1. **Historical Perspective**
   
   *every society* has used drugs to effect change in mood, thought, behavior, to *temporarily* change perception of reality

   and in *every society* some individuals *abused* these drugs
   meaning that they used the drug(s) outside of the society’s sanctioned uses (time, place, amount, etc.)

   and these unsanctioned users always --- *problems* for self, for those around them, for the greater society

   traditionally, these abusers only used a *small # of drugs* that each society had access to…which helped to keep *small the number of abusers*
   
   **but not now!**

   there are many psychoactive drugs available now
   there is *fairly easy access* to these *many drugs*
   there are many *synthetic derivatives* available…and more coming every day… “designer chemistry” available to all via internet
   
   there are new drug delivery techniques (e.g. alkaloid salts of drugs to be smoked)
   
   some drugs are now *inexpensive, available and socially sanctioned!*

2. **Concerning Drug Abuse Treatments**

   treatment costs a lot…but not treating costs a lot more!

   substance abusers are heterogeneous in nature/severity of abuse
   thus, one treatment approach will not fit all abusers

   majority of abusers have comorbid (dual) psychiatric diagnoses that must also be treated
2. **Concerning Drug Abuse Treatments** (cont.)
   in some cases, the psychiatric Dxs have --- to drug abuse (“self-medication”)
   in some cases, the drug abuse has --- psychiatric symptoms or both!

   multiple factors **sustain drug abuse patterns**:
   reinforcing effects of drug
   “permanent” or treatment resistant changes in NS
   avoidance of withdrawal effects
   a beneficial decrease in underlying psychiatric symptoms
   social reinforcement for drug use
   financial gain
   drug use often starts very early in life, lifestyle difficult to change
   drug use decreases awareness of aversive elements in abuser’s life
   lack of treatment options, lack of access to treatment
   other ……

3. **Nosology & Epidemiology of Substance Dependence/Abuse**
   see DSM IV, Table 13.1, p. 370
   substance **abuse** --- leads to substance **dependence**
   maladaptive patterns of substance use --- to significant impairment & distress

   **1 or more = abuse**
   role failure
dangerous to self/others
legal problems
continued used despite problems

   **3 or more = dependence**
tolerance
dependence & w/d Sxs
increasing amounts, duration of use
cannot decrease use, more efforts to obtain drug
loss of + roles, replaced by drug use
use continues while S acknowledges problems
Epidemiology:

“prevalence” = highest # of cases in entire population
  e.g. alcohol is drug with highest prevalence of all psychoactive drugs
“lifetime prevalence” of alcohol is 13-23% of population of USA
  (vs. 6% mean average for all other psych.act. drugs)

current data on young adults (late teens to early 20’s) on “have ever used”:
  90% alcohol 14% inhalants (e.g. gasoline)
  65% nicotine (smoked) 14% stimulants
  53% marijuana 12% cocaine
  25% nicotine (chewed) 9% opiates
  16% hallucinogens (not MJ)

about 33% of Ss with drug addictions also have a comorbid psych. diagnosis
  of drug abuse/dependent Ss:
    60% “personality disorders”
    50% “bipolar”
    47% “schizophrenic/schizoidal”
    33% “OCD”
    30% “unipolar depression” (males = females)
    24% “anxiety”

Julien argues that both substance abuse/dependence and psychiatric diagnosis must be treated concomitantly
Preston argues that substance abuse/dependence must be treated first; that drug abstinence is necessary before one can treat psych diagnosis

what do you think?
4. **Psychoactive Substances as Behavioral Reinforcers**

What is the biochemistry, neurophysiology, and neuropathology of behavioral reward as it pertains to substance abuse/dependency?

Substances that are prone to compulsive abuse activate the reward (positive reinforcement/attentional focus) areas of the CNS:

- **medial forebrain bundle**
- **ventral tegmentum**
- **hippocampus**
- **frontal cortex (orbital/basal prefrontal)**
- **nucleus Accumbens**
- **mesocorticolimbic pathway**
- **amygdala**

and they tend to be **agonists for: DA (esp. DA2), 5HT, opioid, GABA, and cannabinoid RSs (maybe NE…)**

Note: cocaine seems to be the “mother” of all reinforcers; all animal species so far tested (N=8) will self-administer it.

A “loop” of fibers: DA

- basal forebrain (prefrontal cortex) & nucleus Accumbens, amygdala, septal area
- ventral tegmentum of midbrain

- opioids, DA, GABA, 5HT & NE
- medial forebrain bundle

Note: Ss who are **DA2 RS deficient** are more likely to show drug abuse/dependence, more likely to abuse methylphenicate/Ritalin and find it pleasurable, and are more likely to use cocaine.

**How does S become DA2 RS deficient?** inherited? acquired? congenital?
4. **Behavioral Reinforcers** (cont.)

The 3 major factors that maintain drug abuse/dependence are:

- **Neural mechanisms**
  - e.g. DA2 RS deficiencies; too much activity in reward/focus “go for it” areas in CNS;
  - activity in hypothal-pituitary-adrenal axis (such as increases in cortisol see in depression, which may --- sub.abuse/depend);
  - underactivity in prefrontal “do not do this” areas of brain

- **Behavioral mechanisms**
  - impaired because of depression, anxiety
  - avoidance of adverse withdrawal effects
  - seeking of feelings of well-being, euphoria

- **Modifying factors**
  - **Social context** of drug use (all my friends do it too, it is “cool”, vs. it is not acceptable in my group of associates)
  - **Genetic factors** account for about 1/3 of variance of overall drug use
  - **Attitudes & expectations** (cognitive factors) in self, others
  - **Previous history**
  - **Drug availability**
    - which has been the major emphasis to date in attempting to control drug use... and has **not** been very successful
    - also, legislation has failed to address impact of **legally sanctioned** & available drugs on sub. abuse/dependency (ETOH, nicotine, caffeine)
    - most likely making currently illegal drugs legal to obtain would **not** help reduce sub.abuse/dependency, although it might
    - reduce criminal acts associated with obtaining drugs
SUBSTANCE ABUSE: Pharmacology & Neurology (p.6)

5. **Drug Education**
   to be effective, it must have 3 elements:
   - **basic information**
   - **means for behavioral change**
     - e.g. how to resist peer pressure
   - methods for **reinforcing new (non-drug) behaviors**
     - e.g. play baseball vs. take drugs

   increase S’s **self-esteem** in a drug-free environment
   requires adults to be good non-drug using **role models** for child
   must be **consistent** re. the harm of drug use, incl. alcohol, nicotine,
   (and caffeine?) (and marijuana?)

6. **Treatment Issues**
   - **out-moded idea** – that sub.abuse/dep. was maintained simply by the S’s
     - **avoidance of adverse effects of w/d**
     - used to think that treatment = detoxification, with the assumption that
       once S was through w/d and totally abstinent, that S was now OK
       and would not relapse back to drug use…**wrong**!
   - by mid-1990s we faced the fact that most former drug abusers return to
     drug use, do relapse….necessitated a change of focus in tx
   - recognition that in **abstinence** state former user feels **not-normal**:
     - apathetic, bored, depressed, anhedonic, malaise, anxious, depressed
     & **craves** relief from this state (which he sees possible only by
     using drug X)
   - when **S uses drug X**, he/she feels **more normal**:
     - more energy, less depressed, can enjoy things, motivated
     - but…may not be able to work, engages in criminal behavior in
       order to obtain drug X, suffers social/familial stigma, feels a
       “failure”, is alienated from others, etc. – a big price to pay!
7. **Pharmacological Treatment**

use pharmacological treatments plus behavioral treatments, both are necessary

in particular, how to handle exposure to **drug-using trigger cues** & **drug-craving trigger cues**

**pharmacological:**

initially treat to reduce adverse withdrawal Sxs

may substitute a legally obtained drug (e.g. methadone)

usually substitute drug has a longer ½ life (reduces w/d Sxs)

eliminates the criminal element from obtaining the drug

may substitute legally obtained drug for **long-term maintenance**

note: goal is not longer for abstinence per se

may use a **drug RS antagonist** (esp. DA2 or opiate) to reduce drug cravings (which seem to be related to a signal from unoccupied RSs)

**treatment of comorbid psychological disorder** with non-addicting, legally obtained medications

overall pharmacological goals are to:

decrease intensity of withdrawal Sxs

decrease rate of relapse

each addictive drug is treated with specific drugs:

**opioid abuse/dependence** –

substitute longer-acting legally obtained opiate agonist

- Methadone, LAAM (L-alpha-acetylmethadone)
- clonidine (NE alpha agonist)
  
  w/ or w/o naltrexone (opiate antagonist)

- **RAAD** – expensive and controversial, riskier, high relapse rate
7. Pharmacological Treatment (cont.)

opioid abuse/dependence – (cont.)
for maintenance approach use opiate agonists/partial agonists
methadone, LAAM, buprenorphine (Buprenex)
or use opiate antagonists, naltrexone (Trexan, ReVia)
usually poor patient compliance

nicotine abuse/dependence –
nicotine replacement tx that does not require smoking per se

gums, patches, nasal sprays, inhalers
 antidepressants
 esp. buproprion (Wellbutrin, Zyban)
 works as an antidepressant and decreases cravings (inhibits DA reuptake)
 above are all maintenance approaches, not abstinence

ETOH abuse/dependence –
tx for w/d (detox), aversive therapy, decrease cravings, comorbid Dxs

  detoxification – decrease alcohol, increase BZDs (e.g. Librium, Valium, Klonopin) long ½ lives
  decrease risk of seizure, decrease w/d Sxs (e.g. anxiety, insomnia)
 Antabuse (disulfiram) for aversive th.
to decrease cravings – naltrexone (blocks opiate RSs)
 acamprosate ( ) – glutamate antagonist, used in Europe
 ibogaine (a Schedule I “narcotic”), decreases cravings, structurally similar to 5HT (in rats it decreases consumption of ETOH, morphine & cocaine)
 is a DA antagonist via effects on 5HT, kappa opiate, & glutamate RSs
 …but has psychedelic properties, which are undesirable
to treat depression – SSRIs, other antidepressants (common comorbid disorder, also anxiety)
8. **Behavioral Treatment**  
(see p.382, Figure 13.6, Julien, 9th ed.)  
regular **outpatient** treatment program attendance  
is the most cost-effective approach after detox. has been completed  
44% abstinent at 1 year anniversary for detox + outpatient  
$1500 for just detox (34% abstinent at 1 year anniversary)  
sometimes done **inpatient** as well, but more costly ($7000 vs. $1500)  
but patient is there! so is slightly more effective than outpatient  
(when patient is not always there!) (50% abstinent at 1 year)  

note: cost of 1 year in jail = $26,000  

note: even brief behavioral counseling (5-10 minutes) is more effective  
than no behavioral counseling at all…  

**treatment issues:**  
discuss and acknowledge positive and negative aspects of drug use,  
and the ambivalence…  
teach coping skills – for trigger avoidance especially  
changing reinforcers to non-drug ones  
managing painful, negative effects of abstinence, from other sources  
in a non-drug way  
 improve interpersonal skills, enlarge social support network  
 improve compliance with pharmacotherapy