ageing process is increasing disruption of the sleep-wake cycle. Up to 50% of older adults over 65 years of age complain about sleep problems. This includes disturbed or “light” sleep, increased awakenings, early morning awakenings, and daytime sleepiness.

The most striking change in sleep with ageing is the interruption of sleep by long periods of wakefulness, possibly the result of an age-dependent intrinsic lightening of sleep homeostatic processes. Older adults wake more easily with a noise and may be more sensitive to environmental stimuli. Therefore, sleep is lighter and more fragmented with age.

These age-associated increases of night time wakefulness are mirrored by increases in daytime fatigue, excessive daytime sleepiness (EDS), and increased likelihood of napping or falling asleep during the day. Aging is also associated with a tendency to fall asleep and awaken earlier (i.e. a tendency for older individuals to be “larks” rather than “owls”). Older individuals also tend to be less tolerant of phase shifts in time of the sleep-wake schedule, such as those produced by jet lag and shift work. These changes suggest an age-related break-down of the normal adult circadian sleep-wake cycle.

Even well older adults who do not complain of sleep disturbance and with little or no other diseases show the changes described previously when compared with younger adults. This suggests that at least some of the sleep disturbance seen in older adults is part of the aging process per se, apparently independent of any medical or psychiatric illnesses or primary sleep disorders, and often referred to as “age-related sleep change”. As to whether this age related decline in the ability to generate sleep equates with a decreased need for sleep in the later years of the human lifespan remains unclear. Sleep changes with advancing age, but when do these changes occur? A classic scientific publication in 1966 by Roffwarg looked at overnight sleep studies from childhood to adults up to 100 years of age and showed that a decline in slow wave sleep and increased night awakenings started surprisingly early in the late 20s to early 30’s. A more recent study, a large meta-analysis of previous population studies suggested that sleep became more fragmented between mid-20s through to 60 but changed little after this time. The most striking changes in slow wave sleep occurs surprisingly early, from the mid to late 20s for many, with a decrease in both the amount of slow wave sleep and also the amplitude of the delta waves.

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Changes to sleep seen in polysomnography studies (a sleep study) show decreases in total sleep time, sleep efficiency, and slow wave sleep; and increases in wake after sleep onset. Increases in the lighter stage 1 and stage 2 sleep stage and decreases in rapid eye movement sleep were also seen. In those who were otherwise well sleep latency and REM sleep latency did not change significantly over the lifespan. Sleep efficiency (total sleep time/time in bed) on average declines by 3% a decade from 60 and the changes are comparable between women and men.

Not only does sleep quality change across the human lifespan, but the timing of sleep also changes. Circadian rhythms are those that occur within a period of 24 hours (from the Greek “about [circa] a day [dies]”), such as the adult human sleep-wake cycle. Older adults tend to have earlier circadian phases, with a tendency to go to bed and wake earlier than younger adults and they have more trouble with rapid phase shifts of shift work and jet lag, at least in terms of sleep quality and performance measures.

Daytime napping - there is debate as to whether regular naps in older adults, particularly those in good health, may be helpful for daytime alertness or possibly worsen night time sleep. Two large studies that studied daytime naps in otherwise well adults showed naps improved cognitive performance post nap but did decrease night time sleep quality a little. A number of sleep disorders such as obstructive sleep apnoea, restless legs syndrome, REM sleep behaviour disorder and other illnesses that disrupt sleep increase with age and so significant daytime sleepiness that is impairing function needs investigation.

Summary

Many older adults are satisfied with their sleep, even though it is of objectively more fragmented compared to younger adults. It seems that, when the various factors that can disrupt sleep (other illnesses, primary sleep disorders, poor sleep hygiene) are screened for many aging adults will have little change in their sleep from the age of 60 onwards as most of the changes in fact occur from early to middle age. However even fit and well older adults, will on average to be earlier to bed and to rise and to be less tolerant of shift work and jet lag compared to their children or grandchildren.



www.sleepstation.org.uk is an online version of the therapy which our sleep doctors use in clinic to treat patients with insomnia. Sleepstation is available privately and via the NHS

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