

# Cocaine & Its Derivatives



# The History of Cocaine

- Cocaine is derived from small leaves of the coca shrub, grown in the high-altitude rain forests and fields that run along the slopes of the Peruvian and Bolivian Andes in South America.

# The History of Cocaine

- **Coca Chewing**
  - Appreciated for giving increased strength and stamina to workers who labored in this harsh mountainous environment.
  - Measure time and distance (how many leaves chewed).
  - Still today, coca chewing is part of the culture of the region.
    - Produces few instances of toxicity or abuse due to low doses.

# The History of Cocaine

- *Bazuco*

- More dangerous and addictive.
- Addictive mixture of coca paste containing a much higher percentage of cocaine combined with tobacco.
- Smoked like a cigarette.
- Dangerously high levels of kerosene, gasoline, and ether involved in the refining process also end up in the cigarette.

# Cocaine in 19<sup>th</sup> Century Life

- **Coca leaves travel from Spain to Europe.**
  - Potency gone after long sea travel.
  - Effects thought to be exaggerated.
- **Cocaine ignored from nearly 300 years**
- **1859: Alfred Neimann, a German chemist, observed its anesthetic effect.**
  - Named it “cocaine.”
- **1860’s: Cocaine entered the patent medicine industry in Europe and the United States.**

# Commercial Uses of Cocaine

- **Angelo Mariani**
  - 1863: mixed alcohol with cocaine and called it “Vin Mariani”
  - Very popular
- **John Pemberton**
  - French Wine Cola
  - 1885: Coca Cola developed
- **William Halstead**
  - Used cocaine as an anesthetic.

# Freud and Cocaine

- **1884: Freud suffering from depression.**
- **Heard about the effects of cocaine.**
- **He obtained it, and found the experience exhilarating, his depression lifted and he felt a new sense of boundless energy.**
- **Distributed to his friends, family and fiancée.**
- ***Uber Coca* (Concerning Coca) was written and published.**

# Acute Effects of Cocaine

- **Effects vary in degree with the route of administration, the purity of the dose, and the user's expectations about the experience.**
  - **Powerful burst of Energy**
  - **General sense of well being although for some induces panic attacks**

# Acute Effects of Cocaine

- **When cocaine levels diminish, the mood changes dramatically.**
  - **The user becomes irritable, despondent, and depressed.**
  - **These aftereffects coincide with the development of a powerful craving for another dose.**
  - **Formication effects**
  - **Suicide rates increase**

# Acute Effects of Cocaine

- Reports of increased sexual arousal and ability
- “Aphrodisiac of the 1980s”
- Expectations may bias this effect

# Acute Effects of Cocaine

- **Sympathetic Arousal (specific changes in the body)**
  - Heart rate and respiration are increased
  - Appetite is diminished
  - Blood pressure rises
  - Pupils in the eyes dilate
  - Sweating / Paleness
  - Can lead to a cerebral hemorrhage or congestive heart failure
  - Cardiac arrhythmia results from cocaine's tendency to bind to heart tissue itself
  - Behavioral skills are adversely affected (reckless behavior)

# Chronic Effects of Cocaine

- **Chronic cocaine users are often irritable, depressed, and paranoid.**
- **Long-term abuse can produce formication**
  - Users scratch skin into open sores or even use knives to cut out imaginary bugs
- **Cocaine psychosis**
- **Snorting leads to continuously stuffy or runny noses and bleeding of nasal membranes**
  - Septum of the nose can develop lesions or become perforated with small holes, both of which present serious problems for breathing.

# Medical Uses of Cocaine

- **Local anesthetic effect**
  - **Blocks the transmission of nerve impulses, deadening all sensations from the area**
  - **Potential for abuse if absorbed through the bloodstream**
  - **Anesthetic effects may be too brief because cocaine breaks down so rapidly**
  - **Lidocaine and other drugs used instead as local anesthetics during dental procedures**

# How Cocaine Works in the Brain

- **Enhances the activity of dopamine and, to a lesser extent, norepinephrine in the brain.**
- **Blocks the reuptake process**
- **Chronic abuse leads to the loss of about 20% of the dopamine receptors in this region of the brain.**
- **Kindling effect**

# Present-Day Cocaine Abuse

- **Early 1970s – Present**
- **“Champagne of drugs”**
- **Early 1980s, attitudes began to change**
  - **Death of John Belushi in 1982**
  - **Drug related deaths of other entertainers and sport figures**
  - **Arrival of crack cocaine in 1985**

# Types of Cocaine Used

- See Figure 4.2 on page 85 of Levinthal
- Coca Leaves → Coca Paste → Cocaine hydrochloride → Freebase or Crack (depending on extraction process)
- Cocaine combined with PCP (Space Cadet, Tragic Magic)
- Cocaine combined with heroin (Speedball)
- Cocaine combined with heroin and LSD (Frisco Special, Frisco Speedball)

# Patterns of Cocaine Abuse

- **National Survey on Drug Use and Health (2003)**
  - ~34 million American aged 18+ had used cocaine at some time in their lives.
  - ~5.5 used during the past year.
  - ~2.1 had used during the past month.

# Patterns of Cocaine Abuse

- **National Survey on Drug Use and Health (2003)**
  - ~8.2 million has used crack at some time in their lives.
  - ~1.3 million had used during the past year.
  - ~572,000 had used during the past month.

# Patterns of Cocaine Abuse

- **DAWN Reports**

- In 2002, there were approximately 199,000 cocaine related emergencies reported by metropolitan hospitals.
- This was about 2.5 times the number reported in 1990.

# Treatment Programs for Cocaine Abuse

- **In 1983, 1-800-COCAINE was established as a 24 hour service for emergency and treatment information**
  - From 1983 to 1990, more than 3 million callers responded, averaging more than 1,000 per day.
- **Changing face of cocaine abuse**
  - **1983:** college educated (50%) earning more than \$25,000 a year (52%) and using powder cocaine (61%)
  - **1988:** no college (83%) earning less than \$25,000 a year (80%)
  - **From 1983 to 1988 increase in freebase and crack cocaine use**

# Treatment Programs for Cocaine Abuse

- Treating cocaine abuse presents difficulties that are peculiar to the power of cocaine.
- Varieties of treatment:
  - Initial phase: Detoxification and Total Abstinence
    - Depression, Headaches, Irritability and Disturbances in Sleep
    - Serious cases need inpatient treatment
    - Extensive interventions combine medical supervision and psychological counseling

# Treatment Programs for Cocaine Abuse

- **Varieties in Treatment:**
  - **Outpatient Programs**
    - Individual remains at home but travels regularly to a facility for treatment
    - Less expensive
    - Only works for those who realize they have a problem and want to stop
    - It is important to stay away from an environment where cocaine and other drugs are prevalent and peer pressure is intense.
      - Crucial for adolescents.

# Treatment Programs for Cocaine Abuse

- **Varieties in Treatment:**
  - **Combined Approach**
    - **A shortened inpatient program (7-14 days) is followed by an intensive outpatient program that continues for several months.**

# Treatment Programs for Cocaine Abuse

- **Approaches to Treatment**
  - **Self-help groups: Cocaine Anonymous**
  - **Cognitive-behavioral therapy**
    - **Learn new ways of acting and thinking in response to their environment.**
  - **Pharmacological approaches**
    - **GVG, currently available as an antiepileptic drug called Vigabatrin**
  - **Combination of pharmacological and behavioral approaches**