Objectives

- Discuss the categories of drugs, and explain their routes of administration.
- Discuss patterns of illicit drug use, including who uses them, and why.
- Discuss the use and abuse of controlled substances, including alcohol.
- Profile illegal drug use and the associated health risks.

Drug Dynamics

- Drugs work by physically resembling chemicals produced naturally in the body
- Receptor site theory – drugs bind to specific receptor sites in our body’s cells

Drug Metabolism

Steps in Drug Breakdown:
1. Drug is introduced.
2. Drug circulates in bloodstream.
3. Drug binds to specific receptor sites.
4. Liver breaks down drugs circulating in bloodstream.
5. Drugs at receptor sites dissolve.
6. Lungs, bowel, skin, and kidneys excrete chemicals metabolized by the liver.
Type of Drugs

- Prescription
- Over-the-counter (OTC)
- Recreational
- Herbal preparations
- Illicit (illegal)
- Commercial preparations

  - Drugs can stimulate, depress, cause hallucinations, alter mood or behavior.

Routes of Administration

- Oral ingestion
- Injection:
  - Intravenous
  - Intramuscular
  - Subcutaneous
- Inhalation
- Inunction (through the skin)
- Suppositories

Misusing and Abusing Drugs

- Drug misuse
  - The use of a drug for a purpose for which it is not intended
    - Using a friend’s prescription
- Drug abuse – excessive use of drugs, which can lead to:
- Addiction – the habitual reliance on a substance to produce a desired mood.
  - Can be physiological or psychological

Table 14.2
Selected Drugs and Risk of Dependence

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk of Dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocaine</td>
<td>Psychological: high Physical (especially crack): moderate</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>Psychological: high Physical: high</td>
</tr>
<tr>
<td>Marijuana</td>
<td>Psychological: moderate Physical: varies</td>
</tr>
<tr>
<td>Opiates</td>
<td>Psychological: high Physical: high</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>Psychological: low Physical: varies</td>
</tr>
<tr>
<td>Inhalants</td>
<td>Psychological: high Physical: moderate</td>
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</tbody>
</table>

Controlled Substances

- Controlled Substances Act of 1970 – created categories for both prescription and illegal substances
- Schedule I drugs – highest potential for abuse, with no medicinal purpose
- Schedule II, III, IV, and V – have known and accepted medical purposes, but many present a serious threat to health when misused or abused

### Table 14.1
Annual Prevalence of Use for Various Types of Drugs, 2002: Full-Time College Students vs. Respondents 1–4 Years beyond High School

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Characteristics</th>
<th>Examples</th>
</tr>
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<tbody>
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<td>Schedule I</td>
<td>High potential for abuse and addiction; no accepted medical use</td>
<td>Amphetamine, Heroin, Phencyclidine (PCP), LSD, Marijuana, GHB, Ketamine, Alcohol, Cigarettes</td>
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<tr>
<td>Schedule II</td>
<td>High potential for abuse and addiction; restricted medical use</td>
<td>Cocaine, Codeine*, Methadone, Morphine, Opium, OxyContin, Vicodin</td>
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<tr>
<td>Schedule III</td>
<td>Some potential for abuse and addiction; currently accepted medical use</td>
<td>Anabolic steroids, Nalorphine, Neurontin</td>
</tr>
<tr>
<td>Schedule IV</td>
<td>Low potential for abuse and addiction; currently accepted medical use</td>
<td>Codeine, Xanax, Minor tranquilizers, Robinsin AC, OTC preparations</td>
</tr>
<tr>
<td>Schedule V</td>
<td>Lowest potential for abuse; accepted medical use</td>
<td>None</td>
</tr>
</tbody>
</table>

*Can also be Schedule III or Schedule IV, depending on use.


### Table 14.3
How Drugs Are Scheduled

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</tbody>
</table>

*Can also be Schedule III or Schedule IV, depending on use.


Stimulants

- Cocaine: blocks reuptake of the neurotransmitter dopamine
  - Methods of cocaine use:
    - Snorting
    - Smoking (freebasing)
    - Injection
  - Physical effects:
    - Euphoric
    - Increased heart rate and blood pressure
    - Loss of appetite
    - Convulsions

![Cocaine](Cocaine.png)

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![Crack Cocaine](Crack_Cocaine.png)
Ups and Downs of Cocaine Use

Stimulants continued

- Amphetamines (medical and recreational):
  - Sold under a variety of names: bennies, dex, meth, speed, cross tops, uppers
  - Methamphetamine – powerfully addicting, easily made using over-the-counter drugs
  - Ice – a potent methamphetamine, usually imported from Asia that is purer and more crystalline than U.S. version

Marijuana

- Physical effects – dilation of blood vessels in the eyes, dry mouth, increased appetite, lowered blood pressure, mild muscular weakness
- Users may experience anxiety and paranoia
- Tetrahydrocannabinol (THC) – psychoactive substance in marijuana

Opiates

- Also called narcotics
- Derived from opium, the dark, resinous substance made from the juice of the opium poppy
- Powerful depressant of the central nervous system
- Derivatives include morphine and codeine
- Synthetic opiates: Percodan, Demerol, and Dilaudid
- Oxycontin, another powerful opiate
- Heroin – highly addictive
Treatment for Heroin Addiction

- Most heroin addiction programs are not very successful
- Distinct pattern of withdrawal:
  - Crave another dose 4–6 hours after initial dose
  - 12 hours after initial dose – sleep disturbance, irritability, muscle tremors
  - 24–72 hours – nausea, abdominal cramps, vomiting, diarrhea
- Methadone – synthetic narcotic that blocks the effects of opiate withdrawal

Hallucinogens

- Psychedelics – mind manifesting
- Reticular formation – located in the brain stem; when hallucinogen reaches this site “messages” become scrambled
- Synesthesia – sensory messages are mixed (smell colors, or hear tastes)
- Lysergic acid diethylamide (LSD)

The Reticular Formation

- Cerebellum
- Pons
- Medulla
- Reticular formation
- Spinal cord

Hallucinogens continued

- Mescaline – derived from peyote cactus
- Psilocybin – derived from a group of mushrooms
- Phencyclidine (PCP) – synthetic substance developed as a “dissociative anesthetic”

Peyote Cactus
Designer Drugs

- Collectively known as club drugs:
  - Ecstasy - The Original
  - GHB - Date rape drug
  - Special K - ketamine - originally an anesthetic
  - Rohypnol - Date rape drug

Inhalants

- Chemicals which produce vapors causing hallucinations and intoxicating effects
- Blood vessels rapidly dilate, BP drops, HR increases to compensate, the result is a rush
- Some agents are organic solvent by-products of the distillation of petroleum products:
  - Rubber cement, model glue, paint thinner, lighter fluid, varnish, wax, and gasoline

Steroids

- Anabolic steroids – artificial forms of the male hormone testosterone
- Ergogenic drugs – substance that enhances athletic performance
- Two forms:
  - Injectable solutions
  - Pills
- Variety of adverse effects: mood swings, acne, liver tumors, elevated cholesterol levels, hypertension, kidney disease
- Anabolic Steroids Control Act of 1990 – Schedule III drug

Solutions to the Problem

- Educating young people
- Stricter border surveillance
- Longer prison sentences
- Increased government spending on prevention
- Enforcing anti-drug laws
- More research
- Legalization?
- Anything else?
Alcohol and College Students

- Approximately 85% of college students consume alcohol
- 1/3 of college students are heavy drinkers
- College drinkers spend more on alcoholic beverages than on soft drinks and textbooks combined

Binge Drinking and College Students

- Binge drinking – 5 drinks in a row for men, 4 drinks in a row for women on a single occasion
- According to the Harvard School of Public Health, 2001:
  - 44.8% of students were binge drinkers
  - 22.8% were frequent drinkers (binge drink 3 or more times in a 2-week period)
  - Frequent binge drinkers are 16 times more likely to miss class, 8 times more likely to get behind in their school work
- Spring Break - Fraternity Party Culture?

Effects of Blood-Alcohol Levels

<table>
<thead>
<tr>
<th>Number of Drinks</th>
<th>Blood Alcohol Concentration (%)</th>
<th>Psychological and Physical Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.00 – 0.05</td>
<td>No overt effects, slight mood elevation</td>
</tr>
<tr>
<td>2</td>
<td>0.06 – 0.09</td>
<td>Feeling of relaxation, warmth, slight decrease in reaction time and in fine-motor coordination</td>
</tr>
<tr>
<td>3</td>
<td>0.10</td>
<td>Coordination and balance becoming difficult; distinct impairment of mental faculties, judgment</td>
</tr>
<tr>
<td>4</td>
<td>0.11 – 0.12</td>
<td>Major impairment of mental and physical control; slurred speech, blurred vision, lack of motor skills</td>
</tr>
<tr>
<td>5</td>
<td>0.14 – 0.15</td>
<td>Loss of motor control; may have incoherence in moving about; mental confusion</td>
</tr>
<tr>
<td>6</td>
<td>0.20</td>
<td>Severe intoxication; minimal conscious control of mind and body</td>
</tr>
<tr>
<td>7</td>
<td>0.30</td>
<td>Unconsciousness, threshold of coma</td>
</tr>
<tr>
<td>8</td>
<td>0.40</td>
<td>Deep coma</td>
</tr>
<tr>
<td>9</td>
<td>0.50</td>
<td>Death from respiratory failure</td>
</tr>
</tbody>
</table>

*For each hour elapsed since the last drink, subtract 0.015 percent blood alcohol concentration, or approximately one drink.

1 drink = one beer (4 percent alcohol), 12 ounces; one highball (1 ounce whiskey), or one glass table wine (5 ounces).

Source: Modified from data given in Ohio State Police Driver Information Seminars and the National Clearinghouse for Alcohol and Alcoholism Information, Rockville, MD.
Beverages & Alcohol Equivalencies

<table>
<thead>
<tr>
<th>Percentage of alcohol by volume</th>
<th>Light beer (12-oz. can)</th>
<th>Regular beer (12-oz. bottle)</th>
<th>Wine (4-oz. glass)</th>
<th>Most cocktails (mixed drinks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4–4.8%</td>
<td>3.2–5.0%</td>
<td>12%</td>
<td>40–50%</td>
<td></td>
</tr>
</tbody>
</table>

| Amount of alcohol per serving | 0.29–0.58 oz. | 0.38–0.60 oz. | 0.48 oz. | 1 oz. |

Chemical Makeup of Alcohol

- **Ethyl alcohol or ethanol** – the intoxicating substance
- **Fermentation**
  - Yeast organisms break down plant sugars, yielding ethanol and carbon dioxide
  - Wine and beer
- **Distillation**
  - Alcohol vapors from the fermented mash are collected and mixed with water
  - Spirits such as whiskey, rum, tequila
- **Proof** – the measure of percentage of alcohol; the alcohol percentage is 50% of the given proof:
  - 100 proof vodka is 50% alcohol by volume

Absorption and Metabolism

- Alcohol molecules are sufficiently small and fat-soluble to be absorbed throughout the entire gastrointestinal system
- Factors that influence how quickly body absorbs alcohol:
  - Alcohol concentration in beverage
  - Amount of alcohol consumed
  - Amount of food in stomach
  - Mood?

Alcohol Poisoning

- Death from alcohol poisoning can be caused by central nervous system and respiratory depression
- Danger of inhalation of vomit or fluid into the lungs
- The amount of alcohol that causes someone to “pass out” is dangerously close to the “lethal dose”
- Signs of alcohol poisoning:
  - Unable to be aroused
  - Weak, rapid pulse
  - Unusual or irregular breathing pattern
  - Cool, damp, pale, bluish skin
Immediate Effects

- The primary action of alcohol is to depress the central nervous system
- Diuretic – results in fluid being drawn out of tissues
- Alcohol irritates the gastrointestinal system
- Dehydration and GI upset causes hangover
- Drug interactions with alcohol can be very dangerous: narcotics and alcohol is potentially lethal

Alcohol and Pregnancy

- Fetal alcohol syndrome (FAS) – alcohol consumed during the first trimester may affect organ development, alcohol consumed during the last trimester may affect the central nervous system development
- Fetal alcohol effects (FAE) – children with a history of prenatal alcohol exposure but with fewer than the full physical or behavioral symptoms of FAS
Fetal Alcohol Syndrome

Drinking And Driving
National Highway Traffic Safety Administration Statistics

Other Costs to Society

- Responsible for 25% of nation’s medical costs and lost earnings
- 50% of all child abuse cases are the result of alcohol-related problems

Alcohol Abuse and Alcoholism

- Alcohol abuse – interferes with work, school, or social and family relationships or entails any violation of the law
- Alcoholism – when personal and health problems related to alcohol use are severe and stopping alcohol consumption results in withdrawal symptoms
Causes of Abuse and Alcoholism

- Biological and family factors:
  - Type 1 alcoholics – drinkers that had at least one parent of either sex that was a problem drinker
  - Type 2 alcoholics – seen in males only, biological sons of alcoholic fathers
- Social and cultural factors:
  - Social pressure
  - Family attitude toward drinking

Women and Alcoholism

- Trend is for women, especially college-age women to drink more heavily
- Some studies suggest that there are almost as many female as male alcoholics
- Women get addicted faster with less alcohol
- Female alcoholics have death rates 50–100% higher than male alcoholics

Relapse

- Approximately 60% of alcoholics relapse within the first three months of treatment
- A comprehensive approach is needed – drug therapy, group support, family therapy, and personal counseling designed to improve living and coping skills is usually the most effective course of treatment
- We have resources here for you!

Recovery

- The family's role
- Treatment programs:
  - Private treatment facilities
  - Family therapy, individual therapy, and group therapy
  - Alcoholics Anonymous (AA)
  - Al-Anon
  - Alateen
- We have resources here for you!