

Epidurals for labor pain

by Henci Goer

What is an epidural?

An epidural is a procedure that stops pain by injecting an anesthetic similar to the type that dentists use. The anesthetic bathes the lower spinal cord and prevents transmission of pain signals. A labor epidural numbs you from your belly button down. Epidurals for cesarean sections are stronger and reach to your breastbone. An epidural also interferes with the ability to move your legs and with certain autonomic nervous system functions such as sweating.

To prepare you for an epidural, nurses start an I.V. and administer about a quart of fluid. This is intended to prevent a fall in blood pressure, but low blood pressure continues to be the epidural's most common, potentially serious side effect. Nurses apply a blood pressure cuff so that your blood pressure can be closely monitored. In many hospitals the cuff periodically inflates and records your pulse and blood pressure automatically. An epidural also requires continuous electronic fetal monitoring to pick up any epidural-caused problems with the baby's heart rate. Finally, you either sit up on the side of the bed or lie on your side while your back is washed with antiseptic and covered with a sterile drape.

For the actual procedure, you arch your back like a "mad cat" or a rainbow. The anesthesiologist numbs the skin a little above waist level with local anesthetic and pushes a large needle through the ligament that connects two spinal vertebrae. You must hold absolutely still while the needle is in your back even if you have a contraction, and you will probably have one or two during this part of the procedure. Feeling carefully for the loss of resistance, the anesthesiologist guides the needle into the epidural space. This space lies beneath the ligament and outward of the two membranes that cover the spinal cord. The anesthesiologist performs one or more tests to check that the needle has neither pierced a blood vessel nor gone below the epidural space, problems that can cause life-threatening complications.

These tests may include pulling back on the plunger of the syringe to see if blood flows in, injecting a small dose of anesthetic and asking if you experience certain symptoms, or injecting a dose of adrenalin (epinephrine), which is supposed to increase pulse rate if the needle is in a blood vessel. If all seems well, the anesthesiologist will thread a tiny, flexible, plastic catheter through the needle, withdraw the needle and inject the full dose of medication. The catheter will be looped and taped to your back to keep it from shifting position. None of these precautions is failsafe.

To maintain anesthesia, the anesthesiologist may connect the catheter to a syringe and place the syringe in a pump that slowly depresses the plunger (continuous infusion). This delivers a continuous dose. Alternatively, the anesthesiologist may cap the catheter and return to inject more anesthetic at intervals or when you complain of returning pain (periodic top-ups).

Ideally you will feel no pain, but have some control over your legs. Anesthesiologists may reduce the anesthetic concentration when you approach full cervical dilation so that again, ideally, you remain comfortable but have enough sensation to push effectively.

The procedure can easily take over an hour from the time you request the epidural to the time the anesthetic takes effect. It can take longer if the anesthesiologist isn't readily available when you ask. The period during which you must hold still generally lasts five to ten minutes.

Some variations of the basic epidural are:

Narcotic-epidural -- It has become common to replace some of the anesthetic with a narcotic in an effort to obtain equally good pain relief while reducing some of the adverse effects of the anesthetic. A variation is to start with pure narcotic and move to a mixture when you desire stronger pain relief. The administration procedure is the same.

Walking epidural -- With the so-called “walking epidural,” the anesthesiologist either injects narcotic only or injects an ultra-low dose of anesthetic or anesthetic mixed with narcotic. With pure narcotic, you can, indeed, walk. With anesthetic, walking requires care and assistance. Despite feeling normal, the epidural still affects muscle strength, your ability to sense your balance and your reaction time to correct imbalance. Also, many women find pain relief to be inadequate (3).

Combined spinal-epidural -- With a combined spinal-epidural, the anesthesiologist injects an initial dose of narcotic or anesthetic beneath the outermost membrane covering the spinal cord and inward of the epidural space (intrathecaly). He or she then pulls back into the epidural space, threads a catheter through the needle and withdraws the needle, leaving the catheter in the epidural space. Intrathecal injection isn’t repeated, so this technique allows you to have a regular epidural should you want additional pain medication later. If, as is more common, the spinal injection is narcotic, you will get some, but not complete pain relief, but unlike the epidural, you will still have complete mobility.

Why might you want an epidural?

It abolishes pain. It is the only pain relief method that can do this. That being said, epidurals fail to take only on one side, or leave “windows” in about five to ten percent of cases (6,11,29). Note: Having a continuous delivery system provides more even pain relief than having the anesthesiologist come in to inject more medication into the catheter at intervals or when pain returns.

It abolishes pain without affecting consciousness. Epidurals leave you awake and aware. Narcotics leave you feeling fuzzy-headed, drowsy, or a little drunk.

It allows you to rest or sleep. This can be a benefit in long or difficult labors.

It may help a labor where progress in dilation has stopped in the active phase. Usually, epidurals slow labor down. Occasionally though, they help labors that have gotten “stuck” probably by inducing profound relaxation. An epidural is certainly worth trying before going to a cesarean.

What are the potential drawbacks or problems with an epidural?

Evaluating the adverse effects of epidurals is difficult for the following reasons:

Women in the comparison group have almost always had some drug (Pitocin, narcotic, a different type of epidural), procedure (I.V., rupture of membranes), or restriction (confinement to bed, nothing by mouth) that could also affect them, their babies, or the labor pattern

Every variation in drug or drug combination, dosage and procedure, could affect mothers, babies and the labor differently, but *none* have undergone scrutiny before becoming widely used.

As a general principle, the incidence of adverse effects goes up when mixing different types of medication, as when a woman starts with injected narcotic and later decides on an epidural. However, in the case of epidurals, this hasn't been investigated either.

Even so, here is what we know about the downside of epidurals:

Delay in obtaining relief -- It can easily take an hour between the time you request an epidural to the time it takes effect ... and that's if the anesthesiologist is readily available.

Changes the psychological experience of labor -- It converts labor and birth from a natural, normal experience in which you are an active agent to one in which the equipment (I.V., Pitocin pump, epidural pump, electronic fetal monitor, blood pressure cuff, etc.) takes center stage.

Requires an I.V. and continuous electronic fetal monitoring -- It also frequently requires Pitocin and bladder catheterization. These procedures have their own potential adverse effects.

Slows labor -- This leads to more vaginal instrumental deliveries and episiotomies and it can lead to more cesareans, especially if the epidural is given early (28). These procedures also can harm mother or baby.

Fever -- Fever becomes more likely the longer the epidural is in place (28). In one study, 15 percent of women who had epidurals ran fevers versus one percent of women who didn't have them (16). Among women who had epidurals, seven percent of women with epidurals whose labors lasted six or fewer hours ran fevers rising to more than one-third of women whose labors lasted over eighteen hours.

Because fever is a symptom of infection, babies of mothers who run fevers will likely be subjected to a septic work-up, (multiple blood tests and a spinal tap) kept in the nursery for observation and possibly given preventative I.V. antibiotics until cultures come back negative. In this same study, newborns whose mothers had epidurals were over three times more likely (34 percent versus 10 percent) to have septic workups and four times more likely (15 percent versus 4 percent) to have antibiotic treatment.

Some studies suggest epidurals are associated not just with fever, but with actual newborn infection. In a study of over 3,000 women, less than one woman in five had an epidural, but nearly three-quarters of the 18 infants with potentially serious infections had mothers who had epidurals (13). Another study found that epidurals were associated with fever in labor but only when there was also placental inflammation, an indicator of infection (10). Epidurals could increase the risk of newborn infection by prolonging labor. Prolonged labor with ruptured membranes increases the risk of infection because women are more likely to have multiple vaginal exams, internal electronic fetal monitoring, and possibly a cesarean section..

Epidural fevers are also associated with newborn problems not related to infection (17). A study found that among newborns whose mothers ran fevers over 101 degrees F during labor, 11.5 percent versus 3 percent required resuscitation, 8 percent versus 1 percent needed oxygen therapy in the nursery, and 5 percent versus 0.5 percent were limp and weak at birth (hypotonia). Ninety-eight percent of women who ran temperatures over 100.4 degrees F had epidurals. Newborns were also much more likely to have a seizure (2 out of 61 versus 2 out of 1095), but those numbers were too small to draw a conclusion.

Low blood pressure -- This is the most common potentially serious complication of epidurals. To give you an idea of how common, a recent study reported that one woman in five experienced

low blood pressure (hypotension) with two per hundred requiring drug treatment to correct it (22). Hypotension (28) can be particularly dangerous in cases where the baby is already at risk such as when the mother has high blood pressure (pregnancy induced hypertension or preeclampsia), the baby is already experiencing fetal distress, or the baby is premature.

Fetal distress -- About one in ten babies will experience an episode of seriously abnormal heart rate as a result of an epidural (11,26,27). *Note:* Some doctors have argued that epidurals protect babies from fetal distress. By eliminating pain, epidurals lower maternal adrenalin levels, which theoretically reduces the risk of fetal distress. However, no trial in which women were randomly assigned to an epidural or not has found that epidurals benefit babies and as you can see here, several studies have found that epidurals can cause the problem they are supposed to prevent.

Life-threatening complications -- About 1 in 3,000 to 1 in 4,000 women will experience a complication (dangerously low blood pressure, respiratory or cardiac arrest, severe allergic reaction, convulsion) that will require emergency treatment to save them and their baby's lives (8,25).

Temporary problems after the birth -- These can include severe headache, urinary incontinence, muscle weakness or abnormal sensation, or a painful bruise (8,21,24,25). All are rare.

Possible effects on newborn behavior -- We know that epidural anesthetics and narcotics get into the baby's circulation, but we have little data on what effects they might have (18). The few studies that evaluate the newborn use a relatively crude test intended only to detect drug effects on muscle tone. It would miss subtle deficits that would be picked up on tests of behavioral competencies. Even so, the crude test found a difference with one type of narcotic-epidural a day after birth, compared with another type and a plain epidural (18). Of course, all mothers in that study had some type of epidural. We don't know how the babies might have compared with babies whose mothers had no drugs. In any case, by increasing the likelihood of having Pitocin, instrumental delivery, cesarean delivery, and of keeping babies in the nursery for treatment or observation, epidurals also almost certainly have indirect effects on mothers, babies, and their early interactions.

The epidural variations introduce some additional potential problems. The narcotic in a narcotic-epidural can cause itching.

Combined spinal-epidurals have all the drawbacks of narcotic-epidurals plus:

Nausea (7,9,14)

Severe postpartum headache -- Compared with an epidural, the incidence of a particularly vicious and prolonged headache rises from 4 per 1,000 to 4 per 100 (1,4,15,19). Improvements in technique may be reducing this risk (2).

Maternal respiratory depression -- This is due to the narcotic. This complication is reported to occur as often as one in a thousand cases, and it can be life-threatening (12).

How might an epidural affect your birth experience and postpartum recovery?

An epidural is very much a two-edged sword. On the plus side, an epidural can transform what otherwise would be a harrowing experience into a positive one. In some cases, an epidural seems to promote progress in a labor that has gotten "stuck."

On the minus side, by the time you are hooked up to all the equipment and monitoring devices, what was a perfectly normal labor has been transformed into a high-tech event. This has profound consequences for how you view yourself and your labor and how your partner, other support people and medical caregivers perceive you and your labor as well. Because epidurals eliminate pain you lose the endorphin rush at the birth. Because epidurals make you much more a passive recipient of care than an active agent, you lose the "I did it!" sense of personal accomplishment that women having unmedicated childbirth often report. If the epidural results in your having a vacuum extraction, forceps, or cesarean delivery, this is even more likely to be so. Experiencing an epidural complication will, of course, adversely affect your experience of labor, your postpartum recovery, or both, and the more significant the complication, the stronger the effect.

REFERENCES

1. Abouleish E et al. Intrathecal morphine 0.2 mg versus epidural bupivacaine 0.125% or their combination: effects on parturients. *Anesthesiology* 1991;74(4):711-6.
2. Beilin Y. Postdural puncture headache (PDPH) and combined spinal-epidural (CSE). *Anesth Analg* 2000;90:1249-50.
3. Breen TW et al. Epidural anesthesia for labor in an ambulatory patient. *Anesth Analg* 1993;77:919-924.
4. Caldwell LE, Rosen MA, and Shnider SM. Subarachnoid morphine and fentanyl for labor analgesia. Efficacy and adverse effects. *Reg Anesth* 1994;19(1):2-8.
5. Chestnut DH et al. Continuous infusion epidural analgesia during labor: A randomized, double-blind comparison of 0.0625% bupivacaine/0.0002% fentanyl versus 0.125% bupivacaine. *Anesthesiology* 1988;68:754-759
6. Chestnut DH et al. Does early administration of epidural analgesia affect obstetric outcome in nulliparous women who are in spontaneous labor? *Anesthesiology* 1994;80(6):1201-1208.
7. Cohen SE et al. Intrathecal sufentanil for labor analgesia--sensory changes, side effects, and fetal heart rate changes. *Anesth Analg* 1993;77(6):1155-60.
8. Crawford JS. Some maternal complications of epidural analgesia for labour. *Anaesthesia* 1985;40(12):1219-1225.
9. D'Angelo R et al. Intrathecal sufentanil compared to epidural bupivacaine for labor analgesia. *Anesthesiology* 1994;90(6):1209-15.
10. Dashe JS, et al. Epidural analgesia and intrapartum fever: placental findings. *Obstet Gynecol* 1999;93(3):341-4.
11. Eddleston JM et al. Comparison of the maternal and fetal effects associated with intermittent or continuous infusion of extradural analgesia. *Br J Anaesth* 1992;69:154-8.
12. Eisenach JC. Combined spinal-epidural analgesia in obstetrics. *Anesthesiology* 1999; 91(1):299-302.
13. Herbst A, Wolner-Hanssen P, and Ingemarsson I. Risk factors for fever in labor. *Obstet Gynecol* 1995;86:790-794.

14. Honet JE et al. Comparison among intrathecal fentanyl, meperidine, and sufentanil for labor analgesia. *Anesth Analg* 1992;75(5):734-9.
15. Kartawadi L et al. Spinal analgesia during labor with low-dose bupivacaine, sufentanil, and epinephrine. A comparison with epidural analgesia. *Reg Anesth* 1996;21(3):191-6.
16. Lieberman E et al. Epidural analgesia, intrapartum fever, and neonatal sepsis evaluation. *Pediatrics* 1997;99(3):415-9.
17. Lieberman E et al. Intrapartum maternal fever and neonatal outcome. *Pediatrics* 2000;105(1):8-13.
18. Loftus JR, Hill H, and Cohen SE. Placental transfer and neonatal effects of epidural sufentanil and fentanyl administered with bupivacaine during labor. *Anesthesiology* 1995;83:300-8.
19. MacArthur C, Lewis M, and Knox EG. Investigation of long term problems after obstetric epidural anaesthesia. *BMJ* 1992;304:1279-1282.
20. Nageotte MP et al. Epidural analgesia compared with combined spinal-epidural analgesia during labor in nulliparous women. *N Engl J Med* 1997;337:1715-9.
21. Ong BY et al. Paresthesias and motor dysfunction after labor and delivery. *Anesth Analg* 1987;66:18-22.
22. Ramin SM et al. Randomized trial of epidural versus intravenous analgesia during labor. *Obstet Gynecol* 1995;86(5):783-789.
23. Russell R and Reynolds F. Epidural infusion of low-dose bupivacaine and opioid in labour. Does reducing motor block increase the spontaneous delivery rate? *Anaesthesia* 1996;51(3):266-73.
24. Scott DB and Hibbard BM. Serious non-fatal complications associated with extradural block in obstetric practice. *Br J Anaesth* 1990;64:537-541.
25. Scott DB and Tunstall ME. Serious complications associated with epidural/spinal blockade in obstetrics: a two-year prospective study. *Int J Obstet Anesth* 1995;4:133-9.
26. Stavrou C, Hofmeyr GJ, and Boezaart AP. Prolonged fetal bradycardia during epidural analgesia. *S Afr Med J* 1990;77:66-68.
27. Steiger RM and Nageotte MP. Effect of uterine contractility and maternal hypotension on prolonged decelerations after bupivacaine epidural anesthesia. *Am J Obstet Gynecol* 1990;163:808-812
28. Thorp JA. Epidural analgesia during labor. *Clin Obstet Gynecol* 1999;42(4):785-801.
29. Withington DE and Weeks SK. Repeat epidural analgesia and unilateral block. *Can J Anaesth* 1994;41(7):568-571.