Lecture: Understanding Drug Addiction: A Clinical and Neurobiological Perspective

1. Definition of Addiction

Drug addiction, also known as **Substance Use Disorder (SUD)**, is defined as a **chronic, relapsing brain disease**. It is characterized by compulsive drug seeking and use despite harmful and adverse consequences. It is considered a brain disease because drugs change the brain's structure and how it works, leading to long-lasting functional changes in circuits involved in reward, stress, and self-control.

2. Why Do People Take Drugs? (The Psychological Motives)

From a clinical perspective, individuals generally start using drugs for several reasons:

- **To feel good:** To produce intense feelings of pleasure or euphoria.
- **To feel better:** To cope with stress, social anxiety, or depression (self-medication).
- **To do better:** To improve cognitive or athletic performance.
- **Curiosity and Social Pressure:** Particularly in adolescents who are vulnerable to peer influence.

3. The Science of Addiction: How Drugs Affect the Brain

The brain is a communication center consisting of billions of **neurons**.

- **Neurotransmission:** Neurons communicate via chemical messengers called **neurotransmitters** (e.g., Dopamine).
- **The Reward System:** Most drugs target the brain's reward circuit by flooding it with **Dopamine**. While natural rewards (food, social interaction) produce small bursts of dopamine, drugs produce much larger surges, which "teach" the brain to seek the drug compulsively.
- **Tolerance:** With continued use, the brain adjusts to the surges of dopamine by producing less of it or reducing receptors. This leads to **tolerance**, where the user needs larger amounts of the drug to achieve the same effect.

4. Risk Factors (Why some and not others?)

No single factor determines if a person will become addicted. It is a combination of:

- **Biological Factors:** Genetics account for 40% to 60% of a person's vulnerability.
- **Environmental Factors:** Home environment, peer pressure, and socioeconomic status.
- **Developmental Factors:** The earlier drug use begins, the more likely it leads to addiction because the **prefrontal cortex** (responsible for decision-making) is still maturing until the mid-20s.

5. Clinical Complications and Mental Health

Drug abuse and mental illness often co-exist (**Comorbidity**).

- Psychological complications include **depression, anxiety, and psychosis**.
- In some cases, mental disorders like schizophrenia or anxiety may precede addiction; in others, drug use may trigger or worsen these conditions.

6. Treatment and Recovery

Addiction is treatable but not always "curable" in the traditional sense; it must be managed like other chronic diseases (e.g., diabetes).

- **Detoxification:** The first step to manage withdrawal symptoms.
- **Behavioral Therapies:** Essential for clinical psychology, including:
    - **Cognitive-Behavioral Therapy (CBT):** Helps patients recognize and cope with triggers.
    - **Motivational Interviewing (MI):** Enhances internal motivation for change.
    - **Family Therapy:** Addresses drug problems within the family dynamic.

Table of Terminology

English Term	المصطلح بالعربية
Drug Addiction	إدمان المخدرات
Substance Use Disorder (SUD)	اضطراب تعاطي المواد
Chronic Relapsing Disease	مرض مزمن انتكاسي
Compulsive Behavior	سلوك قهري
Neurotransmitter	ناقل عصبي
Dopamine	دوبامين
Reward Circuit	دارة المكافأة
Tolerance	التحمل (التحمل الدوائي)
Withdrawal Symptoms	أعراض الانسحاب
Prefrontal Cortex	القشرة الجبهية الأمامية
Comorbidity	الاعتلال المشترك (وجود مرضين معاً)
Detoxification	إزالة السموم
Cognitive Behavioral Therapy (CBT)	العلاج المعرفي السلوكي
Relapse	الانتكاسة
Craving	التوق الشديد / الاشتهاء