# PRINCIPLES OF ADDICTION



#### **The Public Health Triad**

#### Agent

#### Host

#### Environment

# Principles Governing the Person-Drug Relationship: The Agents (Psychoactive Drugs)

#### **Principle of Homeostasis**

The human body operates within certain physiological limits which act to maximize the potential for both immediate and long survival

#### **Principle of Access:**

For a substance to display psychoactive properties, it must be capable of crossing the blood-brain barrier and interacting with the human neurotransmitter system.



# **Principle of Adaptation**

The relationship between a person and a psychoactive drug evolves dynamically as the body and the psyche change to incorporate the drug's presence or absence



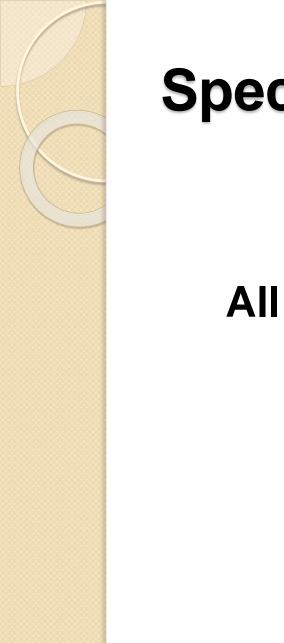
### **Mechanisms of Adaptation**

- Tolerance
- Underdose
- Overdose
- Withdrawal
- Reverse tolerance



### **Mechanisms of Adaptation**

- Kindling
- Cross tolerance



#### **Specification Principle**

# All drug-person interactions are potentially idiosyncratic



#### **Risk Principles**

 Drug experimentation decisions are influenced by the ratio between the potential benefits of using a drug and the potential risks of taking a drug.



#### **Risk Principles**

 Drugs can be consumed because of their perceived low-moderate risks, in spite of their high risks, or because of their high risks. Risks can be an obstacle to use or an attraction to use

#### **Risk Amplification**:

Combining drug consumption risk factors dramatically increases the potential for harm to self and others.



#### Potentiation Synergism

#### **Dose-response Principle I**

It is not possible to predict the effects of a particular drug without first defining the dosage of the drug that is to be ingested

#### **Dose-response Principle II**

The quantity of a drug consumed within a specified time is directly related to the magnitude of the drug response



#### **Categories of Dosage**

- Packaged dose
- Event dose
- Cumulative dose
- ED (effective dose)

### **Categories of Dosage**

ED (effective dose)
ED<sub>1</sub>, ED<sub>50</sub>, Etc.

LD (lethal dose)
LD<sub>1</sub>, LD<sub>50</sub>, Etc.



The quantity of a drug sufficient to move a particular person from sustained non-problematic to sustained problematic drug use



The priming dose will:

Produce an effect strong enough and different enough from past effects to cause the brain to redefine the meaning of intoxication

#### Priming Dose: Mechanisms of Action

The priming dose can initiate problematic use by:

- Activating the reward pathways in the brain
- Producing a drug-induced psychosis

The priming dose can initiate problematic use by:

- Inducing seizure activity (in the case of CNS stimulants)
- Initiating drug hunger (i.e., craving)

The priming dose can initiate problematic use by:

 Inciting repeated episodes of drug seeking and drug using behavior in spite of adverse consequences



The priming dose varies by genetic background, by gender, and during different stages of human development

### **Principle of Intensity of Use**

The personal and social costs of drug use rise in tandem with increased frequency and quantity (the latter measured by dosage per episode and per day/week/lifetime)

**Principles of Purity and** Adulteration The untoward effects of a particular drug containing multiple and complex ingredients may be related, not to the drug's primary psychoactive ingredient, but to secondary ingredients or additives.

#### **Principles of Purity and** Adulteration

The risk associated with drug-

taking can be either increased or

decreased when the purity of the substance is altered



#### Potency

Potency = the relative power or strength of a drug compared to another drug, usually of the same pharmacologic class

# **Potency Principle I**

**Throughout American history, our** understanding of particular drugs has been confounded by the appearance of new and more potent forms of drugs with altered effects and addiction potential.



# **Potency Principle II**

Any change in the potency of a known drug may require a parallel reevaluation of the drug's effects and addiction potential.

# **Drug Form Principle I**

Changing the form of a drug can, by influencing dose, rapidity of onset, and duration of action, increase or decrease the drug's abuse potential

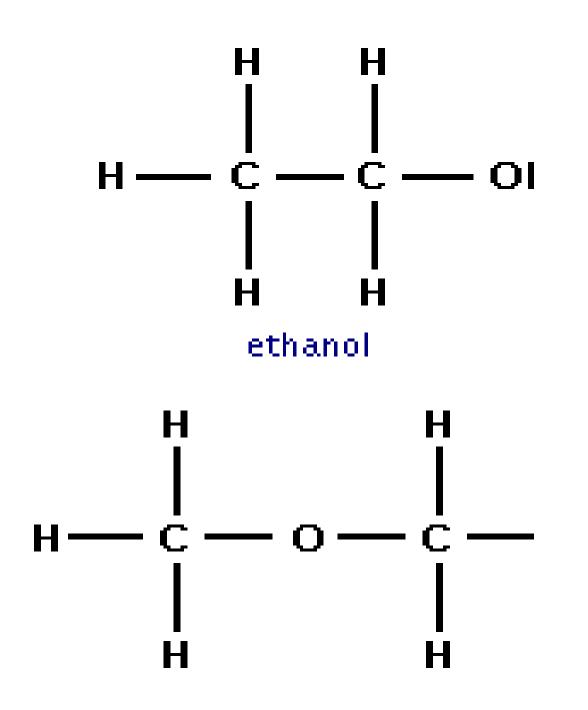
## **Drug Form Principle II**

The toxicity of a drug can not be determined simply on the basis of whether the substance has an organic or synthetic origin



#### Drug Form Principle III: Analogues

Minor changes in the molecular structure of a drug can provoke devastatingly different effects



### **Speed of Onset Principle**

Drugs with a rapid onset of action tend to have a higher risk of misuse than drugs with a slower onset of action

#### **Duration of Effect Principle I**

Short acting drugs have

traditionally exhibited higher risks

for toxicity/lethality than longacting drugs of the same class



# **Duration of Effect Principle II**

Short-acting drugs (Xanax, heroin, Seconal) have the potential for more severe but shorter withdrawal than long-acting drugs (Librium, methadone, phenobarbital)



### **Speed of Elimination Principle**

The risks of drug use are

influenced by the length of time

require to metabolize and eliminate the drug from the body

Method of Administration Principle I Any alteration in a drug's method of administration may require a redefinition of the risks associated with use of the drug, including its addiction potential.

### Method of Administration Principle II Changing a drug's route of administration may alter a drug's perceived harmfulness and thus its attractiveness

### Method of Administration Principle II In some cases, the route of administration is a potentially riskier factor than the effect of the substance being administered

## **Drug Interaction Principle I**

**Risks of untoward consequences** 

from drug use arise in the transition

from single drug use to multiple drug use

**Drug Interaction:** Planned Synergism I The planned administration of two or more drugs to achieve an effect different than and greater than their independent effects

**Drug Interaction:** Planned Synergism II The effects produced by combining psychoactive drug administration with a non-chemical but rewarding behavior may also require the re-evaluation of the drug's addiction potential



### **Planned Synergism Principle**

Planned synergism poses

enormous threats to centuries of

knowledge that is based on

studying the effects of each drug in isolation

## **Drug Substitution Principle** Lack of access to one drug often results in drug substitution: the replacement of the preferred drug with a drug whose effects are similar.

### **Principle of Drug Sequencing**

The acute or chronic effects of resulting from the excessive use of one drug can generate vulnerability for misuse of drugs in similar or contrasting categories.

### **Drug Prices Principle I**

Any significant price reduction of a drug may increase its potential for misuse by engaging more vulnerable populations and by increasing dose per episode of use and dose per lifetime.

## **Drug Prices Principle II** Increased price often serves to shrink overall consumption, but a point may be reached where the price leads to a rechristening of the drug as a status symbol-increasing its popularity more for symbolic than pharmacological value.

### **Drug Prices Principle III**

Any change in the available dosage unit of a drug may increase its potential for misuse

### **Drug Withdrawal Principle**

Withdrawal symptoms associated with discontinuation of a particular drug are often the opposite of the signs exhibited during the period of intoxication.

## **Universality of Drug Effect**

Although most drugs of abuse have idiosyncratatic actions, they often either directly or indirectly produce their effects through their interaction with a single brain pathway, the mesolimbic reward system

## Principles Governing the Person-Drug Relationship: The Person (Host)

"From the same jug of whiskey comes tears for one and laughter for another."

- Sidney Cohen, 1964



### **Species Effect Principle**

The effects of psychoactive drugs differ significantly across species

### **Exposure Principle**

### Addiction is a disease of exposure

### **Specification Principle**

The effect of a psychoactive drug can not be specified without taking into account:

- Age of onset
- Gender
- Unique vulnerability



### **Intent Principle**

One's motivation for using a drug shapes and defines the drug experience.

**Developmental Windows of** Vulnerability Principle I Vulnerability for initiating use of particular drugs and the acute and cumulative effects of those drugs vary considerably by age

**Developmental Windows of** Vulnerability Principle II Drugs cannot be defined in terms of their relative safety or abuse potential until their effects have been tested across the human life cycle



### Adam's Rib Principle

All statements regarding drug effects and drug addiction need to be checked for gender validity

### **Principle of Addition**

Personal vulnerability to the powers of psychoactive drugs increase when the individual discovers that the drug can add something (pleasure, energy, confidence, tranquility, people) to themselves or their life that is missing

### **Principle of Subtraction**

Personal vulnerability to the powers of psychoactive drugs increase when the individual discovers that the drug can either hide or take away something (pain, boredom, shyness) that is undesirable

### Principle of Initiating and Sustaining Factors

The factors that operate to sustain

addiction are often quite different

than the factors that contributed to the initiation of drug use

# Host Vulnerability and Drug Sequencing

The untoward effects of one drug can lead to other predictable drug choices that can ameliorate these dysphoric effects



### Set Vulnerability

The risk of a particular psychoactive drug cannot be calculated without reference to the beliefs, attitudes, and expectations the user brings to the drug experience



### **Addiction to Set**

The rituals associated with the method of administration can be as reinforcing as the effect of the drug itself

# Drug Use as a Deviant Career

Participation in drug use and the

underground economies that

surround such use are for many

citizens a career choice

### Set as a Control Mechanism

The use of a drug within a culturally-defined and established ritual is less likely to result in abuse and dependency, than use outside such sanctioned rituals

## Principles Governing the Person-Drug Relationship: The Environment



The risk of a particular psychoactive drug cannot be calculated without reference to the physical and social environment within which the drug is to be used



### **Cultural Response**

No culture is neutral about the psychoactive drugs in its environment. Cultures generally place psychoactive drugs in one of four categories

### **Cultural Categories**

### **Celebrated Drugs**

- Use is promoted by the culture
- Use seen as reflecting the values and order of the culture

#### **Cultural Categories**

#### **Tolerated Drugs**

- Moving out of favor
- Use is accompanied by social stigma



#### **Cultural Categories**

#### **Instrumental Drugs**

May be used in the culture but only under highly structured definition of who, when, where, how much, and under what circumstances use can occur



#### **Cultural Categories**

#### **Prohibited Drugs**

Use is seen as so antithetical to the values of the culture that it is severely punished

**Cultural Response: Shifts in Categories** The movement of drugs from one category to another reflect not only changing knowledge about the drug but also changing cultural values



## **Cultural Vulnerability**

Drug-related problems tend to rise within cultures whose norms are in rapid flux.

#### Status of Women and Children

Most cultures evolve rules that postpone the onset of psychoactive drug use to after the biological changes of adolescence and/or structure such exposure as a rite of passage into manhood or womanhood.

#### Status of Women and Children

#### Most cultures evolve special rules governing psychoactive drug consumption of child-bearing women



Drug choices can rapidly shift as the character and experience of the culture evolves

#### **Drugs as Symbols**

#### The use of a particular drug may have individual and/or communal meaning.



#### **Drugs as Symbols**

## The social significance of a drug may transcend its pharmacology



#### **Drugs as Symbols**

# The culture that surrounds the drug may be more powerful than the drug itself.

#### **Dormance, Emergence** & Hibernation

A drug can lie dormant within a culture for generations before it breaks into the open as a favored intoxicant

#### **Dormance, Emergence** & Hibernation

Once they emerge, drugs may move through a stage of popularity into a period of sustained hibernation, only to re-emerge again as a major drug of abuse.

#### **Drugs and Cultural Fit**

The celebration and suppression of drugs reflect continuities and discontinuities between the pharmacological effects of various drugs and the evolving values of a culture.



#### **Niched Use**

Understanding niched drug use is only possible through an understanding of the world view and psychological/social experience of those drawn to a particular drug



#### **On Initial Vulnerability**

Those individuals closest to the discovery or application of a psychoactive drug are particularly vulnerable to untoward consequences resulting from its use



#### **The First Experimenters**

New drugs not yet culturally

blessed are most often embraced

by those who have little investment

in the existing political, economic,

and social order



- Wartime conditions can spawn increased psychoactive drug consumption by
- bringing large numbers of adolescents and young adults into intimate social contact.



- Wartime conditions can spawn increased psychoactive drug consumption by:
- Suspending family- and community-of-origin norms governing drug-taking behavior



- Wartime conditions can spawn increased psychoactive drug consumption by:
- Introducing new drugs for which there are no pre-existing prohibitions or ground rules for use



- Wartime conditions can spawn increased psychoactive drug consumption by:
- Providing a medium for the selfmedication of fear and boredom.

# Drugs as Weapons

#### Intoxicants have a long role as weapons of interpersonal, political and economic exploitation

#### **Technology and Drug Use**

**Technological innovation can spark** changes in patterns of drug use and force a re-evaluation of the risks associated with use of a particular drug or class of drugs

## **Technology and Drug Use**

Technology can also play a role in reducing drug consumption and shifting drug tastes from high risk to low risk drugs.



#### Addiction as latrogenic Illness

Medicine has played a significant role in the spread of addiction in America. Nearly every drug of abuse, during its early introduction, was prescribed--in some cases indiscriminately--as a medical remedy.



#### **Normalization Principle**

One of the ways to introduce or expand drug consumption is to expand the range of benign places where the drug may be purchased and sold.



#### Piggybacking

One of the ways to introduce a new drug is to attach it to an already accepted drug that is not perceived to have high risks.



#### Rechristening

Renaming a drug can compensate for its damaged reputation and thus re-ignite use



#### **Image Manipulation**

A drug's value can be enhanced with different groups by declaring it to be either a "natural" or "organic" drug with one group or a "synthetic" or "designer" drug with another



#### **Trojan Horse**

Drugs purported to cure or treat addiction often emerge later as drugs of abuse

## **Stages of a Drug Epidemic**

Most drug epidemics don't go

away. They transform themselves into something else.

 Periods of excessive stimulant use are often followed by periods of excessive depressant use

## On the Cyclical Nature of Drug Trends

#### Each generation must relearn its own chemical lessons and define its own chemical tastes.



#### **Trend Sequences**

 Some drug epidemics are inherently self-limiting both personally and collectively



#### **Trend Sequences**

Poorly designed social

interventions aimed at suppression of self-limiting trends can prolong rather than shorten their natural life cycle



#### **The Red Herring**

The use of exotic and illicit drugs that garner great public attention may mask fundamental changes that are occurring in the use of socially approved drugs



#### **Manufactured "Epidemics"**

Rhetorical amplifications of slight shifts in drug use into claimed "epidemics" are often fueled by personal and institutional selfinterest



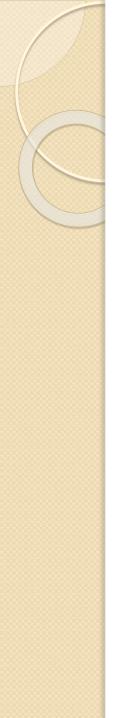
#### **Myths that Kill**

Initial reports of drug effects are notoriously unreliable and often embed myths within the culture that generate their own harmful effects



#### **Backlash Effect**

If certain risks of a particular drug as conveyed by mainstream institutions are not confirmed by experiences with the drug, then all risks portrayed for the substance are discounted



#### **Popular Image of the Addict**

There is often great incongruence between the popular image of the addict and the true profile of those who are addicted



#### **Popular Image of the Addict**

Our views about addiction are influenced primarily by our view of who's addicted.



Racism, classism and sexism exert a powerful influence on the definition and enforcement of drug control policy

#### Social Responses to New Drug Trends

Cultural responses to new drug

threats mimic the stages in which

humans respond to stress:

denial

alarm reaction



stage of resistance

stage of exhaustion.

#### **Collective Tolerance**

 Like individuals, communities and cultures can slowly develop a tolerance for particular drugs and their related consequences

## **Collective Tolerance**

 Individuals and communities have the greatest difficulty perceiving and mobilizing a response to drug patterns whose entrenchment was slow and insidious.

#### **Mechanism of Control**

- The ultimate mechanism to reduce the personal and social consequences of psychoactive drug use is not law but belief and ritual.
- Cultural cohesion is the ultimate mechanism of control.