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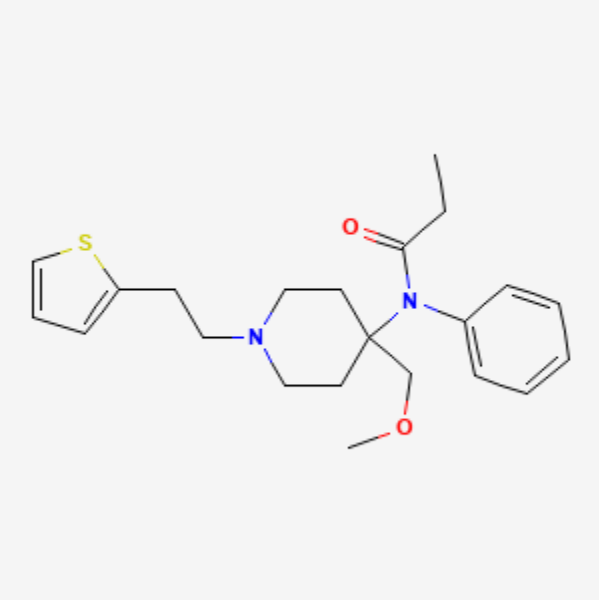
**NLM Citation:** Drugs and Lactation Database (LactMed®) [Internet]. Bethesda (MD): National Institute of Child Health and Human Development; 2006-. Sufentanil. [Updated 2026 Mar 15].
**Bookshelf URL:** https://www.ncbi.nlm.nih.gov/books/

# Sufentanil

Revised: March 15, 2026.

CASRN: 56030-54-7




## Drug Levels and Effects

### Summary of Use during Lactation

When used epidurally or intravenously during labor or for a short time immediately postpartum, amounts of sufentanil ingested by the neonate are small and would not be expected to cause any adverse effects in breastfed infants. Labor pain medication may delay the onset of lactation; however, it appears that with good breastfeeding support, epidural sufentanil plus a local anesthetic has little or no effect on breastfeeding success.[1,2]

Because of sufentanil's long half-life during continued intravenous infusion or repeated intravenous administration, sufentanil levels in milk would be expected to increase if used for an extended period postpartum.[1] Maternal use of oral opioids during breastfeeding can cause infant drowsiness, which may progress to rare but severe central nervous system depression. Newborn infants seem to be particularly sensitive

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to the effects of even small dosages of narcotic analgesics. If sufentanil is required by the mother of a newborn, it is not a reason to discontinue breastfeeding; however, once the mother's milk comes in, it is best to provide pain control with a nonnarcotic analgesic and limit maternal intake of sufentanil to a few days. If the baby shows signs of increased sleepiness (more than usual), difficulty breastfeeding, breathing difficulties, or limpness, a physician should be contacted immediately. Withdrawal symptoms can occur in breastfed infants when maternal administration of an opioid analgesic is stopped, or when breastfeeding is stopped. Because there is no published experience with repeated doses of intravenous or sublingual sufentanil during established lactation, other agents may be preferred, especially while nursing a newborn or preterm infant.

## Drug Levels

Sufentanil is metabolized to a minimally active and inactive metabolites. The oral bioavailability of sufentanil is unknown. Therapeutic plasma levels from intravenous sufentanil during surgery in adults are 0.25 to 8 mcg/L. The usual intravenous dosage of sufentanil for anesthesia in an infant during surgery is 10 to 15 mcg/kg. Lower dosages 0.25 to 1 mcg/kg are used for analgesia. Sufentanil is also commonly administered epidurally. Plasma levels are markedly lower when the epidural route is used.[3]

*Maternal Levels.* Nine women who had undergone cesarean section received sufentanil 50 mcg epidurally immediately after delivery. Sufentanil was undetectable (<0.1 mcg/L) in colostrum at about 1 hour after the dose.[4]

Twenty-nine women undergoing cesarean section received 20 mcg of epidural sufentanil prior to surgery and were then randomized to receive either an epidural anesthetic combined with sufentanil 3.75 mcg per hour plus 1.25 mcg every 20 minutes as needed via a patient-controlled epidural analgesia (PCEA) device, or an epidural anesthetic alone via PCEA with no sufentanil. Breastmilk was sampled on postpartum days 1, 2 and 3. Sufentanil was detected in breastmilk in all groups. Levels were highest in the group receiving postpartum sufentanil via PCEA; however, cumulative sufentanil dosages were not reported. Milk levels were apparently low in the other 2 groups.[5] Reporting errors in this study do not allow for estimation of infant sufentanil dose from milk.

Two women were treated with intravenous sufentanil postoperatively with a bolus dose of 0.5 mg/kg followed by a continuous infusion of 1 mcg/kg hourly for 79 and 58 hours, respectively. Peak milk concentrations were 57.6 ng/L and 62.2 ng/l at 70 and 45 hours after the start of the infusion, respectively. The calculated cumulative doses that their infants received were 5.14 ng and 6.47 ng, respectively.[6]

*Infant Levels.* Relevant published information was not found as of the revision date.

## Effects in Breastfed Infants

Newborns of breastfeeding mothers who received epidural sufentanil before and after cesarean section delivery were reportedly not clinically affected and had no differences in behavior or clinical signs over 3 days postpartum compared to newborns of mothers who received epidural sufentanil prior to delivery only.[5]

## Effects on Lactation and Breastmilk

Narcotics can increase serum prolactin.[7,8] However, the prolactin level in a mother with established lactation may not affect her ability to breastfeed.

A national survey of women and their infants from late pregnancy through 12 months postpartum compared the time of lactogenesis II in mothers who did and did not receive pain medication during labor. Categories of medication were spinal or epidural only, spinal or epidural plus another medication, and other pain medication only. Women who received medications from any of the categories had about twice the risk of having delayed lactogenesis II (>72 hours) compared to women who received no labor pain medication.[9]

A nonrandomized convenience sample of women who did (n = 209) or did not (n = 157) receive epidural analgesia during labor was analyzed to determine whether epidurals affected the onset of lactation. Although not standardized, the typical procedure used sufentanil 10 to 15 mg together with either ropivacaine 0.1% or levobupivacaine 0.0625% epidurally, supplemented by epidural boluses of ropivacaine 0.1% or levobupivacaine 0.0625% about every 2 hours. No difference was found in the time of lactation onset between the two groups. Although women in both groups stated they wished to breastfeed prior to delivery, exclusive breastfeeding at 20 days postpartum was less frequent in the women who received an epidural (43%) than in women who did not (57%).[10]

In a study in China, women with a scheduled cesarean section were randomized to receive intravenous patient-controlled analgesia with either sufentanil or tramadol. Postpartum prolactin levels were higher in the tramadol group (348 mcg/L) than in the sufentanil group (314 mcg/L). The onset of lactation was sooner in the tramadol group (21.4 hours) than in the sufentanil group (25.1 hours). Both of these difference were statistically significant.[11] Note that injectable tramadol is not available in the U.S.

A study of 169 pregnant women randomized them to receive one of three solutions as epidural anesthesia during labor. Bupivacaine 0.1% or 0.125% was combined with sufentanil 5 mcg and bupivacaine 0.1% was combined with sufentanil 10 mcg, each in 15 mL. No difference in average LATCH score was found among the infants in the 3 groups.[12]

A retrospective medical record study in China compared women who received patient-controlled epidural analgesia during labor (n = 527) to those who did not (n = 395). Epidural analgesia included 0.1% levobupivacaine and 5 mg of sufentanil in 10 mL of saline. All women completed a questionnaire regarding their breastfeeding experience at 6 months postpartum. There were no statistically significant differences between the groups in the proportion who initiated breastfeeding within 1 hour after birth or who exclusively or partially breastfed their infants at 1, 3, or 6 months postpartum.[13]

An observational study in Sweden compared nursing behaviors of the infants of mothers who received intravenous oxytocin or intramuscular oxytocin with or without receiving epidural analgesia with sufentanil and bupivacaine. Infants of mothers who received oxytocin infusions alone during labor breastfed as well as those of mothers who had no interventions during labor. Mothers who received oxytocin plus epidural analgesia had reduced breastfeeding behaviors and more weight loss at 2 days postpartum than those who did not receive epidural analgesia. The mothers of infants who breastfed well had greater variability in serum oxytocin than those whose infants did not breastfeed well.[14]

A study in China compared an epidural infusion of ropivacaine 700 mcg/hour (n = 76) to sufentanil 1.75 mcg/hour plus ropivacaine 700 mcg/hour (n = 81) during normal vaginal delivery. The combined ropivacaine and sufentanil provided better pain control than ropivacaine alone. Onset of lactation was shorter and lactation adequacy (milk volume) was better in the combined group than in the ropivacaine-only group.[15]

A study of women with gestational diabetes undergoing elective cesarean section randomized them to postoperative patient-controlled analgesia with either intravenous esketamine 0.5 mg/kg, sufentanil 150 mcg and ondansetron 4 mg (n = 70) or sufentanil and ondansetron alone in the same doses (n = 70). There was no difference between the groups in the time to first lactation, with most beginning at 24 to 48 hours after delivery.[16]

A study compared two postoperative analgesia methods (transverse abdominal plane block followed by patient-controlled intravenous analgesia containing either 50 or 100 mcg/100 mL of sufentanil. The serum prolactin was higher after cesarean section in the low-dose group, the time to first colostrum was slightly shorter, and the volume of milk at 48 hours was slightly greater in the low dose group.[17]

A randomized study in women receiving a cesarean section compared postoperative patient-controlled analgesia with hydromorphone 0.2 mg/kg to sufentanil 2 mcg/kg. Both regimens included intravenous palonosetron 4 mcg/kg. The hydromorphone group had higher breastfeeding satisfaction at 72 hours postpartum. The frequency of dizziness and drowsiness within 48 hours also was lower in the hydromorphone group.[18]

## Alternate Drugs to Consider

Acetaminophen, Butorphanol, Fentanyl, Hydromorphone, Ibuprofen, Morphine

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# Substance Identification

## Substance Name

Sufentanil

## CAS Registry Number

56030-54-7

## Drug Class

Breast Feeding

Lactation

Milk, Human

Analgesics, Opioid

Narcotics

Anesthetics, Intravenous

Opiates