

is often a strong family history of the DQ1 (6) B1\*0602 negative syndrome. As yet, no other disease susceptibility loci have been identified.

Many subjects with the narcoleptic syndrome do not attend a sleep disorders clinic or have laboratory investigations. A study of subjects who have undergone diagnostic investigations showed that the accurate clinical diagnosis of cataplexy is the most specific discriminatory feature of the syndrome and should take precedence over any laboratory findings.

### SLEEP, OFFENDING AND THE LAW

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With a change in social attitudes which has led to young adults sleeping over in friends' houses, and often in the same room, after parties, there has been an increase in sleep related sexual offending. Sexual offending in sleep can arise because the perpetrator sleepwalks in a sexually offensive way, eg, walking nude through the streets. It can also occur as a direct assault on a sleeping colleague in which contact is made with the sleeper's genitals.

Finally sleepers may be approached by an awake person who requests sexual intercourse. Misinterpretation of sleeping behaviour can lead the perpetrator to believe that the sleeper is awake. A detailed knowledge of sleeping behaviour is required by the examining neuropsychiatrist to decide whether or not the perpetrator had reasons to believe that the sleeping victim had given their consent for the sexual approach. Aggressive attacks are common during either sleepwalking or REM sleep disorders.

Fortunately, assaults leading to serious injury are rare, the law in England interprets sleepwalking as insanity. This has the advantage that the normal sleepwalker is stigmatized as being insane.

### HYPNOTICS AND DAYTIME PERFORMANCE

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It is now widely accepted that daytime tiredness, resulting from, among other things, sleep debt, sleep apnoea and insomnia is a major determinant of road traffic accidents and fatalities.

Most of the pharmacological substances used to manage patients with sleep disturbance (hypnotics, antihistamines, antidepressants) are, by their very nature, powerful sedatives. The psychopharmacological actions of many putative sleep inducers cause residual sedative sequelae which can interfere with daytime functioning on a variety of psychometric analogues of the activities of daily living.

The residual actions of ligands of the GABA-Cl ion receptor, sedative antidepressants and antihistamines on daytime performance will be reviewed and evidence presented to show that sedative tricyclic antidepressants old antihistamines and certain benzodiazepines destroy the integrity of daytime function in populations of sleep disturbed patients. At the same time it will be demonstrated that specific benzodiazepines, cyclopyrrolones and imidazopyridines have few, if any effects on daytime performance.

### THE PHARMACOLOGY AND THERAPEUTICS OF SLEEP

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The complaint of insomnia is common occurring in about 5% of young people but rising to 35% in those over 65. It may be short term or chronic. Most common causes of insomnia fall under one of "5 P"

headings: Physical, Physiological, Psychological, Psychiatric, and Pharmacological. If non-drug methods of treatment are inappropriate or ineffective, hypnotic medication is indicated.

Currently, hypnotic medication comprises a few older drugs such as chloral, antihistamines, often available without prescription, a range of benzodiazepines, and two newer benzodiazepine-like drugs, zopiclone and zolpidem. Some benzodiazepines used as hypnotics such as nitrazepam are long-acting, producing residual effects the next day and accumulating, to toxic levels in the elderly. The shorter-acting compounds such as triazolam may result in rebound insomnia on discontinuation. Adverse neuropsychiatric reactions such as depression and amnesia may occasionally be reported. Abuse of benzodiazepines is an increasing worldwide problem. Zopiclone is short-acting, zolpidem even shorter-acting, and neither is associated with appreciable residual effects. They also do not disrupt sleep patterns as the benzodiazepines do. Zaleplon, a drug in development, is ultra-short-acting, also with beneficial effects on sleep patterns. All these newer drugs need careful monitoring to assess any dependence or abuse potential.

The use of hypnotic medication in short-term insomnia is uncontroversial. If the cause of the insomnia is identifiable and self-limiting, then the use of a short-acting hypnotic is indicated for a few nights. If, however, the insomnia is, or is likely to become, long-term, the use of hypnotic medication may also become long-term. It is debatable whether the risks of long-term use outweigh any therapeutic advantages. Non-drug strategies should be vigorously pursued before resort to medication, unless the patient is greatly distressed by the insomnia, in which case intermittent or p.r.n. use may be most appropriate.

### NORMAL SLEEP PHYSIOLOGY

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Sleep is a behavior characterized by very low level of motor activity, a stereotypic posture, reduced responsibility to external stimulation, and reversibility. These measures are traditionally used to define physiological sleep in the EEG, the EOG, and the EMG. In wake, the EEG alternates between low voltage fast activity (10–30 cps) and a sinusoidal 8–12 cps pattern called alpha. NREM sleep is characterized a progression for mixed frequency fact activity with occasional sleep spindles to predominance of slow high amplitude lower (delta activity). Eye movements are rare and EMG is low to moderate. During REM sleep, the EEG reverts to a low voltage, mixed frequency pattern similar to that of Stage 1. Bursts of prominent rapid eye movements appear. The background EEM is virtually absent, but many small muscle twitches may occur.

NREM and REM sleep alternate cyclically through the night. Except in certain pathological conditions, a night of sleep begins with about 80 minutes of NREM sleep, followed by a REM period of about ten minutes. This 90 minute NREM-REM cycle is then repeated about 3–6 times during the night. In the successive cycles of the night, the amounts of Stages 3 and 4 decrease, and the proportion of the cycle occupied by REM sleep tends to increase.

It should be clear from this pattern of NREM and REM sleep that sleep is not the simple, uniform suspension of activity which many had assumed it to be for centuries. Rather, sleep shows a complex, highly organized pattern of diverse physiological variables.

Although the EEG, EOG, and EMG measures do a pretty good job of state discrimination, there are occasions when states are not clearly differentiable. State changes do not switch off and on like light switches. Rather, they change more or less gradually, which can make it difficult to draw very sharp dividing lines between states. Even more vexing is the fact that the different processes may change at different rates. For example, during the transition from