

COMPOUND GUIDE

Oxytocin — Neuropeptide Hormone

9-AA nonapeptide · FDA approved IV/IM (obstetric only) · Intranasal/SubQ = investigational

 Quick Start

FDA APPROVED — HOSPITAL USE ONLY (IV/IM, OBSTETRICS)

Oxytocin is FDA-approved as Pitocin for IV/IM administration in hospital obstetric settings — labour induction, postpartum haemorrhage, and uterine atony. Intranasal and subcutaneous administration are investigational (non-approved) routes. This guide covers the investigational research context. Do not confuse research preparations with Pitocin.



WHAT IT IS

Oxytocin is a 9-amino acid nonapeptide produced in the hypothalamus (PVN and SON nuclei) and released by the posterior pituitary. It mediates uterine contractions, lactation, and — as a neurotransmitter acting in limbic brain circuits — trust, social bonding, anxiety reduction, and aspects of social cognition. Often called "the bonding hormone."



RESEARCH DOSING (INTRANASAL)

Intranasal: 10–72 IU per session, divided into 2–4 sprays per nostril. The SOARS-B autism trial used up to 48 IU/day. Half-life intranasally: ~20 minutes for direct nasal effects, but downstream brain effects last hours. Note: 1 IU ≈ 2 mcg oxytocin. SubQ dosing (100–500 mcg) does not meaningfully cross the blood-brain barrier — central effects are primarily via intranasal delivery.



REGULATORY STATUS

FDA-approved IV/IM (Pitocin) for obstetric use only — hospital-administered. Intranasal/SubQ are investigational. Not on WADA prohibited list. Research preparations (not Pitocin) used in investigational contexts. For research purposes only.



Dosing Protocols by Route

ROUTE	DOSE	TIMING	BBB PENETRATION	CONTEXT
Intranasal	10–72 IU/session	20–40 min before activity or test	Direct nasal-brain pathway	Central effects (social, cognitive) — primary research route
SubQ injection	100–500 mcg	20–30 min before	Minimal	Peripheral effects; limited central brain activity
IV/IM (Pitocin)	As per obstetric label	Hospital only	Not applicable	Approved use only; not for research settings outside hospitals



IU TO MCG CONVERSION

1 International Unit (IU) of oxytocin ≈ 2 mcg. A 5 mg research vial ≈ 2,500 IU. With 3.0 mL BAC water, concentration ≈ 833 IU/mL (≈1.67 mg/mL). For intranasal nasal spray, concentration of the spray solution and spray volume per actuation determine IU per spray — this varies by preparation.



Supplies & Reconstitution

Reconstitution & Dosing

LA LAB does not stock this as a standalone product, so vial-specific reconstitution and dosing figures are not provided here. This page is a research reference only. For compounds we carry, see [our guides](#).

Reconstitution Steps

01

Warm the vial

Allow vial to reach room temperature from freezer before reconstitution.

02

Swab and draw

Alcohol swab both vial tops, air-dry. Draw required BAC water volume.

03

Inject along the wall

Let BAC water run slowly down the inside glass wall. Do not jet onto the powder.

04

Swirl gently

Swirl until clear. Oxytocin solution should be colourless. Do not shake.

05

Refrigerate

Store at 2–8°C for up to 30 days. Oxytocin is relatively stable in solution under refrigeration. Protect from light. Do not freeze after reconstitution.

**Mechanism of Action****OXYTOCIN RECEPTOR (OXTR)**

Binds OXTR (a G-protein coupled receptor) throughout the brain (amygdala, nucleus accumbens, VTA, PFC) and periphery (uterus, breast, heart). Central OXTR activation mediates social bonding, trust, and anxiety modulation.

AMYGDALA DAMPENING

Reduces amygdala reactivity to threat and social stressors, studied in fMRI research. This is the proposed mechanism for reduced social anxiety and increased trust observed in controlled laboratory studies (Kirsch et al. 2005 meta-analysis).

UTERINE CONTRACTION (PERIPHERAL)

The approved (Pitocin) mechanism: peripheral OXTR on smooth muscle drives uterine contractions for labour induction and haemorrhage control. This peripheral effect is relevant to safety — exogenous oxytocin in pregnancy can cause uterine hyperstimulation.

SHORT PLASMA HALF-LIFE

IV half-life: 3–6 minutes. Intranasal effects persist 20 min to hours — the intranasal route produces direct olfactory-to-brain delivery, not through systemic circulation. This is why intranasal and IV oxytocin have very different effects profiles.

**Key Human Research**

STUDY	DESIGN	KEY FINDING
Kirsch et al. 2005	RCT; intranasal; trust game paradigm	Intranasal oxytocin increased trust in a financial game vs placebo — landmark study
SOARS-B (NEJM 2021)	RCT; n=290; autism spectrum disorder; 24 weeks; up to 48 IU/day intranasal	NO significant difference in social responsiveness scale vs placebo — negative primary endpoint
Social anxiety studies	Multiple; intranasal; healthy volunteers	Reduced amygdala reactivity to threatening faces on fMRI; anxiety reduction not consistent across studies
Attachment theory research	Observational; intranasal studies	Enhanced mother-infant synchrony observed; effects context-dependent and not always replicable

**REPLICATION CRISIS IN OXYTOCIN RESEARCH**

The oxytocin research field has faced significant replication challenges. Many early findings (e.g. trust, generosity, eye contact effects) have not replicated in larger, pre-registered studies. Meta-analyses show highly heterogeneous effects across populations, doses, and contexts. The SOARS-B trial's negative result in autism is a key example. Interpret positive findings with caution.

**Storage**

STATE	TEMPERATURE	DURATION	NOTES
Lyophilised (powder)	–20°C (freezer)	Up to 24 months	Protect from moisture; oxytocin is relatively stable lyophilised
Reconstituted (liquid)	2–8°C (refrigerator)	Up to 30 days	More stable than most peptides once reconstituted; still protect from light
Short-term (travel)	<25°C	Up to 72 hours	Avoid heat and direct sunlight

**DISCLAIMER**

This document is an educational research reference only. Oxytocin is FDA-approved only as Pitocin for IV/IM obstetric use in hospitals. Intranasal and SubQ routes are investigational. The research evidence base has significant replication issues. Do not confuse research preparations with Pitocin. By purchasing from LA LAB you confirm you are 18+ and that products are for research purposes only.