

Introduction: Lean, also known as Purple Drank, Barre, Sizzurp or Syrup, refers to a drink that is made from over the counter (OTC) medications and used for psychoactive effect. It typically contains codeine and promethazine and has been referred to as CPHCS (codeine and promethazine hydrochloride cough syrup) in research papers.¹ It has been referenced in rap lyrics and is linked to a slowed-down hip-hop beat which mirrors the effects of intoxication from the cocktail.² Use of Lean in the UK has been particularly linked to young people, with concerns and alerts raised by drug services around the country.

Background: In the US a codeine and promethazine linctus is readily available, which is mixed with a fizzy drink and sometimes a sweet, alcohol and/or fruit juice to mask the taste of the medicine to form a purple cocktail.³ In the UK however there is no equivalent OTC medication, and due to constraints in obtaining prescription strength cough syrup, some users mix promethazine or codeine with other OTC cough syrups, sometimes taken with alcohol. The term Lean in the UK has therefore come to apply to a combination of OTC medications, usually in syrup form.

Effects: These will depend on the ingredients but for Lean made from codeine and promethazine, users report that it has several stages or plateaus: the first being mild stimulation, the second a mix of relaxation and euphoria (similar to alcohol plus cannabis) with mild hallucinations, the third a dissociative “out of body” state akin to a low dose of ketamine, and the fourth level is a fully dissociative state similar to a high dose of ketamine.⁴ Effects begin within 30-60 minutes and last for approximately six hours. Comments from users include “everything was slowed down”, “fun to drink (if you can avoid falling asleep)” and “some trippy stuff”, along with a sense of wellness and distortion of time. Social contact also appears to play a part: “it’s a community drug... you’re not really going to drink it all by yourself, you’re going to pour for all your friends.”^{5,6,7,8}

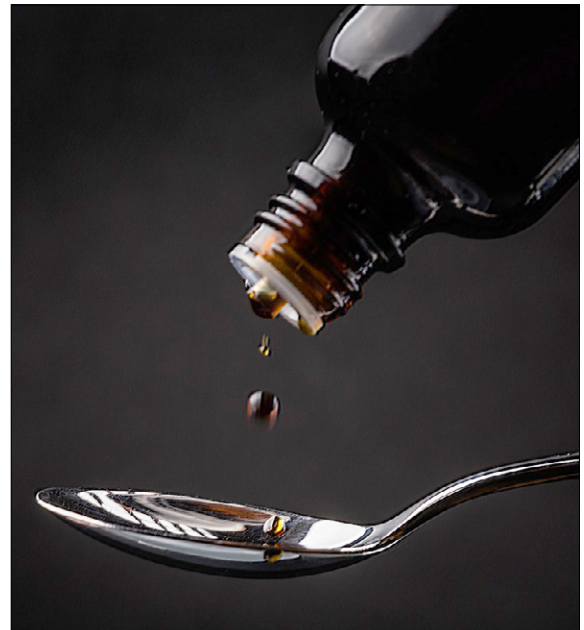


Fig. 1: Image by kind permission

Promethazine is the consistent ingredient in Lean; it was originally prescribed as an antihistamine for the treatment of allergic conditions but is now primarily used as a sedative and/or an anti-emetic.⁹ On its own it is a mild sedative/depressant, although at higher doses has been linked to hallucinations.¹⁰ Promethazine is thought to increase the effects of opioids¹¹ and it has been found to be commonly used by opioid users, with one US study finding that 24% of methadone maintenance patients reported using promethazine in the past month.¹² **Legal status:** available without prescription in OTC products.

	Effects ^{4,6,13}	Onset	Peak levels	Duration
Promethazine	Drowsiness, nausea, vomiting, blotchy or red skin, dilated pupils, blurred vision, dry mouth and tongue, raised heartrate and temperature, high blood pressure, lack of muscle co-ordination, urinary retention, involuntary eye movement, agitation and visual hallucinations.	20 mins	2-4 hours	4-6 hours

Codeine is an opiate drug often taken for pain relief, but which is also taken as a cough suppressant and as an antidiarrhoeal agent. It metabolises into morphine in the body, however due to differences in individual genetic makeup some people convert very little (or no) codeine into morphine. Its analgesic effects and toxicity are directly related to the amount of morphine produced.⁴ **Legal status:** Class B Controlled Drug under the Misuse of Drugs Act. It is normally only legally available on prescription, however a limited number of weaker preparations are exempt from this requirement and are available from pharmacists without a prescription.



Fig. 2: UK Codeine linctus
15mg/5ml

	Effects ^{4,13,14}	Onset	Peak levels	Duration
Codeine	Relaxed, warm, euphoria, pain relief, confidence, itching skin, low blood pressure, nausea, drowsiness, vomiting, sweating, dry mouth, uneasiness/restlessness, constricted pupils, constipation, rash, stomach pain, dizziness, confusion, mood changes.	30-45 mins	1-2 hours	4-6 hours

Dextromethorphan (DXM) is a synthetically produced drug that is available in a range of cough and cold preparations. It is a dissociative drug, and when consumed at inappropriately high doses (over 1500mg/day) it can induce a psychotic state including delusions, hallucinations and paranoia.^{13,15} DXM and its active metabolite affect opioid receptors and can cause coma and respiratory depression, their effects on NMDA receptors result in sedation and they also have affinity for serotonin receptors, noradrenaline transporters and can cause serotonin toxicity. Dependence and a withdrawal syndrome have been reported.^{16,17,24} **Legal status:** available without prescription in OTC products.

	Effects ^{4,13,16,17}	Onset	Peak levels	Duration
Dextromethorphan (DXM)	Euphoria, relaxation, elation, analgesia, stimulant effects, feeling drunk, loss of motor coordination, giggling, “out of body” experiences, hallucinations, time distortion, hypertension, increased heartrate, excessive sweating, skin flushing, vomiting, agitation, drowsiness, dilated pupils, involuntary eye movement.	30-60 mins	1.6-2.5 hours	6 hours

Other ingredients: Many of these OTC medications also contain paracetamol, which itself poses a significant overdose risk and can lead to permanent liver damage. A study in seven European countries in 2015 found that overdose caused 19% of all acute liver failure leading to registration for transplants, and that 97% of these cases were linked to paracetamol. Rates varied in different countries, with highest overdose rates in Ireland (52%) and the United Kingdom (28%).¹⁹ There were 219 deaths involving paracetamol and its compounds in England and Wales in 2016, an increase from 197 deaths in the previous year.²⁰



Fig. 3: Lean (UK)

Appearance and taste: These will vary according to the combination of the medicines being used to make Lean. Medicines can be diluted with fizzy drinks and sometimes a soluble sweet to improve the taste and add colour.

Patterns of use: Codeine converts to morphine in the body and can quickly lead to dependence. Regular users of codeine develop increased tolerance and experience cravings and withdrawal effects that can include cold sweats, nausea, vomiting and sleeplessness. Fatal overdose from codeine is possible: from 2011-2015 codeine deaths in the UK increased from 88 to 128.²⁰

Regular users of DXM report a rapidly developing and persistent tolerance to the drug. Although it is not generally thought to be addictive, some users may develop cravings, withdrawal symptoms and the need to use it more regularly with some people experiencing withdrawal symptoms.^{16,17,27,28}

Ongoing, long-term use can lead to psychosis and decreased cognitive skills.²⁸



Fig. 4: Ingredients for Lean (UK)

Dosage*:^{4,21-25,29} Individual dosage for Lean made from codeine/promethazine depends on a number of factors including body weight, individual tolerance to codeine and how much codeine is metabolised into morphine. The ratio of codeine to promethazine is a matter of personal taste, however too much promethazine can result in the user falling asleep.²⁷ In the US, where codeine/promethazine linctus comes ready-mixed, dosing is more straightforward. However when mixing Lean from separate medicines dosages must be more carefully calculated, and it is important to measure by amount (e.g. mg) of the active ingredient rather than in volume (e.g. ml). For example codeine linctus in the UK comes in both 15mg/5ml and 25mg/5ml strengths,²⁹ so the same volume of liquid can result in different amounts of codeine.

	Dose ³⁰⁻³⁵		
	Low	Medium	High
Lean (codeine plus promethazine)	100mg codeine 12mg promethazine	200mg codeine 25mg promethazine	400mg codeine 50mg promethazine

Dosage* (continued)

	Dose			Dangerous dose	Signs of overdose
	Low	Medium	High		
Promethazine	25mg	50mg	75mg (max. daily dose)	>100mg	Toxicity from promethazine overdose mostly manifests as sedation with central and peripheral anticholinergic effects that include: delirium, poor coordination, increased body temperature, blurred or double-vision, increased heart rate, mental confusion, disorientation, agitation, respiratory depression, memory problems, inability to concentrate, wandering thoughts, incoherent speech, irritability, sudden muscle spasms, unusual sensitivity to light and sudden sounds, visual disturbances, seeing flashes of light, restricted or “tunnel vision”, visual, auditory or other sensory hallucinations, low or shallow breathing, seizures, unconsciousness, coma, sudden death.
Codeine	30mg	80mg	240mg (max. daily dose)	>400mg	Codeine toxicity is due to opioid effects. Respiratory depression: low or shallow breathing, pin-point pupils, blue or paler skin or lips, cold and clammy skin, unconsciousness, lack of breathing, coma, death.
DXM	100mg (120mg max. daily dose)	400mg	600mg	>1500mg	Psychosis, extreme hallucinations, muscle spasms, seizures, hyperthermia. In combination with other drugs can lead to serotonin syndrome which can be fatal: see page 7 for symptoms.
Paracetamol				>4000mg or more than 150mg/kg in any 24-hour period.	Overdose can cause permanent liver damage and be fatal. Signs of overdose include: nausea, vomiting, yellowing of the skin and the whites of the eyes (jaundice), loss of co-ordination, stomach pain, low blood sugar which can cause symptoms including sweating, trembling and irritability.

**Dosage information is a summary of data from users, research and other resources and should not be taken as recommendations. People can react differently to the same dosage. What is safe for one person can be deadly for another.*

Harm reduction:

- **Start low, go slow.** While some of these medicines can be bought from a chemist, they can still be very damaging. Poisoning/fatal overdose is possible with codeine, promethazine, DXM and paracetamol individually and combining them puts you at risk of death, for example by overdose from respiratory failure or death from liver failure. Dosage varies greatly depending on what you use to make Lean, so start with a small dose.
- **Less is more.** Try to keep your mix of medicines to a minimum. The more medications you add, the greater the risk you have of coming to harm.
- **Check the contents for paracetamol**
Paracetamol overdose can kill and also cause permanent liver damage: a standard bottle of linctus for example can contain 8 grams of paracetamol, twice the maximum daily dose.
- Adding alcohol (either drinking alcohol when drinking Lean, or if alcohol is an ingredient of the linctus being used) increases the risk of overdose for each substance individually and may result in toxicity. Check for ethanol (alcohol) content of the linctus: some preparations contain 3.3 vol% of ethanol.
- **Don't drive** under the influence of Lean.
- **Avoid benzos and nitrous oxide.** Adding benzodiazepines (such as Valium/diazepam or Xanax/alprazolam) to the mix greatly increases the risk of overdose. Using nitrous oxide at the same time as Lean can intensify the deliriant effects of promethazine.

Issuing public warnings or press alerts about new, over the counter or readily-available drugs may prove counterproductive, particularly if Lean has yet to become a significant issue in your local area. While alerts can raise awareness and highlight dangers they also risk publicising a new drug or drug combination.

Target harm reduction messages at those using or at risk of using if this has become an issue locally.

Avoid scare tactics: messages should highlight harms but still be realistic for the target audience.

- **Look after your mates.** Use with people who can respond in the event of an emergency; if using together don't all use Lean at the same time. Make sure one of you has a mobile phone that works, so that you can call an ambulance.
- DXM can lead to serotonin syndrome when combined with other medications including anti-depressants, antibiotics and painkillers.⁴ The main symptoms of serotonin syndrome are: rigid, jerky, twitchy unusual movements; fully dilated pupils; overheating; shivering; racing heart; agitation and confusion. Serotonin syndrome can kill if it is not dealt with quickly. If in doubt, ring for an ambulance.
- **Naloxone** can reverse the effects of opioid overdose and saves lives. Get a kit from your local drug treatment service (see next page).



Fig. 5: Image by kind permission

Recovery Position: The recovery position is for someone who is unconscious but breathing normally. If they are not breathing normally CPR is required, with an emphasis on giving supplementary oxygen via rescue breaths.



Start by placing their arm as if they are waving.



Place the other arm across their chest and hold their hand against their cheek.



Lift up the knee that is furthest from you. Continue to hold their hand in place.



Turn them on their side by pulling the knee towards you and down.

For further information on Overdose & Emergencies see [UK and Ireland DrugWatch Information Sheet](#).

Where to get help: We would advise anyone experiencing issues from Lean or other substances to seek medical support via their GP or the NHS. There are a wide range of local drug services throughout the UK, to find out what is available in your area please use the links below:

England: [Find Support | Frank](#) Scotland: [Scottish Drug Services](#)
Wales: [Dan 24/7](#) Northern Ireland: [Public Health Agency](#) ROI: [Drugs.IE](#)

For further advice, medical professionals can use the National Poisons Information Service 24-hour telephone service on 0344 892 0111 or its online database, TOXBASE. Any health professional encountering an unusual or unexpected adverse reaction to the use of Lean (or any other drug) should report the reaction to [RIDR](#).

Written by [Mark Adley](#) in association with [UK and Ireland DrugWatch](#): an informal online professional information network established by a group of professionals working in the UK and Irish drugs sector.

The aim of the group is to raise/establish standards for drug information, alerts and warnings.

It is currently an unfunded, bottom-up initiative that works in the spirit of mutual co-operation.

Details of current members can be found [here](#).

A version of this document for young people is also available for download, along with other drug information sheets and resources from [michaellinnell.org.uk](#) or [thedrugswheel.com](#).

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Image references

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