DRUG EFFECTS ON SLEEP (p.1)

Note: Gained by clinical observation often, not by FDA guidelines as part of a consistent protocol in the preapproval screening of new drugs (unless the new drug's stated purpose is as a hypnotic)

1. **Stimulants**

All interfere with sleep:

Increase WASO, # awakenings, SOL, stages 1&2

Decrease TST, stages 3&4, stage REM

e.g. caffeine, nicotine, central nervous system stimulants (methylphenidate, amphetamines, cocaine)

e.g. modafinil (Provigil) decreases EDS, does it interfere with sleep?

Note: must consider **drug half-life** and when take drug relative to bedtime

2. **Sedative-Hypnotics**

All facilitate sleep, but may alter sleep architecture/staging:

Increase TST, stage 2 (esp. sleep spindles), next day sleepiness ("hangover")

Decrease WASO, # awakenings, SOL

Marked decrease in stage REM with barbiturates

Marked decrease in stages 3&4 with BZDs, slight decrease with barbs

Note: must consider drug half-life, esp. re. **SOI, SMI, & hangover effects**

e.g. Ambien (zolpidem) 1.5 – 4.5 hours half-life

Ativan (lorazepam)	7.9 – 11.4	Nembutal (pentobarbital)	21 - 48
Dalmane (flurazepam)	48 – 120	Seconal (secobarbital)	2 - 3
Doral (quazepam)	48 – 120		
Halcion (triazolam)	2 – 6	Benadryl (diphenhydramine)	1 - 3
ProSom (estazolam)	8 – 24	Unisom (doxylamine)	10
Restoril (temazepam)	8 – 20		
Sonata (zaleplon)	.9 – 1.1	ethanol (ethyl alcohol)	dose dependent
Xanax (alpraxolam)	6.3 – 11.2		

DRUG EFFECTS ON SLEEP (cont., p.2)

3. **Antidepressants**

May either interfere with or facilitate sleep

MAOIs:

Completely eliminate stage REM
Slight increase in WASO, slight decrease in TST

Heterocyclics:

Suppress REM to varying degrees
Slight increase in stage 3&4, increase TST usually
Some are sedating --- decrease WASO, # awakenings, & SOL
Some are activating --- increase WASO, # awakenings, & SOL

e.g. sedating antidepressants:
Elavil (amitriptyline), Adapin/Sinequan (doxepin), Tofranil (imipramine)

e.g. non-sedating (activating) antidepressants:
Anafranil (comipramine), norpramine (desipramine), Pamelor (nortriptyline), Vivactyl (protriptyline)

SSRIs:

Suppress REM, may markedly delay REM onset
May decrease TST
May increase SOL, stage
Depends on the individual medication
Prozac (fluoxetine): increased insomnia reported in 5 – 19% of *Ss*
Luvox (fluvoxamine), Paxil (paroxetine): sedation reported in up to 26% of *Ss*

DRUG EFFECTS ON SLEEP (cont., p3)

3. **<u>Antidepressants</u>** (cont.)

Other antidepressants:

Desyrel (trazodone)
5 – 45% of *Ss* report "drowsiness"
Increased TST, next day EDS, stages 3 & 4
Decreased SOL, WASO, slight decrease in REM

Serzone (nefazodone)
6 – 24% of *Ss* report "drowsiness"
Increased stages 3&4

Effexor (venlafaxine)
4 – 18% of *Ss* report "insomnia" at usual dose levels
12 – 31% of *Ss* report "somnolence" at higher dose levels (>150mg)

Remeron (mirtazapine)
Up to 52% of *Ss* report "sedation" (about equal to Elavil or Desyrel)

Wellbutrin (bupropion)
5 – 19% of *Ss* report "insomnia"
No effect on TST or SOL
Decreased REM latency, increased % of REM

Note: issues re. **REM suppression** & **REM rebound** upon D/C antidepressants

Note: delaying REM onset to end of night's sleep & dream recall/vividness

Note: selective REM suppression & antidepressant action of these drugs
Does REM suppression "cure" depression?…

DRUG EFFECTS ON SLEEP (cont., p4)

4. **Antipsychotics**

Like depressives, psychotics often report poor sleep (increased SOL & WASO, decreased TST, many awakenings, restless sleep, etc.)

Antipsychotics (neuroleptics, antischozophrenic drugs) usually improve sleep
Increase TST, although may have some hangover effects, esp. traditional antipsychotics (*Ss* c/o drowsiness, sedation)
e.g. Thorazine (chlorpromazine)
Mellaril (theoridazine)

May increase or decrease stage 3 & 4

Newer antipsychotics may be sedating
e.g. Clozaril (clozapine)
Zyprexa (olanzapine)

5. **Mood Stabilizers**

e.g. Lithium
Increased sedation, TST, may increase stage 3&4
Decreased REM
Case of induced somnambulism has been reported

e.g. Tegretol (carbamazepine)
Increased sedation (up to 11% of *Ss*), TST
Agitation, restlessness, & insomnia also reported occasionally

e.g. Depakote (valproic acid)
Slight increase in sedation
No significant effects on sleep reported

DRUG EFFECTS ON SLEEP (cont., p.5)

6. **Narcotics**

Acute use: increased WASO, decreased REM & stages 3&4
Chronic use: no change in WASO or stages 3&4, decreased REM

7. **Other Drugs**

Aspirin: acute use decreases stages 3&4
Catapres (clonidine):
- No effect on TST
- Increases WASO, more fragmented sleep architecture
- Decreases REM

Tagamet (cimetidine):
- Increases stages 3&4

L-Dopa:
- No effect on TST or stages3/4
- Increases REM

Steroids (including Prednisone):
- Increases SOL, WASO, c/o insomnia
- Decreases TST

Tetrahydrocannabinol (marijuana)
- Acute use: minimal sleep disruption, slight decrease in REM
- Chronic use: marked, long-term suppression of stages 3&4