MEDICINE

Unborn Baby's Heart Rate

A new electrocardiograph that enables doctors to check fetal hearts accurately will help make childbirth safer for both mother and baby—By Faye Marley

➤ WHETHER OR NOT a baby's heart rate is normal should be determined before he is born. The most accurate way is with a new electrocardiograph that is inserted direct to the baby inside the womb.

From the time a doctor's stethoscope picked out the sound of the unborn infant's heart 100 years ago, obstetricians have been trying to find better ways to separate the heart sound of the baby from that of his mother.

Amplifiers and ordinary electrocardiographs with electrodes on the mother's abdomen, have been used at George Washington University, Washington, D. C. These have been about 90% satisfactory in detecting infant heartbeats and the presence of twins as early as the 19th week of pregnancy.

The new fetal heart rate monitor was patented by a team of doctors at Indiana University Medical Center, Indianapolis.

Dr. Suzanne Knoebel, one of the inventors, told SCIENCE SERVICE that its use showed whether or not a baby could be born normally, or whether a cesarean birth was needed to save its life.

"We use the monitor on babies whose mothers show signs of abnormality," Dr. Knoebel said. "The monitor is a research tool that eliminates interfering sounds."

Others who collaborated in developing the instrument were Dr. Robert J. Braunlin, now of Fort Wayne, Ind., who was a graduate engineer before he took up medical training, Dr. Charles A. Hunter Jr. and Dr. Kenneth G. Lansford.

Dr. Braunlin said that no plans for commercial production have been worked out, and that only a few of the monitors have been made. The cost is $2,685 each.

Research is going on with animals that could lead to a method of controlling the blood pressure of an unborn baby, which is not now possible.

For example, Dr. A. Stark Wolkoff of the University of North Carolina School of Medicine, Chapel Hill, is working with sheep, under a five-year grant from the National Institute of Child Health and Human Development, Bethesda, Md. He selected sheep for his study because the weight of a newborn lamb and a baby are somewhat similar, between eight and ten pounds. In the first two years of research he found that the animal's fetus can control the acidity of its blood by using the placenta as its lungs and kidneys.

The aim of this research, as well as that with the fetal heart rate monitor, is to make childbirth safer for the baby as well as for the mother. About 162,000 babies die at birth, or soon after, in the United States each year.

In addition, about 250,000 survive but are handicapped by birth defects. Thirty-five of the recognizable defects are congenital heart malformation, but 17 of them can be cured or improved by operations unknown until a few years ago.

Scientists are still trying to solve the problems of heredity, of viruses and of interference in the environment of the uterine world where babies grow. In the meantime, obstetricians and family doctors are advised to keep track of the baby's heart beat with available instruments. The stethoscope is still used by most doctors for this purpose.

Family doctors deliver at least 70% of the infants born annually in the United States, and Dr. Joseph B. Forman of the Yale University Medical School told the meeting of the American Academy of General Practice this week at Atlantic City that constant vigilance is necessary in monitoring the fetal heart.

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Veterans Administration

DEADLY SPIDER—This common brown spider, Loxoscleles reclusus, found from Kansas to the Gulf Coast and from Tennessee to Oklahoma, is highly poisonous and potentially more dangerous than the Black Widow. A little smaller than the Black Widow, it is distinguished by a dark spot on its head shaped like a violin *(see p. 256).*

NEUROLOGY

Brain 'Information Officer'

➤ THE RIDGE of the human brain called the hippocampus seems to be an "information officer" that presides over the complex process of memory and determines how the brain handles information.

This theory has been reported by Dr. W. Ross Adey, of the brain research institute at the University of California at Los Angeles. His research has made possible recent advances in the understanding of the mechanisms by which the brain stores and retrieves information.

The hippocampus is not thought of as a memory center. Its function probably is to put the stamp of approval on what information is to be stored, determine how and where information is to be filed in other brain structures, and decide when it is to be recalled.

Its "palisade" arrangement of nerve cells and its relation to other brain structures, would make the hippocampus suitable for such functions. It has been little modified by evolution and is remarkably similar in such widely diverse mammalian species as porpoises and man.

Experiments have shown that when the hippocampus is interfered with, recent memory and ability to learn new things are impaired. The hippocampus probably is concerned with the focused attention necessary for "laying down a memory trace."

Evidence suggests that brain cell activity may involve a parallel system consisting of two reactions. One is detected as bursts of fast, pulse-coded electricity from individual brain cells. The other is a general slow, brain-wave phenomenon, independent of pulse-coded firing of individual cells. The hippocampus then may be the pacemaker for the slow-wave events in brain tissue.

Memory traces may be laid down very widely through the brain in characteristic patterns of particular brain waves. This is suggested by experiments in which animals learn to perform a particular task. Recall then might be related to a "best-fit" concept, during reappearance of a particular wave pattern to which a cell had become sensitive.

Dr. Adey and his associates have demonstrated that the supporting tissue of the brain, known as neuroglia, may also have an intimate role in the memory process. They have seen changes in the resistance, or impedance, of brain tissue in relation to learning, and suggest that such changes arise in these peculiar cells.

The chemistry of the process may involve changes in the architecture of the boundaries, or interfaces, of the two types of brain cells—neuroglia and neurones. These changes would alter the traffic flow of charged particles (ions) of sodium and potassium across the boundaries.

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