SLEEP WALKING

Sleep walking (or **somnambulism**) is an example of a *parasomnia* (a 'near sleep' condition). It is more common in childhood (affecting around 20% of children, especially those aged 4-6) than adulthood (3-10%). It is also more common in boys. In adulthood, however, it is equally common in men and women. The main characteristic is walking around as if awake, and frequently involves 'ordinary' behaviours like dressing or making food.

Sleepwalking is more common in boys

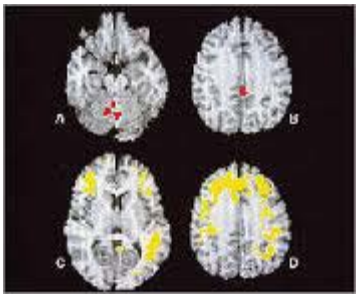
Although the eyes may be open, sleepwalkers are very difficult to wake. Each episode can last for only a few seconds or for several minutes. Contrary to popular belief, it is *not* dangerous to wake a sleep-walker up. However, s/he is unlikely to remember little if anything about the episode, but is usually embarrassed when told of it.

An embarrassing moment?

It is well-known that there is active inhibition of motor neurons during REM sleep, and hence we are in a state of being virtually paralysed during that

stage. Presumably, the function of the paralysis is to prevent us from acting out a REM dream. However, in some people the active inhibition of motor neurons does not occur, and they become active during REM sleep, presumably acting out whatever dream they are having. This condition is called **REM Sleep Behaviour Disorder**.

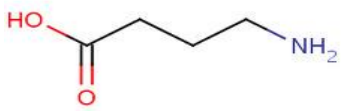
However, sleepwalking occurs in the deep stages of sleep (Stage 3 and 4), so a different mechanism must be failing to operate to cause the condition.



The yellow areas indicate Stage 3 and 4 sleep in the brain of a sleep walker

Explanations of sleepwalking

Oliviero (2008) discovered that inhibition of the brain's motor system does not just occur in REM sleep, but also occurs in NREM sleep. This inhibition is regulated by a **neurotransmitter** called **GABA**:



Oliviero argues that the system that produces GABA is more likely to be *underdeveloped* in children than in adults, and that this is why sleepwalking is much more common in children. In most children, the system eventually does develop normally, and hence sleepwalking disappears. In other children, though, the system fails to develop normally and so sleepwalking continues into adulthood.

Oliviero also speculates that the GABA system can be affected by *environmental influences*. These include physical factors (e.g. drugs like alcohol, or a fever) and psychological factors (e.g. stress). This would explain why sleepwalking is more common following a night's drinking or when we have to revise for exams.

However, remember that these are *speculations*. There is no evidence that physical/psychological factors do affect the GABA system, nor any convincing reason why the brain would issue commands for movement during NREM sleep, when dreaming is much less likely to occur. It is also difficult to explain why there is a sex difference in sleepwalking during childhood.

One environmental factor that has been clearly linked to sleepwalking is *sleep deprivation*. Research conducted by **Zadra, et al. (2008)** showed that sleepwalkers deprived of sleep for 25 hours and then allowed to sleep normally were significantly more likely to sleepwalk compared with when they slept not having been sleep deprived. Presumably, sleep deprivation also somehow interferes with the GABA system. In children, sleepwalking typically begins around the age of 4, when children stop taking daytime naps. It could be that they are, in a sense, also sleep-deprived, and hence more likely to sleepwalk.

If GABA is the important neurotransmitter, then the question is what causes the GABA system to malfunction. Interestingly, sleepwalking runs in families, and a person is ten times more likely to display the condition if a first degree relative is a sufferer. There is also a higher Concordance Rate for sleepwalking in MZ than DZ twins. Therefore, sleepwalking might be a **genetic** condition. Research has identified a specific genetic marker (a gene

called HLA DQB1*5) which is more likely to be present in sleepwalkers than non-sleepwalkers.

This gene is involved in producing proteins called HLA, which play a role in the regulation of the immune system. Presumably, if this is the gene involved, it somehow exerts an effect on the GABA system and leads to sleepwalking occurring. However, the view that a simple single gene is involved is weakened by the fact that the gene is present in some non-sleepwalkers, and is not present in some sleepwalkers. Note, too, that most examples of genetic research are plagued by the problem of small sample sizes (making any findings difficult to interpret) and that sleepwalkers who volunteer for this kind of research may not be representative of sleepwalkers in general (i.e. those who don't volunteer).