



## Definition

- + Narcotic analgesics are **potent analgesic drugs**
- + They relieve pain **centrally** by depressing the cerebral sensory cortex
- + They act via **opioid receptors**

## ⚠ Important Notes

- 😴 In therapeutic doses → cause **drowsiness**
- 🫁 Cause **respiratory depression**
- ⏱ Long-term use →
  - + Tolerance
  - + Psychological dependence
  - + Physical dependence (Addiction)

## 🔬 Classification of Opioids

### 1) Endogenous Opioids (Natural in Body)

Produced naturally by the body:

- 🧩 Endorphins
- 🧩 Dynorphins
- 🧩 Enkephalins

### 2) Exogenous Opioids (Drugs)

#### A) Naturally occurring alkaloids

- Morphine
- Codeine

#### B) Semisynthetic opioids

- Heroin

#### C) Fully synthetic opioids

- Fentanyl
- Pethidine



## Opioid Receptors

### 📍 Location

#### + Found in:

- 🧠 CNS (Brain & Spinal cord)
- 🍽 GIT cells

### 🔑 Types of Opioid Receptors

Receptor	Location	Main Effects
μ (Mu)	Brain & spinal cord	Analgesia, miosis, respiratory depression, euphoria, addiction
κ (Kappa)	Brain & spinal cord	Analgesia, miosis, sedation
δ (Delta)	Brain	Analgesia

### 💻 Key Points

- + Include μ, κ, δ receptors
- + Each receptor has different drug binding specificity
- + Mu receptor mediates **most opioid effects**

## 📘 Terminology

- + Narcotic analgesics = Opioids
- + Opioids: Natural or synthetic compounds producing morphine-like effects
- + Opiates: Natural drugs only (e.g. morphine & codeine) obtained from opium poppy juice

## 💊 Morphine

### 🧪 General Characteristics

- + Phenanthrene derivative of opium alkaloids
- + Natural strong opioid agonist
- + Acts via stimulation of opiate receptors in:
  - CNS
  - Periphery (μ, κ, δ receptors)



## Distribution of Morphine

- + Distributed all over the body
- + Crosses Blood-Brain Barrier 
- + Crosses Placental Barrier during pregnancy →  Fetal addiction
- + Crosses placenta during labor → Neonatal asphyxia

## Treatment of Neonatal Asphyxia

- Naloxone 0.4 mg IM to mother before labor
- OR intra-umbilical injection to baby after labor

## Therapeutic Uses of Morphine (Indications)

### 1 Analgesic (Severe Pain)

-  Cardiac pain (e.g. Myocardial infarction)
-  Cancer pain (terminal stages)
-  Fracture pain

⚠ Contraindicated in:

- Head injury → ↑ Intracranial pressure
- Eye surgery
- Labor

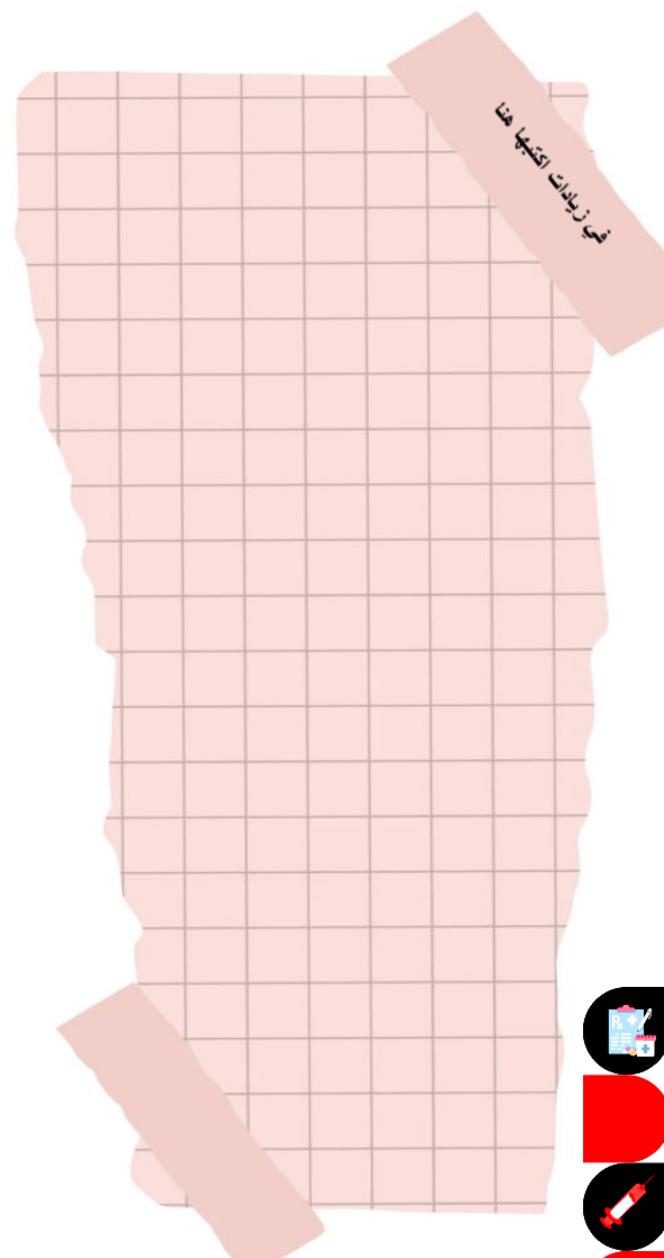
### 2 Pre-anesthetic Medication

+ Provides:

- Analgesia 
- Amnesia 
- Sedation 

### 3 Antitussive

- Used in dry cough
- But replaced by:
  - Codeine
  - Dextromethorphan(less addiction)



## ⚠ Adverse Effects of Morphine

- 🫁 Respiratory depression & bronchospasm
- 🏐 Miosis (Pin-point pupil)
- 🤢 Nausea & vomiting
- 📈 Hypotension
- ❤️ Bradycardia
- 🚫 Constipation
- 🚻 Urinary retention
- 😊 Neonatal asphyxia
- ⚡ Tolerance
- 🔒 Physical dependence



### ● Important Exam Note

✚ Tolerance develops to:

- Analgesia
- Respiratory depression
- Euphoria
- Sedation

! BUT NOT to:

- Constipation
- Miosis

## ⌚ Tolerance & Physical Dependence

✚ Repeated use produces tolerance to:

- Respiratory depressant effect
- Analgesic effect
- Euphoric effect
- Sedative effect

✚ Physical & psychological dependence occur readily

### ⚠ Withdrawal Symptoms

- Autonomic symptoms
- Motor symptoms
- Psychological symptoms
- Severe unbearable reactions





# Codeine

## Characteristics

- + Natural phenanthrene opium alkaloid
- + Methyl-morphine

## Comparison with Morphine

- 1/10 potency as analgesic
- Less constipation
- Less addiction
- Strong antitussive effect (like morphine)

Therapeutic Use      Dry useless cough (Antitussive)



# Tramadol

## Mechanism of Action

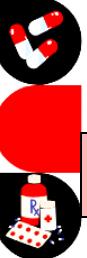
- + Inhibits reuptake of:
  - Noradrenaline (Norepinephrine)
  - Serotonin (5-HT)
    - + Also acts on opioid receptors

## Properties

- 1/10 potency of morphine
- Less respiratory depression
- Less constipation
- Less addiction
- Increased risk of convulsions

## Uses

- Postoperative pain
- Chronic moderate pain
- Neuropathic pain
- Orthopedic surgery pain  
(Route: Oral, IM, IV)





# Methadone



## Characteristics

- + As potent as morphine (analgesic)
- + Less addictive
- + Less withdrawal manifestations
- + Has local anesthetic effect
- + Orally active & long acting



### Main Therapeutic Uses

- 1 Treatment of opioid addiction (Detoxification & Maintenance)
- 2 Substitute for morphine or heroin during withdrawal



### Advantage

- + Gradual withdrawal → smoother & less severe withdrawal symptoms



### Comparison: Narcotic Analgesics vs NSAIDs

Feature	Narcotic Analgesics	NSAIDs
Potency	Very potent	Less potent
Type of pain	All types of pain	Superficial pain
Mechanism	Central (Opioid receptors)	Central & peripheral (COX 1,2,3)
Other effects	Stupor & drowsiness	Antipyretic + Anti-inflammatory
Long use	Tolerance & dependence	No tolerance, No dependence





قصّها... وزّعها... تؤجر عليها

## الدال على الخير كفاعله

