Emotional aid delivers labor-saving results

An expectant mother entering a modern hospital collides head-on with high-tech medicine. During labor and delivery, she stands a good chance of getting intravenous infusions, injections of medications that facilitate labor and reduce pain, continuous electrode monitoring of her unborn child and, perhaps, a forceps delivery or a cesarean section.

But a new study demonstrates for the first time in a fully equipped hospital that old-fashioned, one-to-one emotional support throughout labor substantially decreases cesarean-section rates, forceps deliveries, the duration of labor and the use of anesthetics and labor-inducing drugs. Moreover, this low-tech emotional support — provided by women who have already experienced a normal labor — reduces maternal and infant hospital stays following delivery, according to a report in the May 1 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

If U.S. hospitals routinely offered consistent emotional support during labor, using technological interventions as back-ups, annual savings could reach $2 billion, asserts study director John Kennell of Case Western Reserve University in Cleveland.

Kennell's team studied 616 women, aged 13 to 34, undergoing labor and delivery at a public hospital in Houston. The women had full-term, normal pregnancies and no previous children. Most came from poor households and had no husband. Prenatal care ranged from good to nonexistent. Hispanic women made up two-thirds of the sample.

Each of 212 randomly chosen participants received emotional support during labor from one of 11 specially trained women. A female observer recorded medical care offered to another 200 women, but never spoke to the laboring mothers. The remaining "controls" underwent regular hospital procedures.

The researchers refer to the women who provide support as "doulas," a Greek word for an experienced mother who guides a new mother in infant care. Emotional support during labor from female relatives has long characterized many cultures. The doulas, recruited from the local community, spoke English and Spanish. In three weeks of training they learned about normal and abnormal labors, obstetric procedures, hospital policies and support techniques.

From admission through delivery, a doula stayed at her assigned patient's side to provide encouragement, to soothe and touch the woman when necessary and to explain the process of labor and what to expect next. Doulas received an average of $200 per patient.

Eight percent of the emotional-support group required a cesarean section, compared with 13 percent of the observed group and 18 percent of controls. Among women with spontaneous vaginal deliveries, only 8 percent receiving doula support needed anesthesia, compared with 23 percent of the observed group and 55 percent of the controls. Women supported by doulas also needed fewer induced labors and delivered their babies faster. Moreover, fewer of their infants required prolonged hospital stays.

The Houston study highlights the benefits of "hands-on" support during labor, writes Mortimer G. Rosen of Columbia Presbyterian Medical Center in New York City in an accompanying editorial. But he suspects doulas may produce less striking effects in hospitals if patients have had prelabor education, if fathers coach the mothers through delivery, and if hospitals maintain a ratio of one nurse per laboring patient.

Kennell disagrees. Even men who dutifully take Lamaze-type courses often find themselves ill-prepared for the "smells, cries, tears and vomit" encountered at the hospital, he asserts. In an ongoing study of doula care with couples, men express the most enthusiasm for additional emotional support, Kennell says. And sadly, the great demands on nurses usually prevent them from providing continuous support to a woman during labor, he adds. *— B. Bower*

Seismosaurus proteins: Bone of contention

Fossil bones from the longest dinosaur known have yielded proteins that apparently survived intact for 150 million years, geochemists reported last week. If bolstered by future work, this controversial claim could open up new methods for studying the evolutionary relationships of long-extinct animals.

W. Dale Spall and his colleagues at Los Alamos (N.M.) National Laboratory chemically extracted the proteins from the vertebra of an enormous sauropod dinosaur — with an estimated length of 160 feet — excavated in central New Mexico. The record-breaking animal, unofficially dubbed seismosaurus, or "earth shaker," lived in the late Jurassic period, making these by far the oldest known proteins, says Spall, who described his team's work at a Geological Society of America meeting in Albuquerque.

Other researchers argue that the proteins may hail from much more recent times. "Perhaps [Spall and his coworkers] have proteins there, but there are proteins everywhere. They are easy to contaminate. You have them in your thumbprints and they exist in groundwater, wherever organisms can exist," says P. Edgar Hare, a geochemist with the Carnegie Institute of Washington (D.C.).

The Los Alamos team drilled a core out of the huge vertebra and used solvents to strip away the mineralized portion. High-pressure liquid chromatography revealed two or perhaps three proteins within the sample, they report.

The researchers did not extract enough material to identify the proteins they found, but they say their analysis of the amino acids in the molecules indicates the proteins are not collagen, the most abundant protein in bone.

Chemists have long wondered whether fossils might contain ancient biological molecules, but only recently have they developed sophisticated techniques that can analyze the very small samples extracted from bone. While researchers have identified free amino acids in animal fossils dating back several hundred million years, Spall says most investigators assume that proteins — made from chains of amino acids — cannot remain intact for many millions of years.

At the outset, he says, "I didn't think we'd find anything." But the bones appeared exceptionally well preserved, perhaps explaining why the proteins survived. He and his colleagues have collected more seismosaurus bone samples, hoping to sequence and identify the proteins. They also plan to perform an amino acid analysis that can reveal whether the proteins are truly ancient.

Spall says their techniques for sampling and analysis avoid obvious contamination from human contact, but he adds that protein from groundwater may have seeped in while the fossil lay encased in sandstone for 150 million years. If so, he says, the isolated proteins would not belong to the dinosaur.

Stephen A. Macko, a geochemist at the University of Virginia in Charlottesville, raises another potential problem. He suggests that the material extracted by Spall might not be protein at all, but rather a nonbiological molecule that contains amino acids. "Further characterization of the material by other techniques should be in order before calling it a protein," says Macko, who recently helped isolate potential protein remnants from 66-million-year-old dinosaurs.

The oldest proteins generally accepted by scientists date back only 1 or 2 million years, Hare says. But if investigators can isolate proteins belonging to much more ancient animals, they can use amino acid sequences to reinterpret relationships among species. For instance, scientists might compare bone proteins from dinosaurs, birds and reptiles to determine how closely these groups cluster on the tree of life. "Using a biochemical point of view to look at how organisms evolved would be a very powerful approach for interpreting the fossil record," Macko says. *— R. Monastersky*