Using PubMed, MedlinePlus, and other National Library of Medicine Resources

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National Library of Medicine
National Institutes of Health
U.S. Department of Health & Human Services
Topics to Cover

- MedlinePlus
- PubMed
- PubMed Labs
- ClinicalTrials.gov
- Genetics Home Reference
- Learning Resources Database
MedlinePlus
Spanish

Drugs and Supplements

Encyclopedia articles and Patient Handouts

4 English Issues and 1 Bilingual Issue per year

Multiple Languages
Opioid Abuse and Addiction

Also called: Narcotics, Opiates

Summary

Opioids, sometimes called narcotics, are a type of drug. They include strong prescription pain relievers, such as oxycodone, hydrocodone, fentanyl, and tramadol. The illegal drug heroin is also an opioid. Some opioids are made from the opium plant, and others are synthetic (man-made).

A doctor may give you a prescription opioid to reduce pain after you have had a major injury or surgery. You may get them if you have severe pain from health conditions like cancer. Some doctors prescribe them for chronic pain.

Opioids can cause side effects such as drowsiness, mental fog, nausea, and constipation. They may also cause slowed breathing, which can lead to overdose deaths. If someone has signs of an overdose, call 9-1-1:

• The person's face is extremely pale and/or feels clammy to the touch
• The person is hardly breathing

Get Opioid Abuse and Addiction updates by email

MEDICAL ENCYCLOPEDIA

Acetaminophen and codeine overdose
Codeine overdose
Hydrocodone and acetaminophen overdose
Hydrocodone/oxycodone overdose
Hydromorphone overdose
Top Health Pages

**English**
- Autoimmune Diseases
- Sexually Transmitted Diseases
- Diabetes
- Coronary Artery Disease
- High Blood Pressure
- Cold and Cough Medicines
- Chronic Bronchitis
- Skin Pigmentation Disorders
- Tuberculosis
- Adrenal Gland Disorders

**Spanish**
- Sexually Transmitted Diseases
- High Blood Pressure
- Chlamydia Infections
- Thyroid Diseases
- HPV
- Pancreatitis
- Lupus
- Gastroenteritis
- Gallbladder Diseases
- Low Blood Pressure
Videos & Tools

Watch health videos on topics such as anatomy, body systems, and surgical procedures. Test your knowledge with interactive tutorials and games. Check your health with calculators and quizzes.

Health Videos
View videos of anatomy and body systems and how diseases and conditions affect them.

Surgery Videos
Find videos of operations and surgical procedures.

Health Check Tools
Check your health with interactive calculators, quizzes and questionnaires.

Games

Understanding Medical Words Tutorial
Evaluating Health Information Tutorial
To Your Health: NLM Update Podcast
Opioid Intoxication

Opioid-based drugs include morphine, oxycodone, and synthetic (man-made) opioid narcotics, such as oxitant. They are prescribed to treat pain after surgery or a dental procedure. Sometimes, they are used to treat severe cough or diarrhea. The illegal drug heroin is also an opioid. When abused, opioids cause a person to feel relaxed and intensely happy (euphoria). In short, the drugs are used to get high.

Opioid intoxication is a condition in which you're not only high from using the drug, but you also have body-wide symptoms that can make you ill and impaired.

Causes

Opioid intoxication may occur when a health care provider prescribes an opioid, but:

- The provider doesn't know the person is already taking another opioid at home.
- The person has a health problem, such as a liver or kidney problem, that may easily result in intoxication.
- The provider prescribes a sleep medicine (sedative) in addition to the opioid.
- The provider doesn't know that another provider already prescribed an opioid.

In people who use opioids to get high, intoxication may be caused by:

- Using too much of the drug
- Using an opioid with certain other drugs, such as sleep medicines or alcohol
- Taking the opioid in ways not normally used, such as smoked or inhaled through the nose (snorted)

Symptoms

Symptoms depend on how much of the drug is taken.

Symptoms of opioid intoxication can include:
Naloxone Injection
pronounced as (nal ox' one)

Why is this medication prescribed?
- How should this medicine be used?
- Other uses for this medicine
- What special precautions should I follow?
- What side effects can this medication cause?

What should I know about storage and disposal of this medication?
- What other information should I know?
- Brand names
- Other names

Why is this medication prescribed?
Naloxone injection and naloxone prefilled auto-injection device (Evzio) are used along with emergency medical treatment to reverse the life-threatening effects of a known or suspected opiate (narcotic) overdose. Naloxone injection is also used after surgery to reverse the effects of opiates given during surgery. Naloxone injection is given to newborns to decrease the effects of opiates received by the pregnant mother prior to delivery. Naloxone injection is in a class of medications called opiate antagonists. It works by blocking the effects of opiates to relieve dangerous symptoms caused by high levels of opiates in the blood.

How should this medicine be used?
Naloxone injection comes as a solution (liquid) to be injected intravenously (into a vein), intramuscularly (into a muscle), or subcutaneously (just under the skin). It also comes as a prefilled auto-injection device containing a solution to be injected intramuscularly or subcutaneously. It is usually given as needed to treat opiate overdoses.

You will probably be unable to treat yourself if you experience an opiate overdose. You should make sure that your family members, caregivers, or the people who spend time with you know how to tell if you are experiencing an overdose, how to use naloxone injection, and what to do until emergency medical help arrives. Your doctor or pharmacist will show you and your family members how to use the medication. You and anyone who may need to give the medication should read the instructions that come with the nasal injection. Ask your pharmacist for the instructions or visit the manufacturer's website to get the instructions.
Cannabidiol

What is it?
Cannabidiol is a chemical in the Cannabis sativa plant, also known as marijuana. Over 60 chemicals, known as cannabinoids, have been identified in the Cannabis sativa plant. While delta-9-tetrahydrocannabinol (THC) is the major active ingredient, cannabidiol makes up about 40% of cannabis extracts and has been studied for many different uses. According to the U.S. Food and Drug Administration (FDA), because cannabidiol has been studied as a new drug, products containing cannabidiol are not defined as dietary supplements. But there are still products labeled as dietary supplements on the market that contain cannabidiol.

People take cannabidiol by mouth for anxiety, bipolar disorder, a muscle disorder called dystonia, seizures, multiple sclerosis, Parkinson's disease, and schizophrenia.

People inhale cannabidiol to help quit smoking.

How effective is it?
Natural Medicines Comprehensive Database rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.

The effectiveness ratings for CANNABIDIOL are as follows:

Insufficient evidence to rate effectiveness for...
- Bipolar disorder: Early reports suggest that taking cannabidiol daily does not improve manic episodes in people with bipolar disorders.
- A muscle disorder called dystonia: Early research suggests that taking cannabidiol daily for 6 weeks might improve dystonia by 20% to 50% in some people. Higher-quality research is needed to confirm this.
Lab Tests

Blood Glucose Test

What is a Blood Glucose Test?

A blood glucose test measures the glucose levels in your blood. Glucose is a type of sugar. It is your body's main source of energy. A hormone called insulin helps move glucose from your bloodstream into your cells. Too much or too little glucose in the blood can be a sign of a serious medical condition. High blood glucose levels (hyperglycemia) may be a sign of diabetes, a disorder that can cause heart disease, blindness, kidney failure and other complications. Low blood glucose levels (hypoglycemia) can also lead to major health problems, including brain damage, if not treated.

Other names: blood sugar, self-monitoring of blood glucose (SMBG), fasting plasma glucose (FPG), fasting blood sugar (FBS), fasting blood glucose (FBG), glucose challenge test, oral glucose tolerance test (OGTT)

What is it used for?

A blood glucose test is used to find out if your blood sugar levels are in the healthy range. It is often used to help diagnose and monitor diabetes.

Why do I need a blood glucose test?

Your health care provider may order a blood glucose test if you have symptoms of high glucose levels (hyperglycemia) or low glucose levels (hypoglycemia).

Symptoms of high blood glucose levels include:

- Increased thirst
- More frequent urination
- Blurred vision
- Fatigue
- Wounds that are slow to heal
Welcome to the Web site for NIH MedlinePlus, the magazine.

Our purpose is to present you with the best in reliable, up-to-date health information.

We bring you the latest breakthroughs from NIH-supported research. We feature people from all walks of life talking about how they’ve handled their health challenges.

Sometimes it’s the famous. Like Rick James, Randy Jackson, or Mary Tyler Moore. But mostly, it’s regular people who have turned to NIH for care and want to share their stories. Often, too, NIH scientists will write about their efforts to cure disease.

We hope NIH MedlinePlus becomes a favorite source of trusted health information for you, whether you read it in your doctors’ office, local health center, clinic, or hospital waiting room. But most of all, we hope that you take out a free subscription. NIH MedlinePlus is produced by NLM, the National Library of Medicine, and the Friends of the National Library of Medicine.

With the best of your health in you and your family.
Other NLM/NIH Content Providers

- ClinicalTrials.gov
- PubMed
- NIH
- Genetics Home Reference
Citations to:
- Journal Articles
- Books
- Book Chapters

Biomedical Literature

Coverage back to 1966

MEDLINE and Non-MEDLINE

U.S. National Library of Medicine
Medical Subject Headings: MeSH

- PubMed’s controlled vocabulary
- 28,000+ terms
- Entry Terms = synonyms
- Hierarchy
5,230+ MEDLINE Journals

Meets 3x per year
Reviews 140 titles
Approves ~14%

LSTRC

MeSH
What’s in PubMed?

- MEDLINE: 88%
- Other (4%): future MEDLINE
- Other includes:
  - records for online books & chapters
  - out of scope articles
Let's take a look at PubMed.gov!
PubMed Labs launched in October 2017
What is PubMed Labs?

PubMed Labs is a test site where we are experimenting with new features and tools that eventually may be incorporated in PubMed, in their current or a revised form based on the input we receive. Please try the site and let us know what you think.
Relapsing and progressive forms of multiple sclerosis: insights from pathology.
Dutta R and Trapp BD. Curr Opin Neurol 2014 - Review.
differences during relapsing and progressive phases of multiple sclerosis. RECENT FINDINGS: The clinical course of multiple sclerosis... while effective during the relapsing phase, have little benefit for progressive multiple sclerosis patients. Development of...

Treatment of progressive multiple sclerosis: what works, what does not, and what is needed.
Disease-modifying drugs have mostly failed as treatments for progressive multiple sclerosis. Management of the disease... symptoms in progressive multiple sclerosis, which translates to few proven therapeutic options in the clinic. A new strategy that...

Progressive multiple sclerosis is characterised clinically by the gradual accrual of disability of relapses and... effective disease-modifying treatment for progressive multiple sclerosis.
PubMed 2.0 release roadmap and beyond

- **PubMed Labs**
  - Oct 2017

- **Gather Feedback from Labs Users**
  - Mar 2018

- **Apply Designs**
  - June 2018

- **Transition**
  - Dec 2018
ClinicalTrials.gov
What do we mean by “Clinical Trial?”

• **Clinical trials** are research studies where people **volunteer to test** new treatments.

• People are assigned to one or more **interventions** (which may include a placebo) so that researchers can **evaluate the effects** on the volunteers.

ClinicalTrials.gov tracks clinical trials and observational studies around the world.
Are your patrons interested in clinical trials?
Uses of ClinicalTrials.gov

ClinicalTrials.gov is a database of privately and publicly funded clinical studies conducted around the world.

- Identify trials to participate
- Track progress of a trial and find summary results when available
ClinicalTrials.gov Demo 1: Finding a study

• Use the Find a study form on clinicaltrials.gov to find all Recruiting trials for opiate dependence.
ClinicalTrials.gov Demo 1: Finding a study (cont.)
A similar map is available for all studies in ClinicalTrials.gov

Click on the map below to show a more detailed map (when available) or search for studies (when map not available).
Many filter options:

- Study status
- Eligibility criteria
- Study type
- Study results
- Study phase and more...

### Filters

<table>
<thead>
<tr>
<th>Row</th>
<th>Saved</th>
<th>Status</th>
<th>Study Title</th>
<th>Conditions</th>
<th>Interventions</th>
<th>Locations</th>
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<tr>
<td>1</td>
<td></td>
<td>Recruiting</td>
<td>Comparing Interventions for Opioid Dependent Patients Presenting in Medical Emergency Departments</td>
<td>Behavioral: Strengths-based Case Management (SBCM)</td>
<td>Behavioral: Screening, Assessment, and Referral (SAR)</td>
<td>Bellevue Hospital Center New York, New York, United States</td>
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<td>Recruiting</td>
<td>Facilitating Rapid Naltrexone Initiation</td>
<td>Opioid Dependence</td>
<td>Drugs: Cl-581-a</td>
<td>New York State Psychiatric Institute New York, New York, United States</td>
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<td>3</td>
<td></td>
<td>Recruiting</td>
<td>The Life STORRIED Study</td>
<td>Opioid Dependence</td>
<td>Other: Narrative Enhanced Risk Tool (NERT)</td>
<td>Mayo Clinic Rochester, Minnesota, United States</td>
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<td></td>
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<td></td>
<td>Communication</td>
<td>Other: probabilistic risk communication tool (PRCT)</td>
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<td>Risk Behavior</td>
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<td>University of Pennsylvania Philadelphia, Pennsylvania, United States</td>
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<td>4</td>
<td></td>
<td>Recruiting</td>
<td>A Strategy to Improve Success of Treatment Discontinuation in Buprenorphine Responders</td>
<td>Opioid-use Disorder</td>
<td>Drugs: Vivitrol</td>
<td>Substance Treatment and Research Service (STARS) Columbia University New York, New York, United States</td>
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<tr>
<td>5</td>
<td></td>
<td>Recruiting</td>
<td>Buprenorphine as Adjunct to Outpatient Induction Onto Vivitrol</td>
<td>Opioid-use Disorder</td>
<td>Drug: Buprenorphine</td>
<td>Substance Treatment and Research Service (STARS) Columbia University New York, New York, United States</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Recruiting</td>
<td>Extended-Release Naltrexone Opioid Treatment at Jail Re-Entry</td>
<td>Heroin Dependence</td>
<td>Drug: Extended-Release Naltrexone</td>
<td>Bellevue Hospital Center New York, New York, United States</td>
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<td></td>
<td>Opioid-Related Disorders</td>
<td></td>
<td>NYC Department of Corrections Rikers Island Jail Facilities New York, New York, United States</td>
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</tbody>
</table>
An individual ClinicalTrials.gov study record includes:

- Description
- Study design
- Arms and interventions
- Outcome measures
- Inclusion and exclusion criteria
- Contact information
Finding Good Evidence for Medical Treatments is Complicated

1. Not all trials are published
2. Publications do not always report on all outcome measures
3. Researchers make changes after starting the study that might affect the interpretation of the findings
Uses of ClinicalTrials.gov (continued)

• Find summary results of completed trials
ClinicalTrials.gov Demo 2: Finding study results

Find a study (all fields optional)

- Status:
  - Recruiting and not yet recruiting studies
  - All studies

- Condition or disease (For example: breast cancer)
  - Opiate Dependence

- Other terms (For example: NCT number, drug name, investigator name)

- Country

Search  Advanced Search
ClinicalTrials.gov Demo 2: Finding study results
ClinicalTrials.gov Demo 2: Finding study results
ClinicalTrials.gov Demo 2: Finding study results

Study Details
- Study Type: Interventional
- Study Design: Allocation: Randomized; Intervention Model: Parallel Assignment; Masking: Double (Participant, Investigator)
- Condition: Vitamin D Deficiency
- Interventions: Drug: Application of topical vitamin d3 (Top-D); Other: Application of Aloe vera gel

- Participant Flow
  - Show Participant Flow

- Baseline Characteristics
  - Show Baseline Characteristics

- Outcome Measures
  - 1. Primary: Level of Serum 25 OHD Level Pre-treatment and Post Treatment [ Time Frame: baseline and 5 months ]
    - Show Outcome Measure 1

- Serious Adverse Events
  - Show Serious Adverse Events
Are your patrons interested in information about genetics and genetic conditions?
Genetics Home Reference

Genetics information for the general public
Genetics Home Reference

• For everyone

• Designed to answer questions like:
  • What mutations are associated with what condition(s)?
  • What is the pattern of inheritance for a specific disease?
  • How do I find a test for a genetic disease?

• Help Me Understand Genetics: an introduction to the fundamentals of human genetics
Demo: Genetics Home Reference

ghr.nlm.nih.gov

With search or browse find opioid addiction

1. What genes are associated with opioid addiction?

2. Where would I go (what online resource) to find a genetic test?
Opioid addiction

Opioid addiction is a long-lasting (chronic) disease that can cause major health, social, and economic problems. Opioids are a class of drugs that act in the nervous system to produce feelings of pleasure and pain relief. Some opioids are legally prescribed by healthcare providers to manage severe and chronic pain. Commonly prescribed opioids include oxycodone, fentanyl, buprenorphine, methadone, oxymorphone, hydrocodone, codeine, and morphine. Some other opioids, such as heroin, are illegal drugs of abuse.

Opioid addiction is characterized by a powerful, compulsive urge to use opioid drugs, even when they are no longer required medically. Opioids have a high potential for causing addiction in some people, even when the medications are prescribed appropriately and taken as directed. Many prescription opioids are misused or diverted to others. Individuals who become addicted may prioritize getting and using these drugs over other activities in their lives, often negatively impacting their professional and personal relationships. It is unknown why some people are more likely to become addicted than others.
The causes of opioid addiction are complex. This condition results from a combination of genetic, environmental, and lifestyle factors, some of which have not been identified.

Many of the genes that are thought to play a role in opioid addiction are involved in the endogenous opioid system, which is the body’s internal system for regulating pain, reward, and addictive behaviors. It consists of opioid substances produced naturally within the body (called endogenous opioids) and their receptors, into which opioids fit like keys into locks. Opioids introduced from outside the body (called exogenous opioids), including opioid medications and heroin, also exert their effects by acting on these receptors. Variations in the genes that provide instructions for making opioid receptors have been studied extensively as genetic risk factors for opioid addiction. Researchers suspect that differences in the receptors’ structure and function influence how the body responds to opioids.

Opioid receptors are found in the nervous system, where they are embedded in the outer membrane of nerve cells (neurons). When endogenous or exogenous opioids attach (bind) to the receptors, the interaction triggers a series of chemical changes within and between neurons that lead to feelings of pleasure and pain relief. The mu (\(\mu\)) opioid receptor, which is produced from the OPRM1 gene, is the primary receptor for most opioid drugs. Common variations in the OPRM1 gene appear to influence how the body responds to opioids, including the amount of an opioid medication needed to achieve pain relief. At least in some populations, these variations have also been associated with the risk of opioid addiction.
Opioid addiction is a complex disorder, and nongenetic factors also play a critical role. Factors that have been shown to increase the risk of opioid addiction include a history of substance abuse; depression or other psychiatric disorders; childhood abuse or neglect; and certain personality traits, including impulsivity and sensation-seeking. Living in poverty and in a rural area, associating with others who abuse opioids or other substances, and having easy access to prescription or illegal opioids also contribute to a person’s risk of opioid addiction. It is likely that a combination of health, social, economic, and lifestyle factors interact with genetic factors to determine an individual’s risk.

Learn more about the genes associated with opioid addiction

- ABCB1
- AVPR1A
- BDNF
- COMT
- CSNK1E
- CYP2B6
- DRD2
- DRD3
- DRD4
- FKBP5
- GABRG1
- GAD1
- GAL
- GRIN2A
- HTR1B
- OPRD1
- OPRK1
- OPRL1
- OPRM1
- PDYN
- Pnoc

Inheritance Pattern

Diagnosis & Management Resources

Other Names for This Condition

Additional Information & Resources
# Diagnosis & Management Resources

- **Formal Treatment/Management Guidelines (1 link)**

- **Genetic Testing (2 links)**
  - Genetic Testing Registry: Opioid dependence
  - Genetic Testing Registry: Opioid-Related Disorders

- **Other Diagnosis and Management Resources (5 links)**

- **General Information from MedlinePlus (5 links)**

# Related Information

- How are genetic conditions diagnosed?
- How are genetic conditions treated or managed?
- What is genetic testing?
- How can I find a genetics professional in my area?
Help Me Understand Genetics

An introduction to fundamental topics related to human genetics, including illustrations and basic explanations of genetics concepts.

- Cells and DNA
- Mutations and Health
- How Genes Work
- Gene Families
Opioid Abuse and Addiction
Also called: Narcotics, Opiates

On this page
Basics
- Summary
- Start Here
- Latest News
- Diagnosis and Tests
- Prevention and Risk Factors
- Treatments and Therapies

Learn More
- Related Issues
- Specifics
- Genetics

See, Play and Learn
- Images

Research
- Statistics and Research
- Clinical Trials
- Journal Articles

Resources
- Find an Expert

For You
- Children
- Teenagers
- Women
- Patient Handouts

Summary
Opioids, sometimes called narcotics, are a type of drug. They include strong prescription pain relievers, such as oxycodone, hydrocodone, fentanyl, and tramadol. The illegal drug heroin is also an opioid. Some opioids are made from the opium plant, and others are synthetic (man-made).

References and abstracts from MEDLINE/PubMed (National Library of Medicine)
- Article: The Neurobiology of Opioid Addiction and the Potential for Prevention...
- Article: Strategies for Reducing Opioid-Overdose Deaths - Lessons from Canada
- Article: Suicide: A Silent Contributor to Opioid-Overdose Deaths
Learning Resources Database
What is it?

- Database that brings together NLM materials in one place
- API allowing libraries to link to NLM content
Scope

- Videos
- Tutorials
- Webinars
- Other materials produced by NLM

Examples: PubMed Quick Tours, videos on using the RxNorm API, finding clinical research in ClinicalTrials.gov.
Components

• Search Interface
  – Where users can search for resources

• REST API
  – Provides URIs that allow searching by title, subject, description, keywords
  – Returns JSON that web pages can parse and display for end users
Learning Resources Database

Search Interface

API

HTML

End users

End users
Where do I find it?

- Learn.nlm.nih.gov

- Linked under Upcoming Training on the new NLM homepage
Using the API to Embed Content

1. Determine the content you would like to embed.
2. Create the URL for the call to the API.
3. Embed this URL into the code for the final page.
https://support.nlm.nih.gov/